Journal of Banking & Finance xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

Corporate governance and the dynamics of capital structure: New evidence

Ya-Kai Chang [a], Robin K. Chou [b,*], Tai-Hsin Huang [a]

[a] Department of Money and Banking, College of Commerce, National Chengchi University, Taiwan
[b] Department of Finance and Risk and Insurance Research Center, College of Commerce, National Chengchi University, Taiwan

ARTICLE INFO

Article history:
Received 31 October 2012
Accepted 27 April 2014
Available online xxxx

JEL classification:
G32
G34

Keywords:
Corporate governance
Dynamic capital structure
Speed of capital structure adjustment

ABSTRACT

The effects of corporate governance on optimal capital structure choices have been well documented, though without offering empirical evidence about the impact of corporate governance quality on the adjustment speed toward an optimal capital structure. This study simultaneously considers two effects of debt originating from agency theory—the takeover defense and the disciplinary effects of debt—on the speed of adjustment to the optimal capital structure. Corporate governance has a distinct effect on the speed of capital structure adjustment: weak governance firms that are underlevered tend to adjust slowly to the optimal capital structure, because the costs of the disciplinary role of debt outweigh the benefits of using debt as a takeover defense tool. Although overlevered weak governance firms also adjust slowly, they do so because they are reluctant to decrease their leverage toward the target level to deter potential raiders, especially if they face a serious takeover threat. Therefore, this study finds that both overlevered and underlevered firms with weak governance adjust slowly toward their target debt levels, though with different motivations.

1. Introduction

Researchers have extensively debated the question of whether firms have a target leverage ratio.[1] Because a deviation of the actual leverage away from the target leverage reduces a firm's value, firms are incentivized to adjust their leverage to the optimal level. However, this adjustment process takes time, particularly when firms face adjustment costs.[2] As Myers (1984) points out, if adjustment costs are large, firms take extended excursions away from their target, and therefore more attention should focus on identifying the adjustment costs, why they are so important, and how rational managers respond to them, rather than just refining static trade-off theories.

We examine the impact of the agency conflicts between managers and shareholders on the speed of capital structure adjustment by considering the effect of corporate governance quality (i.e., strength of shareholder rights).[3,4] Although researchers have widely discussed the effect of corporate governance on capital structure choices, little attention has centered on the effect of corporate governance quality on the adjustment speed of firms' capital structure.

* Corresponding author. Address: Department of Finance, College of Commerce, National Chengchi University, 64 Zhinan Road Sec. 2, Taipei, Taiwan. Tel.: +886 2 29393091; fax: +886 2 29393394.
E-mail address: rchou@nccu.edu.tw (R.K. Chou).

[1] This debate actually represents a shift from prior literature, which focuses on the existence of leverage targets, to emphasizing the need to quantify the importance of the targets. (See Rajan and Zingales, 1995; Hovakimian et al., 2001, 2004; Fama and French, 2002; Flannery and Rangan, 2006; Kayhan and Titman, 2007; Lemmon et al., 2008).

[2] In a perfect world with zero adjustment costs, a firm offsets any deviation to maintain its optimal target leverage immediately. In contrast, with infinite transaction costs, it makes no movement toward its target leverage. Researchers who study the effects of adjustment costs on the speed of adjustment to target leverage include Hovakimian et al. (2001), Leary and Roberts (2005), Flannery and Rangan (2006), Strebulaev (2007), Faulkender et al. (2008), and Huang and Ritter (2009).

[3] An increasing body of literature examines the influences of agency problems between shareholders and debtholders, such as underinvestment (e.g., Ju and Ou-Yang, 2006; Titman and Tsyplakov, 2007; Sundaresan and Wang, 2007; Hackbarth, 2008; Pawlina, 2010; Dang, 2011; Hackbarth and Mauer, 2012) and asset substitution (e.g., Leland, 1998; Ju and Ou-Yang, 2006; Sundaresan and Wang, 2007; Dangl and Zechner, 2007), on debt restructuring. However, to the best of our knowledge, theoretical and empirical evidence regarding the effect of manager–shareholder conflicts on the adjustment speed toward an optimal capital structure remains rare.

[4] As a robustness check, we perform additional analyses to investigate the impact of agency conflicts between shareholders and debtholders on the adjustment speed of firms' capital structure, using credit rating data (S&P Domestic Long-Term Issuer Credit Rating) as a proxy for corporate governance quality. These additional results are consistent with our initial results, focused on agency problems between managers and shareholders.

http://dx.doi.org/10.1016/j.jbankfin.2014.04.026
0378-4266/

Adjustment costs are directly related to the severity of conflicts between managers and shareholders, and researchers have proposed various explanations for adjustment costs that rely on the influence of self-interested managers.

For example, the takeover defense effect of debt explanation indicates that managers use debt as a defense against corporate raiders (Berger et al., 1997). When their job security comes under threat, they use more leverage, even beyond the optimal point (firm value-maximizing levels), to defend themselves against ever-present raiders and prevent a takeover. That is, when self-interested managers maximize their personal benefits, they tend to increase their debt use, regardless of its effect on shareholder wealth. Berger et al. (1997) show that for underlevered firms, unsuccessful tender offers prompt firms to add leverage and increase the adjustment speed toward their target leverage. In contrast, for overlevered firms, takeover threats still cause them to increase their leverage, so firms slow their adjustment speed of leverage toward the target levels.

Another notable effect of debt is its disciplinary role. Because debt limits managers' flexibility to use free cash flows (Jensen, 1986), self-interested managers maximize their personal benefits by decreasing their debt use, again regardless of its effect on shareholder wealth. Morellec et al. (2012) thus argue that corporate governance quality is an important influence on the speed with which firms adjust their capital structure toward target leverages. With their theoretical dynamic trade-off model, they examine the effects of corporate governance quality on capital structure dynamics. The results of their model show that when making financing decisions, managers consider the costs of refinancing, especially the disciplinary effect of debt, which produces the majority of the total adjustment costs. Morellec et al. (2012) further suggest that the disciplinary cost of debt causes firms with weak corporate governance to adjust more slowly toward the optimal capital structure than it does firms with strong corporate governance.

However, Berger et al. (1997) do not consider the effect of different corporate governance quality on the adjustment speed toward an optimal capital structure. Managers of firms with weak versus strong governance may have different incentives to adjust their capital structures and thus adopt different adjustment speeds. In contrast, Morellec et al.'s (2012) do not consider the impact of takeover threats from outsiders or deviations from the target leverage levels when examining the relationship between the adjustment speed of capital structure and corporate governance quality.

To address this gap, we jointly test for the effects of the disciplinary and takeover defense roles of debt on capital structure adjustments on overlevered and underlevered firms. We predict that for underlevered (overlevered) firms, if the takeover defense benefits of debt outweigh its disciplinary costs, firms with weak governance, compared to those with strong governance, tend to adjust more quickly (slowly) toward the target leverage. However, if the disciplinary cost of debt is a more important consideration, underlevered (overlevered) firms with weak governance tend to adjust more slowly (quickly) toward the target leverage than do their strong governance counterparts.

We use dynamic partial adjustment capital structure models to examine the influence of corporate governance quality on the adjustment speed of capital structure, in which corporate governance quality is represented by the G-index (Gompers et al., 2003; hereafter, GIM), which reflects the strength of shareholder rights. We first test the effect of corporate governance on the speed of the leverage adjustment, without differentiating firms' deviations from their target leverages. We find that weak governance firms typically adjust more slowly to their target leverage ratios, consistent with Morellec et al.'s (2012) theoretical model, which stresses the disciplinary role of debt. However, because Morellec et al. (2012) ignore the potential takeover defense role of debt, they cannot differentiate disciplinary from takeover defense roles of debt.

To investigate the possibility of debt as a takeover defense tool, we next separately examine the relation between corporate governance and the speed of capital structure adjustment for underlevered and for overlevered firms. For underlevered firms, the speeds of adjustment toward the target capital structure are slower for those with weak governance than for their strong governance counterparts. This finding conflicts with the argument of using debt as a takeover defense: if weak governance firms tend to use debt as a takeover defense, they are likely to adjust their leverage upward more quickly than strong governance firms. Thus, we conclude that managers of underlevered weak governance firms consider the disciplinary costs of debt greater than the benefits of the takeover defense of debt. However, for overlevered firms, weak governance firms adjust more slowly toward the target leverage than strong governance firms, indicating that managers of overlevered weak governance firms are reluctant to adjust leverage downward because the benefits of debt as a takeover defense are greater than the disciplinary costs of debt.

To further test the above assertions, we examine the behavior of both underlevered and overlevered firms surrounding merger and acquisition (M&A) announcements, such that we seek evidence of a direct link between M&A events and the speed of capital structure adjustment. The results show that after the M&A announcement, the debt of overlevered firms with weak governance increases markedly more than their strong governance counterparts; that is, self-interested managers are willing to increase their debt to drive away raiders, even if this behavior results in large disciplinary costs. Therefore, our hypotheses are further supported. Furthermore, we also consider the impacts of product market competition and the omitted variable problems on capital structure adjustment speeds and find that our conclusions remain unchanged.

