DOI: 10.1111/fmii.12211

ORIGINAL ARTICLE

FINANCIAL MARKETS, INSTITUTIONS & INSTRUMENTS · NEW YORK UNIVERSITY SALOMON CENTER · WILEY

Financial flexibility and the persistence of extreme financial leverage policies: A new empirical approach

Tahera Ebrahimi | **Basil Al-Najjar**

Finance & Economics, Manchester Metropolitan University Business School, All Saints Campus, Manchester, UK

Correspondence
Tahera Ebrahimi, Finance & Economics, Manchester Metropolitan University Business School, All Saints Campus, Oxford Road, Manchester, M15 6BH, UK.
Email: t.ebrahimi@mmu.ac.uk

Abstract

Firms might adopt capital structure policies which are far away from their optimal targets, this is known in the literature as extreme financing policies. Unlike previous empirical studies, our research sheds new light on the impact of financial flexibility (changes in credit ratings and over/underinvestment) on the duration of these policies. Using a large sample of US firms for the period from 1985 to 2017, we employ a novel empirical approach of multilevel survival model estimators for different subsamples of conservative and aggressive debt policy users. The results show that, on average, the duration of extreme financing policies renders the degree of urgency to shift towards firms' optimal leverage. Accordingly, firms adopting extreme financial policies are less keen to adjust quickly to their target debt ratios and such speed of adjustment varies between conservative and aggressive debt users. Our results provide interesting empirical implications for firms adopting conservative or aggressive debt policies.

KEYWORDS
aggressive debt policy, conservative debt policy, hazard models, optimal capital structure

1 INTRODUCTION

Many studies have investigated capital structure dynamics (see for example, Gyimah et al., 2021; Lartey et al., 2021; Amini et al., 2021; Liao et al., 2015). In addition, the association between capital structure and firm value has been explored significantly in the corporate finance related literature. The preceding arguments led to the development of the well-known trade-off theory of capital structure in which a firm chooses a value maximising level of leverage by balancing the tax benefits related to interest deduction against the expected financial distress, the bankruptcy-related costs (see for example, Kraus & Litzenberger, 1973) and the agency problems (Myers, 1977; Shleifer and Vishny, 1992). Empirically, however, it is well documented that many firms opt for a capital structure policy which is far from the optimally desired one. Firms do adopt no or very low debt policy (Ebrahimi et al., 2020; Huang et al., 2015; Joaquim et al., 2016) or firms employ a very high leverage policy (Baker et al., 2016; Denis & McKeon, 2012; Gharsalli, 2019). Colombo & Botta (2022) also argue that if firms are not in need of external financing, they are not keen to rebalance their capital structure decisions and reduce the distance from their optimal leverage ratio.

Given the identification of the optimal capital structure as a value-maximising decision, delaying embracing this decision seems to be irrational and a value-destroying decision for stakeholders. A variety of concerns may arise if a firm is not using its debt capacity, if it is under-levered or to reduce its debt if it is over-levered. The current literature provides convincing evidence and rich results with specific attention to the puzzle related to the determinants of the conservative debt policy (Devos et al. (2012), Bessler et al. (2013), Ebrahimi et al. (2020) and the aggressive debt policy (Andrade & Kaplan, 1998; Gharsalli, 2019; Korteweg, 2010), but overlooking the duration of these financing policies. The predominant view in the literature is that firms move towards their target leverage reasonably and quickly, which is in line with the trade-off theory (such as Fama & French (2002), Flannery & Rangan (2006), An et al. (2015). However, there are other studies (such as Halling et al. (2016) challenged this view. Therefore, an interesting issue to investigate is not only the factors determining the adoption of such extreme financing policies but also the duration of these policies. Accordingly, our main purpose in this paper is to investigate the duration of these extreme debt policies by employing a novel empirical approach of multilevel survival model estimators for different subsamples of extremely levered firms (conservatism and aggressive debt users) which is a significant addition and advancement to existing literature.

The first part of this paper focuses on the persistence of extreme financing policies. Little is yet known about the persistence of these phenomena. In terms of extreme financing policies, Strebulaev & Yang (2013) are the only scholars who investigate the duration of a zero-leverage policy and they conclude that this behaviour is a highly persistent phenomenon. However, a key issue of their study is that they indirectly assume that firms do adjust at the same rate towards a homogenous debt target. Thus, this will restrict the likelihood for firms to have different motivations for not adopting an optimal capital structure, which ultimately takes different paths towards their adjustment. In this view, (Cook & Tang, 2010) argue that the costs and benefits of moving towards optimal leverage are not certainly symmetrical in magnitude for firms with different distances from their target leverage. Therefore, we begin by distinguishing debt-free firms with small and large deviations from their target capital structure to investigate whether these two subsamples exhibit different patterns towards their target. We expect that the duration of this phenomenon should vary accordingly.

The evidence suggests that the duration of a zero-leverage policy is driven by the motivation to adopt such a policy. When a zero-leverage policy is close to the firms' target leverage, it will be maintained for a longer period, but this policy is a transitory event for their counterparts with greater deviation from their target leverage. By employing survival model estimators, the relationship between the duration of a zero-leverage policy and dropping this policy appears to be quadratic. Empirically, the negative coefficient of the duration of a zero-leverage policy on the probability of dropping such policy refers to the fact that zero-leverage firms have to maintain this policy for a longer time as they have limited access to debt resources. A positive coefficient implies that such zero-levered firms will deliberately adopt this policy in order to maintain a higher credit rating or/and improve their financial flexibility and will drop this policy later when they achieve their purpose.

In contrast, the duration of a very high-leverage policy is found to have a negative impact on the probability of dropping this policy. In particular, the tendency of firms to rebalance towards their targeted leverage decreases as the deviation from their optimal target increases. This view contradicts the suggestion that leverage ratios do change to obtain the value-maximising target (an optimal leverage range), as documented in previous studies in this field (Hovakimian, 2004; Leary & Roberts, 2005).

This study contributes to the literature in different ways. There are still different scholars theorizing that financial flexibility is the main concern for managers (such as DeAngelo et al., 2011). In this view, maintaining a sufficient credit rating is central to financial flexibility and the ability to fund investments at low adjusting leverage costs. Different studies also emphasise how credit rating plays a crucial role in the leverage change. For instance, Kisgen (2006) and Kisgen (2009) argue that firms with a target credit rating adjust their capital structure to achieve such a target. This is because a sufficient credit rating provides the debt market with a solution to the firm's demand for financial flexibility. Financially flexible firms are those able to finance their investment opportunities as they arise (Khieu & Pyles, 2016; Martin & Santomero, 1997). Hence, our first major contribution is that we are the first to empirically investigate the impact of financial flexibility, by examining credit ratings change and over/underinvestment, on the duration of extreme financing policies. This will allow us to examine whether credit ratings change and/or suboptimal investment can be a function of firms dropping their extreme financial policies and moving towards their target leverage.

Furthermore, previous studies such as Dang (2013) and Joaquim et al. (2016) find that firms pursue a debt-free policy to maintain financial flexibility and enhance their investment when the opportunities arise. However, the findings of Devos et al. (2012) suggest that firms may be voluntarily stockpiling debt capacity, but relatively the behaviour of these debt-free firms is consistent with the financial constraints explanation. To shed a new light on this issue and build on these studies, our second contribution is that this paper is the first to distinguish between debt-free firms with small and large deviations from their target leverage and argue that this statement is only applicable to those debt-free firms that deliberately deviate from their target leverage. To test this argument, we specify a Q model of investment by including a dummy indicator of dropping a zero-leverage policy and its interaction with cash flow to seek firms' investment sensitivity to internal funds. Indeed, we find that good things come to those who wait. After adopting a zero-leverage (debt-free) policy for some time, zero-levered firms with a greater deviation from their target leverage achieve a considerable increase in their credit ratings. They are also less dependent on internal funds and more able to mitigate their deviation from their optimal investment, compared to their zero-leverage counterpart with less deviation from their target level.

This research belongs to the cohort of empirical literature that has recently investigated firms' leverage adjustment. However, in contrast with previous studies (such as An et al. (2015); Flannery & Rangan, 2006 which generally estimate a linear partial adjustment model, we further contribute to the extant literature by proposing a novel empirical approach to survival (duration) model that forecasts the probability of extreme financing policies as a function of time. This forms our third major contribution to this research field. To illustrate the importance of our approach, one can consider a situation in which adopting extreme leverage may occur more than once over an individual firm's life. Thus, by employing this approach, we can control and distinguish whether an extreme leverage policy is a sticky policy or if this policy is only a result of a short period between maturing debt contracts and new debt refinancing (conservative debt) or it is a result of a temporary drop in firms' equity value (aggressive debt).

The remainder of this study is organised as follows. Section 2 highlights the theoretical framework and hypotheses development. Section 3 discusses the data and methodology, while Section 4 provides the main empirical results. Section 5 demonstrates further analyses of the zero-leverage policy, while Section 6 concludes this study.

2 | THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

2.1 | Theoretical framework

The recent debate in the literature has shifted towards the factors that drive firms to move towards their optimal capital structure. The concept of leverage adjustment is embedded within the dynamic trade off theory. According to this theory, imperfections in the market cause firms to deviate from their optimal capital structure temporarily (Flannery & Rangan, 2006; Flannery et al., 2020; Ghose, 2017; Lemmon et al., 2008). It is argued that an optimal capital structure maximises firm value (Kraus & Litzenberger, 1973) and hence, when a firm deviates from its target, it attempts to move back to its optimal point. The urgency of this change towards a firm's target leverage depends on the cost and benefit of doing so, which is influenced by several factors such as transaction costs (Flannery & Rangan, 2006), cost of equity issuance (Hussain et al., 2020; Warr et al. et al., 2012), macroeconomic conditions (Cook & Tang, 2010) and firm characteristics (Mukherjee & Wang, 2013). We, indeed, contribute to this literature by investigating the impact of financial flexibility measured through credit rating changes and over/underinvestment on the duration of extreme financing policies as an adjustment cost.

