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Peer Effects in Capital Structure Adjustments

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Abstract

This study investigates whether there are "peer effects" in capital structure adjustments using an instrumental variable (IV) approach proposed by Leary and Roberts (2014, Journal of Finance). This study finds that firms refer to peer firms' decisions and characteristics in setting target leverage ratios and in adjusting their leverage toward their leverage targets. This study also finds evidence for "asymmetric" peer effects for over-levered and under-levered firms: (i) over-levered firms increase the speed of the adjustment when adverse equity shocks happen to their peers, while under-levered firms do so when there are positive equity shocks to their peers; (ii) peer effects regarding leverage adjustment speeds are more significant for over-levered firms than for under-levered firms.

JEL classification: G30, G32, G34

Keywords: Peer Effects, Capital Structure, Speed of Adjustment, Leverage Adjustments

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I. Introduction

The topic of capital structure adjustments has been investigated widely since Fischer, Heinkel, and Zechner (1989) put forward the dynamic capital structure theory. Nearly all existing literature has been built on the assumption that firms set their leverage targets and adjust their leverage toward their targets only if the benefits outweigh the costs, particularly the adjustment costs. However, in spite of empirical evidence for industry effects as measured by the coefficient of industry median leverage ratios, why they exist has been left unresolved (Leary and Roberts, 2014). Moreover, a survey conducted by Graham and Harvey (2001) indicated that a large number of CFOs refer to peer firms' financial decisions to make their own decisions. In this study, we ask the following question: "Why do firms refer to peer firms' decisions or factors affecting their decisions when they make their own capital structure adjustment decisions?" Two possible reasons might explain this: first, credit rating concerns, product market competition and other common issues may lead to this mimicking behavior (Bolton and Scharfstein, 1990); second, firms' capital structure adjustment decisions are simply not as rational in making the decisions as previously thought (this rationality is taken as a premise in previous research). In this sense, this "peer effect" topic can be compared with the "herding" effect in behavioral finance. Thus, instead of looking at the well-explored determinants of capital structure adjustment costs, this paper will mainly focus on how significant peer effects are in making leverage adjustment decisions.

Apart from theoretical arguments for peer effects, identifying peer effects empirically is not as simple and straight forward as they might seem.Leary and Roberts (2014) proposed to use an event study approach or to utilize an instrumental variable for peer effects in capital structure decisions, given that the reflection problem or endogeneity problem arises when firms are selected into peer groups. Firms in the same peer groups might be subject to the same financial and institutional environment. The number of events is too small to conduct an event study approach, so an instrumental variable is required to exploit exogenous variation of peer firms. To identify peer effects, Leary and Roberts (2014) utilize equity shocks defined as idiosyncratic variations in stock returns extracted from a capital asset pricing model augmented with an industry factor. Equity shock is an ideal instrument for peer effects, in that it contains few common variations. Besides, this firm-year-specific measure ensures that a large sample could be used to conduct empirical analyses.

Given that there is no research examining peer effects in firms' capital structure adjustmentdecisions, this study investigates whether peer effects exist in setting target leverage, how peer firms affect firms in adjusting their leverage toward the targets, and whether peer effects in more highly levered firms are more significant.

II. Literature on Peer Effects and Leverage Adjustments

There has been a significant body of literature in both theoretical and empirical research that investigates capital structure adjustment issues from various perspectives. For instance, Fischer, Heinkel, and Zechner (1989) develop a model of dynamic capital structure adjustment, which suggests that in the presence of adjustment costs, only when the benefits of such adjustment outweigh the costs will the firms actively adjust firm leverage. Flannery and Ragan (2006) introduce the partial-adjustment model of firm leverage in response to the questions of whether firms have leverage targets, and if so, what the adjustment speed is in general. They find that firms do have leverage targets, which is consistent with recent studies in this arena including Huang and Ritter (2009), Frank and Goyal (2009) and Faulkender et al. (2012), though Welch (2004) seems to be the only exception. However, there is no consensus reached regarding the magnitude of adjustment speed. Fama and French (2002) use ordinary least squares (OLS) and report only a moderate adjustment rate of 10%; Flannery and Ragan (2006) utilize mean differencing estimators and find that firms converge toward their target at a significant rate of more than 30%; and most recently, Faulkender et al. (2012) adopt the generalized method of moments (GMM) and conclude that overall the adjustment rate is around 20%, while the active adjustment rate is around 30%. Given that samples in all those works are Compustat-based, the differences might result from the adoption of various estimating methodologies. As an extension of Flannery and Ragan's (2006) research, Cook and Tang (2010) find that in better macroeconomic states, typical firms tend to adjust leverage toward targets at a faster speed. In the context of over 1,100 large acquisitions, Harford, Klasa and Walcott (2009) explore the relationship between deviation from target and firms' financing behavior, and the way firms adjust their capital structure after the acquisitions. Their evidence suggests that in the presence of large acquisitions, huge cash payments push firm leverage up above targets. Yet firms are observed to converge to their target leverage in the years following the acquisition. Colak, Flannery, and Öztekin (2014) analyze the role of political uncertainty in firms' adjusting leverage toward targets. Their evidence indicates that political uncertainty lowers the leverage adjustment speed, in that it raises adjustment costs arising from both secondary equity offerings (SEO) and bond issuances.