We contribute to the extant literature by providing empirical evidence of the joint impact of current deviations from optimal leverage levels and corporate governance quality on the adjustment speed of capital structure, in accordance with the takeover defense and disciplinary roles of debt. Our results complement those of Berger et al. (1997), who do not explicitly consider the disciplinary role of debt or corporate governance quality on debt adjustments. Our results also complement theoretical findings from Morellec et al. (2012), whose theoretical model does not specifically consider the takeover defense role of debt or the effect of deviations from optimal leverage levels. Our empirical results further indicate that both the disciplinary and takeover defense roles of debt offer important motivations for managers to adjust firm leverage. Moreover, these two effects depend on firms' corporate governance quality and deviations from target leverage levels. We provide a broader, clearer picture of managers' motivations to adjust leverage levels and how the adjustment process depends on the firm's current deviations from its optimal leverage and its corporate governance quality.

The remainder of this article is organized as follows: Section 2 briefly reviews prior literature. Section 3 introduces the dynamic partial adjustment capital structure model before we describe the data and variable definitions in Section 4. Section 5 contains the empirical results, and Section 6 concludes.

2. Literature review

The notion of agency conflicts within a firm offers an important determinant of capital structure (Jensen and Meckling, 1976). The presence of significant agency problems usually distorts corporate policy choices and weakens corporate performance. We link agency costs to capital structure by examining how corporate

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

governance quality (e.g., strength of shareholder rights) influences capital structure dynamics. Because agency conflicts are derived from the divergence of ownership and control, firms in which shareholder rights are severely restricted likely suffer higher agency costs, because managers can exploit the weak shareholder rights and place their own private benefits ahead of shareholders' interests.

A substantial amount of literature has documented the importance of corporate governance for analyzing a firm's financing choices (e.g., Jensen, 1986; Zwiebel, 1996; Berger et al., 1997; Garvey and Hanka, 1999; Harvey et al., 2004; Morellec, 2004; Wald and Long, 2007).[5] However, studies on the adjustment speed of capital structure or corporate governance quality in capital structure choices largely ignore the overall impact of corporate governance quality on the adjustment speed of capital structure toward its targets. We therefore attempt to distill basic mechanisms for how debts are likely to be treated by self-interested mangers from the extant literature, and we test the relationship between different mechanisms and adjustment speed. In particular, we distinguish two agency models of debts: the disciplinary effect and the takeover defense effect. Theoretical and empirical evidence regarding these two views on the strength of shareholders rights and their effect on determining capital structure adjustment speed is scarce.

2.1. Debts as takeover defense tools

Berger et al. (1997) find that when entrenched managers do not face pressure from either ownership and compensation incentives or active monitoring, they use lower leverage levels. However, after experiencing a shock to their security, such as unsuccessful tender offers, entrenched managers may use more leverage, beyond the value-maximizing level, as a defense device in support of defensive restructuring to deter outside raiders. The authors explore this issue by analyzing how leverage changes for underlevered and overlevered firms: underlevered firms react to takeover threats by levering themselves beyond the target leverage level, whereas overlevered firms respond by either not changing or increasing their leverage.

In other words, for underlevered firms the shock of a takeover threat increases the speed at which they move toward the target leverage, whereas for overlevered firms a security shock makes them maintain the same adjustment speed or decrease it toward the target leverage. Nevertheless, Berger et al. (1997) do not explicitly consider the potential effects of corporate governance on the takeover defense effect of debt. Therefore, we note the consequences of corporate governance quality on the use of debt as a takeover defense.

2.2. Debts as disciplinary tools

Debt can be used as a disciplinary device to constrain managers from wasting free cash flows. Therefore, self-interested managers may prefer less leverage than is optimal, because of the performance pressures associated with commitments to disgorge large amounts of cash (e.g., Jensen, 1986; Zwiebel, 1996; Morellec, 2004). Morellec et al. (2012) suggest that a firm's capital structure should be determined by not only taxes, the costs of refinancing, and bankruptcy costs but also the severity of manager–shareholder conflicts. Their dynamic trade-off model emphasizes the role of capital market frictions in capital structure dynamics. They also examine the importance of the interaction between market frictions and corporate governance quality in the dynamics of leverage ratios, arguing that when managers make corporate financing decisions, they consider the total costs of debt as the sum of the refinancing costs and those linked to the disciplinary effect of debt.[6] Furthermore, the total adjustment costs come mostly from the disciplinary effect of debt, which induces firms' financial inertia and persistence in their capital structure.

Morellec et al. (2012) further note that shareholders receive cash distributions on a pro-rata basis, so that management receives a fraction of the distributions when new debt is issued. However, the private benefits of control allow management's stake in the firm to exceed its direct ownership. Therefore, when debt constrains managers by limiting the cash flows available as private benefits, self-interested managers issue less debt than is optimal, which induces a slower adjustment speed. That is, the speeds of adjustment toward the target capital structure are slower for firms with weak governance than for firms with strong governance. Despite these insights, Morellec et al. (2012) do not consider the impact of outside takeover threats or firms' current deviations from the optimal leverage levels (Berger et al., 1997) in their dynamic trade-off model.

3. Hypotheses and model specification

3.1. Hypotheses

In accordance with these takeover defense and disciplinary roles of debt, we expect that the speed of capital structure adjustments relates to deviations from the target leverage and governance quality. We thus propose four hypotheses as follows.

H1a. For *overlevered* firms, the adjustment speed of capital structure toward targets should be *slower* for firms with *weak* corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The takeover defense effect of debt is more important than other factors for self-interested managers.

H1b. For *underlevered* firms, the adjustment speed of capital structure toward targets should be *quicker* for firms with *weak* corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The takeover defense effect of debt is more important than other factors for self-interested managers.

H2a. For *overlevered* firms, the adjustment speed of capital structure toward targets should be *quicker* for firms with *weak* corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of

[5] Morellec (2004) shows that manager–shareholder conflicts can explain the low debt level observed in practice and examines the impact of these conflicts on cross-sectional variation in capital structures. Berger et al. (1997) report that entrenched managers use less leverage in a sample of 434 industrial firms between 1984 and 1991; lower leverage also appears in firms run by chief executive officers (CEOs) with low direct stock ownership, low option holdings, long tenure, high excess compensation, a large board, and a low fraction of outside directors on the board. Garvey and Hanka (1999) further find that firms reduce their debt level when they are insulated from external discipline by state antitakeover laws. Other studies confirm Jensen's (1986) and Zwiebel's (1996) findings that debt is an optimal mechanism to discipline self-interested managers. In contrast with Garvey and Hanka (1999), Wald and Long (2007) conclude that manufacturing firms incorporated in states that have passed antitakeover laws have higher leverage after their passage. Harvey et al. (2004) claim that actively monitored debt (syndicate loans) benefits firms with high expected managerial agency costs.

[6] Morellec et al. (2012) show that the levels of agency conflicts inferred from the data relate to various corporate governance mechanisms, and that institutional ownership, anti-takeover provisions, and CEO tenure have the greatest impacts on agency conflicts.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

shareholders). The disciplinary effect of debt is more important than other factors for self-interested managers.[7]

H2b. For *underlevered* firms, the adjustment speed of capital structure toward targets should be *slower* for firms with *weak* corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The disciplinary effect of debt is more important than other factors for self-interested managers.

3.2. Econometric models

A regression specification used to estimate the trade-off leverage behavior must allow each firm's target debt ratio to vary over time and recognize that the deviation from the target leverage is not necessarily offset quickly. Both requirements can be incorporated into the standard partial adjustment model.[8] Extant literature provides two approaches to estimate this model. The approach used by Hovakimian et al. (2001), De Miguel and Pindado (2001), Fama and French (2002), and Kayhan and Titman (2007) estimates the model in two steps: estimate the target leverage ratio, and then conduct a partial adjustment regression. The second method, as used by Flannery and Rangan (2006), estimates a reduced-form model to obtain the coefficient of the adjustment speed directly. Here, we adopt both approaches to estimate the adjustment speed.

3.2.1. Two-stage model

In the first stage, we estimate the target debt ratio as the fitted value from a regression of observed debt ratios on a set of the firm's characteristics and its governance quality, which provide proxies for the factors identified by the trade-off theory as key determinants of the target.[9] The model is thus formulated as follows:

$$DR_{i,t+1} = \gamma Gov_{i,t} + \beta X_{i,t} + v_{1i,t+1}, \quad (1)$$

where $Gov_{i,t}$ is the corporate governance variable; $X_{i,t}$ is a vector of firm characteristic variables; $v_{1i,t+1}$ is the disturbance term with a zero mean and constant variance, and it is uncorrelated with the regressors; and γ and β are unknown parameters. Our primary target measure is the fitted value, $DR^*_{i,t+1}$, from the regression specified by Eq. (1). We define *Gov* and *X* in the next section.

In the second stage, we measure how quickly the firm adjusts to its target leverage from the current leverage. In the absence of frictions, firms fully adjust to their targets instantly; in the presence of adjustment costs, they cannot continuously and fully adjust. We apply the standard partial adjustment model, as in Fama and French (2002) and Kayhan and Titman (2007), as follows:

$$DR_{i,t+1} - DR_{i,t} = \delta\left(DR^*_{i,t+1} - DR_{i,t}\right) + v_{2i,t+1}, \quad (2)$$

where $v_{2i,t+1}$ is the disturbance term uncorrelated with the regressors; and δ represents the adjustment speed of the leverage, deviating away from the firm's next-period target leverage, which lies between zero and unity. A value of $\delta = 1$ indicates that the firm fully adjusts for any deviation away from its target leverage immediately, whereas $\delta < 1$ implies the presence of adjustment costs and predicts persistent, undesired leverage ratios. The gap between the desired and actual leverage levels should decrease over time, provided δ is greater than zero.