The dynamic trade-off theory suggests that firms operate at a suboptimal capital structure level until the adjustment benefits offset their costs, then firms will move towards the optimal leverage (Lockhart, 2014; William, 2020). The relative benefits and costs associated with leverage changes can differ for conservative and aggressive debt users. Low-levered firms can benefit by levering up in terms of capturing more interest benefits (interest tax shields) and controlling potential managers—shareholders' agency costs of free cash flow but limiting their debt capacity or financial flexibility so they can easily lever up if needed in the future. On the other hand, high firms with high debt in their capital structure have a relatively high level of tax shields and by reducing leverage, they might be able to fund their future investments with debt financing. This is because highly levered firms might need to forgo attractive investment opportunities given the highly related costs of issuing new debt (risk shifting) or equity (overhang problem). Therefore, the importance of the ability to fund investments relative to capturing the interest tax shield can lead firms to have different tendencies towards leverage changes whether they are over or under-levered.

2.2 | Hypotheses development

Existing literature examines the link between credit rating and capital structure (Kisgen, 2006; Wojewodzki et al., 2018). Graham and Harvey (2001) report that CFOs focus on credit rating to guide debt financing. Kisgen (2006) develops a key hypothesis which is known as the 'credit rating-capital structure hypothesis', indicating that credit rating changes are related to the managerial decisions on the firm's capital structure. In this view, managers consider the '*discrete costs and benefits*' of different credit rating levels as they decide their debt (capital structure) decisions. Since such costs and benefits of credit ratings are bound to be of significance to these managers, they are extremely responsive even with slight changes to their credit rating levels. Therefore, this hypothesis predicts that firms follow a financial decision to make sure that they attain higher credit ratings or at least maintain their existing rating levels.

Furthermore, Hovakimian et al. (2009) and Kisgen (2009) are amongst researchers who argue that firms have a target credit rating and they adjust their capital structure to achieve this target. Kisgen (2009) finds empirical evidence that downgraded firms have a higher likelihood of reducing their leverage compared to those not downgraded. He notes that US firms tend to issue approximately 4% less debt if compared to equity following a downgrade. Kisgen further claims that the speed of adjustment to target ratings for firms which experienced downgrading is almost double those that have not experienced such changes in their ratings. In a similar study, Hovakimian et al. (2009) find that a firm's tendency to issue equity increases if its actual credit rating is below its target. For the upgrade firms, Kisgen finds such firms issue approximately 1% more debt relative to equity financing than other firms. Another empirical study by

Tang (2009)also reports that upgraded firms are more likely to take advantage of their better position in the market and issue more debt. The debt issuance behaviour of upgraded companies can be the result of their past financing strategy (financial flexibility hypothesis). In this view, firms choose to have low debt financing now in order to build their borrowing power and have better access to the debt market in the future (DeAngelo et al., 2011).

Overall, the evidence from previous studies indicates that firms whose ratings are deteriorating generally decrease their leverage. Inversely, firms that experienced an improvement in their ratings chose to increase their leverage due to lower costs and better access to the debt market. We carry forward this evidence to more specific leverage decisions by examining the responses of conservative and extremely leveraged firms when they experience credit rating changes. It is interesting to see whether credit changes are of significance to managers with extreme financing policies. Therefore, we propose the following hypotheses:

H1a. The probability of dropping zero (conservative) leverage policy increases when they experience an upgrade in their rating.

H1b. The probability of dropping aggressive leverage policy increases when they experience a downgrade in their rating.

There is widespread evidence supporting the conjecture that access to external funds is directly associated with the financing of investment opportunities. Access to the debt market varies amongst firms with different capital structures (Clementi & Hopenhayn, 2006; Vartia, 2004). This is because a high level of leverage leads over-levered firms to lose their ability to obtain additional capital at a reasonable cost, which ultimately affects their ability to finance their investments. On the other hand, under-levered firms are credit-constrained. The demand for higher interest by lenders limits their access to additional funds to invest optimally (Banerjee & Duflo, 2014; Bessler et al., 2013; Devos et al., 2012).

In addition, firms face possibly dynamic and interdependent investment and financing decisions. The conventional wisdom of 'debt overhang' (Myers, 1977) is that high leverage encourages firms not to deploy value-maximising projects because creditors obtain more value due to debt priority and senior structure (underinvestment). Hennessy (2004)empirically shows the debt overhang effect on pre-existing high-levered firms leads to substantially distorted investment and lower firm value. On the other hand, when firms are significantly debt-financed, managers will be engaging in overinvestment in risky projects (also called risk shifting or asset substitution) as this risk increase can transfer earnings from debtholders to shareholders (Jensen & Meckling, 1976). Therefore, when the cost of sub-optimal investment is sufficiently high, managers tend to adjust their strategies to mitigate these costs. These adjustments aim to reduce the inefficiencies associated with high leverage, ensuring that the firm's investment decisions are more in line with the firm's long-term growth, stability and future value by reducing excessive debt.

It is also argued that future investment opportunities can influence current capital structure decisions since flexibility is crucial in allowing firms to undertake their future investments (Almeida et al., 2011; Myers & Majluf, 1984). Therefore, if firms fully anticipate future growth opportunities, they will forgo tax saving and preserve debt capacity as a strategy to meet future demand. In this view, firms optimally choose to issue low or no debt to significantly mitigate future underinvestment. It is important, however, to recognise that issuing no debt has a double-edge effect: while it lessens the underinvestment problem, it may also create an incentive for overinvestments which may take the form of undertaking negative net present value projects. In this type of situation, increasing debt can help reduce overinvestment problems by limiting free cash flow and managerial decision-making (Jensen, 1986). Therefore, we expect that when debt is substantially low, issuing debt is driven by moving towards an optimal level of investment.

In exploring the causal direction from investment to leverage, it is important to consider that while issues such as asset substitution and debt overhang typically reflect the consequences of existing financial conditions, they do not contradict the investment-driven approach to leverage decisions. The credit rating-capital structure hypothesis supports the idea that firms may strategically adjust their capital structure in response to new investment opportunities, aiming to secure financing while maintaining or improving their credit rating scores. According to the Pecking Order Theory, firms prefer internal financing first and then debt to fund investments, which suggests proactive management of leverage in anticipation of investment needs (Myers & Majluf, 1984). Additionally, the Dynamic Trade-off Theory suggests that firms optimise their debt levels to balance the benefits of financing with the costs of financial distress, mainly when obtaining new investment opportunities (Miller, 1977). Thus, while concerns like debt overhang and asset substitution are relevant, they do not prevent the possibility that firms actively manage leverage in response to investment opportunities and credit rating considerations. Hence, we posit that:

H2a. The probability of dropping zero (conservative) leverage policy increases when they experience over/underinvestment.

H2b. The probability of dropping aggressive leverage policy increases when they experience over/underinvestment.

3 | DATA AND METHODOLOGY

3.1 | Methodology

Most of the literature in the field of corporate finance has used standard logit or probit regression to identify factors associated with corporate finance events when the dependent variable is binary. Although there have been a few applications of duration (survival) analysis, it has been primarily used to model and analyse credit risk, default probability, sovereign default and other financial instruments (Cruces & Trebesch, 2013; Gupta et al., 2016; Li, 2000). Survival analysis enhances the logit/probit model by offering time-dependent forecasts, which not only predict the occurrence of an event but also estimate when it might occur (Bellotti & Crook, 2009; Cruces & Trebesch, 2013). Furthermore, Bellotti & Crook (2009) argue that survival analysis naturally incorporates time-varying factors, such as macroeconomic data, more efficiently than ordinary regression or logistic regression models.

It is also important to note that most applications of survival analysis in financial contexts have overlooked the inclusion of multiple failure times, which occur when a corporation encounters an event more than once during its lifespan. Analysing the time to default with this approach is beneficial for identifying patterns and gaining insights into the underlying data but may waste information that could be relevant. For a comprehensive analysis of the entire dataset, Steele (2011) proposes an extension to the survival model known as the two-state model. This extension allows for the analysis of multiple event data and accounts for the lack of independence amongst failure times. A recent study on sovereign default by Ghulam & Derber (2018) suggests that multilevel survival (duration) analysis may be a more suitable method for identifying determinants of default, particularly when considering the strong influence of past events.

In scenarios where extreme leverage may occur more than once in a firm's lifetime, this paper will focus on using a multilevel/recurrent survival model of panel data (duration data) to analyse the factors influencing the probability of extreme financing policies. By employing this approach, we aim to capture the recurrent nature of extreme leverage events and identify the key determinants of these policies. The following section will provide a detailed discussion of our adopted methodology.