There has been some literature, though not much, about peer effects in corporate finance. In an earlier study, Duflo and Saez (2002) suggest that peer effects are an important determinant of savings decisions by showing that employees take into account their colleagues' decisions in enrolling in a Tax Deferred Account plan sponsored by the institution. Similar evidence could be found among MBA students and their peers in making executive compensation and acquisition strategy decisions (Shue, 2013). Using a large sample of antitakeover provisions and headquarter locations for US firms, John and Kadyrzhanova (2008) note that firms tend to adopt antitakeover provisions not long after their peers headquartered at the same geographic location adopt them, and thus substantiate peer effects in corporate governance. Matvos and Ostrovsky (2010) also find evidence of peer effects in mutual fund votes. In particular, they discover that a fund is more likely to vote against management, following what their peers do. Lerner and Malmendier (2013) interestingly point out that when the number of entrepreneurial peers increases, the entrepreneurship decreases, driven by unsuccessful entrepreneurial ventures. However, the role peer effects play in corporate capital structure decisions has been largely understudied, though this issue has been considered significant in the research of Graham and Harvey (2001). In a recent study, Leary and Roberts (2014) find that firms respond to the financial decisions of their peer firms. This is the first direct evidence of peer effects in firm financial decisions, which is quite related to this paper.

The contributions of the paper mainly lie in the following two aspects. First, as is discussed above, finance-related research regarding peer effects has been rare. This paper will fill in this gap. Second, we combine the peer effect with capital structure dynamics for the first time, identifying this as one significant factor other than adjustment cost in firms setting their target leverage and firms adjusting their leverage toward target leverage, though we are not the first to point out the peer effect itself. Additionally, we extract the active component of firms' leverage adjustment, which might help us to have a better understanding of active mimicking behaviors of firms following their peers.

III. Empirical Model and Main Hypotheses

A. Construction of peer firm equity shocks

We obtain peer firm equity shocks from the following equations, where i, j and t refer to the individual firm, peer group (i.e., industry group) and month, respectively. We divide firms into peer groups based on three-digit SIC codes. Unlike Fama and French's (1997) industry classification of 48 industries, this study divides firms into peer groups based on three-digit SIC codes. The total number of newly defined industries is 219.

Equation (1) is a revised capital asset pricing model including one additional component, the excess industry returns $(\bar{r}_{-ijt} - r_{ft})$, apart from the excess market returns $(r_{mt} - r_{ft})$. It is estimated on a rolling annual basis using monthly returns (i.e. the past 24 to 60 months of data). $\bar{r}_{-ijt}$ is defined as the industry average return excluding firm i' s. Our strategy, however, is to get annualized measures, given that the firm-level variables in our main regression model are annually measured. The annualized firm-specific equity shock, denoted as $ES_{i,t}$, can be obtained by deducting annualized expected returns ($\hat{r}_{it}^{A}$) from annualized actual returns (r_{it}^{A}) for each firm (Eq. (3)). Peer shock, our main variable of interest and denoted by $\overline{ES}_{-i,t}$, is then obtained by taking average of firms' equity shocks excluding firm i's.