3.2.2. Reduced-form model

Several studies (e.g., Flannery and Rangan, 2006) estimate adjustment speed in a single step by substituting Eq. (1) into Eq. (2) and rearranging to obtain a reduced-form dynamic partial adjustment capital structure model:

$$DR_{i,t+1} = \delta\gamma GOV_{i,t} + \delta\beta X_{i,t} + (1-\delta)DR_{i,t} + \varepsilon_{i,t+1}. \quad (3)$$

In this equation, $\varepsilon_{i,t+1}$ is the error term uncorrelated with the regressors, and the coefficient on the lagged leverage ratio is $(1-\delta)$, where δ is the proportion of deviation from target leverage adjusted from period t to period $t+1$. Because the lagged dependent variable is usually correlated with the error term, we first regress $DR_{i,t}$ on the lagged book value of leverage and $X_{i,t}$ from Eq. (1). The variable $DR_{i,t}$ on the right-hand side of Eq. (3) then can be substituted for by its fitted value, $\widehat{DR}_{i,t}$.

Several econometric issues arise in relation to the two-stage model of Eqs. (1) and (2) and the reduced-form model in Eq. (3). The main issue is that the target debt ratio, $DR^*_{i,t+1}$, is unobservable, and the entire set of its determinants is neither known nor fully observable. Therefore, $DR^*_{i,t+1}$ is measured with an error, leading to a biased estimate of the adjustment speed in both models. The introduction of firm-specific fixed effects into both models should mitigate the problem, because they vary only across firms and are constant over time.[10] In addition, we include year dummies to control for and absorb any omitted time-varying influences on capital structure. For all regression models, we correct the standard errors for the presence of heteroskedasticity and clustering in error terms.

4. Variable definition and data

4.1. Variable definition

4.1.1. Leverage ratio

Previous works adopt both market and book equity values to examine capital structure (e.g., Bowman, 1980; Gaud et al., 2005). The book value of equity is merely a "plug number" to balance the left-hand and right-hand sides of the balance sheet; it can even be negative for ill-managed firms. Furthermore, book values may be less correlated with market values among small firms. Flannery and Rangan (2006) claim that the finance theory tends to downplay the importance of book ratios.

Hovakimian et al. (2001), Fama and French (2002), Hovakimian (2003), Welch (2004), and Leary and Roberts (2005) analyze market-valued debt ratios. According to Welch (2004), market-based debt ratios can describe the relative ownership of the firm

[7] Given that Morellec et al. (2012) focus on the behavior of underlevered firms in their model, our hypothesis (H2a) thus needs to be interpreted with caution. Rejecting the hypothesis does not indicate a rejection of the Morellec et al. (2012) model. We thank an anonymous referee for pointing this out.

[8] The partial adjustment models suggest that firms make partial adjustments toward the target leverage during each period. In contrast, the dynamic trade-off models predict that because of adjustment costs, firms keep their leverage within an optimal range and do not rebalance in each period, which implies that using the partial adjustment models could cause biased results. Our results thus should be interpreted with caution. Nevertheless, assuming that the biases from using the partial adjustment models are similar for both weak and strong governance firms, our results of comparing the adjustment speeds of these firms should remain valid, because we focus on relative rather than absolute speeds.

[9] We perform additional analyses of the first-stage model, using the market debt ratio (MDR). The regression results show that all other parameter estimates, including the positive coefficient estimates on total assets (LnTA), rating (Rated), and industry median leverage ratio (Med), as well as the negative coefficient estimates on the market to book ratio (MB), profitability (EBIT), and research and development expenditure (RD), are generally consistent with previous studies (e.g., Hovakimian et al., 2001, 2004; Flannery and Rangan, 2006; Byoun, 2008; Lemmon et al., 2008; Frank and Goyal, 2009; Huang and Ritter, 2009). Furthermore, our main independent variable, the governance index (G-index) as a proxy for agency conflicts, has a negative effect on target leverage, which is consistent with Morellec et al.'s (2012) finding that firms with weak governance tend to lower their target leverage. As a robustness check, we also use the book debt ratio (BDR) in our first-stage model and find similar results.

[10] Flannery and Rangan (2006) show that the inclusion of firm-specific fixed effects tends to generate sharper target leverage estimates, which explains the higher adjustment speed estimates these regressions produce.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

by creditors and equity holders. They also are an indispensable input in weighted average cost of capital computations. Thus, as in many prior studies of capital structure, we define leverage as the market-valued leverage ratio,[11] calculated as follows:

$$MDR_{i,t} = \frac{D_{i,t}}{D_{i,t} + S_{i,t}P_{i,t}}, \quad (4)$$

where $D_{i,t}$ denotes the book value of firm i's interest-bearing debt at time t, $S_{i,t}$ denotes the firm's common shares outstanding at time t, and $P_{i,t}$ is the price per share at time t.

4.1.2. Corporate governance

The presence of significant agency problems between corporate insiders (managers and controlling shareholders) and outsiders (minority shareholders) typically distorts corporate policy choices and lowers corporate performance. Because debt limits managerial flexibility (Jensen, 1986), self-interested managers do not make capital structure decisions that maximize shareholder wealth. Thus, a firm's leverage should be influenced by not only firm-specific characteristics, but also manager–shareholder conflicts.

We use the G-index as a proxy for agency costs and examine its relation with managers' motivations to adjust their capital structures to target leverages. In particular, GIM (2003) regard the G-index as a measure of the strength of shareholder rights and show that the severity of agency costs tends to be inversely related to the strength of shareholder rights. That is, weak shareholder rights mean greater managerial power (Klock et al., 2005; Chava et al., 2009; Huang et al., 2005; Jiraporn et al., 2006; Dittmar and Mahrt-Smith, 2007; Jiraporn and Gleason, 2007).[12] Firms whose shareholder rights are more suppressed are more likely to experience a wider divergence of ownership and control and more prone to agency conflicts. Because leverage relates to agency costs, and agency costs are associated with shareholder rights, the G-index is a good proxy for the severity of agency conflicts when investigating the relationship between the strength of shareholder rights and adjustment speed.

The G-index counts the presence of 24 charter provisions that reduce minority shareholder rights and managerial vulnerability to takeovers. Among the mechanisms included, the G-index offers: (1) provisions that insulate management compensation and perks from disgruntled shareholders, (2) provisions that lower shareholder voting power, (3) state laws that delay and/or make takeover attempts costly, and (4) antitakeover provisions in the corporate charter. The less protected firm management is, the lower its assigned governance score. Higher index values imply weaker governance. As a robustness check, we also use the E-index constructed by Bebchuk et al. (2009), who argue that not all provisions listed in GIM are effective antitakeover measures and construct their index only using 6 out of the 24 provisions.

4.1.3. Firm characteristics

We choose a standard set of firm characteristics that affect a firm's leverage ratio choices, similar to those used by Rajan and Zingales (1995), Hovakimian (2003), Hovakimian et al. (2001), Fama and French (2002), and Flannery and Rangan (2006). Specifically, the market-to-book ratio (MB) is the ratio of the market value of total assets to their book value; it should have two opposite effects on the leverage ratio. First, a higher MB signals greater future investment opportunities, which firms may try to protect by restraining their leverage (e.g., Hovakimian et al., 2004; Flannery and Rangan, 2006). Second, because investment opportunities often require additional funding in excess of profits, leverage must be increased according to the pecking order theory (Drobetz and Wanzenried, 2006). The tangibility (FA) is the fixed assets (e.g., property, plant, and equipment) divided by total assets. Firms with more valuable tangible assets should enjoy higher credibility with regard to repaying their debts, as well as a relatively lower risk of bankruptcy, such that their debt capacity should be higher (Titman and Wessels, 1988; Hovakimian et al., 2004).

EBIT is a profitability ratio of earnings before interest and taxes to total assets. There are different perspectives on the relationship between EBIT and the leverage ratio. Firms with higher earnings per asset dollar tend to operate with lower leverage ratios, because high retained earnings reduce the need to issue debt. However, higher leverage also might reflect a firm's ability to meet debt payments using its relatively high cash flow. The term DEP refers to the ratio of depreciation to total assets. Firms with higher depreciation expenses have less need for interest deductions provided by debt financing, and so they also are less likely to issue debt for tax shield purposes. The proxy for firm size (LnTA) uses the natural logarithm of total assets. Larger firms tend to entail more leverage, because they are more transparent, with lower asset volatility and better access to public debt markets (Rajan and Zingales, 1995; Hovakimian et al., 2004).

The R&D expenditure (RD) variable is represented by the ratio of R&D expenses to a firm's book assets. Firms with higher R&D expenditures are inclined to have unique assets and develop unique products, which may imply higher bankruptcy costs (Titman, 1984; Hovakimian et al., 2004). Thus, firms with higher R&D prefer lower leverage ratios to protect themselves. The Rated dummy variable takes a value of 1 when a firm has a public debt rating in the Compustat database and 0 otherwise. In addition, to control for industry characteristics that may not be captured by other independent variables, we include the firm's industry median leverage ratio (Med), with an industry identified according to its four-digit Standard Industrial Classification (SIC) code.