3.2 | Discrete-time event history analysis

Methods for analysing the length of time until the occurrence of the event is also known as duration analysis or survival analysis. This method considers the time to the event occurrence, which is defined as the time until a firm in our sample drops the extreme leverage policy. Assuming 'T' is a non-negative random variable representing the time of dropping extreme leverage and 't' denotes the time itself. In such a case 'T' will have a continuous probability distribution, which is the probability that a firm has the event before t,

$$f(t) = \int_0^t f(s)\, ds = pr(T \le t) \tag{1}$$

Then the probability that the spell is at the length of at least 't', is given by the survival function, which is the probability that a firm does not have the event before t.

$$S(t) = 1 - F(t) = pr(T \ge t) \tag{2}$$

Given that the spell has lasted up to time 't', then the probability it might end in the next short interval of time (Δt) is stated by:

$$l(t, \Delta t) = pr(t \le T \le t + \Delta t \mid T \ge t) \tag{3}$$

Then a key function for characterising this aspect of the distribution is the hazard rate, which spells are completed after a duration if they will last at least until 't'. The relationship between the hazard function and survival function is defined as follows, which is a particularly useful function for duration analysis.

$$h_t = \lim_{\Delta t \to 0} \frac{pr(t \le T \le t + \Delta t \mid T \ge t)}{\Delta t} = \lim_{\Delta t \to 0} \frac{F(t + \Delta t) - F(t)}{\Delta t\, S(t)} = \frac{f(t)}{S(t)} \tag{4}$$

In other words, the hazard rate is defined as the limiting probability that an event fails to occur in the stated time period, only if the firm has survived to the start of such period, divided by the time interval's width. This rate would take any value from 'zero' to 'infinity' and can increase/decrease or even have no changes (remain constant) over time. An h-value of zero indicates no risk of failure, yet a value approaching infinity indicates a failure certainty at that point.

Data on the timing of several events per subject are often called multilevel survival data. Multilevel event history data arise when events are repeatable. The event could be of different types or the same type (our case). When an event occurs more than once over the individual's lifetime, it is termed a recurrent event or multi-episode event. Such events are observed particularly in biomedical studies, for example, repeated infection or cancer (Steele, 2011). Special attention should be paid when analysing such recurrent event data. For instance, the risk of an event for a subject may depend on whether this subject has already experienced the event. We cannot assume the duration between the episodes from the same firm is independent. There might be unobserved individual-level factors (i.e., constant across episodes) which affect the hazard rate of the event for all episodes. The presence of such unobserved individual-level factors and failure to account for them could lead to a correlation between the duration of episodes from the same individual. Repeated events are normally handled by utilizing individual-specific random effects in the model, leading to a multilevel model in which even historical data have a two-level structure with episodes (level 1) nested within the individual (level 2). A multilevel/recurrent discrete time random effect can be written as:

$$h_{\mathrm{itj}} = \alpha(D)_{\mathrm{itj}} + \beta(x)_{\mathrm{itj}} + u_{\mathrm{i}} \tag{5}$$

where h_{itj} is the probability of the event (dropping extreme leverage) for firm i and episode[1] j during interval t. $(D)_{\mathrm{itj}}$ is a vector of functions of the cumulative duration by interval t with coefficients α and $(x)_{\mathrm{itj}}$ is a vector of covariates (time-varying or defined at the episode or individual level) with coefficients β. $u_{\mathrm{i}} \sim N(0, \sigma_{\mathrm{u}}^2)$ allows for unobserved heterogeneity (shared frailty) between individuals due to time-invariant omitted variables. One important feature of this model is that it will enable the non-proportional effect of variables x by including the interaction between x and the function of t in D, the duration and variables' effect to differ across episodes by including a dummy for order of event and interact with t and x. This model will be estimated in Stata using the xtmelogit command. We will discuss what we included in X in the following section.

3.3 | Data

Our initial sample comprised all US firms on the annual Compustat dataset excluding financial and utility firms (SIC codes 4900–4999 and 6000–6999) due to their different financial ratios and regulated capital structure. We also restrict our sampled firms to those with an FIC 'USA' and have a minimum value (book value) of $10 million. Furthermore, we complement our data with a Compustat S&P 500 rating which is composed over the period 1985–2017.

We further restrict our sample to those companies which at least have experience of adopting extreme financing policies once during our sample period. To identify this extreme policy, we look at both conservative and aggressive debt policies. Firms with absolutely no outstanding amount of debt, both short-term debt and long-term debt, are classified as conservative debt users (Ebrahimi et al., 2020; Strebulaev & Yang, 2013). In terms of excessive leverage users, it is hard to define the exact debt ratio as a threshold in identifying the other side of extreme financing policies. To our knowledge, no other study has defined this threshold, except D'Mello & Gruskin (2014), who define a firm as highly levered if it has at least 30% total debt in its capital structure. However, to be more precise and consistent, we rely on the distribution of leverage in our sample and assume an axis of symmetry. The percentage of zero-leverage policy in our sample is approximately 15%. To ensure consistency with the zero-leverage sample (at a cut-off point of 15%), a cut-off point of 85% is defined as an aggressive debt policy with a minimum of 0.50 leverage. Those firms which do not meet these criteria are dropped from our sample. Accordingly, our final sample is reduced to 51,775 firm-year observations containing 26,135 'zero levered' and 25,620 'aggressive debt' users over 1985–2017.

3.3.1 | Dependent variables

The main objective of our study is to investigate the persistence of extreme financing policies. Our choice of extreme financing policies are conservative and aggressive debt users. Therefore, we have two dependant variables: where dropping zero-leverage is a dummy variable which is equal to 1 if a zero-leverage firm becomes non-zero-leverage by issuing at least 2% leverage, and 0 otherwise. In the second form of extreme financing policy, the dependent variable is replaced by a dummy variable which is equal to 1 if an aggressive debt firm drops this policy by reducing at least 2% of its leverage and 0 otherwise.

3.3.2 | Credit rating change

Existing literature examines the effects of credit rating changes on the decisions of capital structure. For instance, Kisgen (2006) examines how capital structure changes in the prediction of credit ratings change, Lemmon and Zender (2010) further suggest that while the presence/absence of firms' credit ratings impacts the borrowing costs (indicating the level of debt capacity), the use of debt ratings to proxy for debt capacities might be problematic. The main reason is that such non-rated firms intentionally select to do so because the credit rating costs might outweigh the potential benefits (Kisgen 2009). Thus, a concern arises that the non-existence of a bond rating captures an unobservable difference in demand. Therefore, identifying such firms with limited access to the debt market can bias the results. To avoid such bias and based on the work of Bessler et al. (2013), we use observable firm characteristics to build a predictive model to obtain the likelihood of access for firms to the public debt market in a specified year. Furthermore, we take the difference [t−(t−1)] of the crediting rating probability likelihood as an indication of a firm's ability to access the debt market (Kiesel & Lücke, 2019) and financial flexibility.

3.3.3 | Suboptimal investment

To capture whether the suboptimal investment can impact the duration of an extreme financing policy, we employ a proxy for underinvestment and overinvestment problems caused likely by conflicts of interests between debtholders and shareholders (see for example, Myers, 1977). We employ Richardson's (2006) framework to create an *investment expectation model*, where the model's fitted value would reflect the official positive NPV projects and the model's residual values reflect the overinvestment/underinvestment depending on the sign (positive/negative). A dichotomous variable equal to one is created as a proxy of underinvestment if the residual is negative and zero otherwise.

Deviation from target leverage: To investigate whether firms with extreme leverage policies, such as zero debt and aggressive debt user firms display different patterns relative to target leverage, we follow the existing literature to estimate the firm's target debt ratio. In doing so, we employ a set of variables that communally proxy for a firm's optimal capital structure (Flannery & Hankins, 2013; Flannery & Rangan, 2006; Hovakimian & Li, 2011; Hovakimian et al., 2001; Zhou et al., 2014). The difference between actual leverage and the fitted value of the employed model is an indication of the deviation from the target leverage for each firm. However, the divergence of the calculated estimated fitted values sparks debate amongst researchers who employ different estimation techniques regarding the strengths and weaknesses of adopted methods. The challenge of the existing study is how to consistently estimate the dynamic panel data model that captures well-defined target leverage, towards which the adjustment process takes place. The primary econometric approach to estimating the partial adjustment framework is based on a two-stage procedure and involves estimating the target leverage. As an alternative approach and to address the limitations, several studies adopt a one-stage estimation procedure (Antoniou et al., 2008; Dang et al., 2011; Flannery & Rangan, 2006)which this paper focuses on. In principle, a single-step partial adjustment model with a firm fixed effect is superior and estimates the target leverage and adjustment speed simultaneously. Therefore, we utilize the fitted value of this model as the target leverage ratio to estimate the deviation from the target debt. Then we rely on the median value of each sample 'conservatism and aggressive debt user' as the threshold to split each sample into two subgroups, with small and large deviations from target leverage.

3.3.4 | Additional variables

Based on the wide literature of capital structure, we control for several firm-level factors commonly used by previous studies such as tax, firm-growth, firm-size, firm-age, firm-profitability, excess cash, asset tangibility, financial distress and dividend payment dummy. The definitions of our variables are reported in Table 1. Finally, all our variables are winsorized at the 1st and 99th percentiles.

4 | EMPIRICAL FINDINGS

4.1 | Descriptive analysis

Table 2 displays the descriptive statistics of the selected firm characteristics, where firms at least experience a zero-leverage policy once in their life in panel A and into very high leverage in panel B. Overall, the results display that on average 13% of firms that follow zero-leverage drop this policy and this percentage is nearly 15% for the group of firms following a very high leverage policy.

TABLE 1 Definitions of Variables.