$$r_{it} = \alpha_{it} + \beta_{it}^{M}(r_{mt} - r_{ft}) + \beta_{it}^{I}(\bar{r}_{-ijt} - r_{ft}) + \eta_{it} \tag{1}$$

$$\hat{r}_{it} = \hat{\alpha}_{it} + \hat{\beta}_{it}^{M}(r_{mt} - r_{ft}) + \hat{\beta}_{it}^{I}(\bar{r}_{-ijt} - r_{ft}) \tag{2}$$

$$ES_{i,t} = r_{it}^{A} - \hat{r}_{it}^{A} \tag{3}$$

B. Model specification

As will be discussed in detail in the next section, Part C, peer shocks are supposed to be related to firms' leverage targets (combining Eq. (4) and Eq. (5)) and leverage adjustment speed (Eq. (8)). Note that in this study, leverage is presented in a revised form, with the denominator of the ratio augmented by net profit, *NI*, from the last period. The purpose of this adjustment is to separate leverage into a mechanical and passive adjustment and an active component (Eq. (6)). This rules out the possibility that mimicking behaviors are only affected by a passive adjustment rather than an active adjustment. Thus, active mimicking patterns of leverage adjustment can be better captured by using this method. By reorganizing Eq. (7) and combining Eq. (4) and Eq. (5), target leverage L^*can be estimated. $FC_{i,t}$ contains a range of firm-specific characteristics such as *EBITDA_TA, MB, DEP_TA, Size, FA_TA, R&D_TA, R&D_Dum*, as well as industry dummies (Flannery and Ragan, 2006; Faulkender et al., 2012). To test whether peer shocks in more highly levered firms are more significant, we estimate Eq. (9). This equation contains a dummy variable *Overlev* that equals one if firms are over-levered in a specific year and the interaction term of Overlev and $\overline{ES}_{-i,t-1}$.

$$L^*_{i,t} = \beta X_{i,t-1} \quad (4)$$

$$\beta X_{i,t} = \beta_1 FC_{i,t} + \beta_2 ES_{i,t} + \beta_3 \overline{ES}_{-i,t} \quad (5)$$

$$L^p_{i,t-1} = \frac{D_{i,t-1}}{A_{i,t-1} + NI_{i,t}} \quad (6)$$

$$L_{i,t} - L^p_{i,t-1} = \gamma(L^*_{i,t} - L^p_{i,t-1}) + \varepsilon_{i,t} \quad (7)$$

$$L_{i,t} - L^p_{i,t-1} = (\gamma_0 + \gamma_1 \overline{ES}_{-i,t-1})(L^*_{i,t} - L^p_{i,t-1}) + \varepsilon_{i,t} \quad (8)$$

$$L_{i,t} - L^p_{i,t-1} = (\gamma_0 + \gamma_1 \overline{ES}_{-i,t-1} + \gamma_2 Overlev_{i,t-1} + \gamma_3 \overline{ES}_{-i,t-1} * Overlev_{i,t-1})(L^*_{i,t} - L^p_{i,t-1}) + \varepsilon_{i,t} \quad (9)$$

C. Hypothesis development

Unlike most existing literature, this paper hypothesizes that firms take into consideration actions and characteristics of peer firms when they set their own leverage targets. Managers in most firms might not know the exact benefits and costs, such as tax shields, non-tax shields, default costs and agency costs, which are determinants of optimal or target capital structure. In this case, what firms probably do would be to include peers' observed characteristics and behaviors in their information set, in that they think peer firms might know better and vice versa. And this might lead to what we observe as peer effects in leverage targets. Thus, we might expect to see the coefficient of $\overline{ES}_{-i,t-1}$ in Eq. (5), β_3, being statistically significant. Note that for this hypothesis, the magnitude of the coefficient, rather than its sign, is meaningful.

H1: When they set leverage targets, firms take into account their peers' actions and characteristics.

