Asymmetric Partial Adjustment toward Target Leverage: International Evidence

Viet Dang, Ian Garrett, and Cuong Nguyen*

Abstract

Examining the roles of costs of deviations from target leverage and costs of leverage adjustments, we find that firms in France, Germany, Japan, the UK, and the US asymmetrically adjust toward their target leverage. Firms' adjustment speeds depend on their deviations from target leverage and financing gaps. Specifically, firms that have a financing deficit and are over-levered have the fastest adjustment speeds. Further, firms that tend to adjust more quickly toward target leverage have lower profitability and growth opportunities, fewer tangible assets and are smaller in size. Our results are consistent with the dynamic trade-off theory of capital structure.

* Viet Dang, Vietanh.Dang@mbs.ac.uk, Manchester Business School, University of Manchester, M15 6PB, UK; Ian Garret, Ian.Garret@mbs.ac.uk, Manchester Business School, University of Manchester, M15 6PB, UK; Cuong Nguyen, Cuong.Nguyen@postgrad.mbs.ac.uk, Manchester Business School, University of Manchester, M15 6PB, UK. We would like to thank Arif Khurshed, Maria Marchica, Roberto Mura, David Smith (FMA Asian Conference discussant), Norman Strong and Martin Walker for helpful comments and suggestions on earlier drafts of this paper. Any remaining errors are our own.

I. Introduction

Recent themes in the capital structure literature have been whether firms have target leverage levels as well as the extent to, and the rate at which they adjust their leverage toward these levels (see Fama and French (2002), Flannery and Rangan (2006), Antoniou, Guney, and Paudyal (2008), Huang and Ritter (2009), among others). Testing the trade-off theory, which states that firms reach their optimal levels of leverage at the point at which marginal costs of debt financing (e.g., financial distress costs and agency costs) equal its marginal benefits (e.g., interest tax shields), these studies find that firms do not adjust their leverage toward their target in a continuous manner. Rather, as guided by the trade-off theory, they undertake partial adjustment due to the presence of costs arising from deviations from target leverage and costs associated with adjusting toward such targets (e.g., Flannery and Rangan (2006)). In this paper, we aim to provide evidence for firms' asymmetric adjustments toward their target leverage through a cross-country empirical study that allows both of these costs to be considered.

There are two main motivations for this paper. First, most previous studies tend to assume that firms undertake leverage adjustments at a homogenous rate.[1] However, recent research argues that costs of deviations from target leverage are relatively higher when firms are over-levered (i.e., with above-target leverage) than when they are under-levered (i.e., with below-target leverage), suggesting over-levered firms possibly have more incentives or are

[1] For example, Flannery and Rangan (2006) report a rather quick adjustment speed for US firms, with about one third of the deviations from target leverage filled within one year. This is economically much faster than the 7-17% range documented by Fama and French (2002). Largely consistent with Flannery and Rangan (2006), Lemmon et al. (2008) also find that on average, firms move toward their target leverage at the speed of around 25% per annum. Such apparent inconsistency could result from differences in the choice of data, model specifications, and/or econometric methods used (see Flannery and Hankins (2010) for a review).

under greater pressures to adjust toward target leverage than their under-levered counterparts (Byoun (2008)).

Byoun (2008) further suggests that deviations from target leverage alone may not fully explain firms' target adjustment behavior since the presence of financing gaps also provides them with a convenient time to move toward their target leverage at low adjustment costs. This is largely consistent with the cash flow realization argument of Faulkender, Flannery, Hankins, and Smith (2010) that there may be significant sunk costs associated with large financing gaps which then reduce adjustment costs and translate to quicker adjustment. Additionally, we argue that in the presence of a financing deficit, firms tend to either have more incentives or be under greater pressures to move toward target leverage than when they experience a financing surplus which should then make them relatively more relaxed. In sum, it is expected that firms' adjustment path toward target leverage is asymmetric, depending on whether they are under- or over-levered and/or whether they have a financing surplus or deficit.

Second, recent international studies of capital structure show that the financial orientation of the economy in which firms operate has a significant impact on the sources of financing available to them and hence their target adjustment behavior (Antoniou et al. (2008), Mahajan and Tartaroglu (2008), De Jong, Kabir, and Nguyen (2008)). Antoniou et al. (2008) further show that firms' adjustments toward target leverage are also dependent on the macroeconomic system. For example, more creditor-friendly bankruptcy laws, higher levels of ownership concentration, and closer relationships between firms and their banks may lead to firms' relative preference for debt financing among firms in bank-oriented economies. However, this strand of research remains silent on how firms' adjustment speeds may be asymmetrically determined by costs of deviations from target leverage and costs of adjustment toward such targets.

In this paper, we bring these two recent strands of the literature together and examine whether firms' target adjustment behavior varies not only asymmetrically, depending on whether they have a financing surplus or deficit and/or whether they are over or under-levered but also whether it varies across different macroeconomic systems. In particular, we examine the capital structure decisions of firms in five countries - France, Germany, Japan (bank-oriented economies) and the UK and the US (market-oriented economies) using asymmetric partial adjustment models of leverage that take into account costs of deviations from target leverage and adjustment costs. The integration of these two strands of research will enable us to duly consider the most relevant determinants of firms' target adjustment behavior.

In addition, we investigate several firm-specific characteristics that proxy for costs of deviations from target leverage and adjustment costs, which affect firms' target adjustment behavior. Specifically, we allow for firms with differences in profitability, growth opportunities, asset tangibility, and firm size to have asymmetric adjustment toward target leverage (Drobetz, Pensa, and Wanzenried (2006) and Flannery and Hankins (2007)). For instance, profitable firms are likely to have relatively slower adjustment speeds because they tend to be relatively less levered and concerned about deviations from their target leverage as their profitability allows them to meet their debt obligations better. On the other hand, firms with low growth, low asset tangibility, and small firm size may face higher costs of deviations from target leverage and/or lower adjustment costs, thus possibly experiencing faster adjustment speeds than those with high growth, high asset tangibility, and large size. Our paper can be considered as the first attempt in the current literature to examine the impact of these variables on firms' target adjustment behavior.

Using Blundell and Bond's (1998) system GMM estimator to consistently estimate two-stage asymmetric partial adjustment models, we find evidence that firms move toward their target leverage reasonably fast, with the speed of adjustment coefficients ranging from

0.392 (Japanese firms) to 0.509 (French firms).[2] Importantly, we find an asymmetric pattern in firms' adjustment speeds. When firms are over-levered, their estimated speed of adjustment coefficients range from 0.357 (Japanese firms) to 0.572 (French firms). However, when they are under-levered, these speeds range from 0.337 (US firms) to 0.469 (French firms). This finding is consistent with previous US evidence that over-levered firms have relatively more reason to be worried about deviations from their target leverage due to financial distress and bankruptcy costs as well as covenant restrictions while under-levered firms tend to be relatively more relaxed with their target adjustment decisions (Byoun (2008), Faulkender et al. (2010), among others).

There is also evidence that firms with a financing deficit tend to move toward their target leverage faster than those with a financing surplus. While adjustment costs are relatively lower in the case of large financing gaps (Faulkender et al., 2010), firms with a financing deficit will have more incentives to visit capital markets to cover their financing gaps than in the presence of a financing surplus since sunk costs are likely to be more significant in that case. This is so because they are likely to have more incentives to undertake their investment opportunities through issues of new debt or equity, thus leaving relatively more room for them to get back to their target faster through adjusting the mix of debt and equity. The presence of above-target leverage makes its impact even more pronounced. Contrary to Byoun's (2008) evidence for US firms, we find that adjustment speeds are fastest when firms have both a financing deficit and above-target leverage (from 0.593 (Japanese

[2] Our two-stage models involve estimating target leverage in the first stage and estimating the speeds of adjustment in the second (see Section II for details). Previous research estimates two-stage partial adjustment models using the OLS or fixed-effects estimators (e.g., Byoun (2008)), which are likely to produce biased coefficients in short dynamic panels with firm fixed effects. Hence, our paper is the first in the literature to adopt an appropriate estimator to estimate the speed of adjustment in two-stage models.

firms) to 0.797 (German firms)) and lowest when they experience both a financing surplus and below-target leverage.

Using firms' characteristics as potential proxies for leverage adjustment costs, we find that firms with low profitability, low growth, low asset tangibility and small firm size have faster adjustment speeds than those with the opposite characteristics. Further, we find that these characteristics tend to affect firms' adjustment speeds more (less) significantly in the presence of a financing surplus and/or below-target leverage (a financing deficit and/or above-target leverage). These findings provide further evidence for firms' asymmetric adjustment toward target leverage and have important implications about the relative importance of the determinants of firms' adjustment paths toward their target leverage.

The remaining of the paper proceeds as follows. Section II presents the empirical models and methodology. Section III describes our data and sample selection. Section IV interprets the empirical findings. Section V offers some concluding remarks.

II. Empirical Models and Methodology

A. A Symmetric Partial Adjustment Model of Leverage

When firms adjust their leverage toward their targets, they need to take into account two major kinds of costs - costs of deviations from target leverage and adjustments costs. Their goal is to minimize the sum of these costs. Assuming that these costs are both quadratic and additive, the total costs related to leverage adjustments can be expressed as:

(1) $$C_t = a\left(D_{it}^* - D_{it-1}\right)^2 + b\left(D_{it} - D_{it-1}\right)^2,$$

where C_t is the total costs of leverage adjustments; D_{it}^* is the unobserved target leverage ratio; and D_{it} and D_{it-1} are the leverage ratios for firm *i* at time *t* and *t*–1, respectively. Here, we measure D_{it} using market leverage, which is the ratio of the book value of total debt to the sum of the market value of equity (firms' market capitalization) plus the book value of total debt.[3] a and b are the respective weights on the costs of deviations from target leverage and adjustment costs. To minimize C_t with respect to D_{it}, we derive the first-order derivative and set it equal to 0, as follows:

(2)
$$\frac{\partial C_{it}}{\partial D_{it}} = 2a\left(D_{it}^{*} - D_{it-1}\right) - 2b\left(D_{it} - D_{it-1}\right) = 0,$$

or
$$D_{it} - D_{it-1} = \frac{a}{(a+b)}\left(D_{it}^{*} - D_{it-1}\right),$$

which can be written as:

(3)
$$D_{it} - D_{it-1} = \lambda\left(D_{it}^{*} - D_{it-1}\right),$$

where $\lambda = a/(a+b)$ represents the proportion of the actual leverage change, $(D_{it} - D_{it-1})$, to the desired movement toward target change, $\left(D_{it}^{*} - D_{it-1}\right)$. Adding a constant and an error component, u_{it} to Equation (3), we obtain the standard partial adjustment model of leverage:

(4)
$$D_{it} - D_{it-1} = \alpha + \lambda\left(D_{it}^{*} - D_{it-1}\right) + u_{it},$$

or, more compactly,

(5)
$$\Delta D_{it} = \alpha + \lambda Dev_{it} + u_{it},$$

where $Dev_{it} = D_{it}^{*} - D_{it-1}$. Note that in Equation (5), firms seek to partially close out deviations from target leverage over time in a symmetric manner, at a homogeneous speed of adjustment, λ. By definition, λ is expected to lie between 0 and 1 with a higher value indicating a higher speed of adjustment.

[3] In unreported robustness checks, we also consider book leverage, which is the ratio of the book value of total debt to the book value of total assets and obtain qualitatively similar results.

In Equation (5), D_{it}^{*} denotes the target leverage ratio that is unobserved but can be specified as a function of firms' characteristics, as follows:

(6) $$\hat{D}_{it}^{*} = \hat{\beta}' \mathbf{x}_{it},$$

where $\hat{\beta}'$ is a vector of the parameters estimated from a fixed-effects regression of leverage on a vector of its determinants, $\mathbf{x}_{it}$:

(7) $$D_{it} = \beta' \mathbf{x}_{it} + \varepsilon_{it}.$$

Here, we follow the literature (e.g. Antoniou et al. (2008)) and include in $\mathbf{x}_{it}$ the following independent variables: profitability, growth opportunities, asset tangibility, firm size, effective tax rates, earnings volatility, dividend payouts, non-debt tax shields, and share price performance. ε_{it} is an error component that includes firm fixed effects and an *i.i.d.* error term. The firm fixed effects control for time-invariant unobservables, thus helping avoid the situation in which their effects vary systematically across firms and hence lead to biased coefficient estimates and standard errors (Peterson (2005)).

In what follows, we briefly discuss the expected relations between the independent variables and target leverage.

Profitability. Both the pecking-order theory (Myers and Majluf (1984) and Myers (1993)) and the dynamic trade-off theory (Strebulaev (2007)) suggest a negative relation between firms' profitability and leverage. Rajan and Zingales (1995), Antoniou et al. (2008), De Jong et al. (2008), among others document international empirical evidence in support of this view. On the contrary, the agency theory states that since agency costs increase with free cash flow (Jensen (1986)), profitable firms should be more levered to alleviate these costs.