Leverage	Total debt to total assets ratio
Dropping zero-leverage policy	Dichotomous variable taking 1 if a firm with zero-leverage becomes non-zero-leverage by increasing its leverage at least 2% and 0, otherwise
Dropping very high leverage policy	Dichotomous variable taking 1 if a firm with debt ratio of more than 50% reduce its leverage to less than 50% by at least 2% and 0, otherwise
Duration of extreme financing policy	The number of years that a firm continuously follow an extreme financing policy
Deviation leverage	It is the deviation from the target debt and is defined as the difference between the actual debt ratio and the fitted debt values obtained from the model: '$Leverage_{it} = \beta_0 + \beta_1 Leverage_{it\text{-}1} + \beta_2 Profitability_{it} + \beta_3 Tobin'sQ_{it} + \beta_4 Depreciation_{it} + \beta_5 Size_{it} + \beta_6 R\&D_{it} + \beta_7 RDD_{it} + \beta_8 IndusLev_{it} + \varepsilon_t$'
Credit rating change	Is the difference (t-t_1) of the firm's probability of achieving credit rating based on the fitted values of the predictive logit model (see Lemmon and Zender 2010): $Rating_{it} = \beta_0 + \beta_1 Tangibility_{it\text{-}1} + \beta_2 Age_{it\text{-}1} + \beta_3 Tobin's\ Q_{it\text{-}1} + \beta_4 Size_{it\text{-}1} + \beta_5 Profitability_{it\text{-}1} + \beta_6 Volatility_{it\text{-}1} + \varepsilon_t$
Underinvestment	Dichotomous variable taking 1 in case the deviation from the optimal investment has a negative value and 0 otherwise. This is measured by the residual value of the following regression model '$New\ Investment_t = \alpha + \beta New\ Investment_{t\text{-}1} + \gamma Z_{t\text{-}1} + \varepsilon_t$' where New Investment is measured as capital expenditures + acquisitions + R&D—sale of PPE (SPPE)—depreciation and amortization. The values are scaled by total assets. Z includes other investment determinants ([1-year lagged]-leverage, firm-size, firm-age, firm-growth, , cash, stock returns and industry and time fixed effects [e.g., Richardson, 2006]). The fitted values are the optimal Investment.
Profitability	Is earnings before interest, taxes and depreciation (EBIT) divided by total assets
Cash	Is cash and short-term investments divided by total assets
Excess cash	Dichotomous variable taking 1 if a firm has a cash balance higher than the industry median-value and 0 otherwise
Tobin's Q	Total assets – book value equity + market value equity divided by total assets
Financial distress	Dichotomous variable taking 1 if the modified Altman *Z*-score is less than 1.80. in this case, a firm is considered to be in a financially distressed situation, and 0 otherwise
Tangibility	Fixed assets divided by firm total assets
Size	(Natural) logarithm of firm total sales
Age	Number of years a firm has been included in the database
Tax benefit	Marginal-corporate-tax rate before interest.
Dividend payer	Dichotomous variable taking 1 if the firm issues dividends and 0 otherwise.

Table 2 is further organised by showing both the mean statistics of those subsamples which continue with the extreme financing policies and those which drop such policies. Overall, the results in panel A indicate that almost all specific characteristics of the two groups, 'dropping and continuing zero-leverage', are significantly different at the 1% level.

Zero-leverage firms that continue with such a policy on average are significantly below target leverage (–0.054) compared to the group that dropped this policy (0.149). Furthermore, the significantly low value of the change in a credit rating (0.004) for continuing zero-leverage firms relative to the group that dropped this policy (0.010) confirms that improving access to the debt market would encourage firms to issue debt financing as indicated by the mean value of debt issuance (–0.02 vs. 0.195). In addition, the subsample of zero-leverage firms which drop this policy has a

TABLE 2 Descriptive Statistic.

Panel A	Zero-leverage sample				Drop zero-leverage		
					No	Yes	
Variable	Mean	Std. dev	Min	Max	Mean	Mean	t.stat
Dropping zero-leverage	0.134	0.340	0.000	1.000			
Duration	2.618	3.597	1.000	32.000	2.727	1.916	
Total leverage	0.027	0.101	0.000	0.544	0.000	0.204	−128.60***
Leverage deviation	−0.025	0.120	−0.962	0.938	−0.054	0.149	−111.60***
Debt issuance	0.012	0.124	−0.470	0.810	−0.020	0.195	−131.21***
Rating change	0.005	0.017	−0.047	0.320	0.004	0.010	−14.702***
Investment deviation	−0.010	0.126	−0.606	0.852	−0.018	0.055	−27.305***
Excess cash	0.778	0.415	0.000	1.000	0.815	0.542	39.198***
Tax benefit	0.228	0.126	0.007	0.510	0.229	0.222	2.99***
Financial distress	0.602	0.489	0.000	1.000	0.588	0.687	−11.507***
Size	10.015	2.383	2.772	18.572	10.000	10.071	−1.569
Age	10.012	8.874	1.000	65.000	10.171	9.020	7.252***
Profitability	−0.123	0.510	−2.000	0.561	−0.114	−0.180	7.54***
Tobin's Q	3.480	4.370	0.505	22.270	3.505	3.324	2.305**
Tangibility	0.168	0.204	0.000	0.905	0.156	0.246	−25.85***
Dividend dummy	0.223	0.416	0.000	1.000	0.223	0.220	0.405
Panel B	**Very high leverage sample**				**Drop very high leverage**		
					No	**Yes**	
Variable	**Mean**	**Std. dev**	**Min**	**Max**	**Mean**	**Mean**	**t.stat**
Dropping excess leverage	0.149	0.356	0.000	1.000			
Duration	3.532	3.398	1.000	32.000	3.656	2.819	14.982***
Total leverage	0.568	0.175	0.000	1.000	0.617	0.288	152.995***
Debt issuance	0.045	0.242	−0.471	0.810	0.101	−0.212	88.530***
Leverage deviation	0.081	0.200	−0.976	0.939	0.130	−0.191	97.281***
Rating change	0.009	0.026	−0.048	0.539	0.010	0.004	9.544***
Investment deviation	0.009	0.134	−0.664	0.843	0.013	−0.014	9.470***
Excess cash	0.330	0.470	0.000	1.000	0.310	0.446	−17.630***
Tax benefit	0.286	0.119	0.000	0.510	0.288	0.271	7.858***
Financial distress	0.739	0.439	0.000	1.000	0.761	0.618	19.190***
Size	11.080	2.609	0.000	20.497	11.166	10.588	13.452***
Age	9.884	8.960	1.000	65.000	10.108	8.807	8.245***
Profitability	−0.018	0.396	−2.000	0.561	−0.019	−0.006	−1.97*
Tobin's Q	2.217	3.397	0.501	22.270	2.132	2.621	−8.167***
Tangibility	0.369	0.270	0.000	1.000	0.379	0.305	16.657***
Dividend dummy	0.308	0.461	0.000	1.000	0.311	0.284	3.610***

Note: This table provides an overview and detailed descriptions of all variables used in this study. This table also shows the mean statistic of those subsample which continue with the extreme financing policy and those which drop the extreme policy. *t*-Tests are conducted to test for differences between the means for the firms which drop the zero-leverage and firms with continue with this policy in panel A, and further in panel B for very high levered firms . *, ** and *** are significant levels at the 10%, 5% and 1% level, respectively. All variables are defined in Table 1.

positive deviation from the optimal investment (0.055) compared to the group that continues with this policy (−0.18). Contrariwise, the very high-levered sample that drops the policy displays a lower credit rating improvement, a negative value in both debt issuance and a deviation from investment decisions.

4.2 | Estimation of hazard rate

Panels A and B of Table 3 report the estimated hazard rate for every firm at zero and very high leverage samples as specified in Equation (4) in the time interval of 1 to 32 years duration. In panel A, there are 26,135 observations at the beginning of the first year of the zero-leverage policy that are at the risk of dropping zero-leverage (denoted as death), of which 1719 have experienced the event by the end of the second year, the estimated hazard for this interval is 0.10.[2] At the beginning of the third year, 13,510 are left in the sample that are continuing the zero-leverage policy, 861 of them stopped following this policy during this interval, so the estimated hazard for this interval is 0.07. In general, we see that the estimated hazard rates tend to decline as the duration of zero-leverage increases and reaches a minimum of 0.00 in year 19 and then increases to 0.09 in year 24. Furthermore, the estimated survival function under the survival column further reveals that 0.39 of the zero-leverage firms never dropped this policy but maintained this policy for more than 27 years. Turning back to the hazard rates of very high-levered firms in panel B of Table 2 shows that in general the hazard rates of this subsample decline over the sample period. In addition, a general comparison between panel A and panel B reveals that the hazard rates within very high leverage are higher relative to the zero-levered firms. For instance, looking at the time interval of 2–3, the number of firms dropping a very high leverage policy (2667) is considerably higher than the number of death events in the zero-leverage sample (1719). The lower tendency to maintain a very high leverage policy leads to a lower cumulative survival of 0.34 at the end of the sample period, compared to 0.39 for the zero-levered firms.

As we discussed in the previous section, some individuals move in and out of the event of interest multiple times. Similarly, adopting extreme leverage may occur more than once over an individual's firm's life as indicated in panels C and D of Table 3.

4.3 | Detection of the baseline hazard curve

As outlined in the previous section before developing the multilevel discrete-time model, we first need to identify the duration dependence effect on the probability of dropping an extreme leverage policy. The baseline hazard specifications are portrayed in Panels A and B of Figure 1 for the zero-leverage policy and the very high leverage policy samples. The hazard curve of each exhibits a different functional relationship with the duration (number of years that a firm follows a specific policy). In fact, it shows that the dropping extreme policies are highly duration-dependent. Thus, it is inaccurate to assume the hazard rates are constant for any given duration groups.