4.1.4. Qualities of corporate governance

We separate firms according to the strong and weak qualities of their corporate governance, using quartiles of the governance index (G-index or E-index). Governance qualities should exert distinct impacts on capital structure adjustment speed toward the desired level. Firms sorted by the governance index appear in descending order, such that weak (strong) governance firms are located in the highest (lowest) quartile of the governance index, because they have weaker (stronger) shareholder rights. Firms located in the middle two quartiles have something between weak and strong governance.

4.2. Data

The primary source of data is Compustat, covering the period 1993–2009. Following conventional practices, we exclude financial firms (SIC codes 6000–6999) and regulated utilities (SIC codes 4900–4999). Each sample firm must have at least two consecutive years of observations. The final sample includes 4297 firm-year observations, and each sample firm was observed for at least two consecutive years. In addition, the governance index as a proxy for corporate governance quality, obtained from the Investor

[11] Titman and Wessels (1988) argue that book value-based leverage ratios are more effective leverage measures because they do not exhibit a spurious correlation with the Q and M/B ratios. Therefore, as a robustness check, we repeated our analyses using book leverage ratios and obtained similar results (available upon request). These findings are consistent with Flannery and Rangan (2006), who use both market and book leverage to estimate the partial adjustment model and find similar results. We thank an anonymous referee for suggesting this alternate ratio.

[12] The G-index has been widely employed to examine situations in which agency costs are relevant. For example, it has been related to the cost of debt financing (Klock et al., 2005), bank loans (Chava et al., 2009), the cost of equity (Huang et al., 2005), and firms' cash holdings (Dittmar and Mahrt-Smith, 2007). Jiraporn et al. (2006) find a link between corporate diversification and the G-index. Jiraporn and Gleason (2007) also explain firms' capital structure using the G-index, indicating that firms with weak shareholder rights adopt higher debt ratios, because leverage can help reduce agency problems.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

Table 1
Summary statistics.

	Mean	Median	Maximum	Minimum	Std. Dev	*N*
MDR	0.186	0.135	0.907	0.000	0.190	4297
BDR	0.211	0.198	0.988	0.000	0.180	4297
MB	1.807	1.406	8.752	0.286	1.313	4297
DEP	0.044	0.041	0.229	0.001	0.023	4297
EBIT	0.077	0.097	0.373	−2.736	0.164	4297
FA	0.256	0.221	0.829	0.001	0.171	4297
LnTA	8.977	8.909	10.687	6.779	0.696	4297
RD	0.053	0.027	0.945	0.000	0.079	4297
Med	0.131	0.114	0.440	0.009	0.099	4297
Rated	0.537	1.000	1.000	0.000	0.499	4297
G-index	9.342	9.000	19.000	2.000	2.704	4297
E-index	2.563	3.000	6.000	0.000	1.342	4297

This table presents the mean, median, maximum, minimum, and standard deviation of the variables (1993–2009). All accounting variables are from Compustat, and the corporate governance index is from IRRC. The sample includes all industrial Compustat firms with complete data for two or more adjacent years. All variables are winsorized at the 1st and 99th percentiles. The abbreviations are as follows: MDR is market debt ratio, BDR is book debt ratio, MB is market-to-book ratio, DEP is depreciation as a proportion of total assets, EBIT is earnings before interest and taxes as a proportion of total assets, FA is fixed assets (e.g., property, plant, and equipment) as a proportion of total assets, LnTA is log of total assets, RD is R&D expenses as a proportion of total assets, Med is industry median debt ratio based on the four-digit SIC, and Rated is a dummy variable equal to 1 if the firm has a public debt rating in Compustat and 0 otherwise. The G-index is 24 antitakeover provisions index by GIM. The E-index is six antitakeover provisions index by Bebchuk et al. (2009).

Table 2
Difference in mean between strong and weak governance firms.

	Strong governance (1) Mean	Weak governance (2) Mean	Difference (1) − (2) (*t*-statistics)
MDR	0.172	0.212	−0.040 (−5.46)
BDR	0.174	0.226	−0.052 (−5.06)
MB	1.902	1.625	0.277 (11.01)
DEP	0.045	0.043	0.002 (4.13)
EBIT	0.070	0.088	−0.018 (−3.59)
FA	0.251	0.266	−0.015 (−2.83)
LnTA	8.577	9.057	−0.480 (−5.81)
RD	0.059	0.041	0.018 (11.47)
Med	0.124	0.144	−0.020 (−5.33)
Rated	0.419	0.644	−0.225 (−10.54)
G-index	6.528	11.694	−5.166 (−143.00)
Obs.	1102	1433	

This table presents differences in means of variables across corporate governance qualities (1993–2009). The sample includes all industrial Compustat firms with complete data for two or more adjacent years. All variables are winsorized at the 1st and 99th percentiles. The abbreviations are as follows: MDR is market debt ratio, BDR is book debt ratio, MB is market-to-book ratio, DEP is depreciation as a proportion of total assets, EBIT is earnings before interest and taxes as a proportion of total assets, FA is fixed assets (e.g., property, plant, and equipment) as a proportion of total assets, LnTA is log of total assets, RD is R&D expenses as a proportion of total assets, Med is industry median debt ratio based on the four-digit SIC, and Rated is a dummy variable equal to 1 if the firm has a public debt rating in Compustat and 0 otherwise. The G-index is 24 antitakeover provisions index by GIM. We divide the samples into governance index quartiles: weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index, because they have weaker (stronger) shareholder rights.

Responsibility Research Center (IRRC) database, is available for 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006 during the sample period.[13] For intermediate years, we set the governance index according to the latest available year.

We use yearly data, because of the limitations on the corporate governance data and the possible biases arising from using datasets that are mismatched in observed frequencies. That is, to examine the influences of corporate governance quality (annual data) and to match the frequencies of the governance variables with firms' characteristic variables, we use yearly data for all variables in performing analyses. This data matching method is also commonly used in prior literature (e.g., Klock et al., 2005; Jiraporn et al., 2006; Dittmar and Mahrt-Smith, 2007; Jiraporn and Gleason, 2007; Chava et al., 2009). Detailed definitions of all the variables used in the study appear in the Appendix, and we report the summary statistics for our sample in Table 1. We winsorized all variables at the 1st and 99th percentiles to avoid the influence of extreme values.

To examine whether corporate governance quality influences corporate capital structures, we conduct univariate tests of variables across strong and weak qualities of corporate governance. Table 2 contains the mean values of all variables under study for both strong and weak governance qualities and the differences in the means between the two.

The mean market (book) leverage ratio of weak governance firms is 21.2% (22.6%), significantly higher than that of strong governance firms, 17.2% (17.4%), at the 1% level. By design, the average G-index is significantly lower for strong governance firms than for weak governance firms. Thus, we conclude that there seems to be a relation between corporate governance and the level of debt usage.

5. Empirical results

5.1. Leverage adjustment speed

5.1.1. Two-stage dynamic partial adjustment model

We use the G-index and E-index to divide the quality of governance into three groups: the strong governance group, which represents the first quartile; the middle group, which contains the middle two quartiles; and the weak governance group, or the last quartile. Table 3 presents the parameter estimates of Eq. (2), including firm-specific and year effects. The strong governance firms adjust faster toward target leverage than the weak governance firms. Panel A (i.e., G-index) shows that firms with strong governance are able to close 58.1% of the gap between the target and actual leverage ratios each year, whereas firms with weak governance correct only 28.5% of the gap between the target and actual leverage ratios annually. Panel B (i.e., E-index) offers similar results: The adjustment speed of weak governance firms is slower than that of strong corporate governance firms.

5.1.2. Reduced-form partial adjustment model

Panels A and B of Table 4 present the estimation results of the reduced-form model from Eq. (3), using the G-index and E-index, respectively. Similar to the two-stage regression results in Table 3, strong governance firms adjust faster toward target leverage than do weak governance firms. From Panel A of Table 4 (G-index), we determine that strong governance firms close 51.7% (= 1 − 48.3%) of the gap between the target and actual leverage ratios, whereas only approximately 20.9% (= 1 − 79.1%) of the gap is corrected by weak governance firms. Panel B (E-index) shows similar patterns.

5.1.3. Boundary issue

Cook et al. (2008) address the problem of specification error that arises when the decision of whether to issue a type of financing appears equivalent to the decision about how much financing to use. This problem is relevant for our study, because the inclusion of zero-debt issuance firms may cause a biased adjustment speed estimate.

We thus reestimate the reduced-form dynamic partial adjustment capital structure models using subsamples that delete the zero-debt issuance observations. Table 5 reports the coefficient estimates of the adjustment speed. The results are qualitatively similar, again showing that strong governance firms close the

[13] The IRRC provides information on the key corporate governance provisions for major U.S. corporations. According to GIM, its sample covers 93% of total capitalization of the NYSE, NASDAQ, and AMEX markets combined.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

Table 3
Regression results for adjustment speed estimates from a two-stage dynamic partial adjustment capital structure model.