Now we consider the situation in which firms' leverage ratios can deviate from the target leverage ratios. According to the dynamic capital structure theory, firms tend to adjust their leverage back to target leverage gradually. Then here comes the question: how fast would they do this? This adjustment behavior is no doubt a more dynamic process than setting leverage targets. According to existing literature, the speed of leverage adjustment is determined by the trade-off of benefits and costs of adjusting leverage. However, we argue that apart from previously identified determinants of adjustment costs, another factor – peer shocks – is an equally important determinant of leverage adjustment speed. Above all, the credit rating agencies might drive firms to follow the pace of their peers. In a specific industry, one crucial rating criterion would be firms' relative leverage levels, rather than the absolute levels. In other words, a rating agency may compare firms' leverage with that of their peers, or use industry average leverage as a benchmark. In this sense, firms have strong incentives to catch up with their peers, and adjust their leverage according to the leverage levels of their peers or the shocks to peer firms. Quite similarly, banks might work in a similar way, as long as a bank loan is one of the most important sources of external financing. Another possible reason might be that, contrary to the well-established belief and premise that firms are making rational financial decisions, they may sometimes exhibit "herding" behavior, which has been studied intensively in the behavioral finance area. Based on the reasons listed above, we expect to see peer effects in adjustment speed. And accordingly, the coefficient of $\overline{ES}_{-i,t-1}$ in Eq. (8) is expected to be significant.

H2: Peer shocks have a significant impact on firms' active leverage adjustment speed towards targets.

Relevantly, and to take it one step further, this study explores the heterogeneity of the significance of peer effects in firms' leverage adjustment speed. Specifically, we would like to check whether over-levered firms are more likely to adjust their leverage than under-levered firms. In the presence of peers, because of the pressures from banks and credit rating agencies, higher-levered firms would be expected to become more stressed and more likely to respond to adverse peer shocks more sensitively than less levered firms. Besides, expected costs of predatory behavior in competitive product markets might result in over-levered firms responding more sensitively to adverse peer shocks than less levered firms (Bolton and Scharfstein, 1990). But in case of under-levered firms, they respond more sensitively to positive peer shocks. So we might observe the coefficient of the interaction term of *Overlev* and $\overline{ES}_{-i,t-1}$, γ_3 in Eq. (9) to be significantly negative.

H3: Peer effects in speed of leverage adjustment are more significant for over-levered firms than for under-levered firms.

IV. Data and Estimation Methods

A. Data and descriptive statistics

In this paper, we use data of publicly traded U.S. companies reported in Standard and Poor's Compustat Annual dataset for the years 1964-2013. For stock market data, we use the monthly data of the Center for Research in Security Prices (CRSP). In addition, we use a Compustat-CRSP link-file to combine two databases. Firms in financial services industry or regulated utilities industry are dropped to construct the final sample. Related variables are winsorized at the 1^{st} and 99^{st} percentiles to limit the effects of extreme values. Our summary statistics are presented in Table 1. There are a total of 90,991 observations and the sample period covers all the years from 1965 until 2013, though the starting point becomes 1971 after we clean the data to obtain non-missing values for all the variables listed in Data Appendix. Unlike Fama and French's (1997) classification of 48 industries, we divide firms into peer groups based on three-digit SIC codes and the total number of newly defined industries is 219. On average, we have roughly 12 firms per industry-year. Panel A and Panel B in Table 1 report summary statistics for firm characteristics and equity shock regression results, respectively. Firm characteristics include a series of common firm-specific characteristics, including *EBITDA_TA, MB, DEP_TA, LNSALE, FA_TA, RD_TA, D_RD* for both firms and their peer firms. On average, book leverage (BL) and market leverage (ML) are 0.224 and 0.241 respectively. Panel B shows the equity shock regression results estimated from Equation (1). The coefficient of excess industry return amounts to 0.649, while that of excess market return is 0.372. These results, derived from the revised CAPM in Eq. (1), suggest that industry factor explains certain proportion of stock returns. In other words, firms within the same industry are faced with the same institutional, operational and financial environments, which is reflected in stock returns. In a well-developed stock market, stock price reflects almost all the related information. Thus, we expect that excess industry return covers most of the industry-related information. After subtracting the expected return, we get idiosyncratic monthly return, which is often defined as monthly equity shock. To obtain annualized equity shock (denoted by ES), we deduct annualized expected returns from annualized returns for each firm. Peer firm equity shock, denoted by $\overline{ES}$, is the average of firms' annualized equity shock excluding firm i's. The mean of $\overline{ES}$ is -0.080 and the median -0.082.

[Insert Table 1 About Here]

Table 2 presents correlation matrix of all the variables. Overall, we could conclude from Pearson correlation coefficients, that there is no serious multicollinearity problem between those independent variables, with most of the correlation coefficients being less than 0.2.