The hazard rates for the zero-leverage sample indicate a quadratic (or cubic) pattern, reflecting an initially decreasing hazard rate reaching a minimum level at about 15/16 years and then the rate increases. On average, a zero-leverage policy is highly persistent, as indicated by the U-turn's point of this policy. Empirical studies conclude that capital structure is a persistent phenomenon (DeAngelo et al., 2011; Lemmon et al., 2008), firms do have target capital structures (Flannery & Rangan, 2006) and the deviation from their targets is temporary (Hovakimian, 2004). Based on these statements and to get a better view of the persistence of capital structure, the hazard curves for the two subsamples of the optimal and non-optimal zero-leverage firms are re-estimated in Panel A. We rely on the median value of the deviation from the target leverage of the zero-leverage firm as the threshold to split the zero-leverage firms into two groups. The hazard curves for different subsamples of the zero-leverage exhibit distinguish patterns, while for zero-leverage firms with a small deviation from the target, the hazard rate declines as the duration of this policy increases.

TABLE 3 Sample Hazard Table.

Time interval	Panel A: Zero levered firms				Panel B: Very high leverage			
	Beg. total	Deaths	Cum survival	Hazard rate	Beg. total	Deaths	Cum. survival	Hazard rate
1 2	26,135	0	1.000	0.000	25,620	0	1.000	0.000
2 3	19,389	1719	0.900	0.100	22,753	2667	0.871	0.122
3 4	13,510	861	0.841	0.073	16,352	808	0.820	0.070
4 5	9813	514	0.790	0.061	12,238	702	0.773	0.061
5 6	7298	328	0.751	0.050	9200	431	0.731	0.052
6 7	5512	201	0.720	0.041	7001	310	0.700	0.040
7 8	4222	129	0.690	0.031	5354	220	0.666	0.042
8 9	3250	97	0.671	0.030	4121	162	0.640	0.041
9 10	2532	82	0.652	0.041	3178	122	0.611	0.043
10 11	1979	50	0.630	0.030	2460	109	0.580	0.041
11 12	1554	31	0.620	0.020	1903	65	0.561	0.040
12 13	1218	28	0.600	0.031	1473	58	0.531	0.044
13 14	959	20	0.591	0.020	1136	45	0.510	0.040
14 15	753	15	0.571	0.022	876	33	0.491	0.040
15 16	588	15	0.561	0.030	681	23	0.470	0.034
16 17	459	8	0.550	0.022	519	18	0.451	0.031
17 18	358	8	0.531	0.033	398	9	0.440	0.032
18 19	275	5	0.520	0.022	309	12	0.421	0.020
19 20	213	0	0.520	0.000	234	4	0.411	0.020
20 21	165	6	0.500	0.041	178	5	0.401	0.031
21 22	122	7	0.473	0.072	134	1	0.400	0.020
22 23	87	0	0.470	0.000	100	3	0.380	0.031
23 24	68	1	0.462	0.020	77	2	0.371	0.031
24 25	50	4	0.421	0.090	59	1	0.371	0.020
25 26	37	0	0.420	0.000	46	1	0.360	0.020
26 27	28	2	0.393	0.082	34	1	0.340	0.011
27 28	20	0	0.391	0.000	24	0	0.341	0.000
28 29	15	0	0.391	0.000	19	0	0.341	0.000
29 30	8	0	0.391	0.000	10	0	0.341	0.000
30 31	2	0	0.391	0.000	3	0	0.341	0.000
31 32	2	0	**0.391**	0.000	3	0	**0.341**	0.000

Episode interval	Panel C: Zero levered firms		Panel D: Very high leverage	
	Beg. total	Hazard rate	Beg. total	Hazard rate
1 2	26,135	0.200	25,620	0.150
2 3	5803	0.200	7269	0.130
3 4	1177	0.181	1570	0.150
4 5	204	0.190	345	0.150

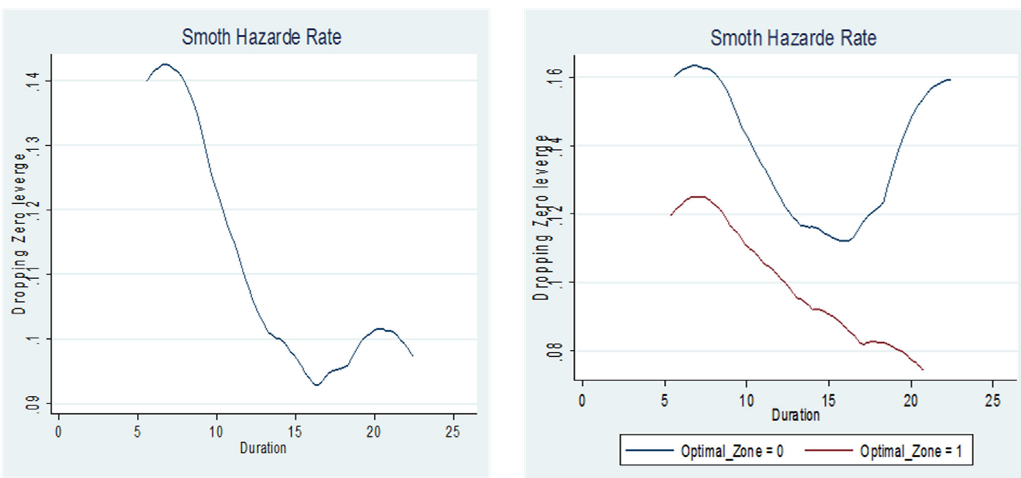
(Continues)

TABLE 3 (Continued)

Episode interval	Panel C: Zero levered firms		Panel D: Very high leverage	
	Beg. total	Hazard rate	Beg. total	Hazard rate
5 6	32	0.350	60	0.130
6 7	2	0.000	7	0.290
7 8			3	0.000

Note: This table reports the estimated hazard rate (dropping extreme leverage policy) for every firm in the sample in the time interval of 1 to 32-year duration and further in the episode interval of 1–8.

Panel A: Zero-leverage



Panel B: Vey High Leverage

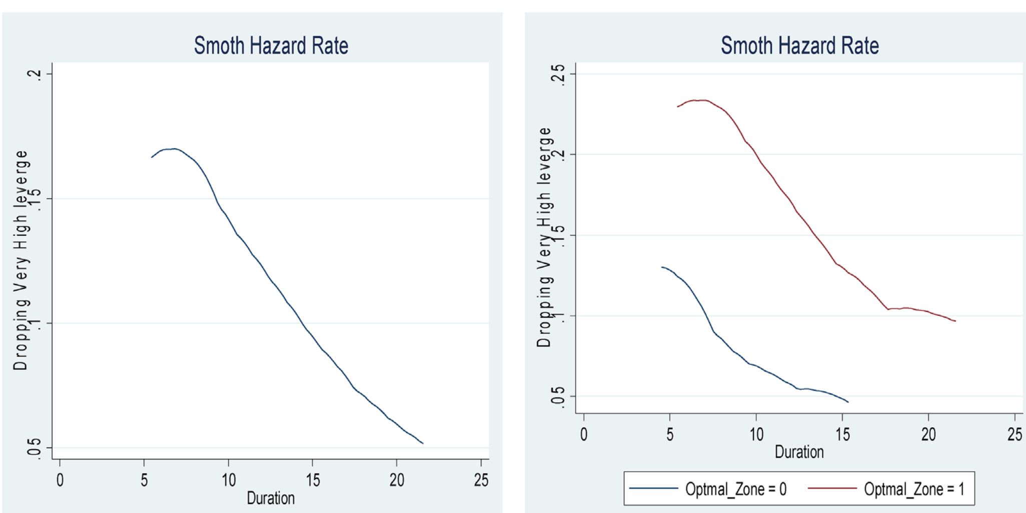


FIGURE 1 Baseline hazard rate. [Color figure can be viewed at wileyonlinelibrary.com]

For zero-leverage firms with greater deviation from their targets, the hazard rate declines but rises from around 15/16 years. Therefore, the quadratic function will form the basis for our forecasts of the multivariate model.

Panel B of Figure 1 provides the baseline hazard specifications for the very high leverage subsample. The estimated hazard curve for this sample tends to decline constantly over time, suggesting that the probability of continuing with a very high-leverage policy increases as the duration of this policy increases. To be consistent with the zero-leverage sample, we re-estimate the hazard curves for both samples of the very high-levered firms based on the median deviation of very high-levered firms from target leverage. Comparing the two hazard curves for these two subsamples reveals that while in general, the estimated hazard rates are declining for both subsamples, it is considerably lower when very high-levered firms are located substantially above the target. Thus, very high-levered firms deviate more positively from their targets, with a higher chance of sticking to this policy. Therefore, unlike the baseline hazard of the zero-leverage sample, a linear function is fitted by utilizing the duration of a very high leverage policy to estimate the parameters in the hazard model.

4.4 | Factors affecting the persistence of extreme leverage policies

Through our baseline hazard estimation analysis, we find that the duration of extreme leverage policies is substantially different amongst firms. To shed further light on this issue, we reinvestigate this difference and find which factors have a persistent impact on these policies.

The statistical analysis of the multilevel survival (duration) model as specified in the methodology section for Equation (5) is presented in Panel A of Table 4, where the dependent variable is dropping zero leverage. The significant sign of the estimated duration and the quadratic duration of the zero-leverage parameters in Column 2 shows the same directional impact as the hazard curve (U-shape). This pattern suggests that the duration of a zero-leverage policy depends on the motivation for adopting this policy. The negative relationship between the duration of the zero-leverage policy and the probability of dropping this policy can be related to firms' inability to raise money in debt markets, leading these firms to maintain zero-leverage for a longer period.