Growth opportunities. The free cash flow hypothesis states that low-growth firms should employ more leverage to mitigate the free cash flow problem (Jensen (1986)). Meanwhile, the debt overhang problem suggests that high-growth firms should use less leverage to mitigate managers' underinvestment incentives (Myers (1977)). In addition, as these firms are likely to experience more information asymmetries, they may have less access to debt markets. Such a negative relation has been empirically supported by Antoniou et al. (2008) and De Jong et al. (2008). On the contrary, in the spirit of the pecking order theory, as internal financing may be insufficient for firms to finance their growth opportunities, high-growth firms may be relatively more levered.

Asset tangibility. As suggested by Jensen and Meckling (1976), better collaterals are likely to alleviate agency costs of debt since they may reduce the problem of asset substitution, thus allowing firms to depend more on leverage. The trade-off theory therefore proposes a positive relation between these and firms' leverage. De Jong et al. (2008), Antoniou et al. (2008), among others report strong empirical evidence to support this view.

Firm size. Since a large firm size tends to be associated with lower financial distress costs and fewer information asymmetries i.e., more stable asset bases and better transparency, big firms are likely to employ more leverage, as suggested by the trade-off theory (Jensen and Meckling (1976)). Mao (2003), Flannery and Rangan (2006), Antoniou et al. (2008), and De Jong et al. (2008) find empirical evidence in line with that argument.

Effective tax rates. The trade-off theory suggests that the presence of tax benefits of debt financing encourages firms to depend relatively more on leverage (Miller and Scholes (1978)). However, both Antoniou et al. (2008) and De Jong et al. (2008) do not find evidence in favor of that suggestion.

Dividend payouts. In the spirit of the free cash flow hypothesis, dividend and debt can be used as substitutes for reducing the free cash flow agency problem. Hence, dividend and leverage may be inversely related (Jensen and Meckling (1976)). There has been contradictory empirical evidence on the impact of this variable. Rozeff (1982) and Antoniou et al. (2008) find that US firms' dividend payout ratios are negatively correlated with their leverage due to both agency and transaction costs. In contrast, Chang and Rhee (1990) find a positive relation between them when dividend tax rates are higher than those on capital gains.

Non-debt tax shields. Non-debt tax shields can be substitutes for tax benefits from debt financing, implying firms with higher non-debt tax shields should be relatively less levered (DeAngelo and Masulis (1980)). Antoniou et al. (2008) find empirical evidence in support of such a negative relation among German, Japanese, and UK firms.

Share price performance. The market-timing hypothesis states that firms' capital structures are the cumulative results of their managers' ability to time the equity market i.e. equity issues in times of overvaluation, suggesting a negative relation between firms' share price performance and their leverage (Baker and Wurgler (2002)). Meanwhile, according to the inertia hypothesis (Welch, 2004), firms' market leverage automatically drops when their stocks are performing well. Antoniou et al. (2008) empirically show that following a positive share price movement, firms' leverage falls.

Earnings volatility. According to the trade-off theory, firms with high earnings volatility are more likely to face with higher costs of debt financing and bankruptcy risk due to a relatively higher likelihood of not being able to meet debt obligations which results from the cyclical nature of their earnings (Bradley, Jarrell, and Kim (1984)). Hence, these firms are expected to have less leverage in their balance sheets. However, De Jong et al. (2008) find mixed evidence of its impact on firms' target leverage while Antoniou et al. (2008) find its role not statistically significant.

B. Asymmetric Partial Adjustment Models Conditional on Deviations from Target Leverage

As costs of deviations from target leverage may vary contingent on whether firms are over or under-levered (Byoun (2008)), the assumption by most of previous studies that adjustment speeds should be homogeneous across all firms is irrelevant. Hence, the problem with Equation (4) is that is does not allow costs of deviations from target leverage to vary according to whether firms are over or under-levered. Over-levered firms may face relatively higher costs of deviations from target leverage i.e. financial distress costs than under-levered firms. This is so because they bear a higher possibility of breaching debt covenants when they exist, thus forcing them to revert back to their target leverage faster (Byoun (2008)). Similarly, firms which increase leverage are not likely to face with the same level of adjustment costs as those which reduce it. Specifically, over-levered firms may face lower adjustment costs than under-levered firms since they are likely to revert back to their target leverage levels via debt retirements which are arguably less costly than debt issues. To account for these, the total costs of leverage adjustment, C_t can be accordingly rewritten as:

(8)
$$C_t = a_1\left(D_{it}^* - D_{it-1}\right)^2 \cdot 1\left(D_{it}^* - D_{it-1} < 0\right) + a_2\left(D_{it}^* - D_{it-1}\right)^2 \cdot 1\left(D_{it}^* - D_{it-1} \geq 0\right) +$$
$$b_1\left(D_{it} - D_{it-1}\right)^2 \cdot 1\left(D_{it}^* - D_{it-1} < 0\right) + b_2\left(D_{it} - D_{it-1}\right)^2 \cdot 1\left(D_{it}^* - D_{it-1} \geq 0\right),$$

where $1(\cdot)$ is an indicator function that takes the value 1 if the underlying condition is true and takes the value 0 otherwise. To minimize C_t, we derive the following first-order condition:

(9)
$$\frac{\partial C_{it}}{\partial D_{it}} = 2a_1\left(D_{it}^* - D_{it-1}\right) \cdot 1\left(D_{it}^* - D_{it-1} < 0\right) + 2a_2\left(D_{it}^* - D_{it-1}\right) \cdot 1\left(D_{it}^* - D_{it-1} \geq 0\right) -$$
$$2b_1\left(D_{it} - D_{it-1}\right) \cdot 1\left(D_{it}^* - D_{it-1} < 0\right) - 2b_2\left(D_{it} - D_{it-1}\right) \cdot 1\left(D_{it}^* - D_{it-1} \geq 0\right) = 0,$$

which, after some arrangements, can be written as:

(10)
$$D_{it} - D_{it-1} = \frac{a_1}{\left(a_1 + b_1\right)}\left(D_{it}^* - D_{it-1}\right) \cdot 1\left(D_{it}^* - D_{it-1} < 0\right) + \frac{a_2}{\left(a_2 + b_2\right)}\left(D_{it}^* - D_{it-1}\right) \cdot 1\left(D_{it}^* - D_{it-1} \geq 0\right).$$

Adding a constant and an error component, v_{it} to this equation, we obtain an asymmetric, partial adjustment model, as follows:

(11)
$$D_{it} - D_{it-1} = \alpha_1 + \lambda_1\left(D_{it}^* - D_{it-1}\right)D_{it}^a + \lambda_2\left(D_{it}^* - D_{it-1}\right)D_{it}^b + v_{it},$$

or, more compactly,

(12) $$\Delta D_{it} = \alpha_1 + \lambda_1 Dev_{it} D_{it}^a + \lambda_2 Dev_{it} D_{it}^b + v_{it},$$

where $\lambda_1 = a_1/(a_1+b_1)$ and $\lambda_2 = a_2/(a_2+b_2)$ represent the proportions of the actual leverage change to the desired movement toward target change, conditional on whether firms are over or under-levered. $D_{it}^a = 1(D_{it}^* - D_{it-1} < 0)$ is a dummy variable that takes the value 1 if firms are over-levered and 0 otherwise. $D_{it}^b = 1(D_{it}^* - D_{it-1} \geq 0)$ is a dummy variable that takes the value 1 if firms are under-levered and 0 otherwise.

The two adjustment speeds, λ_1 and λ_2, should be in the 0 - 1 vicinity by definition. Further, as discussed above, over-levered firms should be relatively more concerned about their leverage position due to relatively higher costs of deviations from target leverage and lower adjustment costs. Hence, it is expected that $\lambda_1 > \lambda_2$.

C. Asymmetric Partial Adjustment Models Conditional on Deviations from Target Leverage and Financing Gaps

In the spirit of Byoun (2008) and the cash flow realization argument of Faulkender et al. (2010), firms' financing gaps can tell a lot about their target adjustment behavior since they determine the level of adjustment costs i.e. sunk costs. Specifically, due to the presence of sunk costs associated with large financing gaps, firms with a significant financing deficit or surplus may have faster adjustment speeds toward their target leverage. However, given a large financing deficit, they will be under greater pressure to cover the gap, especially when being under-levered. In contrast, contingent on having a large financing surplus, they will possibly have more incentives to utilize their surplus funding through closing out deviations from target leverage when being over-levered. Following Shyam-Sunder and Myers (1999) and Frank and Goyal (2003), a financing gap (henceforth *FG*) is defined as follows:

(13) $$FG_{it} = DIV_{it} + I_{it} + \Delta W_{it} - OCF_{it},$$

where OCF_{it} stands for operating cash flows after interest and taxes; I_{it} is firms' net investments; ΔW_{it} stands for the change in net working capital; and DIV_{it} represents firms' dividend payments. Equation (13) can be equivalently rewritten as:

$$FG_{it} = NCF_{it} - CDIV_{it} - OSUF_{it}, \tag{14}$$

where NCF_{it} stands for net cash flow - financing; $CDIV_{it}$ is cash dividends; and $OSUF_{it}$ represents other sources/uses - financing. Whenever values on $CDIV_{it}$ and $OSUF_{it}$ are missing, we set them to zero.[4]

Following the derivation of the asymmetric models in Equations (11) - (12), we can derive the following partial adjustment model of leverage, conditional on firms having either a financing surplus or a deficit:

$$\Delta D_{it} = \alpha_2 + \lambda_3 Dev_{it} D_{it}^s + \lambda_4 Dev_{it} D_{it}^d + w_{it}, \tag{15}$$

where D_{it}^s is a dummy variable equal to 1 in case of a financing surplus and 0 otherwise for firm *i* at time *t*. D_{it}^d is a dummy variable equal to 1 in case of a financing deficit and 0 otherwise for firm *i* at time *t*. Our hypothesis here is that when firms experience a financing deficit, they will have relatively more incentives to visit capital markets i.e. to either issue new debt or equity to finance their growth opportunities than when they have a financing surplus which should make them relatively more relaxed with their target adjustments. Hence it is likely that $\lambda_3 \geq \lambda_4$.

When we let firms' deviations from target leverage interact with their financing gaps, Equation (15) can be rewritten as:

$$\Delta D_{it} = \alpha_3 + \left(\lambda_5 D_{it}^s + \lambda_6 D_{it}^d\right) Dev_{it} D_{it}^a + \left(\lambda_7 D_{it}^s + \lambda_8 D_{it}^d\right) Dev_{it} D_{it}^b + \xi_{it}. \tag{16}$$

[4] The definition of financing gaps by Equation (14) here is more suitable with *Datastream* data, given its availability and account structure.

A question arising from Equation (16) is that in the presence of both deviations from target leverage and financing gaps, which factor will be relatively more important and therefore needs to be considered first when firms are making their target adjustment decisions? In light of that question, we expect that deviations from target leverage will be generally considered first. In the spirit of the trade-off theory, the sign of deviations from target leverage directly determines how easy it is for firms to access external capital markets as it determines the level of financial distress costs for them. Over-levered firms may therefore find it relatively harder to visit capital markets and vice versa. However, financing gaps only determine whether it is necessary to visit these markets or not. Taking both deviations from target leverage and financing gaps into consideration, it can therefore be reasonably concluded that firms likely experience fastest adjustment speeds when having both above-target leverage and a financing deficit i.e., λ_5 is the highest coefficient.

D. Asymmetric Partial Adjustment Models Conditional on Deviations from Target Leverage, Financing Gaps and Transition Variables

In addition to deviations from target leverage and financing gaps, major determinants of firms' target leverage i.e. profitability, growth opportunities, asset tangibility, and firm size may also have significant impacts on costs of deviations from target leverage and adjustment costs, hence adjustment speeds (Drobetz et al. (2006) and Flannery and Hankins (2007)). For example, in the spirit of the pecking order theory and the dynamic trade-off theory, less profitable firms are likely to be over-levered. In addition, they may also experience a financing deficit. As a result, these firms are likely to be subject to higher costs of deviations from target leverage and relatively lower adjustment costs, thus implying faster adjustment speeds. Meanwhile, firms with fewer tangible assets are likely to move faster toward their target leverage due to higher costs of deviations from target leverage as they will have less value in case of liquidation (Mao (2003) and Flannery and Rangan (2006)). That is almost the same story with small firms. Being subject to higher financial distress costs and more information asymmetries, small firms are likely to experience higher costs of deviations from target leverage.

The story for low-growth firms is somewhat more complicated. As discussed earlier, since low-growth firms tend to employ relatively more leverage to mitigate the free cash flow problem, it is likely that over-levered firms may be relatively more popular among those within this group. Unreported results do support this argument. As a result, low-growth firms may have more concerns about deviations from target leverage which then are translated into faster adjustment speeds. Therefore, if we allow Equations (12), (15), and (16) to interact with these transition variables, they can accordingly be rewritten as:

(17) $$\Delta D_{it} = \gamma_1 + \varphi_1 Dev_{it} D_{it}^{L} + \varphi_2 Dev_{it} D_{it}^{H} + u_{it},$$

(18) $$\Delta D_{it} = \gamma_2 + \left(\phi_1 D_{it}^{L} + \phi_2 D_{it}^{H}\right) Dev_{it} D_{it}^{a} + \left(\phi_3 D_{it}^{L} + \phi_4 D_{it}^{H}\right) Dev_{it} D_{it}^{b} + \upsilon_{it},$$

(19) $$\Delta D_{it} = \gamma_3 + \left(\phi_5 D_{it}^{L} + \phi_6 D_{it}^{H}\right) Dev_{it} D_{it}^{s} + \left(\phi_7 D_{it}^{L} + \phi_8 D_{it}^{H}\right) Dev_{it} D_{it}^{d} + \omega_{it},$$

where D_{it}^{L} is a dummy variable equal to 1 if firm *i* at time *t*–1 has low profitability, low growth, low asset tangibility, or small size, respectively and 0 otherwise.[5] D_{it}^{H} is a dummy variable equal to 1 if firm *i* at time *t*–1 has high profitability, high growth, high asset tangibility, or large size, respectively and 0 otherwise.