[Insert Table 2 About Here]

B. Estimation methods

The empirical model in this paper is a dynamic panel regression model. OLS generally produces an upward-biased coefficient estimate for lagged dependent variable due to omission of fixed effects, while estimators of fixed effects tend to yield a downward-biased coefficient estimate by ignoring the correlation of the error term and the lagged dependent variables. The recently widely-adopted difference or system GMM seems to be one optimal solution. However, there were two problems in implementing GMM: first, it is computationally intensive as the sample size is relatively huge; second, it is quite difficult to find valid instrumental sets which satisfy Sargan/Hansen test. Therefore, we use both OLS and FE estimation and show that the results are not significantly affected by the choice of estimation methods.

V. Empirical Results

A. Peer effects in target leverage

Empirical results for Hypothesis 1 (H1) are presented in Table 3. In panel A, the dependent variable is market leverage (ML) for all four models. In previous empirical literature, either median or average leverage value (Model (1) and Model (2)) is used so as to capture industry effects, cause for which has not been fully investigated yet. Actually, this industry effect is related to this paper to the extent that it includes common factors affecting firms within the same industry, such as institutional and operational environments, and it reflects specific influence from peer firms. In both Model (3) and Model (4), we use $\overline{ES}$ as an instrumental variable for peer firm leverage ratios. Model (4) also includes peer firm characteristics, which is meant to show the role of peer firm characteristics affecting their own capital structure in selecting their optimal or target capital structure of one specific firm. Peer firms might have indirect impact on one firm via their characteristics (Leary and Roberts, 2014). In all models, coefficients of lagged market leverage are around 0.85, which indicates that adjustment speed is 15%. In other words, one typical firm will close the gap between actual leverage and target leverage by 15% per year. This speed is somewhere between that reported by Fama and French (2002), 10% and that presented by Faulkender et al. (2012), 20%. Coefficients of controlled variables show similar patterns across all models. Model (1) and Model (2) indicate that industry effect is significantly negative with the coefficients of IndMed_ML（t-1） and ML_peer（t-1） being -0.027 and -0.042 respectively. Our peer shock measure $\overline{ES}$ is significantly negatively associated with market leverage, which is consistent with Hypothesis 1 – there are peer effects in setting target leverage. Interestingly enough, the magnitude of this effect is even larger than firm's own equity shock. Also, the economic significance of peer effects is larger than that of firm size (regressions with standardized regressors are unreported). Model (4) suggests that peer firm characteristics are correlated with market leverage to a certain extent. But this relationship is not that strong and the specification shows no obvious improvements from Model (3) to Model (4). Adjusted R squared remains unchanged. So the remaining part of this paper is based on Model (3). In panel B, we replace the market leverage with book leverage. Still, we could observe significant peer effects in book leverage, though the magnitude changes. Also, we compare the results of different estimation methods, OLS and Fixed Effect (FE). As the model is a dynamic panel regression model, the coefficients of lagged dependent variable changes dramatically, while peer effect measure remains almost unchanged.

[Insert Table 3 About Here]

B. Effects of peer firms and capital structure adjustment speed

Table 4 presents peer effects in leverage adjustment speed of firms. The first column shows the full sample regression result and the second and the third column reports the regression results for over-levered firms and under-levered firms respectively. $L^{p}_{i,t-1}$ is an adjusted leverage measure which is defined as total debt in previous year divided by the sum of book assets in previous year plus net income in the present year. In this way, we can separate the leverage change between periods into two parts, the active adjustment component in the left side of the model in Table 4 (also denoted by ChAML) and the remaining passive adjustment component. MADEV is the deviation of the revised market leverage from target. The interaction term of peer shock and MADEV is denoted by $\overline{ES}$ $\times$MADEV. In the first column for the whole sample result, the coefficient of $\overline{ES}$ $\times$MADEV is not significant. This does not seem to support Hypothesis 2. However, when we divide the sample into over-levered firms and under-levered firms, we observe interesting results. The coefficient of the interaction term in over-levered firms is significantly negatively associated with the dependent variable, while the coefficient in under-levered firms shows significantly positive association with the dependent variable. Actually, the heterogeneity between over-levered firms and under-levered firms leads to this result. Specifically, over-levered firms respond to adverse shocks from peer firms more sensitively. In other words, over-levered firms are faced with riskier situations and they tend to speed up in adjusting leverage ratios back to targets whenever there are bad events happening to their peers. In contrast, if there are favorable and positive shocks, typically new investment opportunities, happening to peers, under-levered firms might also consider making similar investment decisions and thus taking on more debts. Under-levered firms respond to positive shocks from peer firms more sensitively. Based on the analysis above, Hypothesis 2 can be substantiated. Peer shocks have a significant impact on firms' active leverage adjustment speed towards targets, though over-levered firms and under-levered firms show opposite pattern of adjustment behaviors.