However, the positive relationship implies that these firms follow zero leverage deliberately for some time to maintain a higher credit rating or/and to improve financial flexibility for future use. This argument is supported by the work of Kisgen (2009) in which a firm may reduce its leverage in the hope of a higher credit rating. The positive coefficient of credit rating change (12.43) also facilitates this finding in a way that a firm drops zero-leverage policy when they have obtained better access to the debt market. This result is in line with *H1a*.

The results also indicate that dropping a zero-leverage policy is not affected by some of the factors that were identified as determinants of following a zero-leverage policy. For instance, size, tax benefits and financial distress appear to be insignificant to the probability of dropping the zero-leverage policy. In addition, the insignificant sign of dividend pay also suggests that zero-levered firms do not issue debt financing to make payments to their shareholders. Profitability has a negative effect, indicating profitable zero-leverage firms do not maintain the zero-leverage policy for a long period. A negative and significant estimated coefficient of the underinvestment dummy suggests that when zero-leverage firms face an overinvestment the probability of dropping such policy increases. Overall, our finding is consistent with *H2a* and Jensen (1986) in which firms issue more debt to overcome the free cash flow problems which are available for overspending by managers.

Moreover, the evidence from prior literature implies that the deviation from the target capital structure is temporary, we expect that if the zero-leverage policy is adopted close to a firm's target leverage, then this policy should be maintained for a longer period than the zero-leverage policy with a greater deviation from the target leverage. In Columns 3 and 4, we utilise a lag dummy variable equal to 1 if the deviation from target leverage is greater than median threshold value and 0 otherwise to divide the sample.

Consistent with our prediction, the negative estimated coefficient of zero-leverage duration turns out to be considerably higher (−0.150) relative to the estimated coefficient for the full sample of zero levered firms (−0.09), suggesting

TABLE 4 Factors Affecting The Duration of Extreme Leverage Policies.

	Panel A: Zero-levered firms				Panel B: Very-high levered firms		
	All firms		Small deviation	Large deviation	All firms	Small deviation	Large deviation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Duration	−0.057***	−0.090***	−0.150***	0.116**	−0.074***	−0.068***	−0.156***
	(0.013)	(0.028)	(0.033)	(0.051)	(0.013)	(0.015)	(0.023)
Quadratic duration		0.004**	0.006***	−0.006**			
		(0.001)	(0.002)	(0.003)			
Credit rating change $_{t-1}$	12.621***	12.439***	8.641***	13.144***	−2.559**	−3.239	−2.119
	(1.748)	(1.723)	(2.198)	(2.918)	(1.264)	(1.972)	(1.776)
Underinvestment$_{t-1}$	−0.868***	−0.859***	−1.004***	−0.828***	0.140**	0.154*	−0.203**
	(0.059)	(0.058)	(0.078)	(0.095)	(0.063)	(0.092)	(0.094)
Excess cash	−1.205***	−1.184***	−1.247***	−1.321***	0.332***	0.264***	0.362***
	(0.067)	(0.066)	(0.087)	(0.110)	(0.066)	(0.096)	(0.098)
Tax benefit	0.149	0.136	0.161	0.000	−0.887**	−0.426	−1.298**
	(0.362)	(0.356)	(0.474)	(0.603)	(0.384)	(0.625)	(0.534)
Financial distress	0.006	0.007	0.199*	0.035	−0.069	0.012	−0.044
	(0.081)	(0.079)	(0.112)	(0.133)	(0.075)	(0.104)	(0.118)
Size	−0.008	−0.009	0.019	0.032	−0.089***	−0.055*	−0.120***
	(0.020)	(0.019)	(0.025)	(0.035)	(0.021)	(0.029)	(0.031)
Age	−0.010**	−0.011***	−0.015***	−0.019***	0.018***	0.025***	0.012*
	(0.004)	(0.004)	(0.005)	(0.007)	(0.004)	(0.006)	(0.006)
Profitability	−0.326***	−0.318***	−0.236	−0.277	0.480**	1.910***	0.124
	(0.123)	(0.121)	(0.156)	(0.217)	(0.197)	(0.432)	(0.247)
Tobin's Q	−0.055***	−0.055***	−0.063***	−0.045**	0.178***	0.345***	0.131***
	(0.012)	(0.012)	(0.017)	(0.020)	(0.027)	(0.057)	(0.031)
Tangibility	0.910***	0.882***	0.050	2.103***	−0.942***	−0.961***	−1.142***
	(0.161)	(0.157)	(0.179)	(0.453)	(0.140)	(0.201)	(0.206)
Dividends	0.045	0.049	−0.017	0.012	0.150**	−0.011	0.273**
	(0.074)	(0.073)	(0.094)	(0.132)	(0.072)	(0.101)	(0.109)
_cons	0.018	0.175	0.909***	−0.899***	−0.297	−1.156***	0.689*
	(0.198)	(0.206)	(0.227)	(0.334)	(0.203)	(0.313)	(0.410)
N	11,085	11,085	5111	5954	10,684	4582	6098
Episodes	6	6	5	6	7	7	7
Wald chi2	747***	1011***	875***	312***	290***	143***	199***

Note: This table reports the determining factors for dropping the extreme leverage policy. The dependent variable is a dummy variable equal to 1 if a firm stops following extreme leverage policy. The duration is the number of years with extreme leverage policy. *, ** and *** are significant levels at the 10%, 5% and 1% level, respectively. All variables are defined in Table 1.

that the probability of continuing a zero-leverage policy increases when a firm is located close to the target level. In contrast, the positive sign of the duration of the zero-leverage policy (0.116) in the other sample suggests that the chance of following this policy decreases when a zero-leverage firm is located far from its optimal point. As discussed before, these firms intend to build up flexibility by preserving debt capacity. Overall, our result is in line with the findings of Leary & Roberts (2005) who find that firms actively rebalance their leverage to stay within an optimal range.

Column 5 of panel B presents the results of the factors affecting the decision to drop a very high-leverage policy. Similar to the zero-leverage policy, the excess debt policy is also a sticky policy. As the duration of this policy increases, the probability of dropping this policy decreases. In line with our hypothesis (H1b), the reduction in the credit rating has a positive impact on the probability of dropping a very high leverage. Furthermore, asset tangibility accounts for the greatest impact on quitting this policy. These findings suggest that the chances of continuing with an aggressive debt policy decrease following the difficulty of raising more debt, due to a higher interest rate or a lack of collateral assets to support the borrowing. Furthermore, the positive impacts of profitability and excess cash are in line with the pecking order theory, in which internal financing (i.e., cash, financial slack) is preferred to external financing hence, lowering the debt financing. Furthermore, a positive coefficient of the underinvestment dummy corroborates our hypothesis (H2b) in which asymmetric information and contracting problems lead firms to forgo investment and hence, managers' preference is to move towards the optimal investment by reducing debt financing (dropping excess leverage) and mitigating the debt overhang.

Finally, we examine the decision to drop a very high leverage policy amongst firms with small and large deviations from target leverage. The coefficient of the duration of this policy for firms with far deviations from the optimal capital structure appears to have a bigger impact on the stickiness of this policy (−0.156), compared to their counterparts (−0.068). The higher the magnitude of this proxy strongly suggests that when a very high levered firm is substantially over levered, it has less incentive for rebalancing its capital structure towards the target. This finding appears to contradict the view that the deviation from the target leverage is temporary (Hovakimian, 2004). However, it is worth highlighting that, to some extent, these findings are Kisgen (2006) who claims that managers concern about credit rating change is not material for some firms as they are confident that a higher level of leverage will not jeopardise their target minimum credit rating. Furthermore, our finding is consistent with Hung et al. (2017) who argue that ratings (obtained from credit rating agencies) do not reflect the up-to-date financial status of a firm.

5 | FURTHER ANALYSES ON THE ZERO LEVERAGE POLICY

5.1 | Demand for the future supply of capital

Since adopting zero-leverage in terms of flexibility represents firms' ability to respond in a timely and value-maximising way, then preserving debt capacity internally without external availability of funds has no value. Therefore, the role of the zero-leverage policy becomes questionable from a flexibility point of view and has no true value unless it enables these companies to raise external funds more easily at a lower cost, which ultimately leads to their pursuing valuable investment in the future. Therefore, we examine whether adopting a zero-leverage policy can mitigate investment distortion, either initiating from equity holders (underinvestment problem) or debt holders (lower costs). Since the underinvestment and financial flexibility hypotheses of the zero-leverage phenomenon are dynamic in nature, we define *t* as the event year, it is the last year where firms maintain their zero-leverage before dropping this policy. Then we analyse the pattern of the firms' behaviour, in particular deviation from optimal investment and their power of borrowing before and after this event.

Myers & Majluf (1984) also argue that reserving borrowing power enables firms with valuable growth opportunities to raise external funds at a low cost and to invest more in the following years. However, as we observed in our previous analysis, not all zero-leverage firms have spare borrowing power as indicated by their distance from target leverage. Therefore, to distinguish zero-leverage firms with and without spare debt capacity, we divide zero-leverage firms into two groups, with small and large deviations from target leverage. We present our results for different sub-sample groups in Table 5, the major differences between the mean values of firms' characteristics before and after dropping zero-leverage. We observe a sharp increase in debt issuance (0.17) after a firm drops its zero-leverage policy, which turns the deviation from target leverage levels to a positive value. An average increase in their access to debt market value can confirm this argument. Past zero-leverage firms with substantial deviations from target leverage can achieve a very significant increase in their access to the debt market, around 225% (0.004 vs. 0.013). This trend is not significant and substantial when the past zero-leverage policy was close to target leverage. This finding is in line with the finding of Kisgen (2009) that firms reduce their leverage to avoid a downgrade and achieve an upgrade in their credit rating.