	$DR_{i,t+1} - DR_{i,t}$		
	Weak	Medium	Strong
Panel A. Results from regressions when governance qualities are determined by the G-index			
TARGDIF	0.285***	0.518***	0.581***
	(0.050)	(0.038)	(0.047)
Fixed effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Obs.	1433	1762	1102
R-square	0.212	0.279	0.318
Wald test *p*-value (*W* vs. *M*)	0.012		
Wald test *p*-value (*M* vs. *S*)		0.315	
Wald test *p*-value (*S* vs. *W*)			0.002
Panel B. Results from regressions when governance qualities are determined by the E-index			
TARGDIF	0.381***	0.446***	0.618***
	(0.069)	(0.037)	(0.048)
Fixed effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Obs.	1045	2300	952
R-square	0.322	0.261	0.351
Wald test *p*-value (*W* vs. *M*)	0.311		
Wald test *p*-value (*M* vs. *S*)		0.027	
Wald test *p*-value (*S* vs. *W*)			0.011

This table reports the second-stage results from estimating Eq. (2) only: $DR_{i,t+1} - DR_{i,t} = \delta(DR^*_{i,t+1} - DR_{i,t}) + v_{2i,t+1}$, controlling for firm fixed effects and year fixed effects across strong, medium, and weak governance firm qualities. Panels A and B report the estimation results for weak, medium, and strong governance sub-samples with the G-index and the E-index, respectively. We divide the samples into governance index quartiles: weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index or E-index, as defined in Table 1, because they have weaker (stronger) shareholder rights; firms located in the middle two quartiles of the G-index or E-index are somewhere between weak governance and strong governance. To save space, we report only the coefficients of TARGDIF ($DR^*_{i,t+1} - DR_{i,t}$). The standard errors (in parentheses) are corrected for heteroskedasticity and clustering. Wald test *p*-value is for the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms. *** represents significance at the 1% level.

Table 4
Regression results for adjustment speed estimates from the reduced-form dynamic partial adjustment capital structure model.

	Leverage ratio		
	Weak	Medium	Strong
Panel A. Results from regressions when governance qualities are determined by the G-index			
LAGLEV	0.791***	0.571***	0.483***
	(0.057)	(0.040)	(0.048)
Fixed effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Obs.	1433	1762	1102
R-square	0.816	0.747	0.828
Wald test *p*-value (*W* vs. *M*)	0.014		
Wald test *p*-value (*W* vs. *S*)		0.271	
Wald test *p*-value (*S* vs. *W*)			0.001
Panel B. Results from regressions when governance qualities are determined by the E-index			
LAGLEV	0.672***	0.627***	0.518***
	(0.077)	(0.039)	(0.052)
Fixed effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Obs.	1045	2300	952
R-square	0.794	0.766	0.854
Wald test *p*-value (*W* vs. *M*)	0.675		
Wald test *p*-value (*W* vs. *S*)		0.173	
Wald test *p*-value (*S* vs. *W*)			0.038

This table reports the results of estimating Eq. (3): $DR_{i,t+1} = \delta\gamma GOV_{i,t} + \delta\beta X_{i,t} + (1-\delta)DR_{i,t} + \varepsilon_{i,t+1}$, controlling for firm fixed effects and year fixed effects across strong, medium, and weak governance qualities. Panels A and B report the estimation results for weak, medium, and strong governance sub-samples with the G-index and E-index, respectively. We divide the samples into governance index quartiles: weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index or E-index, as defined in Table 1, because they have weaker (stronger) shareholder rights; firms located in the middle two quartiles of the G-index or E-index are somewhere between weak governance and strong governance. To save space, we report only the coefficients of LAGLEV ($DR_{i,t}$). The standard errors (in parentheses) are corrected for heteroskedasticity and clustering. Wald test *p*-value is for the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms. *** represents significance at the 1% level.

gap between the target and actual leverage ratios faster than do weak governance firms.[14]

Furthermore, Tables 3–5 show the results of Wald tests for the null hypothesis of equal adjustment speed for weak vs. medium, medium vs. strong, and strong vs. weak governance firms, respectively. They demonstrate that the differences in the adjustment speeds between weak and strong governance firms are all significant at the 5% level or better, supporting our assertion that weak governance firms adjust slower toward the target leverage than do strong governance firms.

5.2. Deviation from target

5.2.1. Deviation from optimal leverage and speed of adjustment

We separate the sample into two groups, underlevered and overlevered firms, and then reestimate the models. Following Berger et al. (1997), we define a firm as underlevered (overlevered) if its leverage falls below (above) the predicted target leverage. According to the takeover defense role of debt, when managers' job security is threatened by potential corporate raiders, they use more leverage, even beyond the target debt ratio. Thus, overlevered firms with weak corporate governance tend to adjust *more slowly* toward the target leverage, compared to firms with strong corporate governance (H1a). In contrast, underlevered firms with weak corporate governance tend to adjust *more quickly* toward the target leverage than their strong governance counterparts (H1b).

However, according to the disciplinary role of debt, when making financing decisions, self-interested managers prefer to reduce their debt use to maximize their personal benefits, regardless of its impact on shareholder wealth. Thus, for overlevered firms, firms with weak corporate governance adjust *more quickly* toward target leverage, compared to firms with strong corporate governance (H2a). Correspondingly, underlevered firms with weak corporate governance tend to adjust *more slowly* toward target leverage, compared with their strong governance counterparts (H2b).

It is thus an empirical question whether the takeover defense role of debt or the disciplinary role of debt dominates in the aggregate. Table 6 reports the results from estimating Eq. (3) for underlevered firms in Panel A and overlevered firms in Panel B. The results show that the adjustment speed of overlevered firms towards target leverage is slower when they have weak governance. To deter takeover threats, managers of weak governance firms tend to resist decreasing their leverage, though debt limits their flexibility to use free cash flows. This finding supports H1a: debts are used as defense measures.

Underlevered firms with weak governance also adjust more slowly than underlevered firms with strong governance, which is inconsistent with the defense effect of debts (Berger et al., 1997). We argue that managers of underlevered weak governance firms face more costs from the disciplinary effect of increasing debts than benefits due to the takeover defense effect of increasing debts. Thus, managers do not have incentives to raise leverage. The empirical results confirm H2b regarding the disciplinary effect of debt.

[14] We also re-estimated the two-stage dynamic partial adjustment model and found similar patterns. The outcomes are not shown here for the sake of brevity but are available on request.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

Table 5
Regression results omitting zero-debt boundary points using the reduced-form dynamic partial adjustment model.

	Leverage ratio		
	Weak	Medium	Strong
Panel A. Results from regressions when governance qualities are determined by the G-index			
LAGLEV	0.791***	0.535***	0.439***
	(0.057)	(0.042)	(0.058)
Fixed effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Obs	1349	1554	897
R-square	0.816	0.738	0.817
Wald test *p*-value (*W* vs. *M*)	0.005		
Wald test *p*-value (*W* vs. *S*)		0.195	
Wald test *p*-value (*S* vs. *W*)			0.000
Panel B. Results from regressions when governance qualities are determined by the E-index			
LAGLEV	0.670***	0.581***	0.451***
	(0.079)	(0.041)	(0.060)
Fixed effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Obs.	998	2,013	789
R-square	0.797	0.758	0.847
Wald test *p*-value (*W* vs. *M*)	0.268		
Wald test *p*-value (*W* vs. *S*)		0.046	
Wald test *p*-value (*S* vs. *W*)			0.016

This table reports the results of estimating Eq. (3): $DR_{i,t+1} = \delta\gamma GOV_{i,t} + \delta\beta X_{i,t} + (1-\delta)DR_{i,t} + \varepsilon_{i,t+1}$ for the sample excluding zero-debt observations and controlling for firm fixed effects and year fixed effects across strong, medium, and weak governance qualities. Panels A and B report the estimation results for weak, medium, and strong governance sub-samples with the G-index and E-index, respectively. We divide the samples into governance index quartiles: weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index or E-index, as defined in Table 1, because they have weaker (stronger) shareholder rights; firms located in the middle two quartiles of the G-index or E-index are somewhere between weak governance and strong governance. To save space, we report only the coefficients of LAGLEV ($DR_{i,t}$). The standard errors (in parentheses) are corrected for heteroskedasticity and clustering. Wald test *p*-value is for the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms. *** represents significance at the 1% level.

Table 6
Regression results for underlevered and overlevered categories.

	G-index		E-index	
	Weak	Strong	Weak	Strong
Panel A. Adjustment speed estimates for underlevered firms across the governance qualities				
LAGLEV	0.747***	0.487***	0.336***	0.189***
	(0.109)	(0.108)	(0.085)	(0.097)
Fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	714	547	550	448
R-square	0.832	0.848	0.779	0.834
Panel B. Adjustment speed estimates for overlevered firms across the governance qualities				
LAGLEV	0.595***	0.167**	0.418***	0.235**
	(0.079)	(0.068)	(0.075)	(0.053)
Fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	719	555	495	504
R-square	0.812	0.873	0.865	0.878

Following Berger et al. (1997), we define a firm-year observation as underlevered (overlevered) if firms have less (more) leverage than predicted. Our sample includes 1261 underlevered observations and 1274 overlevered observations according to the G-index. When we use the E-index as a proxy for corporate governance, our sample includes 998 underlevered observations and 999 overlevered observations. Panels A and B show the results from estimating a reduced-form dynamic partial adjustment capital structure model pertaining to Eq. (3) across governance qualities for underlevered and overlevered firm samples, respectively. We divide the samples into governance index quartiles: weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index or E-index, as defined in Table 1, because they have weaker (stronger) shareholder rights. To save space, we report only the coefficients of LAGLEV ($DR_{i,t}$). The standard errors (in parentheses) are corrected for heteroskedasticity and clustering. **, and *** represent significance at the 5% and 1% levels, respectively.