[Insert Table 4 About Here]

To take it one step further, we would like to explore whether peer effects in over-levered firms are more significant than in under-levered firms in terms of leverage adjustment speed.Table 5 presents the empirical result for this. Overlev×MADEV is the interaction term of dummy variable Overlev (Overlev equals one if firms are over-levered and zero otherwise) and MADEV and Overlev× $\overline{ES}$ ×MADEV is the interaction term of Overlev, peer firm equity shock and MADEV. The coefficient of $\overline{ES}$ ×MADEV shows no significance which is consistent with the result of column one in Table 4. A significantly positive association between Overlev×MADEV and dependent variable and a significantly negative association between Overlev× $\overline{ES}$ ×MADEV and dependent variable are observed, which suggests that compared with under-levered firms, when there are adverse shocks, over-levered firms adjust their leverage ratios at a faster speed. This is consistent with Hypothesis 3.

[Insert Table 5 About Here]

VI. Conclusion

Contrary to classical assumption in corporate finance that firms make financial decisions independently, Graham and Harvey's (2001) survey indicate that firms actually care about what happens to their peers or what their peers have done. Due to endogeneity problem arising from the selection of firms into peer groups, the topic of peer effects in corporate finance has been largely understudied. This paper adopts peer firm equity shocks as an instrumental variable for peer firm related financing information (Leary and Roberts, 2014) and aims at filling in the gap of peer effects in firms' dynamic behaviors relating to capital structure adjustment. Estimates in this paper demonstrate that: (1) when they set leverage targets, firms take into account their peers' behaviors; (2) peer shocks have a significant impact on firms' active leverage adjustment speed towards targets and this impact shows different patterns for over-levered firms and under-levered firms. When adverse equity shocks happen to their peers, over-levered firms will accelerate leverage adjustment. In contrast, when there are positive shocks, under-levered firms will likely to adjust their leverage towards targets at a faster speed; (3) also peer effects in over-levered firms are more significant than in under-levered firms in terms of leverage adjustment speed.

Though this paper will fill in the gap of peer effects in dynamic capital structure theory, there are observable limitations as well. First, the relative significance of peer effects over other industry-related factors is still unknown; second, mechanisms behind peer effects might need to be explored. Our further research might go deeper into the two aspects.

Data Appendix

Abbreviation	Description	Formula
ML	Market leverage	(Total long-term debt [dltt] + Total short-term debt [dlc]) / Total long-term debt [dltt] + Total short-term debt [dlc] + Close price at the end of calendar year [prcc_c] * Number of common shares outstanding [csho])
BL	Book leverage	(Total long-term debt [dltt] + Total short-term debt [dlc]) / Total assets [at]
LNSALE	Firm size	Natural logarithm of Total revenue [sale]
EBITDA_TA	Profitability	(Operating income before depreciation [oibdp]) / Total assets [at]
MB	Market-to-Book	(Total long-term debt [dltt] + Total debt in current liabilities [dlc] + Liquidation value of preferred stock [pstkl] + Close price at the end of calendar year [prcc_c] * Number of common shares outstanding [csho]) / Total assets [at]
FA_TA	Tangibility of assets	Total property, plant and equipment [ppent] / Total assets [at]
DEP_TA	Depreciation	(Total depreciation [dp])/ Total assets [at]
RD_TA	R&D intensity	R&D expenses [xrd] / Total assets
D_RD	R&D dummy	R&D dummy; one if there are R&D expenses and zero otherwise