We also expect that after a period of zero-leverage policy, the firm's ability to invest will be increased. The investment demonstrates a sharp and statistically significant increase after dropping its zero-leverage policy. In particular, we find zero-leverage firms with substantial deviation from target leverage increase their net investment which results in mitigating the deviation from optimal investment by 276%. (−0.025 vs. 0.044). Finally, zero-leverage firms that are close to their target leverage maintain the policy over longer periods of time than those that substantially deviate from optimal leverage (3.14 vs. 2.70) before they eventually raise debt.

5.2 | Access to debt market after dropping zero-leverage

In this part, we examine if current zero-leverage is a strategic decision for the shift in the future demand for capital. We expect to see that following a period of adopting this strategy, firms have achieved a flexible financial status. Gamba and Triantis (2008) refer to financial flexibility as a firm's ability to access external funds at a lower cost when profitable opportunities arise. Therefore, we expect to observe an increase in investment after firms drop their zero-leverage policy and we also should observe that when firms decide to lever up after adopting this strategy, they will have better access to debt financing at lower cost and therefore rely less on internal funds.

Dropping zero-leverage may be endogenous to investment level (see Marchica and Mura, 2010). Therefore, to address this concern, the dynamic model of investment below is estimated using Blundell & Bond's (1998)) system-GMM technique.

$$
\begin{aligned}
New\ Investment_{it} = {} & \beta_0 + \beta_1 New\ Investment_{it-1} + \beta_2 Profitability_{it-1} + \beta_3 Tobin's\ Q_{it-1} \\
& + \beta_4 Dropping\ ZL_{it} + \beta_5 (Profitability_{it-1} \times Dropping\ ZL_{it}) + \eta_i + \eta_t + \nu_{it} \qquad (6)
\end{aligned}
$$

where *Dropping zero-leverage* is a dummy variable which is equal to 1 if the zero-leverage firm becomes non-zero-leverage and 0, otherwise (see Table 1 the definition of other variables). η_i and η_t are the panel and time-fixed effects, respectively, υ_{it} is the disturbance term assumed to be independent for each firm and year. If a firm has achieved a financially flexible status after dropping the ZL policy, then we expect dropping this policy to have a positive impact on investment. Furthermore, as a financially flexible firm has better access to the debt market, the interaction of this dummy variable with cash flow should decrease the sensitivity of investment to internal funds.

Table 6 reports the results of different specifications of the investment model. The lag levels of t-2 through t-7 of both the dependent and the explanatory variables are used as instruments. We also use marginal tax benefits as another instrumental variable. The idea is that potential tax benefits are expected to encourage firms to issue debt and drop the zero-leverage policy but are not expected to have any strong impact on the level of investments. The validity of this method depends on assumptions regarding the serial correlation of residuals and the validity of instruments. In all cases, correlation tests confirm the validity of assumptions regarding serial uncorrelated errors. Hansen tests also confirm the validity of lagged levels and marginal tax benefits as instruments. Columns 1 and 2 report the results for

TABLE 5 Firm Behaviour Before and After Dropping Zero-leverage Policy.

	Panel A. All zero leverage firms				Panel B. Small deviation				Panel C. Large deviation			
	t-1	t	t+1	Change in mean [(t+1)-(t-1)]	t-1	t	t+1	Change in mean [(t+1)-(t-1)]	t-1	t	t+1	Change in mean [(t+1)-(t-1)]
Debt issuance												
N	3376	4089	5010		1497	1982	2903		1879	2107	2107	
Mean	−0.021	−0.031	0.153	0.171***	−0.022	−0.031	0.160	0.180***	−0.021	0.000	0.170	0.150***
Deviation leverage												
N	2899	3433	4288		1196	1326	2202		1703	2107	2086	
Mean	−0.051	−0.070	0.111	0.160***	−0.033	−0.031	0.111	0.142***	−0.080	−0.091	0.100	0.190***
Cash												
N	4088	5010	5010		1981	2903	2903		1170	1170	1170	
Mean	0.361	0.371	0.263	−0.100***	0.400	0.410	0.311	−0.090***	0.311	0.300	0.200	−0.111***
Credit rating												
N	2193	2522	2928		707	819	1001		838	946	1015	
Mean	0.003	0.005	0.008	0.005**	0.002	0.004	0.004	0.002	0.004	0.006	0.013	0.010***
Zero-leverage duration												
N	4075	5010	5000		1981	2903	2903		2107	2107	2107	
Mean	2.630	3.451	0.000	−2.631***	3.140	3.700	0.000	−3.141***	2.270	3.201	0.000	−2.272***
Deviation investment												
N	2369	2761	3200		981	1110	1308		1388	1651	1892	
Mean	−0.017	−0.006	0.044	0.061***	−0.015	0.005	0.043	0.058***	−0.025	−0.011	0.044	0.069***

Note: This table presents an analysis of some firm characteristics in a dynamic framework around the event year t, the year t refers to the last year before a firm drops its zero-leverage policy. It also shows the change in mean value and *t*-test on the equality of mean from [(t+1) to (t-1)]. Panel A is for the results of all firms that experience a zero-leverage policy at least once in their life. Panel B and C present the results for two groups of zero-leverage firms with small and large deviations from target leverage. . *, ** and *** are significant levels at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

TABLE 6 Investment Sensitivity to Cash Flow and Dropping Zero-Leverage Policy.

	All zero leverage firms		ZL with a small deviation from the target	ZL with a large deviation from the target
	(1)	(2)	(3)	(4)
New investment$_{t-1}$	0.345***	0.355***	0.417***	0.267***
	(0.021)	(0.021)	(0.025)	(0.030)
Profitability$_{t-1}$	0.207***	0.212***	0.282***	0.165***
	(0.012)	(0.013)	(0.019)	(0.017)
Tobin's Q$_{t-1}$	0.011***	0.009***	0.002	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Dropping ZL	0.080***	0.085***	0.053***	0.100***
	(0.007)	(0.015)	(0.025)	(0.015)
Profitability$_{t-1}$* dropping ZL		−0.015	−0.010	−0.140***
		(0.045)	(0.060)	(0.054)
Constant	−0.052***	−0.048***	−0.061***	−0.021*
	(0.009)	(0.009)	(0.015)	(0.011)
N	20,470	20,448	9096	7689
Number of firms	4468	4463	2869	2678
F	23.500***	22.811***	20.230***	8.940***
Correlation 1 (*p*-value)	(0.000)	(0.000)	(0.000)	(0.000)
Correlation 2 (*p*-value)	(0.136)	(0.142)	(0.114)	(0.681)
Hansen test of overidentification (*p*-value)	22.340 (0.616)	23.140 (0.511)	29.860 (0.190)	17.250 (0.838)
Difference-in-Hansen test of exogeneity (*p*-value)	19.010 (0.585)	19.331 (0.500)	22.930 (0.292)	16.50 0(0.685)

Note: This table reports the regression results of the Q-model of investment using the system GMM method. The dependent variable is *New Investment* measured at time t. *Dropping zero-leverage* is a dummy variable that is equal to 1 if the zero-leverage firm becomes a Non-zero-leverage firm, and 0, otherwise. Columns (1) and (2) present the results for all firms that experience a zero-leverage policy at least once in their life. The last two columns present the results for two groups of zero-leverage firms with small and large deviations from target leverage. Correlation 1 and Correlation 2 are the tests of the first and second order of autocorrelation of residuals, respectively, under the null of no serial correlation. Hansen tests for the null hypothesis of the validity of instruments (overidentification restriction). The Difference-in-Hansen tests for the null hypothesis of exogeneity of instruments used for the equations in levels. In all models, Tax Benefit is used as an instrument and the unreported Difference-in-Hansen tests for this instrument do not reject the null hypothesis. Year and industry dummies are included in all models. The standard errors are robust to heteroscedasticity and clustered at the firm level. The definitions of all variables are provided in Table 1. *, ** and *** are significant levels at the 10%, 5% and 1% level, respectively. All variables are defined in Table 1.

the full sample. In line with other literature, growth opportunities (Q) appear to have a positive impact on investment decisions. The positive and significant coefficient of cash flow implies that in the presence of market imperfection, firms are relying more on internal finance to fund their growth opportunities (Gatchev et al., 2010). The dummy indicator of dropping the zero-leverage policy exerts a positive impact on investment, implying that firms invest more after a period of zero-leverage policy or after achieving financially flexible status.

In Columns 3 and 4 we re-estimate the investment model for the two subsamples with small and large deviations from the target leverage. Unlike zero-leverage firms with small deviations from the target, zero-leverage firms with a large deviation from optimal leverage sacrifice their borrowing power today to build up their power to access external funds at a lower cost when profitable opportunities arise. The magnitude of cash flow on investment in Column 3 is greater than their counterparts in Column 4 when firms have a higher deviation from optimality (0.282 vs. 0.165). This finding implies that firms with small deviations from their target leverage rely more on internal funds to finance their investments even after dropping the zero-leverage policy. Furthermore, the magnitude of Q turns out to be not significant for this subsample, indicating that on average they are not able to invest their growth opportunities as much as possible. As expected, the magnitude of the coefficient of dropping zero-leverage policy in the subsample of zero-levered with a higher distance from the optimal point is greater (0.100 vs. 0.053) compared to the other group.