[5] We lag these transition variables by one period since firms' fundamentals are reported at the end of the year. Hence, their statuses may affect their leverage decisions in the next accounting period. More importantly, by lagging these variables, we can avoid the situation in which they contemporaneously determine firms' target leverage which then gives rise to the endogeneity problem since firms' estimated target leverage is used to construct the variable of deviations from target leverage Dev_{it} in the second estimation stage.

Profitability. Both the pecking-order theory and the dynamic trade-off theory predict a negative relation between firm's profitability and leverage. This implies that profitable firms tend to be less levered than otherwise. In addition, these firms may also serve their debt obligations better due to more available internal funding. As a result, they are likely to be relatively more relaxed with their target adjustment decisions i.e. experience relatively slower adjustment speeds. On the contrary, as discussed earlier, since low profitability tends to be associated with above-target leverage and a financing deficit, less profitable firms may move toward their target leverage faster when significant sunk costs are likely prominent in the presence of large financing gaps in the spirit of Faulkender et al. (2010).

Growth opportunities. High-growth firms are expected to employ relatively less leverage for the trade-off theory suggests a negative relation between growth opportunities and the level of financial distress costs since high-growth firms are more likely to fail. Moreover, due to information asymmetries, firms tend to issue equity in the first instance when overvaluation eventually results in higher expected growth. Our hypothesis therefore is that low-growth firms may be relatively more levered. Their need to employ leverage to mitigate the free cash flow problem further confirms this prediction. Hence, these firms may have more concerns about financial distress costs associated with their leverage position i.e. move faster toward their target leverage. In addition, low-growth firms' tendency to be relatively more active in debt markets may also suggest that they are subject to relatively lower adjustment costs when making target adjustment decisions.

Asset tangibility. Tangible assets enable firms to have more access to debt markets as they serve as collaterals better (Hovakimian et al. (2004) and Leary and Roberts (2005)). This is in line with Benmelech, Garmaise, and Moskowitz (2005) that higher asset liquidation value is associated with greater loan size, lower interest rates, and longer maturities and durations. However, this does not necessarily imply that firms with high asset tangibility should be more concerned about their leverage position. Instead, firms with low asset tangibility should do that since according to Mao (2003) and Flannery and Rangan (2006), they are likely to have less value in case of liquidation. Moreover, due to their lower collateral quality, lenders are likely to apply higher interest rates, making debt financing relatively more expensive. These together suggest that firms with low asset tangibility will be under relatively greater pressure to make leverage adjustments i.e. to move faster toward their target leverage.

Firm size. It is likely that big firms will experience relatively slower adjustment speeds since they tend to have more access to capital markets and hence be more relaxed with their target adjustment decisions (Titman and Wessels (1988) and Johnson (1998)). This is so because they are likely to have better ability to negotiate with lenders and credit ratings when banks consider firm size as one of the proxies for their creditability.

E. Testing Procedure

To sum up our empirical strategy, we employ a two-step estimation approach. In the first step, we adopt the fixed-effects estimator to estimate firms' target leverage, as specified by Equation (6). Firms' adjustment speeds then are estimated as specified by Equations (5), (12), (15), (16), (17), (18), and (19). In this second stage, we employ the system Generalized Methods of Moments estimator (SYS-GMM), as guided by Blundell and Bond (1998). By using instruments in first-differences for equations in levels and instruments in levels for equations in first-differences, this method controls for unobserved individual specific heterogeneity and partially retains variations among firms, thus yielding more asymptotically consistent estimations in presence of heteroscedasticity and serial correlation which tends to be prominent in a short panels with highly persistent series i.e. leverage than the traditional GMM method (Arellano and Bond (1991)).

Put it differently, under the SYS-GMM method, both lagged first-differences and lagged levels instruments are included, thus giving room for the exploitation of additional moment conditions i.e. the orthogonal conditions which exist between the errors and regressors' lagged values. Specifically, in our models, lagged ΔDev_{it} is employed as instruments in levels equations for Dev_{it} by requiring that $E(\Delta Dev_{it}\ u_{it}) = 0$. This is obviously a much weaker requirement than requiring $E(Dev_{it}\ u_{it}) = 0$ and hence leads to additional moment conditions. In dynamic panel models, the method is claimed to perform well when series are highly persistent i.e. λ is close to 1 and hence result in a significant fall in the finite sample bias. The validity of the set of instruments used in the SYS-GMM method is examined by the *AR2* test, which is a test for no second-order serial correlation with the error term.

III. Data, Sample Selection and Descriptive Statistics

Our sample includes firm-year data from 1980 to 2007 collected from the *Worldscope* database for five countries, namely France, Germany, Japan, the UK, and the US. Since we estimate a series of dynamic panel data models using SYS-GMM, we require that firms have at least five consecutive annual observations (Arellano and Bond, 1991). We exclude financial firms (with SIC code I from 6000 to 6999) and utility firms (with SIC code I from 4000 to 4999) from the sample as these firms are likely to be heavily regulated and hence have different financing behaviors. All variables of interest are winsorized at 0.5 and 99.5% to eliminate any unexpected effects by outliers. Finally, the final data set consists of 9,034 firms with 78,108 firm-year observations.

TABLE 1 summarizes the number of firms and firm-year observations available for each country and provides a statistics description for the variables of interest i.e. regressors in the estimation of firms' target leverage.

[TABLE 1 about here]

The results show that firms in bank-oriented economies have higher leverage ratios (in terms of both book- and market-based) than their counterparts in market-oriented economies with Japanese firms having the highest leverage ratios (0.236-0.335), followed by French and German firms. This is consistent with the conclusion by Fukuda and Hirota (1996) and Antoniou et al. (2008) that firms with closer relationships with banks tend to be relatively more levered for it is relatively easier for them to obtain debt financing from these banks at relatively lower costs. The relatively lower leverage ratios observed for UK and US firms can be explained by the lower level of ownership concentration among these firms and their looser relationships with their banks (La Porta et al. (1997) and (1998)). In addition, as suggested by Rajan and Zingales (1995), the difference in tax rates between these two groups may also throw light into their different leverage levels. Particularly, tax-exempt investors in bank-oriented economies may be more tax advantaged than those in market-oriented economies. This is consistent with the relatively lower level of effective tax rates among UK and US firms. Besides, the difference in their bankruptcy laws may also come into play. On average, these laws in bank-oriented economies tend to be more creditor-friendly while those in market-oriented economies are generally more management-friendly.

The market-to-book ratios (i.e. growth opportunities) are highest among UK and US firms, somewhat implying the market orientation for firms in these two countries. This may suggest that equity capital markets are generally more important for them than for those in bank-oriented economies.

Except for Japanese firms, firms in other bank-oriented economies have relatively lower asset tangibility than do their capital market-based counterparts. This is probably the result of their especially close relationships with their banks which then enable them to have better access to debt markets without having a lot of tangible assets as collaterals in place. It also seems that firms in bank-oriented economies on average are larger than those in market-oriented economies. In the spirit of the trade-off theory, bigger firm size implies better access to debt financing sources for those firms in bank-oriented economies, further explaining their relatively higher levels of leverage.

German firms have the highest dividend payout ratios, followed by Japanese, UK, French, and US firms. This is agreeable to the nature of the tax system in each individual country in the sample. For example, the German tax system generally discourages internal equity so it imposes relatively lower rates on dividend payments, resulting in firms there finding it more beneficial to increase dividend payments. This is almost the same story with the Japanese system. In the UK, prior to 1997, dividend payments were largely encouraged. However, the system then began to favor firms' earnings retention. Meanwhile, in both France and the US, their tax systems have consistently been in favor of earnings retention, explaining why dividend payout ratios are lowest among firms in these countries. In brief, tax considerations have an important role in firms' dividend policies, in line with their ultimate goal of wealth maximization for their shareholders.

Earnings volatility is generally higher among firms in market-oriented economies, throwing some light into why they have to be relatively more conservative with their financing policies and employ less leverage in their capital structures.

IV. Empirical Results

A. Target Leverage Estimations

TABLE 2 below reports the fixed-effects estimation results for target leverage, as specified by Equation (7). Our results suggest that firms' target leverage behaviors can be best explained by the trade-off theory. First, there is strong evidence of a negative relation between profitability and leverage for firms across all countries in the sample, which is consistent with the pecking order theory as well as the dynamic trade-off theory. This finding is in line with Antoniou et al. (2008) and De Jong et al. (2008) that profitable firms tend to depend relatively more on internal financing to avoid financial distress costs and adjustment costs associated with external financing. The magnitude of the impact is relatively more significant among firms in bank-oriented economies, suggesting that firms' profitability tends to have more influence on their decisions to visit debt markets and implying their relative preference for debt financing in these countries. In addition, this finding also has an interesting implication about the relatively closer relationships between firms in bank-oriented economies and their banks which result in profitability having relatively more pronounced impact on their decisions to visit debt markets. On the contrary, with firms in market-oriented economies, equity markets are relatively more important financing sources.

[TABLE 2 about here]

In support of the trade-off framework, there is consistent evidence across firms in the five countries in the sample that growth opportunities are inversely related to firms' leverage. Similar to profitability, the effect of growth opportunities is relatively more pronounced among firms in bank-oriented economies, especially Japanese firms, suggesting that the cash flow hypothesis generally works better with them. Overall, this finding is consistent with the empirical evidence reported by Antoniou et al. (2008). The fact that the impact of firms' growth opportunities on their target leverage is most pronounced among Japanese firms has important implication about the close nature of the relationships between them and their banks and hence their preference for debt financing. Their relative preference for debt financing makes their decisions to visit corporate debt markets relatively more sensitive to the status of their growth opportunities due to the free cash flow and underinvestment problems.

Asset tangibility has a statistically and economically significant impact on firms' leverage across all countries in the sample, in line with the prediction by the trade-off theory and the empirical evidence reported by Antoniou et al. (2008) and De Jong et al. (2008). Similar to profitability and growth opportunities, the impact is particularly more pronounced among firms in bank-oriented economies, especially Japanese firms, further confirming their relative preference for debt financing. These firms' preference for debt financing then leads to the situation in which the quality of their collaterals has relatively more impact on their decisions to visit debt markets.

The consistently positive impact of firm size on firms' target leverage in all countries lends support to the trade-off theory and previous empirical evidence. However, the role of effective tax rates on firms' target leverage is only prominent among German, UK, and US firms. The negative coefficients of effective tax rates on these firms are contrary to the trade-off theory that high-tax-rate firms tend to depend relatively more on debt financing (Graham (1996)). One possible explanation for this is that less levered firms are subject to higher effective tax rates though it remains unclear why they do not adjust their leverage to reduce taxes. Meanwhile, effective tax rates do not seem to have any impact on French and Japanese firms' leverage. According to Antoniou et al. (2008), the inconsistency in the effect of effective tax rates on firms' target leverage may be caused by the invariations in corporate tax rates across firms. In addition, Mackie-Mason (1990) suggests that as firms' leverage is the cumulative result of separate decisions over time and tax shields tend to have very little effect on firms' marginal tax rates, it is hard to empirically prove the impact of effective tax rates on firms' target leverage.

The effect of dividend payouts on firms' target leverage in all countries (except for firms in the UK) is both statistically and economically insignificant. This finding is largely similar to that reported by Antoniou et al. (2008). As suggested by Blundel, Bond, Devereux and Schiantarelli (1992), dividend payouts are likely to be endogenously determined.[6]

[6] For a more detailed discussion on this variable, refer to Antoniou et al. (2008).

The coefficients on non-debt tax shields are statistically significant and positive among French, Japanese, and UK firms, inconsistent with the idea of the trade-off theory that firms with higher non-debt tax shields should employ less leverage. However, according to Mao (2003), this is probably due to the fact that depreciation of tangible assets composes the major part of their non-debt tax shields, suggesting higher asset tangibility for these firms.

Consistent with the empirical evidence reported by Antoniou et al. (2008), the coefficients on share price performance are significantly negative across firms in all countries in the sample. This finding is consistent with the market timing hypothesis (Baker and Wurgler (2002)) that firms' leverage is the result of managers' attempt to time the equity market. In addition, it may be also agreeable to the inertia hypothesis that firms' leverage tends to automatically fall during periods of impressive stock performance (Welch (2004)). Similar to Antoniou et al. (2008), there is no clear distinction in the effect of this variable between firms in bank-oriented economies and their counterparts in market-oriented economies (except for US firms). Managers' attempt to time the equity market is therefore likely prominent in all countries, regardless of their institutional, economic, and legal backgrounds.