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Table 1. Summary Statistics

variable	mean	sd	p25	p50	p75
Panel A: Firm characteristics					
Firm-specific variables					
BL	0.224	0.198	0.046	0.196	0.343
ML	0.241	0.239	0.027	0.171	0.393
Size	4.558	2.237	3.131	4.539	6.057
EBITDA_TA	0.067	0.228	0.041	0.119	0.181
MB	1.619	1.645	0.723	1.064	1.795
FA_TA	0.282	0.211	0.116	0.235	0.395
DEP_TA	0.045	0.034	0.024	0.038	0.056
RD_TA	0.047	0.099	0.000	0.000	0.048
D_RD	0.506	0.500	0.000	1.000	1.000
Peer firm variables					
BL_peer	0.224	0.090	0.160	0.219	0.275
ML_peer	0.241	0.133	0.131	0.227	0.324
Size_peer	4.558	1.290	3.681	4.412	5.369
EBITDA_TA_peer	0.067	0.108	0.025	0.090	0.141
MB_peer	1.619	0.792	1.031	1.439	2.046
FA_TA_peer	0.282	0.159	0.169	0.244	0.347
DEP_TA_peer	0.045	0.017	0.034	0.042	0.052
RD_TA_peer	0.047	0.064	0.002	0.015	0.086
D_RD_peer	0.506	0.366	0.167	0.455	0.895
Panel B: Equity shock regression results					
α_{ijt}	0.009	0.018	-0.001	0.008	0.018
β_{ijt}^{M}	0.372	0.879	-0.044	0.414	0.860
β_{ijt}^{I}	0.649	0.627	0.241	0.555	0.946
R squared	0.251	0.163	0.116	0.229	0.364
Monthly return	0.015	0.170	-0.063	0.000	0.077
Expected monthly return	0.019	0.076	-0.016	0.016	0.050
Idio monthly return	-0.004	0.163	-0.076	-0.012	0.054
Obs. per regression	59.15	2.823	60	60	60
Annualized *ES*	-0.080	0.588	-0.374	-0.106	0.159
Annualized peer shock $(\overline{ES})$	-0.080	0.184	-0.173	-0.082	0.004
Observations	90,991				
Firms	9,221				
No. of industries	219				
Firms per ind-year	12.021	21.498		6	

Table 2. Correlation Matrix

	BL	ML	ES	$\overline{ES}$	LNSALE	EBITDA_TA	MB	FA_TA	DEP_TA	RD_TA	D_RD
BL	1.000										
ML	0.812	1.000									
ES	-0.028	-0.057	1.000								
$\overline{ES}$	0.038	0.074	0.077	1.000							
LNSALE	0.087	0.108	0.036	0.047	1.000						
EBITDA_TA	-0.039	-0.005	0.140	0.067	0.444	1.000					
MB	-0.163	-0.412	0.079	-0.073	-0.161	-0.185	1.000				
FA_TA	0.273	0.258	0.009	0.058	0.114	0.187	-0.143	1.000			
DEP_TA	0.108	0.047	-0.031	-0.020	-0.078	-0.072	0.010	0.461	1.000		
RD_TA	-0.179	-0.277	-0.058	-0.089	-0.296	-0.576	0.394	-0.268	0.093	1.000	
D_RD	0.180	0.230	0.016	0.047	0.052	0.142	-0.185	0.274	0.063	-0.456	1.000

Table 3. Peer Effects in Setting Leverage Targets

Panel A. Ordinary Least Squares (OLS)

VARIABLES	Model (1) ML	Model (2) ML	Model (3) ML	Model (4) ML
ML（t−1）	0.855***	0.853***	0.852***	0.852***
	(0.003)	(0.003)	(0.003)	(0.003)
$\overline{ES}$（t−1）			-0.017***	-0.018***
			(0.003)	(0.003)
ES（t−1）			-0.002***	-0.002***
			(0.001)	(0.001)
LNSALE（t−1）	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
EBITDA_TA（t−1）	-0.036***	-0.036***	-0.035***	-0.037***
	(0.004)	(0.004)	(0.004)	(0.004)
MB（t−1）	-0.001**	-0.001***	-0.001**	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
FA_TA（t−1）	0.031***	0.031***	0.031***	0.031***
	(0.004)	(0.004)	(0.004)	(0.004)
DEP_TA（t−1）	-0.174***	-0.172***	-0.173***	-0.163***
	(0.021)	(0.021)	(0.021)	(0.021)
RD_TA（t−1）	-0.062***	-0.063***	-0.063***	-0.065***
	(0.008)	(0.008)	(0.008)	(0.008)
D_RD（t−1）	0.004***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
LNSALE_peer（t−1）				-0.004***
				(0.001)
EBITDA_TA_peer（t−1）				0.067***
				(0.011)
MB_peer（t−1）				0.003**
				(0.001)
FA_TA_peer（t−1）				0.007
				(0.011)
DEP_TA_peer（t−1）				-0.228***
				(0.062)
RD_TA_peer（t−1）				0.077***
				(0.025)
D_RD_peer（t−1）				0.001
				(0.005)
IndMed_ML（t−1）	-0.027***			
	(0.006)			
ML_peer（t−1）		-0.042***		