These results overall suggest that self-interested managers, by weighing the personal benefits they would gain from different leverage levels, self-select their preferred leverage, regardless of the optimal target leverage, and are reluctant to adjust toward that optimum, even though doing so could increase shareholders' wealth.[15,16] Corporate governance seems to be an effective tool to alleviate the agency problem of debt usage, because debt is more likely to serve as a tool for gaining personal benefits by managers of firms with weak corporate governance.

We next provide further evidence regarding whether managers increase leverage ratios beyond the target debt ratio that maximizes firms' values. To support our hypotheses of underlevered firms treating debt as a disciplinary tool and overlevered firms using debt as a takeover defense tool, we directly test the sample of firms experiencing M&A events. We examine the annual mean changes in leverage and deviation in the years surrounding the M&A announcement dates for strong and weak governance firms, defined by the G-index for overlevered firms and underlevered firms, respectively. In this case, the deviation is defined as $DR^{*}_{i,t+1} - DR_{i,t}$. Year T − 1 (T + 1) denotes the year before (after) the M&A announcement date. Data regarding the dates of M&A announcements are compiled from the Securities Data Corporation's (SDC) Worldwide Mergers and Acquisitions database over the period 1993–2009.

For underlevered firms, according to Berger et al. (1997), after experiencing a shock to their security, if managers of weak governance firms were to use debt as a takeover defense tool, they should increase debt and lower the deviations between actual and target leverage ratios more than managers of strong governance firms. That is, the mean changes in leverage of weak governance firms would increase more than those of strong governance firms, and the mean changes in deviations of weak governance firms should decrease more than those of strong governance firms.[17]

However, Panel A in Table 7 indicates that the results are inconsistent with the defense effect of debt (Berger et al., 1997). The values of the mean change in leverage of weak governance firms are positive but smaller than those of strong governance firms. Moreover, the values of the mean change in deviations of firms with weak governance are larger than those of firms with strong governance firms. Through the positive values of the mean change in deviations, we find that the leverages of underlevered firms with weak governance are further away from their target leverage ratio after experiencing the shock of takeover threat, when the benefits of takeover defense of debt are likely to be the largest.

For overlevered firms, Panel B of Table 7 indicates that most of the mean changes in leverages (deviations) are positive (negative) for firms with weak corporate governance. In other words, when managers experience a takeover threat, they choose to increase debt significantly. This strategy moves firms' leverages away from the target debt ratios and lowers the adjustment speed. These findings provide direct evidence that the managers of overlevered weak governance firms face more costs from the takeover defense

[15] We found similar results using the two-stage adjustment model, but do not report them here.

[16] Bebchuk et al. (2013) argue that the effects of entrenchment may differ during different time periods. To examine this issue, we split our sample period into two subperiods, 1993–1999 and 2000–2009, and retested our data. The results are similar to those of the overall sample period (1993–2009), and our conclusions remain unchanged. We thank a referee for suggesting this robustness check.

[17] We thank an anonymous referee for suggesting these tests.

Table 7
Leverages and deviations for years surrounding M&A announcement dates.

Year relative to the M&A announcement date	T − 1	T + 1	T + 2	T + 3	T + 4	T + 5	T − 1	T + 1	T + 2	T + 3	T + 4	T + 5
	Strong						Weak					
Panel A. Leverages and deviations for underlevered firms across the governance qualities												
Mean leverage (%)	14.72	16.74	16.86	17.07	16.45	16.08	12.19	12.60	13.34	13.20	14.06	12.65
Mean deviation (%)	6.78	6.71	6.42	6.14	5.99	6.10	6.36	6.69	6.57	6.44	6.52	6.54
Mean change in leverage (%)		2.02	2.14	2.35	1.73	1.36		0.41	1.15	1.01	1.87	0.46
Mean change in deviation (%)		−0.07	−0.36	−0.64	−0.79	−0.68		0.33	0.21	0.08	0.16	0.18
Panel B. Leverages and deviations for overlevered firms across the governance qualities												
Mean leverage (%)	38.74	27.58	26.14	29.75	30.76	27.78	19.24	20.45	20.79	19.07	27.58	26.06
Mean deviation (%)	−8.81	−10.17	−4.86	−4.75	−7.98	−5.48	−3.32	−6.76	−10.00	−6.36	−7.65	−8.71
Mean change in leverage (%)		−11.16	−12.60	−8.99	−8.07	−10.96		1.21	1.55	−0.17	8.34	6.82
Mean change in deviation (%)		−1.36	3.95	4.06	0.83	3.33		−3.44	−6.68	−3.04	−4.33	−5.39

This table reports the leverage and the deviation between actual and target leverage ratios across strong and weak governance qualities in the years surrounding the M&A announcement dates. Panels A and B show the results for underlevered and overlevered firm samples, respectively. We measure the deviation as $DR^{*}_{i,t+1} - DR_{i,t}$, where $DR^{*}_{i,t+1}$ is the target leverage. Columns 3–7 show the mean difference in leverage and deviation for firms with strong governance qualities. Columns 9–13 report the mean difference in leverage and deviation for firms with weak governance. Both the definition of governance qualities and formation of quartiles are as described in Table 2. Year −1 (+1) is the year before (after) the M&A announcement.

effect of decreasing debts than benefits due to the disciplinary effect of decreasing debts.

5.2.2. Effect of product market competition

The costs and benefits of underlevered and overlevered weak governance firms may be affected by industry competition as well. Economists often argue that managerial slack is a problem primarily for firms in non-competitive industries, whereas managers of firms in competitive industries have strong incentives to reduce slack and maximize profits, or else go out of business. According to Scherer (1980, p. 38), "Over the long pull, there is one simple criterion for the survival of a business enterprise: Profits must be nonnegative. No matter how strongly managers prefer to pursue other objectives . . . failure to satisfy this criterion means ultimately that a firm will disappear from the economic scene."

Table 8
The impact of product market competition on the speeds of adjustment.

	Low competition		High competition	
	Weak	Strong	Weak	Strong
Panel A. Adjustment speed estimates for underlevered firms across the governance qualities				
LAGLEV	0.774**	0.597**	0.316**	0.287**
	(0.391)	(0.302)	(0.160)	(0.161)
Fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	342	275	372	272
R-square	0.881	0.890	0.871	0.893
Panel B. Adjustment speed estimates for overlevered firms across the governance qualities				
LAGLEV	0.893***	0.790**	0.369**	0.325**
	(0.345)	(0.365)	(0.146)	(0.157)
Fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	344	279	375	276
R-square	0.878	0.886	0.867	0.889

Following Berger et al. (1997), we define a firm-year observation as underlevered (overlevered) if firms have less (more) leverage than predicted. Panels A and B show the results from estimating a reduced-form dynamic partial adjustment capital structure model pertaining to Eq. (3) across governance qualities between firms in low competition and high competition industries for underlevered and overlevered firms, respectively. We divide the samples based on the product market competition and assign those firms located above (below) the median of Herfindahl–Hirschman index to low (high) competitive industries. We also divide the samples into governance index quartiles. Weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index, as defined in Table 1, because they have weaker (stronger) shareholder rights. To save space, we report only the coefficients of LAGLEV ($DR_{i,t}$). The standard errors (in parentheses) are corrected for heteroskedasticity and clustering. **, and *** represent significance at the 5% and 1% levels, respectively.

Previous researchers have therefore attempted to formalize the idea that product market competition acts an important role in reducing a firm's agency conflicts between managers and shareholders (e.g., Alchian, 1950; Stigler, 1958; Fama, 1980; Winston, 1998; Kole and Lehn, 1997, 1999; Raith, 2003; Karuna, 2008). In other words, market competition can be seen as a managerial incentive for improving firm performance. Based on the preceding arguments, we hypothesize that underlevered (or overlevered) firms with weak governance in high competitive industries have more incentive to maximize shareholders' wealth and thus increase their adjustment speed toward their target leverage. In addition, this increase will significantly close the gap of adjustment speeds between weak and strong governance firms.

We first use the Herfindahl–Hirschman (HH) index as a proxy for market competition and split our sample into firms in low and high competition industries as those located above and below the median of the index, respectively.[18] We then reestimate the adjustment speed for firms in different governance qualities and for underlevered and overlevered firms, respectively. The results, shown in Table 8, are consistent with our prediction; they indicate that because market competition helps weak governance firms align manager and shareholder interests, the difference in the speed of adjustment between weak and strong governance firms becomes smaller in highly competitive industries for both underlevered and overlevered firms. That is, the adjustment speeds of weak governance firms are much closer to those of strong governance firms in highly competitive industries. This additional analysis for the effect of product market competition provides further support for our hypotheses.

5.2.3. Omitted variable bias

As GIM (2003) note, our regression results might be driven by an endogeneity problem of omitted variable.[19] Such a problem could arise if the governance index is correlated with firm characteristics, which is not captured by our empirical model. To address this endogeneity concern, we reestimate Eq. (3) with the interaction

[18] HH index is defined as the sum of squared market shares in a given industry based on the four-digit SIC code. A higher HH index implies less competition.