Finally, similar to Antoniou et al. (2008), we find that the coefficient on earnings volatility is economically insignificant across firms in all countries in the sample. Our data seems not to support the trade-off theory and the empirical evidence reported in the current literature that firms with higher earnings volatility should depend relatively less on debt financing due to relatively higher financial distress costs for them and vice versa. It is however consistent with the evidence reported by Leary and Roberts (2005) that firms' earnings volatility has little to do with their target leverage.

Overall, our results suggest that both the magnitude and direction of traditional determinants of capital structures on firms' leverage are generally in line with the trade-off theory and previous empirical evidence, with the exception of effective tax rates, dividend payouts, and earnings volatility. More importantly, there is evidence of firms' well-defined target leverage, as suggested by the trade-off theory.[7]

B. Symmetric Adjustments toward Target Leverage

TABLE 3 reports the SYS-GMM estimation results for the symmetric and asymmetric partial adjustment models specified by Equations (5) and (12), respectively. The results for the symmetric model contained in Columns (1), (3), (5), (7) and (9) show that, on average, firms in France, Germany, Japan, the UK and the US move toward their target leverage at reasonably fast speeds, ranging from 0.392 (Japanese firms) to 0.509 (French firms). This indicates that firms in these five sample countries can close out deviations from their target leverage between two and three years. Hence, this finding provides strong evidence for the trade-off theory and is generally consistent with previous empirical evidence (e.g. Flannery and Rangan (2006), Antoniou et al. (2008) and Byoun (2008)).

[TABLE 3 about here]

Our results also reveal that firms in bank-oriented economies (except for Japan) tend to adjust toward their target leverage at relatively faster speeds than those in market-oriented

---

[7] We also run a pooled regression to examine the effects of countries' macroeconomic orientation on firms' target leverage. We include institutional factors such as anti-director rights, creditor rights, rule of law, and ownership concentration (La Porta et al. (1997 and 1998)) as well as macroeconomic variables such as the GDP growth rate, term structure of interest rates, and equity premium. The results on the impact of firms' fundamentals on their target leverage are generally consistent with previous results with profitability and share price performance (firm size) having negative (positive) impacts on firms' target leverage. The estimated coefficients for all the macroeconomic variables have the expected signs but are mostly insignificant (except for the term structure of interest rates and creditor rights).

economies.[8] Since these former firms rely relatively more on leverage, they are potentially subject to higher financial distress costs than others (Byoun (2008)). Consequently, they are likely to be under greater pressures to adjust toward their target leverage. Further, German and French firms have close relationships with banks, which make it easier and less costly for them to undertake leverage adjustments, which should then be interpreted into faster adjustment speeds.

C. Asymmetric Adjustments toward Target Leverage Conditional on Having Above- or Below-Target Leverage

The results for the asymmetric partial adjustment model reported in Columns (2), (4), (6), (8) and (10) of TABLE 3 support our prediction that over-levered firms adjust significantly faster toward their target leverage than under-levered firms (except for Japanese firms). Specifically, firms with above-target leverage in France, Germany, the UK and the US have adjustment speeds of 0.572, 0.556, 0.536 and 0.481, respectively while those with below-target leverage have their adjustment speeds of 0.469, 0.382, 0.368 and 0.371, respectively. The difference between the adjustment speeds for under- and over-levered firms is both statistically and economically significant, as indicated by the *F*-test. Specifically, French, German, UK and US firms adjust toward their target leverage at speeds of about 14% faster when they are over-levered than when they are under-levered.

There are two major possible explanations on why over-levered firms have faster adjustment speeds than under-levered firms. First, financial distress costs for over-levered firms are possibly higher since they bear a higher possibility of breaching debt covenants

[8] This is probably due to the especially close nature of the relationship between Japanese firms and their banks, as documented earlier. Japanese firms may be among most relaxing firms when making target adjustment decisions regardless of their heavy dependence on debt financing.

when they exist, thus forcing them to revert back to their target leverage faster (Byoun (2008)). Second, over-levered firms may face lower adjustment costs than under-levered firms since they are likely to revert back to their target leverage levels via debt retirements which are arguably less costly than debt issues.[9] Overall, facing with potentially higher costs of deviations from target leverage and lower adjustment costs, over-levered firms need to move toward their target leverage faster than otherwise.

D. Asymmetric Adjustments toward Target Leverage Conditional on Having a Financing Surplus or Deficit

TABLE 4 reports the estimation results for Equations (15) and (16) that model asymmetric adjustments conditional on firms' financing gaps. The results in Columns (1), (3), (5), (7) and (9) show that firms with a financing deficit have significantly faster adjustment speeds (from 0.453 (US firms) to 0.609 (French firms)) than those with a financing surplus. These latter firms adjust relatively more slowly toward their target leverage (from 0.328 (Japanese firms) to 0.438 (French firms)). Hence, on average, firms with a financing deficit move toward their target leverage at speeds of approximately 20% faster than those with a financing surplus (except for US firms as the difference between the two group in this country is only about 8%). This finding is in stark contrast with Byoun's (2008) recent evidence on US firms and lends support to our prediction that firms with a financing deficit may have relatively more incentives to cover their financing gaps while those with a financing surplus tend to be relatively more relaxed with their target adjustment behavior.[10]

[9] In addition to these two major reasons, unreported results show that firms with above-target leverage are likely to have a financing deficit, which creates relatively more incentives for them to adjust. This issue is further discussed in subsequent sections.

[10] Byoun's results may be driven by his choice of model specifications. In addition, he also remains largely silent on why firms with a financing surplus should adjust faster toward their target leverage in the

[TABLE 4 about here]

In Columns (2), (4), (6), (8) and (10), we examine how firms with different financing gaps undertake leverage adjustments, controlling for their positions in relation to their target leverage. The results show that the presence of above-target leverage makes the impact of a financing deficit on firms' adjustment speeds more pronounced. Importantly, when firms experience both above-target leverage and a financing deficit, their adjustment speeds become the quickest, ranging from 0.593 (Japanese firms) to 0.797 (German firms). These estimated adjustment speeds are statistically faster than these for firms with above-target leverage and a financing surplus or those with below-target leverage and a financing deficit (with the exception of Japanese firms).

Conditional on having below-target leverage, firms do not have statistically different adjustment speeds when they have a financing deficit or surplus (except for Japanese and US firms). One possible explanation for this finding is that in the presence of below-target leverage, firms are relatively more relaxed with their target adjustment decisions and hence financing gaps have relatively less impact on their adjustment mechanisms. Similarly, conditional on having a financing surplus, their adjustment speeds do not statistically differ between over-levered and under-levered firms (with the exception of Japanese and US firms).
Overall, our results for Equations (15) and (16) support our hypothesis that firms with above-target leverage and/or a financing deficit either have relatively more incentives or find it more compulsory to adjust quickly toward their target leverage than do the remaining firms. Our results with regard to deviations from target leverage are generally consistent with Byoun (2008). However, those with regard to financing gaps are contrary to Byoun's - firms with below-target leverage and/or a financing surplus tend to be more relaxed with their target

---

presence of lower adjustment costs and costs of deviations from target leverage since the presence of a financing surplus tends to be associated with below-target leverage.

adjustment decisions and hence undertake slower leverage adjustments. Our data fails to support our earlier prediction that in the presence of both costs of deviations from target leverage and adjustment costs, firms will generally take into account costs of deviations from target leverage first since they directly shape their ability to access debt markets while their financing gaps only determine whether it is necessary to visit these markets.

The next sections reports firms' adjustment speeds when their deviations from target leverage and financing gaps are interacted with firms' major determinants of target leverage which act as proxies for costs of deviations from target leverage and adjustment costs.

E. Asymmetric Adjustments toward Target Leverage Conditional on Profitability

TABLE 5 reports the results for three asymmetric adjustment models based on Equations (17), (18), and (19) conditional on firms having either low or high profitability. The results in Columns (1), (4), (7), (10), and (13) support our earlier prediction that across firms in all the five countries in our sample, less profitable firms adjust toward their target leverage faster than more profitable ones. As discussed earlier, less profitable firms tend to be more levered than otherwise. In addition, these firms may also have less ability to serve their debt obligations due to less available internal funding. As a result, they are likely to be relatively more concerned about their target adjustment decisions i.e., experience relatively faster adjustment speeds. Besides, less profitable firms are more likely to experience a financing deficit which is associated with the presence of sunk costs and above-target leverage, faster adjustment speeds can be reasonably expected.[11] In contrast, more profitable firms enjoy financial flexibility and tend to be relatively more relaxed with their target adjustment decisions so that their leverage adjustments take place at slower speeds.

[11] Indeed, unreported results show that low profitability tends to be associated with a financing deficit and above-target leverage.

[TABLE 5 about here]

The results in Columns (2), (5), (8), (11), and (14) reveal the asymmetric adjustment mechanisms of firms experiencing above- or below-target leverage and low or high profitability. Conditional on having above-target leverage, less profitable firms do not always have statistically different adjustment speeds from their more profitable counterparts (except for UK and US firms).[12] This finding suggests that when firms experience above-target leverage, they may have little choice but to reduce it and revert back to their target levels, regardless of their profitability statuses. However, we find an opposite pattern in the presence of below-target leverage as in that situation less profitable firms adjust much faster (from 0.584 (Germany firms) to 0.691 (French firms)) than more profitable ones. Since under-levered firms may be relatively more relaxed with their target adjustment decisions, costs of deviations from target leverage and adjustment costs as proxied by their profitability status can be reasonably expected to have a more pronounced impact on their adjustment speeds.

In Columns (3), (6), (9), (12) and (15) of TABLE 5, we examine the asymmetric adjustment mechanism for firms with different financing gaps and profitability statuses. Conditional on having a financing deficit, firms with low and high profitability do not always have significantly different adjustment speeds (except for French and US firms). In contrast, conditional on having a financing surplus, less profitable firms adjust at statistically faster speeds than more profitable ones. These results suggest that when firms experience a financing deficit, they are likely to be under greater pressure to make leverage adjustments, regardless of their profitability statuses. In the presence of a financing surplus, however, they are likely to be more relaxed with their target adjustment decisions so that adjustment costs,

[12] Since UK and US firms tend to be relatively less levered and less dependent on debt financing than their counterparts in bank-oriented economies, being over-levered may have relatively less to do with their profitability statuses.

as proxied by their profitability statuses, become relatively more relevant and significantly affect their adjustment mechanisms**.**

Overall, we find that profitability has an important impact on firms' adjustment paths toward target leverage with less profitable firms adjusting significantly more quickly toward their target leverage than more profitable ones. However, when we control for firms' positions in relation to their target leverage and sunk costs associated with financing gaps, the impact of profitability on leverage adjustments becomes less significant. Put it differently, firms' profitability statuses matter relatively less when they have above-target leverage and/or a financing deficit.

F. Asymmetric Adjustments toward Target Leverage Conditional on Growth Opportunities

TABLE 6 reports the results from Equations (17), (18), and (19) contingent on firms' growth opportunities. Estimation results in Columns (1), (4), (7), (10), and (13) support our earlier hypothesis as except for German firms, low-growth firms tend to adjust relatively faster (from 0.480 (Japanese and US firms) to 0.626 (French firms)). Unreported results show that similar to less profitable firms, these firms tend to be over-levered, suggesting relatively higher costs of deviations from target leverage for them. In addition, low-growth firms are also more active in debt markets, thus making their target adjustment decisions mostly through debt as a relatively source of financing. These together then are interpreted into relatively faster adjustment speeds for those firms.

[TABLE 6 about here]

When deviations from target leverage are taken into account, as reported in Columns (2), (5), (8), (11) and (14), there is evidence that conditional on having above-target leverage, high-growth firms have faster adjustment speeds (from 0.620 (US firms) to 0.774 (UK firms)) (except for French and Japanese firms), which is in conflict with the above results and our earlier prediction that low-growth firms should experience faster adjustment speeds. One possible explanation is that the presence of above-target leverage increases firms concerns about financial distress costs associated with growth opportunities among high-growth firms even when they are relatively less levered as suggested by the trade-off theory.

On the contrary, conditional on having below-target leverage, low-growth firms move faster toward their target leverage than high-growth firms. Specifically, low-growth firms adjust at speeds ranging from 0.564 (Japanese firms) to 0.717 (French firms), compared with the 0.240 (UK firms) – 0.404 (Japanese firms) vicinity of high-growth firms. This is consistent with our previous finding that these firms tend to be subject to higher financial distress costs associated with being over-levered and lower adjustment costs.

The asymmetric impact of financing gaps and growth opportunity statuses is reported in Columns (3), (6), (9), (12) and (15) of TABLE 6. Conditional on having a financing surplus, low-growth firms always move faster toward their target leverage than high-growth firms. Nevertheless, conditional on having a financing deficit, such a clear pattern no longer exists. Low-growth firms do not always faster than their high-growth counterparts (with the exception of French and US firms). This finding is in line with our initial prediction that firms with a financing deficit are likely to either have more incentives or find it relatively more compulsory to make adjustments to their leverage, regardless of the status of their growth opportunities.