		(0.006)		
Constant	0.039***	0.045***	0.032***	0.038***
	(0.012)	(0.011)	(0.011)	(0.013)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	79,165	79,165	79,165	79,165
Adjusted R-squared	0.778	0.778	0.778	0.778

Panel B. Comparisons of OLS estimates and FE estimates

	OLS	FE	OLS	FE
VARIABLES	ML	ML	BL	BL
ML（t−1）	0.852***	0.644***		
	(0.003)	(0.005)		
BL（t−1）			0.868***	0.676***
			(0.003)	(0.006)
$\overline{ES}$（t−1）	-0.017***	-0.016***	-0.005**	-0.004**
	(0.003)	(0.002)	(0.002)	(0.002)
ES（t−1）	-0.002***	-0.003***	-0.006***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
LNSALE（t−1）	0.001***	0.017***	0.001***	0.005***
	(0.000)	(0.001)	(0.000)	(0.001)
EBITDA_TA（t−1）	-0.035***	-0.069***	-0.032***	-0.040***
	(0.004)	(0.006)	(0.004)	(0.006)
MB（t−1）	-0.001**	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.001)
FA_TA（t−1）	0.031***	0.063***	0.020***	0.035***
	(0.004)	(0.008)	(0.003)	(0.007)
DEP_TA（t−1）	-0.173***	-0.276***	-0.087***	-0.139***
	(0.021)	(0.034)	(0.019)	(0.032)
RD_TA（t−1）	-0.063***	-0.072***	-0.033***	-0.029*
	(0.008)	(0.013)	(0.009)	(0.017)
D_RD（t−1）	0.004***	-0.007**	0.002*	-0.003
	(0.001)	(0.003)	(0.001)	(0.002)
Constant	0.032***	0.020***	0.032***	0.048***
	(0.011)	(0.006)	(0.010)	(0.005)
Industry Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	79,165	79,124	79,882	79,882
Adjusted R-squared	0.778	0.461	0.762	0.459

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Effects of Peer Firms on Speed of Leverage Adjustment

Empirical Model: $L_{i,t} - L^{p}_{i,t-1} = (\gamma_0 + \gamma_1 \overline{ES}_{-i,t-1})(L^{*}_{i,t} - L^{p}_{i,t-1}) + \varepsilon$

	All firms	Overlev	Underlev
VARIABLES	ChAML	ChAML	ChAML
MADEV	0.203***	0.334***	0.152***
	(0.003)	(0.006)	(0.014)
$\overline{ES}$ ×MADEV	0.002	-0.092***	0.079***
	(0.018)	(0.024)	(0.019)
Constant	0.004***	0.047***	0.004*
	(0.000)	(0.001)	(0.002)
Observations	79,165	33,716	45,449
Adjusted R-squared	0.135	0.177	0.016

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.Effect of Peer Shocks on Speed of Leverage Adjustment: Over-levered Firms vs. Under-levered Firms

Empirical Model:

$$L_{i,t} - L^{p}_{i,t-1} = (\gamma_0 + \gamma_1 \overline{ES}_{-i,t-1} + \gamma_2 Overlev_{i,t-1} + \gamma_3 \overline{ES}_{-i,t-1} * Overlev_{i,t-1})(L^{*}_{i,t} - L^{p}_{i,t-1}) + \varepsilon$$

VARIABLES	ChAML
MADEV	0.021**
	(0.010)
$(\overline{ES})$ ×MADEV	0.027
	(0.020)
Overlev×MADEV	0.266***
	(0.014)
Overlev× $(\overline{ES})$ ×MADEV	-0.114***
	(0.032)
Constant	0.028***
	(0.001)
Observations	79,165
Adjusted R-squared	0.153

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1