[19] Our regressions may suffer from another endogeneity problem of reverse causality, though this issue should be a less concern in the paper. However, as a robustness check, we also used the Sarbanes–Oxley Act of 2002 (SOX) as an exogenous shock to corporate governance quality to identify the causal impact of the governance quality on the capital structure dynamics. Other recent studies also use the passage of SOX as a natural experiment (e.g., Knyazeva, 2009; Larcker and Rusticus, 2010; Jiraporn et al., 2012) to address endogeneity issues. After controlling for endogeneity, the regression results are overall consistent with our main findings. We thank an anonymous referee for pointing out these problems.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

terms between the firm's governance variable and characteristic variables ($GOV^*X_{i,t}$). The results are reported in Table 9. The results indicate that the governance index interactions with the market-to-book ratio, depreciation, profitability, R&D expenditures and firm size are significant. That is, the adjustment speeds toward the target leverage are affected by not only the direct effects of corporate governance, but also by the indirect effects of the interactions between the governance mechanism and firm specific characteristics.

Table 9
Adjustment for omitted variable.

	G-index		E-index	
	Weak	Strong	Weak	Strong
Panel A. Adjustment speed estimates for underlevered firms across the governance qualities				
LAGLEV	0.831***	0.488***	0.389***	0.206**
	(0.099)	(0.086)	(0.079)	(0.085)
GOV∗MB	0.001	−0.001	−0.015**	−0.002
	(0.004)	(0.002)	(0.007)	(0.004)
GOV∗DEP	−0.041	−0.211	−0.805**	−0.733**
	(0.379)	(0.202)	(0.359)	(0.309)
GOV∗EBIT	−0.077	−0.049*	−0.022	−0.118**
	(0.049)	(0.026)	(0.053)	(0.050)
GOV∗FA	0.006	0.016	0.043	0.071
	(0.051)	(0.032)	(0.051)	(0.044)
GOV∗LnTA	−0.001	0.006	−0.005	0.015
	(0.010)	(0.007)	(0.009)	(0.010)
GOV∗RD	0.171	−0.047	0.221	−0.231*
	(0.174)	(0.054)	(0.145)	(0.122)
GOV∗Rated	−0.003	0.002	0.001	−0.016
	(0.002)	(0.003)	(0.004)	(0.010)
GOV∗Med	0.013	−0.068	0.051	−0.145
	(0.046)	(0.046)	(0.075)	(0.096)
Fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	714	547	550	448
R-square	0.831	0.853	0.789	0.839
Panel B. Adjustment speed estimates for overlevered firms across the governance qualities				
LAGLEV	0.629***	0.229***	0.367***	0.219***
	(0.083)	(0.067)	(0.079)	(0.069)
GOV∗MB	−0.019*	0.006	−0.003	0.002
	(0.010)	(0.004)	(0.009)	(0.006)
GOV∗DEP	−0.756	−0.222	0.575	−0.657**
	(0.487)	(0.223)	(0.421)	(0.314)
GOV∗EBIT	0.109	−0.074***	0.039	−0.088**
	(0.084)	(0.027)	(0.062)	(0.038)
GOV∗FA	−0.012	0.003	−0.005	0.099*
	(0.063)	(0.049)	(0.063)	(0.053)
GOV∗LnTA	−0.011	0.014	0.021	0.028**
	(0.023)	(0.010)	(0.017)	(0.012)
GOV*RD	−0.381	−0.155	−0.040	0.112
	(0.446)	(0.130)	(0.169)	(0.116)
GOV∗Rated	0.025	−0.018	0.014	−0.009
	(0.023)	(0.017)	(0.017)	(0.019)
GOV∗Med	−0.040	−0.068	−0.051	−0.030
	(0.078)	(0.055)	(0.065)	(0.097)
Fixed effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	719	555	495	504
R-square	0.820	0.871	0.869	0.881

Following Berger et al. (1997), we define a firm-year observation as underlevered (overlevered) if firms have less (more) leverage than predicted. Panels A and B show the results from estimating pertaining to Equation: $DR_{i,t+1} = \delta\gamma GOV_{i,t} + \delta\beta X_{i,t} + (1-\delta)DR_{i,t} + \delta\lambda GOV^*X_{i,t} + \varepsilon_{i,t+1}$ across governance qualities for underlevered and overlevered firm samples, respectively. We divide the samples into governance index quartiles. Weak (strong) governance firms are those firms located in the highest (lowest) quartile of the G-index or E-index, as defined in Table 1, because they have weaker (stronger) shareholder rights. To save space, we report only the coefficients of LAGLEV ($DR_{i,t}$) and interaction terms between the firm's governance variable and characteristic variables ($GOV*X_{i,t}$). The standard errors (in parentheses) are corrected for heteroskedasticity and clustering.

* Represent significance at the 10% levels.

** Represent significance at the 5% levels.

*** Represent significance at the 1% levels.

However, the empirical results, after controlling for the omitted variable bias, show that the effects of corporate governance quality on the adjustment speed toward an optimal capital structure are overall consistent with our main findings in Table 6, i.e., both underlevered and overlevered firms with weak governance adjust more slowly toward their target debt levels, compared with their strong governance counterparts.

6. Conclusion

We test the effects of the disciplinary and the takeover defense roles of debt on capital structure adjustments jointly for overlevered and underlevered firms, while also considering the influences of firms' corporate governance quality. We examine the impact of corporate governance on the speed of capital structure adjustment using both two-stage and reduced-form dynamic partial adjustment capital structure models over the period 1993–2009.

Overlevered weak governance firms adjust more slowly toward the target leverage, compared with their strong governance counterparts. This finding implies that weak governance firms that face more takeover threats are less likely to decrease leverage and use debt as a takeover defense measure. In contrast, underlevered weak governance firms tend to adjust more slowly toward target leverage than their strong governance counterparts. If weak governance firms were to use debt as a takeover defense, it would be somewhat puzzling, because they also should increase their debt more than strong governance firms; that is, they would adjust more quickly to or even increase debt over their target leverages.

The above result implies that due to the disciplinary role of debt, managers of underlevered weak governance firms do not tend to increase leverage, because the disciplinary costs of increasing debt significantly outweigh its benefits as a takeover defense measure. Overall, by weighing the personal benefits they would gain from different leverage levels, self-interested managers select their preferred leverage, regardless of the optimal target leverage, and are reluctant to adjust to the optimal level, even though doing so could increase shareholders' wealth. Corporate governance thus seems an effective tool for alleviating the agency problem of debt usage, because debt is more likely to be used as a tool for gaining personal benefits by managers of firms with weak corporate governance.

When we examine firms without differentiating their deviations from target leverages, as Morellec et al. (2012) do, we find similar results, indicating that weak governance firms always adjust more slowly to their target leverage ratios. However, because Morellec et al. (2012) do not examine the takeover defense effect of debt on capital structure adjustment speed, they are not able to differentiate agency motivations (i.e., disciplinary and takeover defense roles of debt) for adjusting leverage. We conclude that overlevered and underlevered weak governance firms adjust slowly for different reasons, contrary to Morellec et al.'s (2012) argument, in which they attribute their finding solely to the disciplinary effect of debt. The defense effect of debt (Berger et al., 1997) also plays an important role in determining a firm's adjustment speed. Thus, our results complement those in the extant literature and provide a finer-grained analysis of the motivations for whether and why firms adjust to their target capital structure.

Finally, we note some limitations of the governance variables we employed. Antitakeover provisions can be easily adopted and altered when a threat is imminent. Therefore, the governance indicators used here are potentially flexible and their a priori values may not be a good indicator for the actual governance setting when the takeover threat is imminent. Our results thus should be interpreted with caution in this case.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

Acknowledgements

The authors thank Baeho Kim, Ike Mathur (the Editor), and two anonymous referees, as well as seminar participants at the 24th Australasian Banking and Finance Conference and the 20th Securities and Financial Market (SFM) Conference for their helpful comments and suggestions. Robin K. Chou gratefully acknowledges financial support from the National Science Council of Taiwan (No. 101-2410-H-004-067-MY3) and from the National Natural Science Foundation of China (Nos. 71232004, 71373296, 71372137 and 70902030).

Appendix A. Variable definitions

The first column gives the name of the variable, while the second column describes the variable. All numbers in brackets refer to the annual Compustat data item number.