In brief, our findings suggest that firms' growth opportunities do matter when firms make adjustments to their leverage. Being subject to higher costs of deviations from target leverage and lower adjustment costs, low-growth firms tend to experience faster adjustment speeds, except for the situation when firms are having a financing deficit. The presence of above-target leverage somewhat mitigates this mechanism, resulting in more concerns about financial distress costs associated with being over-levered and thus faster adjustment speeds among high-growth firms.

G. Asymmetric Adjustments toward Target Leverage Conditional on Asset Tangibility

TABLE 7 reports the results from Equations (17), (18), and (19) conditional on firms' asset tangibility. The results in Columns (1), (4), (7), (10), and (13) support our hypothesis that firms with low asset tangibility should be more concerned about deviations from target leverage. There is evidence that firms with low asset tangibility adjust faster (from 0.443 (Japanese firms) to 0.631 (French firms)) than those with more tangible assets (from 0.397 (Japanese firms) to 0.454 (French firms)).

[TABLE 7 about here]

Firms with low asset tangibility should be more concerned about deviations from target leverage as they are likely to have less value in case of liquidation. Moreover, due to their lower collateral quality, lenders are likely to apply higher interest rates. As a result, these firms may find it relatively more compulsory to move back to their target leverage.

The impact of the interaction between deviations from target leverage and the status of asset tangibility on firms' adjustment speeds is reported in Columns (2), (5), (8), (11), and (14). In the presence of above-target leverage, with the exception of UK firms, adjustment speeds range from 0.447 (Japanese firms) to 0.698 (French firms) for firms with relatively fewer tangible assets, statistically faster than those for firms with relatively more tangible assets (from 0.364 (Japanese firms) to 0.496 (French firms)). The same pattern is also found among firms in the under-levered group (with the exception of Japanese firms). One possible candidate why the impact of asset tangibility is always consistent even in the presence of above-target leverage is that as one of the most important determinants of firms' target leverage, asset tangibility i.e. collateral quality directly determines firms' access to debt markets, costs of debt financing, and the level of financial distress costs. As a result, the fact that they have fewer tangible assets in place is still likely to lead to similar concerns about financial distress costs as when they are over-levered.

Conditional on having a financing surplus, as shown in Columns (3), (6), (9), (12), and (15), adjustment speeds of firms with low asset tangibility are significantly higher than these of firms with high asset tangibility. However, in the presence of a financing deficit, unlike French, German, and US firms, firms with low asset tangibility in Japan and the UK do not statistically move faster toward their target leverage than those with high asset tangibility. Overall, these findings further confirm our prediction that firms' levels of asset tangibility which act as proxies for their costs of deviations from target leverage and adjustment costs are relatively less relevant in the presence of a financing deficit.

H. Asymmetric Adjustments toward Target Leverage Conditional on Firm Size

TABLE 8 reports the results for three asymmetric adjustment models based on Equations (17), (18), and (19) contingent on firms' size. The results in Columns (1), (4), (7), (10), and (13) are supportive of our initial hypothesis that small firms will generally be found having faster adjustment speeds (from 0.487 (US firms) to 0.643 (French firms)) in spite of the evidence in the current literature that these firms tend to employ relatively less leverage on their balance sheets. This is so because financial distress costs related to deviations from target leverage are relatively higher for these firms. In addition, unreported results show that small firms are also likely to have a financing deficit, implying relatively lower adjustment costs for them. As a result, they may have more incentives to move toward their target levels.

[TABLE 8 about here]

The results in Columns (2), (5), (8), (11), and (14) show how the interaction between deviations from target leverage and firm size impacts firms' target adjustment behavior. Conditional on having above-target leverage, small firms move toward their target leverage at significantly faster speeds than big firms do (except for UK firms and only marginally applicable to French firms). In the presence of below-target leverage, the same pattern exists with more consistent and stronger evidence of small firms having faster adjustment speeds across all countries in the sample (from 0.462 (US firms) to 0.650 (French firms)).

In Columns (3), (6), (9), (12) and (15) of TABLE 8, we examine the asymmetric adjustment mechanism for firms with different financing gaps and firm size. There is evidence to further support our earlier prediction that firms with a financing deficit and/or small size have more incentives to adjust faster toward their target. Specifically, conditional on having small size, firms with a financing deficit move toward their target leverage at much faster speeds (from 0.551 (US firms) to 0.770 (French firms)) than those having a financing surplus (from 0.438 (Japanese firms) to 0.583 (German firms)). That is largely the same story with firms in the big size group. Similarly, contingent on having a financing surplus, small firms adjust their leverage at speeds from 0.432 (US firms) to 0.583 (German firms). These are significantly higher than those for big firms. However, in the presence of a financing deficit, there is mixed evidence with no clear distinction between adjustment speeds for small and big firms in the UK. This suggests that having a financing deficit leaves firms with relatively less flexibility with regard to how fast they should move back to their target leverage.

These above results roughly complete the overall picture with strong evidence of faster adjustment speeds for firms with above-target leverage and/or a financing deficit since they are likely to be subject to relatively higher costs of deviations from target leverage and lower adjustment costs. In addition, in the presence of both/either above-target leverage and/or a financing deficit, transition variables, especially profitability, growth opportunities, and firm size – proxies for costs of deviations from target leverage and adjustment costs have relatively less impact on their target adjustment behavior than otherwise. Put it differently, the presence of relatively higher costs of deviations from target leverage associated with being above-levered leaves them with relatively less choice to move back toward their target (with the exceptions of growth opportunities which increase concerns about financial distress costs associated with high-growth firms and asset tangibility which still have prominent asymmetric impacts in the case of above-target leverage). Meanwhile, the presence of a financing deficit implies significant sunk costs which then reduce adjustment costs. This is important since a rather complete story of firms' financing behaviors can now be initiated. Firms initially determine the optimal leverage levels for themselves basing on their fundamentals. Later any adjustments to these levels are made depending on their consideration of costs of deviations from these levels and adjustment costs.

To summarize the results in subsections E-H above, we find that given the statuses of these transition variables, firms still tend to have faster adjustment speeds in the presence of above-target leverage. The evidence on the impact of financing gaps remains mostly similar to previously reported results with firms moving faster toward their target leverage conditional on having a financing deficit, thus contrary to Byoun's (2008) finding. When transition variables are introduced, less profitable, low-growth, low asset tangibility, and small firms are found moving relatively faster to their target. These findings are generally in favor of our initial prediction that either (both) costs of deviations from target leverage are relatively higher or (and) adjustment costs are relatively lower for these firms. Specifically, less profitable and low-growth firms are possibly subject to lower adjustment costs while those with low asset tangibility and small size tend to experience higher financial distress costs associated with debt financing. In both cases, firms may be under greater pressure to move faster toward their target leverage.

V. Conclusions

Developing asymmetric partial adjustment models embedding costs of deviations from target leverage and costs of leverage adjustment, we examine whether firms' adjustments toward target leverage are asymmetrically affected by these costs. Our results suggest that firms' adjustment speeds are clearly a function of these costs. Specifically, in the presence of above-target leverage and/or a financing deficit, firms may either have relatively more incentives or find it relatively more compulsory to quickly move toward their target leverage. Overall, firms' leverage adjustments follow an asymmetric pattern that is generally consistent with the dynamic trade-off theory but is not in line with mechanical mean reversion and random, non-target financing decisions (see Chang and Dasgupta (2009)).

Our results also show that firms' adjustment behaviors are country-dependent with French firms experiencing fastest and Japanese firms having slowest adjustment speeds among firms in the sample. In addition, we find that several major determinants of firms' target leverage, which act as proxies for their adjustment costs, have important effects on firms' adjustment speeds. Specifically, firms with low profitability, low growth opportunities, low asset tangibility or small size tend to move toward their target leverage faster than otherwise. When such variables interact with firms' deviations from target leverage and financing gaps, they are likely to have relatively more relevant impacts on firms' target adjustment decisions conditional on firms having a financing surplus and/or below-target leverage.

Finally, our results suggest that because firms with above-target leverage and/or a deficit tend to adjust quickest toward target leverage, it is likely that their incremental financing activities will be also consistent with the trade-off theory, i.e., they should retire debt and/or issue equity in the first case. Hence, an analysis of firms' choice of securities conditional on their deviations from target leverage and financing gaps is warranted, and we save it for future research.

References

Altinkilic, O., and R. Hansen. "Are there Economies of Scale in Underwriter Spreads? Evidence of Rising External Financing Costs." *Review of Financial Studies*, 13 (2000), 191-218.

Anderson, T., and C. Hsiao. "Formulation and Estimation of Dynamic Models Using Panel Data." *Journal of Econometrics*, 18 (1982), 47-82.

Ang, J., and D. Peterson. "Optimal Debt versus Debt Capacity: A Disequilibrium Model of Corporate Debt Behavior." In Chen, A. W., ed. *Research in Finance*, 6 (1986), JAI Press.

Antoniou, A.; Y. Guney; and K. Paudyal. "The Determinants of Capital Structure: Capital Market-Oriented Versus Bank-Oriented Institutions." *Journal of Financial and Quantitative Analysis*, 43 (2008), 59-92.

Antoniou, A.; Y. Guney; and K. Paudyal. "The Determinants of Debt Maturity Structure: Evidence from France, Germany and the UK." *European Financial Management*, 12 (2006), 161-194.

Arellano, M., and O. Bover. "Another Look at the Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics,* 68 (1995), 29-51.

Arellano, M., and S. Bond. "Some Tests of Specification for Panel Data: Monte-Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies*, 38 (1991), 277-297.

Baker, M., and J. Wurgler. "Market Timing and Capital Structure." *Journal of Finance*, 57 (2002), 1-32.

Ball, R.; S. Kothari; and A. Robin. "The Effect of International Institutional Factors on Properties of Accounting Earnings." *Journal of Accounting and Economics*, 29 (2000), 1-51.

Benmelech, E.; M. Garmaise; and T. Moskowitz. "Do Liquidation Values Affect Financial Contracts? Evidence from Commercial Loan Contracts and Zoning Regulation." *Quarterly Journal of Economics*, 120 (2005), 1121-1154.

Blundell, R., and S. Bond. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics*, 87 (1998), 115-143.

Blundell, R.; S. Bond; M. Devereux; and F. Schiantarelli. "Investment and Tobin's Q." Journal of Econometrics, 51 (1992), 233-257.

Byoun, S. "How and When Do Firms Adjust their Capital Structures toward Targets?" *Journal of Finance*, 63 (2008), 3069-3098.

Chang, R., and S. Rhee. "The Impact of Personal Taxes on Corporate Dividend Policy and Capital Structure Decisions." *Financial Management*, 19 (1990), 21-31.

Chang, X., and S. Dasgupta. "Target Behavior and Financing: How Conclusive Is the Evidence?" *Journal of Finance*, 64 (2009), 1767-1796.

Cook, D., and T. Tang. “Macroeconomic Conditions and Capital Structure Adjustment Speed.” *Journal of Corporate Finance*, 16 (2010), 73-87.

De Jong, A., and C. Veld. “An Empirical Analysis of Incremental Capital Structure Decisions Under Managerial Entrenchment.” *Journal of Banking and Finance*, 25 (2001), 1857-1895.

De Jong, A.; R. Kabir; and T. Nguyen. “Capital Structure around the World: The Roles of Firm- and Country-Specific Determinants.” *Journal of Banking and Finance*, 32 (2008), 1954-1969.

DeAngelo, H., and R. Masulis. “Optimal Capital Structure under Corporate and Personal Taxation.” *Journal of Financial Economics*, 8 (1980), 3-29.

Drobetz, W.; P. Pensa; and G. Wanzenried. “Firm Characteristics and Dynamic Capital Structure Adjustment.” *Unpublished Manuscript*, University of Hamburg (2006).

Fama, E., and K. French. “Testing Trade-off and Pecking Order Predictions about Dividends and Debt.” *Review of Financial Studies*, 15 (2002), 1-33.

Faulkender, M.; M. Flannery; K. Hankins; and J. Smith. “Transaction Costs and Capital Structure Adjustments.” *Working Paper* (2010).

Fischer, E.; R. Heinkel; and J. Zechner. “Dynamic Capital Structure Choice: Theory and Tests.” *Journal of Finance*, 44 (1989), 19-40.

Flannery, M., and K. Hankins. “A Theory of Capital Structure Adjustment Speed.” *Unpublished Manuscript*, University of Florida (2007).

Flannery, M., and K. Hankins. “Estimating Dynamic Panels in Corporate Finance.” *Working Paper* (2010).

Flannery, M., and K. Rangan. “Partial Adjustment toward Target Capital Structures.” *Journal of Financial Economics*, 79 (2006), 469-506.

Fukuda, A., and S. Hirota. “Main Bank Relationships and Capital Structure in Japan.” *Journal of the Japanese and International Economies*, 10 (1996), 250-261.

Graham, J. “Debt and the Marginal Tax Rate.” *Journal of Financial Economics*, 41 (1996), 41-73.

Graham, J., and C. Harvey. “The Theory and Practice of Corporate Finance: Evidence from the Field.” *Journal of Financial Economics*, 60 (2001), 187-243.

Harris, M., and A. Raviv. “Capital Structure and the Informational Role of Debt.” *Journal of Finance*, 45 (1990), 321-349.

Hovakimian, A. “The Role of Target Leverage in Security Issues and Repurchases.” *Journal of Business*, 77 (2004), 1041-1071.

Hovakimian, A.; G. Hovakimian; and H. Tehranian. “Determinants of Target Capital Structure: The Case of Dual Debt and Equity Issues.” *Journal of Financial Economics*, 71 (2004), 517-540.

Hovakimian, A.; T. Opler; and S. Titman. “The Debt-Equity Choice.” *Journal of Financial and Quantitative Analysis*, 36 (2001), 1-24.

Hsiao, C. "Benefits and Limitations of Panel Data, Econometric Reviews." *Taylor and Francis Journals*, 4 (1985), 121-174.

Huang, R., and J. Ritter, 2009, "Testing Theories of Capital Structure and Estimating the Speed of Adjustment," *Journal of Financial and Quantitative Analysis*, 44 (2009), 237-271.

Jensen, M. "Agency Costs of Free Cash Flows, Corporate Finance, and Takeovers." *American Economic Review*, 76 (1986), 323-329.

Jensen, M., and W. Meckling. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics*, 3 (1976), 305-360.

Johnson, A. "The Effect of Bank Debt on Optimal Capital Structure." *Financial Management*, 27 (1998), 47-57.

La Porta, R.; F. Lopez-de-Silanes; A. Shleifer; and R. Vishny. "Law and Finance." Journal of Political Economy, 106 (1998), 1113-1155.

La, Porta R.; F. Lopez-de-Silanes; A. Shleifer; and R. Vishny. "Legal Determinants of External Finance." Journal of Finance, 52 (1997), 1131-1150.

Leary, M., and M. Roberts. "Do Firms Rebalance Their Capital Structure?" Journal of Finance, 60 (2005), 2575-2619.

Lemmon, M., and J. Zender. "Debt Capacity and Tests of Capital Structure Theories." *Working paper*, University of Utah and University of Colorado, (2004).

Lemmon, M.; M. Roberts; and J. Zender. "Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure." *Journal of Finance*, 63 (2008), 1575-1608.

Mackie-Mason, J. "Do Taxes Affect Corporate Financing Decisions?" *Journal of Finance*, 45 (1990), 1471-1494.

Mahajan, A., and S. Tartaroglu. "Equity Market Timing and Capital Structure: International Evidence." *Journal of Banking and Finance*, 32 (2008), 754-766.

Mao, C. "Interaction of Debt Agency Problems and Optimal Capital Structure: Theory and Evidence." *Journal of Financial and Quantitative Analysis*, 38 (2003), 399-423.

Miao, C. "Interaction of Debt Agency Problems and Optimal Capital Structure: Theory and Evidence." *Journal of Financial and Quantitative Analysis*, 38 (2003), 399-423.

Miller, M. "Debt and Taxes." *Journal of Finance*, 32 (1977), 261-276.

Miller, M., and M. Scholes. "Dividends and Taxes." *Journal of Financial Economics*, 6 (1978), 333-364.

Modigliani, F., and M. Miller. "Corporate Income Taxes and the Cost of Capital: A Correction." *American Economic Review*, 53 (1963), 433-443.

Modigliani, F., and M. Miller. "The Cost of Capital, Corporate Finance, and the Theory of Investment." *American Economic Review*, 48 (1958), 261-297.

Myers, S. "Determinants of Corporate Borrowing." *Journal of Financial Economics*, 5 (1977), 147-175.

Myers, S. "Still Searching for Optimal Capital Structure." *Journal of Applied Corporate Finance*, 6 (1993), 4-14.

Myers, S. “The Capital Structure Puzzle.” *Journal of Finance*, 39 (1984), 575-592.

Myers, S., and N. Majluf. “Corporate Financing and Investment Decisions When Firms Have Information that Investors Do not.” *Journal of Financial Economics*, 13 (1984), 187-221.

Peterson, A. “Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches.” *Working Paper*, Northwestern University (2005).

Rajan, R., and L. Zingales. “What Do We Know about Capital Structure? Some Evidence from International Data.” *Journal of Finance*, 50 (1995), 1421-1260.

Rozeff, M. “Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios.” *Journal of Financial Research*, 5 (1982), 249-259.

Sibilkov, V. “Asset Liquidity and Capital Structure.” *Journal of Financial and Quantitative Analysis*, 44 (2009), 1173-1196.

Strebulaev, I. “Do Tests of Capital Structure Theory Mean What They Say?” *Journal of Finance*, 62 (2007), 1747-1788.

Titman, S., and R. Wessels. The Determinants of Capital Structure.” *Journal of Finance*, 43 (1988), 1-19.

Welch, I. “Capital Structure and Stock Returns.” *Journal of Political Economy*, 112 (2004), 106-131.

TABLE 1

Summary Statistics

This table presents the descriptive statistics of the variables considered in the paper. Book leverage is the ratio of the book value of total debt to the book value of total assets. Market leverage is the ratio of the book value of total debt to the market value of equity plus the book value of total debt. Profitability is operating income (*Datastream* item WC01250) scaled by book value of total assets (WC02999). Growth opportunity is the market -to-book ratio (market value of total assets (market capitalization (WC08001) plus book value of total debt (WC03255)) scaled by total assets). Asset tangibility is fixed assets (WC02501) scaled by total assets. Firm size is the natural log of the book value of total assets (WC07230 in 1980 US$ value dollars). Effective tax rate is income taxes (WC01451) scaled by pre-tax income (WC01401). Dividend payout ratio is total dividends paid (WC05376) scaled by net income (WC01706). Non-debt tax shield is depreciation and amortization (WC01148) scaled by total assets. Share price performance is changes in share prices (WC05001) scaled by share prices in the last period. Earnings volatility is the first difference of annual earnings (WC01706) (% change) minus average of first differences.

Statistics	France			Germany			Japan			UK			US		
	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev
Book Leverage	0.223	0.213	0.158	0.215	0.188	0.186	0.236	0.207	0.197	0.181	0.153	0.169	0.219	0.189	0.200
Market Leverage	0.284	0.247	0.227	0.278	0.229	0.250	0.335	0.301	0.268	0.190	0.138	0.194	0.218	0.142	0.235
Profitability	0.028	0.049	0.134	0.003	0.026	0.126	0.047	0.041	0.054	0.016	0.069	0.252	0.004	0.073	0.274
Growth Opportunity	1.166	0.858	1.139	1.097	0.828	1.091	0.884	0.706	0.771	1.567	1.051	1.884	1.951	1.214	2.243
Asset Tangibility	0.188	0.151	0.159	0.251	0.220	0.188	0.310	0.296	0.171	0.293	0.239	0.244	0.285	0.227	0.225
Firm Size	11.739	11.409	2.183	11.915	11.612	2.032	12.584	12.374	1.554	10.657	10.510	2.091	11.594	11.557	2.266
Effective Tax Rate	0.253	0.327	0.462	0.227	0.303	0.625	0.369	0.427	0.601	0.194	0.262	0.429	0.234	0.327	0.395
Dividend Payout Ratio	0.250	0.162	0.647	0.349	0.032	1.167	0.317	0.189	0.997	0.314	0.210	1.097	0.148	0.000	0.567
Non-Debt Tax Shield	0.055	0.045	0.048	0.062	0.050	0.055	0.031	0.027	0.023	0.049	0.040	0.043	0.054	0.045	0.047
Share Price Performance	0.132	0.054	0.593	0.112	0.030	0.575	0.121	0.008	0.525	0.101	0.014	0.634	0.235	0.044	1.043
Earnings Volatility	3.745	0.723	13.018	5.647	1.119	18.798	3.611	0.876	11.599	4.100	0.887	12.831	4.002	0.938	13.202
Observations		3,763			3,516			23,728			11,216			35,885	
Firms		470			426			2,970			1,291			3,877	

TABLE 2

Fixed-Effects Estimation of the Determinants of Target Leverage

This table presents the estimation results for determinants of target leverage. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the fixed–effect estimation method) are for Equation (7):

$$D_{it} = \psi' \mathbf{x}_{it} + \varepsilon_{it},$$

where D_{it} is firms' market leverage and $\mathbf{x}_{it}$ represents the vector of independent variables. See TABLE 1 for these variables' definitions. Figures in parentheses are *t*-statistics. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable	Predicted sign	France	Germany	Japan	UK	US
		(1)	(2)	(3)	(4)	(5)
Profitability	-/+	-0.237**	-0.153**	-0.959**	-0.064**	-0.131**
		(-5.38)	(-4.89)	(-19.88)	(-6.09)	(-14.81)
Growth Opportunities	-	-0.017**	-0.022**	-0.029**	-0.009**	-0.016**
		(-3.53)	(-3.45)	(-8.75)	(-5.39)	(-18.61)
Asset Tangibility	+	0.230**	0.390**	0.450**	0.184**	0.171**
		(2.95)	(6.76)	(12.79)	(5.79)	(8.74)
Firm Size	+	0.037**	0.050**	0.037**	0.047**	0.033**
		(4.90)	(4.83)	(5.59)	(11.55)	(12.50)
Effective Tax Rate	+	-0.001	-0.012**	$1.43*10^{-3}$	-0.015**	-0.010**
		(-0.12)	(-3.17)	(0.21)	(-4.50)	(-3.92)
Dividend Payout Ratio	-/+	0.005	$2.33*10^{-4}$	$7.30*10^{-4}$	-0.002**	-0.003
		(1.57)	(-0.12)	(0.27)	(-1.63)	(-1.89)
Non-Debt Tax Shield	-/+	0.254*	0.104	0.307*	0.245**	0.047
		(2.27)	(1.09)	(2.22)	(3.51)	(1.21)
Share Price Performance	-	-0.050**	-0.043**	-0.047**	-0.040**	-0.015**
		(-10.15)	(-10.72)	(-31.17)	(-15.98)	(-14.65)
Earnings Volatility	-	$2.15*10^{-4}$**	$1.85*10^{-4}$**	0.001**	$1.58*10^{-4}$**	$4.21*10^{-4}$**
		(4.90)	(4.83)	(5.59)	(11.55)	(4.21)
R^2		0.219	0.176	0.234	0.144	0.161
Observations		3,763	3,516	23,728	11,216	35,885
Firms		470	426	2,970	1,291	3,877

TABLE 3

Partial Adjustment Models

This table presents the estimation results for firms' adjustment speeds. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the SYS-GMM estimation method) are for Equations (5) and (12):

$\Delta D_{it} = \alpha + \lambda Dev_{it} + u_{it}$, and

$\Delta D_{it} = \alpha_1 + \lambda_1 Dev_{it} D^a_{it} + \lambda_2 Dev_{it} D^b_{it} + v_{it}$,

where ΔD_{it} is the change in market leverage ratios. Target leverage is estimated by Equation (7). See TABLE 1 for variable definitions, TABLE 2 for target leverage estimation. Dev_{it} stands for the deviation of market leverage in the last period from target for the current period. D^a (D^b) is a dummy variable equal to 1 if current market leverage is higher than or equal to (lower than) target and 0 otherwise. Figures in parentheses are *t*-statistics. *F*-test reports the *p*-value of the *F*-test for the hypothesis that the coefficient estimates for above-target and below-target leverage are equal. *AR2* reports the *p*-value of the test for no second-order serial correlation, which is asymptotically distributed as *N*(0,1) under the null hypothesis of no serial correlation. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable	France		Germany		Japan		UK		US	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dev_{it}	0.509**		0.459**		0.392**		0.447**		0.415**	
	(27.80)		(21.56)		(46.31)		(30.39)		(45.45)	
$Dev_{it}. D^a$		0.572**		0.556**		0.357**		0.536**		0.481**
		(20.66)		(14.02)		(24.64)		(25.20)		(37.46)
$Dev_{it}. D^b$		0.469**		0.382**		0.454**		0.368**		0.371**
		(15.89)		(10.71)		(38.07)		(13.52)		(22.04)
Intercept	0.001	0.003*	0.002**	0.007**	-0.008**	-0.010**	0.004**	0.008**	0.002**	0.005**
	(1.37)	(2.24)	(2.90)	(3.15)	(-22.27)	(-12.80)	(8.44)	(6.27)	(6.30)	(5.80)
AR2	0.303	0.426	0.273	0.538	0.000	0.000	0.060	0.028	0.146	0.110
F-test		0.020		0.006		0.000		0.000		0.000
Observations	3,763	3,763	3,516	3,516	23,728	23,728	11,216	11,216	35,885	35,885
Firms	470	470	426	426	2,970	2,970	1,291	1,291	3,877	3,877

TABLE 4

Asymmetric Partial Adjustment Models with Deviations from Target Leverage and Financing Gaps

This table presents the estimation results for firms' asymmetric adjustment speeds. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the SYS-GMM estimation method) are for Equations (15) and (16):

$\Delta D_{it} = \alpha_2 + \lambda_3 Dev_{it} D_{it}^{s} + \lambda_4 Dev_{it} D_{it}^{d} + w_{it}$, and