Variable	Definition
MDR	Market debt ratio = (short-term debt [34] + long-term debt [9])/(short-term debt [34] + long-term debt [9] + price [199] × shares outstanding [25])
BDR	Book debt ratio = (short-term debt [34] + long-term debt [9])/total assets [6]
DEP	Depreciation = depreciation expense [14]/total assets [6]
EBIT	Profitability = earnings before interest and taxes ([18] + [15] + [16])/total assets [6]
LnTA	Firm size = log of total assets [6]
MB	Market-to-book ratio = book debt + market equity ([9] + [34] + [10] + [199] × [25])/total assets [6]
FA	Tangibility = fixed assets (e.g., property, plant, and equipment) [8]/total assets [6]
RD	Research and development (R&D) expenditures = research and development expenses [46]/total assets [6]
Rated	Dummy variable equal to 1 if the firm has a public debt rating in Compustat, and 0 otherwise.
Med	Industry median debt ratio (excluding the instant firm) calculated for each year based on the industry groupings in four-digit SIC codes
G-index	An index that counts the presence of 24 antitakeover, voting, compensation-related, and state law-related provisions present in a corporate charter, introduced by GIM (2003). The data were extracted from IRRC
E-index	Sum of the number of the six antitakeover provisions, restricting shareholder rights, introduced by Bebchuk et al. (2009). The antitakeover provisions are as follows: staggered board, limits to amend bylaws, limits to amend charter, supermajority to approve a merger, golden parachute, and poison pill. The data were compiled from IRRC

References

Alchian, A.A., 1950. Uncertainty, evolution, and economic theory. Journal of Political Economy 58, 211–221.
Bebchuk, L., Cohen, A., Ferrell, A., 2009. What matters in corporate governance? Review of Financial Studies 22, 783–827.
Bebchuk, L.A., Cohen, A., Wang, C.C.Y., 2013. Learning and the disappearing association between governance and returns. Journal of Financial Economics 108, 323–348.
Berger, P.G., Ofek, E., Yermack, D.L., 1997. Managerial entrenchment and capital structure decisions. Journal of Finance 52, 1411–1438.
Bowman, R.G., 1980. The importance of a market value measurement of debt in assessing leverage. Journal of Accounting Research 18, 242–254.
Byoun, S., 2008. How and when do firms adjust their capital structures toward targets? Journal of Finance 6, 3069–3096.
Chava, S., Livdan, D., Purnanandam, A., 2009. Do shareholder rights affect the cost of bank loans? Review of Financial Studies 22, 2973–3004.
Cook, D.O., Kieshnick, R., McCullough, B.D., 2008. Regression analysis of proportions in finance with self selection. Journal of Empirical Finance 15, 860–867.
Dang, V.A., 2011. Leverage, debt maturity and firm investment: an empirical analysis. Journal of Business Finance and Accounting 38, 225–258.
Dangl, T., Zechner, J., 2007. Debt Maturity and the Dynamics of Leverage Working paper. Vienna University of Technology.
De Miguel, A., Pindado, J., 2001. Determinants of the capital structure: new evidence from Spanish data. Journal of Corporate Finance 7, 77–99.
Dittmar, A., Mahrt-Smith, J., 2007. Corporate governance and the value of cash holdings. Journal of Financial Economics 83, 599–634.
Drobetz, W., Wanzenried, G., 2006. What determines the speed of adjustment to the target capital structure? Applied Financial Economics 16, 941–961.
Fama, E.F., 1980. Agency problems and the theory of the firm. Journal of Political Economy 88, 288–307.
Fama, E.F., French, K.R., 2002. Testing trade-off and pecking order predictions about dividends and debt. Review of Financial Studies 15, 1–33.
Faulkender, M.W., Flannery, M.J., Hankins, K.W., Smith, J.M., 2008. Do Adjustment Costs Impeding Realization of Target Capital Structure? Working paper Robert H. Smith School of Business, University of Maryland.
Flannery, M.J., Rangan, K.P., 2006. Partial adjustment toward target capital structures. Journal of Financial Economics 79, 469–506.
Frank, M.Z., Goyal, V.K., 2009. Capital structure decisions: which factors are reliably important? Financial Management 38, 1–37.
Garvey, G.T., Hanka, G., 1999. Capital structure and corporate control: the effect of state antitakeover laws on firm leverage. Journal of Finance 54, 519–546.
Gaud, P., Jani, E., Hoesli, M., Bender, A., 2005. The capital structure of Swiss companies: an empirical analysis using dynamic panel data. European Financial Management 11, 51–63.
Gompers, P., Ishii, J., Metrick, A., 2003. Corporate governance and equity prices. Quarterly Journal of Economics 118, 107–155.
Hackbarth, D., 2008. Managerial traits and capital structure decisions. Journal of Financial and Quantitative Analysis 43, 843–882.
Hackbarth, D., Mauer, D.C., 2012. Optimal priority structure, capital structure, and investment. Review of Financial Studies 50, 747–796.
Harvey, C.R., Lins, K.V., Roper, A.H., 2004. The effect of capital structure when expected agency costs are extreme. Journal of Financial Economics 74, 3–30.
Hovakimian, A., 2003. Are Observed Capital Structures Determined by Equity Market Timing? Working paper Zicklin School of Business, Baruch College.
Hovakimian, A., Hovakimian, G., Tehranian, H., 2004. Determinants of target capital structure: the case of dual debt and equity issues. Journal of Financial Economics 71, 517–540.
Hovakimian, A., Opler, T., Titman, S., 2001. The debt–equity choice: An analysis of issuing firms. Journal of Financial and Quantitative Analysis 36, 1–24.
Huang, H., Agnes, C.S., Collins, D., 2005. Shareholder Rights and the Cost of Equity Capital Working paper. Prairie View A&M University.
Huang, R., Ritter, J.R., 2009. Testing theories of capital structure and estimating the speed of adjustment. Journal of Financial and Quantitative Analysis 44, 237–271.
Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review 76, 323–329.
Jensen, M., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and capital structure. Journal of Financial Economics 3, 305–360.
Jiraporn, P., Gleason, K.C., 2007. Capital structure, shareholder rights, and corporate governance. Journal of Financial Research 30, 21–33.
Jiraporn, P., Kim, Y.S., Davidson, W.N., Singh, M., 2006. Corporate governance, shareholder rights, and firm diversification. Journal of Banking and Finance 30, 947–963.
Jiraporn, P., Kim, J., Kim, Y.S., Kitsabunnarat, P., 2012. Capital structure and corporate governance quality: evidence from the Institutional Shareholder Services (ISS). International Review of Economics and Finance 22, 208–221.
Ju, T., Ou-Yang, H., 2006. Asset Substitution and Underinvestment: A Dynamic View Working paper. Shanghai Jiao Tong University.
Karuna, C., 2008. Industry Product Market Competition and Corporate Governance Working paper. University of California Irvine.
Kayhan, A., Titman, S., 2007. Firms' histories and their capital structure. Journal of Financial Economics 83, 1–32.
Klock, M.S., Mansi, S.A., Maxwell, W.F., 2005. Does corporate governance matter to bondholders? Journal of Financial and Quantitative Analysis 40, 134–156.
Knyazeva, D., 2009. Analysts and journalists: firm policies and governance design Working paper. University of Rochester.
Kole, S., Lehn, K., 1997. Deregulation, the evolution of corporate governance structure, and survival. American Economic Review 87, 421–425.
Kole, S., Lehn, K., 1999. Deregulation and the adaptation of governance structure: the case of the U.S. airline industry. Journal of Financial Economics 52, 79–117.
Larcker, D.F., Rusticus, T.O., 2010. On the use of instrumental variables in accounting research. Journal of Accounting and Economics 49, 186–205.
Leary, M.T., Roberts, M.R., 2005. Do firms rebalance their capital structure? Journal of Finance 60, 2575–2619.
Leland, H.E., 1998. Agency costs, risk management, and capital structure. Journal of Finance 53, 1213–1243.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026

Lemmon, M., Roberts, M.R., Zender, J.F., 2008. Back to the beginning: persistence and the cross-section of corporate capital structure. Journal of Finance 63, 1575–1608.
Morellec, E., 2004. Can managerial discretion explain observed leverage ratios? Review of Financial Studies 17, 257–294.
Morellec, E., Nikolov, B., Schürhoff, N., 2012. Corporate governance and capital structure dynamics. Journal of Finance 67, 803–848.
Myers, S.C., 1984. The capital structure puzzle. Journal of Finance 39, 575–592.
Pawlina, G., 2010. Underinvestment, capital structure and strategic debt restructuring. Journal of Corporate Finance 16, 679–702.
Raith, M., 2003. Competition, risk and managerial incentives. American Economic Review 93, 1425–1436.
Rajan, R.G., Zingales, L., 1995. What do we know about capital structure: some evidence from international data? Journal of Finance 51, 219–244.
Scherer, F.M., 1980. Industrial Market Structure and Economic Performance. Rand McNally, Chicago, IL.
Stigler, G.J., 1958. The economics of scale. Journal of Law and Economics 1, 54–71.
Strebulaev, I.A., 2007. Do test of capital structure theory mean what they say? Journal of Finance 62, 1747–1787.
Sundaresan, S., Wang, N., 2007. Dynamic Investment, Capital Structure, and Debt Overhang Working paper. Columbia University.
Titman, S., Tsyplakov, S., 2007. A dynamic model of optimal capital structure. Review of Financial Studies 11, 401–451.
Titman, S., 1984. The effect of capital structure on a firm's liquidation decision. Journal of Financial Economics 13, 137–151.
Titman, S., Wessels, R., 1988. The determinants of capital structure choice. Journal of Finance 43, 1–18.
Wald, J.K., Long, M.S., 2007. The effect of state laws on capital structure. Journal of Financial Economics 83, 297–319.
Welch, I., 2004. Capital structure and stock returns. Journal of Political Economy 112, 106–131.
Winston, C., 1998. U.S. industry adjustment to economic deregulation. Journal of Economic Perspectives 12, 89–110.
Zwiebel, J., 1996. Dynamic capital structure under managerial entrenchment. American Economic Review 86, 1197–1215.

Please cite this article in press as: Chang, Y.-K., et al. Corporate governance and the dynamics of capital structure: New evidence. J. Bank Finance (2014), http://dx.doi.org/10.1016/j.jbankfin.2014.04.026