$\Delta D_{it} = \alpha_3 + \left(\lambda_5 D_{it}^{s} + \lambda_6 D_{it}^{d}\right) Dev_{it} D_{it}^{a} + \left(\lambda_7 D_{it}^{s} + \lambda_8 D_{it}^{d}\right) Dev_{it} D_{it}^{b} + \xi_{it}$,

where ΔD_{it} is the change in market leverage ratios. Target leverage is estimated by Equation (7). See TABLE 1 for variable definitions, TABLE 2 for target leverage estimation. Dev_{it} stands for the deviation of market leverage in the last period from target for the current period. D^a (D^b) is a dummy variable equal to 1 if current market leverage is higher than or equal to (lower than) target and 0 otherwise. Financing deficit or surplus is cash flow from financing minus cash dividends and other sources of financing. D^s (D^d) is a dummy variable equal to 1 if the cash flow is negative (positive) and 0 otherwise. Figures in parentheses are *t*-statistics. *F*-test reports the *p*-value of the *F*-test for the hypothesis that the coefficient estimates for each pair of scenarios are equal. *AR2* reports the *p*-value of the test for no second-order serial correlation, which is asymptotically distributed as *N*(0,1) under the null hypothesis of no serial correlation. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable	France		Germany		Japan		UK		US	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$Dev_{it}.\ D^s$ (1)	0.438**		0.388**		0.328**		0.371**		0.387**	
	(18.81)		(12.32)		(37.21)		(19.48)		(30.29)	
$Dev_{it}.\ D^d$ (2)	0.609**		0.566**		0.574**		0.572**		0.453**	
	(19.76)		(15.86)		(36.14)		(24.17)		(34.21)	
$Dev_{it}.\ D^a.\ D^s$ (1)		0.464**		0.441**		0.290**		0.402**		0.358**
		(14.89)		(10.94)		(22.77)		(16.29)		(24.11)
$Dev_{it}.\ D^a.\ D^d$ (2)		0.742**		0.797**		0.593**		0.751**		0.639**
		(15.83)		(14.49)		(21.14)		(23.71)		(33.14)
$Dev_{it}.\ D^b.\ D^s$ (3)		0.448**		0.380**		0.428**		0.364**		0.472**
		(11.95)		(7.68)		(31.34)		(10.15)		(20.61)
$Dev_{it}.\ D^b.\ D^d$ (4)		0.523**		0.379**		0.556**		0.434**		0.330**
		(12.75)		(9.79)		(31.80)		(13.03)		(16.57)
Intercept	-0.001	0.001	0.000	0.006**	-0.010**	-0.012**	0.002**	0.006**	0.001**	0.003**
	(-0.79)	(1.00)	(0.35)	(2.63)	(-26.26)	(-16.70)	(4.13)	(4.26)	(2.81)	(3.90)
AR2	0.248	0.416	0.264	0.879	0.000	0.000	0.048	0.030	0.179	0.161
F-test [(1) and (2)]	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000
F-test [(3) and (4)]		0.168		0.989		0.000		0.121		0.000
F-test [(1) and (3)]		0.769		0.363		0.000		0.427		0.032
F-test [(2) and (4)]		0.001		0.000		0.275		0.000		0.000
Observations	3,763	3,763	3,516	3,516	23,728	23,728	11,216	11,216	35,885	35,885
Firms	470	470	426	426	2,970	2,970	1,291	1,291	3,877	3,877

TABLE 5

Asymmetric Partial Adjustment Models Conditional on Profitability

This table presents the estimation results for firms' asymmetric adjustment speeds. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the SYS-GMM estimation method with a transition variable (profitability)) are for Equations (17), (18), and (19):

$$\Delta D_{it} = \gamma_1 + \varphi_1 Dev_{it} D_{it}^{LP} + \varphi_2 Dev_{it} D_{it}^{HP} + u_{it},$$

$$\Delta D_{it} = \gamma_2 + \left(\phi_1 D_{it}^{LP} + \phi_2 D_{it}^{HP}\right) Dev_{it} D_{it}^{a} + \left(\phi_3 D_{it}^{LP} + \phi_4 D_{it}^{HP}\right) Dev_{it} D_{it}^{b} + \upsilon_{it}, \text{ and } \Delta D_{it} = \gamma_3 + \left(\phi_5 D_{it}^{LP} + \phi_6 D_{it}^{HP}\right) Dev_{it} D_{it}^{s} + \left(\phi_7 D_{it}^{LP} + \phi_8 D_{it}^{HP}\right) Dev_{it} D_{it}^{d} + \omega_{it},$$

where ΔD_{it} is the change in market leverage ratios. Target leverage is estimated by Equation (7). See TABLE 1 for variable definitions, TABLE 2 for target leverage estimation. Dev_{it} is the deviation of from target leverage. D^a (D^b) is a dummy variable equal to 1 if leverage is above (below) target leverage and 0 otherwise. Financing gap is cash flow from financing minus cash dividends and other sources of financing. D^s (D^d) is a dummy variable equal to 1 if financing gap is negative (positive) and 0 otherwise. D^{HP} (D^{LP}) is a dummy variable equal to 1 if lagged profitability is greater than or equal to (lower than) the median level. Figures in parentheses are *t*-statistics. *F*-test reports the *p*-value of the *F*-test for the hypothesis that the coefficient estimates for each pair of scenarios are equal. *AR2* reports the *p*-value of the test for no second-order serial correlation, which is asymptotically distributed as *N*(0,1) under the null hypothesis of no serial correlation. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable		France			Germany			Japan			UK			US		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$Dev_{it}.\ D^{LP}$	(1)	0.613**			0.536**			0.474**			0.518**			0.500**		
		(22.77)			(18.45)			(44.07)			(29.34)			(38.66)		
$Dev_{it}.\ D^{HP}$	(2)	0.468**			0.421**			0.377**			0.401**			0.372**		
		(16.89)			(13.65)			(31.95)			(17.16)			(29.58)		
$Dev_{it}.\ D^{a}.\ D^{LP}$	(1)		0.585**			0.550**			0.403**			0.477**			0.470**	
			(17.46)			(14.51)			(31.12)			(19.23)			(29.19)	
$Dev_{it}.\ D^{a}.\ D^{HP}$	(2)		0.665**			0.665**			0.400**			0.668**			0.530**	
			(14.67)			(11.30)			(20.16)			(21.40)			(32.15)	
$Dev_{it}.\ D^{b}.\ D^{LP}$	(3)		0.691**			0.584**			0.592**			0.615**			0.594**	
			(18.59)			(11.39)			(32.07)			(21.80)			(27.61)	
$Dev_{it}.\ D^{b}.\ D^{HP}$	(4)		0.334**			0.285**			0.373**			0.236**			0.268**	
			(8.83)			(7.13)			(26.57)			(7.06)			(13.47)	
$Dev_{it}.\ D^{s}.\ D^{LP}$	(1)			0.560**			0.530**			0.436**			0.512**			0.481**
				(17.86)			(14.43)			(40.58)			(20.46)			(26.43)
$Dev_{it}.\ D^{s}.\ D^{HP}$	(2)			0.374**			0.297**			0.282**			0.245**			0.331**
				(11.51)			(7.55)			(22.83)			(9.76)			(19.93)
$Dev_{it}.\ D^{d}.\ D^{LP}$	(3)			0.705**			0.595**			0.607**			0.578**			0.537**
				(14.93)			(10.86)			(23.58)			(19.06)			(30.62)
$Dev_{it}.\ D^{d}.\ D^{HP}$	(4)			0.584**			0.559**			0.580**			0.599**			0.423**
				(15.55)			(12.06)			(30.76)			(18.12)			(24.37)
Intercept		0.002	0.005**	0.001	0.004**	0.009**	0.002	-0.007**	-0.008**	-0.009**	0.005**	0.009**	0.004**	0.003**	0.005**	0.002**
		(3.08)	(3.76)	(1.10)	(3.74)	(4.52)	(1.89)	(-19.37)	(-11.22)	(-23.98)	(7.88)	(7.27)	(5.87)	(8.19)	(6.93)	(5.09)
*AR*2		0.412	0.629	0.353	0.417	0.675	0.387	0.000	0.000	0.000	0.034	0.016	0.043	0.073	0.058	0.102
F-test [(1) and (2)]		0.000	0.173	0.000	0.012	0.095	0.000	0.000	0.888	0.000	0.000	0.000	0.000	0.000	0.007	0.000
F-test [(3) and (4)]			0.000	0.048		0.000	0.637		0.000	0.395		0.000	0.627		0.000	0.000
F-test [(1) and (3)]			0.029	0.013		0.617	0.349		0.000	0.000		0.001	0.115		0.000	0.026
F-test [(2) and (4)]			0.000	0.000		0.000	0.000		0.295	0.000		0.000	0.000		0.000	0.000
Observations		3,763	3,763	3,763	3,516	3,516	3,516	23,728	23,728	23,728	11,216	11,216	11,216	35,885	35,885	35,885
Firms		470	470	470	426	426	426	2,970	2,970	2,970	1,291	1,291	1,291	3,877	3,877	3,877

TABLE 6

Asymmetric Partial Adjustment Models Conditional on Growth Opportunity

This table presents the estimation results for firms' asymmetric adjustment speeds. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the SYS-GMM estimation method with a transition variable (growth opportunity)) are for Equations (17), (18), and (19):

$$\Delta D_{it} = \gamma_1 + \varphi_1 Dev_{it} D_{it}^{LG} + \varphi_2 Dev_{it} D_{it}^{HG} + u_{it},$$

$$\Delta D_{it} = \gamma_2 + \left(\phi_1 D_{it}^{LG} + \phi_2 D_{it}^{HG}\right) Dev_{it} D_{it}^{a} + \left(\phi_3 D_{it}^{LG} + \phi_4 D_{it}^{HG}\right) Dev_{it} D_{it}^{b} + \upsilon_{it}, \text{ and } \Delta D_{it} = \gamma_3 + \left(\phi_5 D_{it}^{LG} + \phi_6 D_{it}^{HG}\right) Dev_{it} D_{it}^{s} + \left(\phi_7 D_{it}^{LG} + \phi_8 D_{it}^{HG}\right) Dev_{it} D_{it}^{d} + \omega_{it},$$

where ΔD_{it} is the change in market leverage ratios. Target leverage is estimated by Equation (7). See TABLE 1 for variable definitions, TABLE 2 for target leverage estimation. Dev_{it} is the deviation of from target leverage. D^a (D^b) is a dummy variable equal to 1 if leverage is above (below) target leverage and 0 otherwise. Financing gap is cash flow from financing minus cash dividends and other sources of financing. D^s (D^d) is a dummy variable equal to 1 if financing gap is negative (positive) and 0 otherwise. D^{HG} (D^{LG}) is the dummy variable equal to 1 if lagged growth opportunity is greater than or equal to (lower than) the median level. Figures in parentheses are *t*-statistics. *F*-test reports the *p*-value of the *F*-test for the hypothesis that the coefficient estimates for each pair of scenarios are equal. *AR2* reports the *p*-value of the test for no second-order serial correlation, which is asymptotically distributed as *N*(0,1) under the null hypothesis of no serial correlation. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable		France			Germany			Japan			UK			US		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$Dev_{it}.\ D^{LG}$	(1)	0.626**			0.518**			0.480**			0.507**			0.490**		
		(23.70)			(16.80)			(47.12)			(27.88)			(39.64)		
$Dev_{it}.\ D^{HG}$	(2)	0.471**			0.453**			0.381**			0.417**			0.374**		
		(18.32)			(14.38)			(31.07)			(15.26)			(27.02)		
$Dev_{it}.\ D^{a}.\ D^{LG}$	(1)		0.598**			0.518**			0.432**			0.437**			0.427**	
			(20.61)			(13.33)			(36.66)			(18.73)			(30.61)	
$Dev_{it}.\ D^{a}.\ D^{HG}$	(2)		0.676**			0.721**			0.380**			0.774**			0.620**	
			(15.04)			(12.31)			(18.10)			(21.86)			(33.41)	
$Dev_{it}.\ D^{b}.\ D^{LG}$	(3)		0.717**			0.607**			0.564**			0.665**			0.662**	
			(15.18)			(11.33)			(27.96)			(22.01)			(31.87)	
$Dev_{it}.\ D^{b}.\ D^{HG}$	(4)		0.359**			0.318**			0.404**			0.240**			0.216**	
			(9.56)			(7.64)			(25.93)			(6.94)			(10.51)	
$Dev_{it}.\ D^{s}.\ D^{LG}$	(1)			0.584**			0.505**			0.462**			0.477**			0.457**
				(21.06)			(16.26)			(46.43)			(20.65)			(29.27)
$Dev_{it}.\ D^{s}.\ D^{HG}$	(2)			0.368**			0.322**			0.262**			0.263**			0.341**
				(11.93)			(6.18)			(19.77)			(8.49)			(16.90)
$Dev_{it}.\ D^{d}.\ D^{LG}$	(3)			0.700**			0.552**			0.562**			0.610**			0.552**
				(14.82)			(8.20)			(19.50)			(19.54)			(29.00)
$Dev_{it}.\ D^{d}.\ D^{HG}$	(4)			0.589**			0.583**			0.599**			0.555**			0.405**
				(16.50)			(14.52)			(33.69)			(16.73)			(23.72)
Intercept		0.003**	0.006**	0.002*	0.003**	0.008**	0.002	-0.006**	-0.008**	-0.008**	0.005**	0.009**	0.005[a]	0.003**	0.007**	0.003**
		(3.65)	(4.16)	(1.99)	(2.75)	(3.97)	(1.63)	(-18.17)	(-10.69)	(-22.58)	(6.27)	(6.72)	(5.47)	(7.96)	(8.43)	(5.92)
AR2		0.414	0.634	0.383	0.351	0.587	0.356	0.000	0.000	0.000	0.030	0.013	0.020	0.091	0.062	0.121
F-test [(1) and (2)]		0.000	0.147	0.000	0.182	0.004	0.003	0.000	0.013	0.000	0.011	0.000	0.000	0.000	0.000	0.000
F-test [(3) and (4)]			0.000	0.052		0.000	0.702		0.000	0.288		0.000	0.223		0.000	0.000
F-test [(1) and (3)]			0.030	0.032		0.189	0.523		0.000	0.001		0.000	0.001		0.000	0.000
F-test [(2) and (4)]			0.000	0.000		0.000	0.000		0.394	0.000		0.000	0.000		0.000	0.011
Observations		3,763	3,763	3,763	3,516	3,516	3,516	23,728	23,728	23,728	11,216	11,216	11,216	35,885	35,885	35,885
Firms		470	470	470	426	426	426	2,970	2,970	2,970	1,291	1,291	1,291	3,877	3,877	3,877

TABLE 7

Asymmetric Partial Adjustment Models Conditional on Asset Tangibility

This table presents the estimation results for firms' asymmetric adjustment speeds. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the SYS-GMM estimation method with a transition variable (asset tangibility)) are for Equations (17), (18), and (19):

$$\Delta D_{it} = \gamma_1 + \varphi_1 Dev_{it} D_{it}^{LAT} + \varphi_2 Dev_{it} D_{it}^{HAT} + u_{it},$$

$$\Delta D_{it} = \gamma_2 + \left(\phi_1 D_{it}^{LAT} + \phi_2 D_{it}^{HAT}\right) Dev_{it} D_{it}^{a} + \left(\phi_3 D_{it}^{LAT} + \phi_4 D_{it}^{HAT}\right) Dev_{it} D_{it}^{b} + \upsilon_{it}, \text{ and } \Delta D_{it} = \gamma_3 + \left(\phi_5 D_{it}^{LAT} + \phi_6 D_{it}^{HAT}\right) Dev_{it} D_{it}^{s} + \left(\phi_7 D_{it}^{LAT} + \phi_8 D_{it}^{HAT}\right) Dev_{it} D_{it}^{d} + \omega_{it},$$

where ΔD_{it} is the change in market leverage ratios. Target leverage is estimated by Equation (7). See TABLE 1 for variable definitions, TABLE 2 for target leverage estimation. Dev_{it} is the deviation of from target leverage. D^a (D^b) is a dummy variable equal to 1 if leverage is above (below) target leverage and 0 otherwise. Financing gap is cash flow from financing minus cash dividends and other sources of financing. D^s (D^d) is a dummy variable equal to 1 if financing gap is negative (positive) and 0 otherwise. D^{HAT} (D^{LAT}) is the dummy variable equal to 1 if lagged asset tangibility is greater than or equal to (lower than) the median level. Figures in parentheses are *t*-statistics. *F*-test reports the *p*-value of the *F*-test for the hypothesis that the coefficient estimates for each pair of scenarios are equal. *AR2* reports the *p*-value of the test for no second-order serial correlation, which is asymptotically distributed as *N*(0,1) under the null hypothesis of no serial correlation. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable		France			Germany			Japan			UK			US		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Dev_{it}. D^{LAT}	(1)	0.631**			0.563**			0.443**			0.512**			0.486**		
		(25.71)			(17.67)			(39.66)			(25.28)			(35.32)		
Dev_{it}. D^{HAT}	(2)	0.454**			0.413**			0.397**			0.429**			0.404**		
		(17.25)			(13.70)			(34.82)			(22.80)			(34.50)		
Dev_{it}. D^a. D^{LAT}	(1)		0.698**			0.654**			0.447**			0.577**			0.545**	
			(21.41)			(15.01)			(26.83)			(18.45)			(28.42)	
Dev_{it}. D^a. D^{HAT}	(2)		0.496**			0.492**			0.364**			0.521**			0.455**	
			(13.35)			(9.64)			(21.65)			(20.22)			(29.33)	
Dev_{it}. D^b. D^{LAT}	(3)		0.568**			0.475**			0.442**			0.445**			0.442**	
			(16.06)			(10.25)			(27.16)			(13.60)			(20.30)	
Dev_{it}. D^b. D^{HAT}	(4)		0.447**			0.378**			0.485**			0.357**			0.381**	
			(10.99)			(9.82)			(31.75)			(10.78)			(18.53)	
Dev_{it}. D^s. D^{LAT}	(1)			0.571**			0.506**			0.371**			0.479**			0.448**
				(17.38)			(11.67)			(31.87)			(16.51)			(22.03)
Dev_{it}. D^s. D^{HAT}	(2)			0.397**			0.338**			0.331**			0.320**			0.372**
				(12.94)			(8.76)			(28.92)			(13.84)			(24.11)
Dev_{it}. D^d. D^{LAT}	(3)			0.709**			0.648**			0.619**			0.585**			0.547**
				(18.02)			(12.84)			(27.87)			(19.22)			(30.68)
Dev_{it}. D^d. D^{HAT}	(4)			0.564**			0.529**			0.577**			0.601**			0.445**
				(15.13)			(11.89)			(27.46)			(21.12)			(26.29)
Intercept		0.001	0.003	-0.001	0.002**	0.007**	0.000	-0.007**	-0.009**	-0.010**	0.004**	0.008**	0.002^{a}	0.001**	0.004**	0.000
		(1.05)	(1.84)	(-0.85)	(2.95)	(2.99)	(0.43)	(-21.98)	(-12.31)	(-26.44)	(8.05)	(6.25)	(3.71)	(5.52)	(4.92)	(1.65)
AR2		0.295	0.441	0.237	0.412	0.687	0.398	0.000	0.000	0.000	0.037	0.017	0.040	0.094	0.072	0.117
F-test [(1) and (2)]		0.000	0.000	0.000	0.002	0.011	0.004	0.004	0.000	0.011	0.002	0.147	0.000	0.000	0.000	0.004
F-test [(3) and (4)]			0.021	0.006		0.081	0.087		0.050	0.186		0.048	0.659		0.034	0.000
F-test [(1) and (3)]			0.007	0.007		0.006	0.045		0.861	0.000		0.008	0.014		0.001	0.000
F-test [(2) and (4)]			0.403	0.000		0.097	0.001		0.000	0.000		0.001	0.000		0.001	0.002
Observations		3,763	3,763	3,763	3,516	3,516	3,516	23,728	23,728	23,728	11,216	11,216	11,216	35,885	35,885	35,885
Firms		470	470	470	426	426	426	2,970	2,970	2,970	1,291	1,291	1,291	3,877	3,877	3,877

TABLE 8

Asymmetric Partial Adjustment Models Conditional on Firm Size

This table presents the estimation results for firms' asymmetric adjustment speeds. Our sample includes 78,108 firm-year observations for France, Germany, Japan, the UK and the US over the 1980-2007 period. Regression results (using the SYS-GMM estimation method with a transition variable (firm size)) are for Equations (17), (18), and (19):

$$\Delta D_{it} = \gamma_1 + \varphi_1 Dev_{it} D_{it}^{SS} + \varphi_2 Dev_{it} D_{it}^{BS} + u_{it},$$

$$\Delta D_{it} = \gamma_2 + \left(\phi_1 D_{it}^{SS} + \phi_2 D_{it}^{BS}\right) Dev_{it} D_{it}^{a} + \left(\phi_3 D_{it}^{SS} + \phi_4 D_{it}^{BS}\right) Dev_{it} D_{it}^{b} + \upsilon_{it}, \text{ and } \Delta D_{it} = \gamma_3 + \left(\phi_5 D_{it}^{SS} + \phi_6 D_{it}^{BS}\right) Dev_{it} D_{it}^{s} + \left(\phi_7 D_{it}^{SS} + \phi_8 D_{it}^{BS}\right) Dev_{it} D_{it}^{d} + \omega_{it},$$

where ΔD_{it} is the change in market leverage ratios. Target leverage is estimated by Equation (7). See TABLE 1 for variable definitions, TABLE 2 for target leverage estimation. Dev_{it} is the deviation of from target leverage. D^a (D^b) is a dummy variable equal to 1 if leverage is above (below) target leverage and 0 otherwise. Financing gap is cash flow from financing minus cash dividends and other sources of financing. D^s (D^d) is a dummy variable equal to 1 if financing gap is negative (positive) and 0 otherwise. D^{BS} (D^{SS}) is the dummy variable equal to 1 if lagged firm size is greater than or equal to (lower than) the median level. Figures in parentheses are *t*-statistics. *F*-test reports the *p*-value of the *F*-test for the hypothesis that the coefficient estimates for each pair of scenarios are equal. *AR2* reports the *p*-value of the test for no second-order serial correlation, which is asymptotically distributed as *N*(0,1) under the null hypothesis of no serial correlation. ** and * indicate that coefficient estimates are significant at the 1, and 5% levels of significance, respectively.

Variable		France			Germany			Japan			UK			US		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$Dev_{it}.\ D^{SS}$	(1)	0.643**			0.617**			0.500**			0.513**			0.487**		
		(20.60)			(20.03)			(46.60)			(27.02)			(36.81)		
$Dev_{it}.\ D^{BS}$	(2)	0.472*			0.383**			0.365**			0.425**			0.402**		
		(20.84)			(12.82)			(30.14)			(20.72)			(34.37)		
$Dev_{it}.\ D^{a}.\ D^{SS}$	(1)		0.666**			0.666**			0.496**			0.522**			0.535**	
			(16.61)			(16.15)			(33.45)			(17.53)			(29.96)	
$Dev_{it}.\ D^{a}.\ D^{BS}$	(2)		0.562**			0.489**			0.333**			0.551**			0.451**	
			(16.37)			(9.94)			(18.23)			(21.00)			(29.31)	
$Dev_{it}.\ D^{b}.\ D^{SS}$	(3)		0.650**			0.580**			0.509**			0.524**			0.462**	
			(16.69)			(13.96)			(31.45)			(17.40)			(22.75)	
$Dev_{it}.\ D^{b}.\ D^{BS}$	(4)		0.401**			0.317**			0.453**			0.312**			0.376**	
			(11.38)			(7.37)			(30.40)			(9.20)			(18.35)	
$Dev_{it}.\ D^{s}.\ D^{SS}$	(1)			0.565**			0.583**			0.438**			0.452**			0.444**
				(14.24)			(16.02)			(38.68)			(15.50)			(22.25)
$Dev_{it}.\ D^{s}.\ D^{BS}$	(2)			0.409**			0.297**			0.294**			0.333**			0.377**
				(14.30)			(7.46)			(25.74)			(14.27)			(24.56)
$Dev_{it}.\ D^{d}.\ D^{SS}$	(3)			0.770**			0.692**			0.644**			0.619**			0.551**
				(14.61)			(13.83)			(30.89)			(22.38)			(33.96)
$Dev_{it}.\ D^{d}.\ D^{BS}$	(4)			0.549**			0.511**			0.569**			0.575**			0.438**
				(16.31)			(11.82)			(26.11)			(17.82)			(25.04)
Intercept		0.001	0.004**	0.000	0.004**	0.008**	0.002	-0.007**	-0.009**	-0.010**	0.004**	0.008**	0.002**	0.002**	0.004**	0.001*
		(1.75)	(2.67)	(-0.39)	(4.24)	(3.48)	(1.45)	(-21.65)	(-12.43)	(-26.37)	(8.46)	(6.14)	(4.21)	(5.94)	(4.76)	(1.98)
AR2		0.501	0.572	0.410	0.465	0.729	0.385	0.000	0.000	0.000	0.035	0.010	0.033	0.077	0.057	0.094
F-test [(1) and (2)]		0.000	0.054	0.002	0.000	0.003	0.000	0.000	0.000	0.000	0.002	0.448	0.002	0.000	0.000	0.008
F-test [(3) and (4)]			0.000	0.000		0.000	0.007		0.007	0.012		0.000	0.272		0.002	0.000
F-test [(1) and (3)]			0.759	0.004		0.133	0.062		0.562	0.000		0.970	0.000		0.010	0.000
F-test [(2) and (4)]			0.003	0.002		0.019	0.001		0.000	0.000		0.000	0.000		0.008	0.010
Observations		3,763	3,763	3,763	3,516	3,516	3,516	23,728	23,728	23,728	11,216	11,216	11,216	35,885	35,885	35,885
Firms		470	470	470	426	426	426	2,970	2,970	2,970	1,291	1,291	1,291	3,877	3,877	3,877