More importantly, the interaction term of cash flow and dropping zero-leverage, which represents the investment sensitivity to cash flow, is only negative and significant (−0.140) when former zero-leverage firms are located far from the target debt ratio. This may reflect the fact that following a period of debt-free policy, only former zero-leverage firms which reserved their borrowing power achieved a flexible financial status. Thus, the zero-leverage policy was a wise decision for this group, as they are less exposed to capital market imperfection and hence, they can raise sufficient funds to enhance their investment while relying significantly less on internal funds. In this vein, the option to issue debt is valuable, which is not taken into account in the classical trade-off target leverage.

6 | CONCLUSION

We empirically examine the persistence of extreme leverage policies and in so doing we are the first to empirically investigate the impact of financial flexibility on the duration of extreme financing policies, hence allowing us to empirically investigate whether credit ratings change and/or suboptimal investment can influence firms' decisions of dropping their extreme financial policies and move towards their target levels. We also distinguish between debt-free firms with small and large deviations from the target leverage. To do so, we propose a novel empirical approach of survival model estimators to control for adopting and dropping extreme financing policies.

Overall, this study provides new evidence of the importance of financial flexibility (credit rating changes and under/over investment) on the duration of extreme financial policies (zero-leverage policy and high-leverage policy). Our evidence suggests that extremely levered firms are not keen to shift towards their target leverage quickly. However, the severity of this postponement differs between the conservative and the aggressive debt users. In contrast to conservative debt users, firms that have too much debt, relative to the optimal level, have a strong incentive not to move towards their optimal levels. This finding is hard to reconcile with the view that firms rebalance towards their target leverage (Hovakimian, 2004; Leary & Roberts, 2005). Thus, this issue is left for future research to examine why firms behave in such a way.

Our paper provides different practical implications, a variety of concerns may arise for stakeholders if a firm is not using its full debt capacity and is under-levered or if a firm reduces its debt further if it is over-levered. In some cases of under-levered firms not moving towards target leverage may be consistent with the logical decision of financial flexibility, which justifies managers' decisions in such firms. In addition, the evidence of this research in the opposite circumstances reveals that firms with a substantial positive excess leverage have failed to adjust their leverage, despite the high cost of financial distress and hence it is important for managers to be aware of such a situation. Finally, the findings of this paper regarding the high stickiness of excess leverage can be a red flag for managers to not depart too much from optimal leverage.

ACKNOWLEDGEMENTS

The authors have nothing to report.

ORCID

Tahera Ebrahimi https://orcid.org/0000-0003-3130-9759
Basil Al-Najjar https://orcid.org/0000-0003-2753-7142

ENDNOTES

[1] When an event occurs then a new episode will start, and the duration is reset to 'zero'.

[2] Hazard rate t = number at risk at the start of interval t/(number of deaths during t-number of censored cases (withdraw) in interval t) → $h_1 = 1726/(19389 - 4160) = 0.10$.

REFERENCES

Almeida, H., Campello, M., & Weisbach, M. S. (2011). Corporate financial and investment policies when future financing is not frictionless. *Journal of Corporate Finance*, *17*, 675–693.

Amini, S., Elmore, R., Öztekin, Ö., & Strauss, J. (2021). Can machines learn capital structure dynamics?. *Journal of Corporate Finance*, *70*, p. 102073.

An, Z., Li, D., & Yu, J. (2015). Firm crash risk, information environment, and speed of leverage adjustment. *Journal of Corporate Finance*, *31*, 132–151.

Andrade, G., & Kaplan, S. N. (1998). How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. *The Journal of Finance*, *53*, 1443–1493.

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis*, *43*, 59–92.

Baker, M., Hoeyer, M. F., & Wurgler, J. (2016). The risk anomaly tradeoff of leverage (No. w22116). National Bureau of Economic Research.

Banerjee, A. V., & Duflo, E. (2014). Do firms want to borrow more? Testing credit constraints using a directed lending program. *Review of Economic Studies*, *81*, 572–607.

Bellotti, T., & Crook, J. (2009). Credit scoring with macroeconomic variables using survival analysis. *Journal of the Operational Research Society*, *60*, 1699–1707.

Bessler, W., Drobetz, W., Haller, R., & Meier, I. (2013). The international zero-leverage phenomenon. *Journal of Corporate Finance*, *23*, 196–221.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*, 115–143.

Clementi, G. L., & Hopenhayn, H. A. (2006). A theory of financing constraints and firm dynamics. *The Quarterly Journal of Economics*, *121*, 229–265.

Colombo, L. V. A., & Botta, M. (2022). Non-linear capital structure dynamics. *Journal of Business Finance & Accounting*, *49*, 1897–1928.

Cook, D. O., & Tang, T. (2010). Macroeconomic conditions and capital structure adjustment speed. *Journal of Corporate Finance*, *16*, 73–87.

Cruces, J. J., & Trebesch, C. (2013). Sovereign defaults: The price of haircuts. *American Economic Journal: Macroeconomics*, *5*, 85–117.

Dang, V. (2013). An empirical analysis of zero-leverage firms: Evidence from the UK. *International Review of Financial Analysis*, *30*, 189–202.

Dang, V., Kim, M., & Shin, Y. (2011). In search for a robust method for estimating dynamic panel data models of capital structure. SSRN eLibrary.

Deangelo, H., Deangelo, L., & Whited, T. M. (2011). Capital structure dynamics and transitory debt. *Journal of Financial Economics*, *99*, 235–261.

Denis, D. J., & Mckeon, S. B. (2012). Debt financing and financial flexibility are evidence from proactive leverage increases. *The Review of Financial Studies*, *25*, 1897–1929.

Devos, E., Dhillon, U., Jagannathan, M., & Krishnamurthy, S. (2012). Why are firms unlevered? *Journal of Corporate Finance*, *18*, 664–682.

D'mello, R., & Gruskin, M. (2014). Are the benefits of debt declining? The decreasing propensity of firms to be adequately levered. *Journal of Corporate Finance*, *29*, 327–350.

Ebrahimi, T., Gupta, J., & Ozkan, A. (2020). Supply-side factors, CEO overconfidence, and zero-leverage policy. *International Journal of Finance & Economics*, *25*, 547–564.

Fama, E. F., & French, K. R. (2002). Testing trade-offs and pecking order predictions about dividends and debt. *Review of Financial Studies*, *15*, 1–33.

Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance*, *19*, 1–19.

Flannery, M. J., Hanousek, J., Shamshur, A., & Tresl, J. (2020). M&A activity and the capital structure of target firms. *Journal of Financial and Quantitative Analysis*, *58*(5), 2064–2095.

Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics*, *79*, 469–506.

Gamba, A., & Triantis, A. (2008). The value of financial flexibility. *The journal of finance*, *63*(5), pp. 2263–2296.

Gatchev, V. A., Pulvino, T., & Tarhan, V. (2010). The interdependent and intertemporal nature of financial decisions: An application to cash flow sensitivities. *The Journal of Finance*, *65*(2), pp. 725–763.

Gharsalli, M. (2019). High leverage and variance of SMEs performance. *The Journal of Risk Finance*, *20*, 155–175.

Ghose, B. (2017). Impact of business group affiliation on capital structure adjustment speed: Evidence from Indian manufacturing sector. *Emerging Economy Studies*, *3*, 54–67.

Ghulam, Y., & Derber, J. (2018). Determinants of sovereign defaults. *The Quarterly Review of Economics and Finance*, *69*, 43–55.

Gupta, J., Gregoriou, A., & Ebrahimi, T. (2016). Empirical comparison of hazard models in predicting bankruptcy. *Social Science Research Network*, *18*, 1–54.

Gyimah, D., Kwansa, N. A., Kyiu, A. K., & Sikochi, A. S. (2021). Multinationality and capital structure dynamics: A corporate governance explanation. *International Review of Financial Analysis*, *76*, p. 101758.

Halling, M., Yu, J., & Zechner, J. (2016). Leverage dynamics over the business cycle. *Journal of Financial Economics*, *122*, 21–41.

Hennessy, C. A. (2004). Tobin's Q, debt overhang, and investment. *The Journal of Finance*, *59*, 1717–1742.

Hovakimian, A., Kayhan, A., & Titman, S. (2009). Credit rating targets. Working paper.

Hovakimian, A., Kayhan, A., & Titman, S. (2009). *Credit rating targets*, Available at SSRN 1098351.

Hovakimian, A., & Li, G. (2011). In search of conclusive evidence: How to test for adjustment to target capital structure. *Journal of Corporate Finance*, *17*, 33–44.

Hovakimian, A., Opler, T., & Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative analysis*, *36*, 1–24.

Huang, Z., Li, W., & Gao, W. (2015). Does zero-leverage policy increase inefficient investment?-From the perspective of lack of bank creditors. *Journal of Applied Business Research*, *31*, 2237.

Hung, C.-H. D., Banerjee, A., & Meng, Q. (2017). Corporate financing and anticipated credit rating changes. *Review of Quantitative Finance and Accounting*, *48*, 893–915.

Hussain, H. I., Ali, M., Hassan, M. K., & El-Khatib, R. (2020). Asymmetric capital structure speed of adjustment, equity mispricing and Shari'ah compliance of Malaysian firms. *International Review of Economics & Finance*, *86*, 965–975.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, *76*, 323–329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*, 305–360.

Joaquim, F., Dias, C. J., & Paula, G. A. (2016). Low-leverage policy dynamics: An empirical analysis. *Review of Accounting and Finance*, *15*, 463–483.

Khieu, H. D., & Pyles, M. K. (2016). The influence of a credit rating change on dividend and investment policy interactions. *Financial Review*, *51*, 579–611.

Kiesel, F., & Lücke, F. (2019). ESG in credit ratings and the impact on financial markets. *Financial Markets, Institutions & Instruments*, *28*, 263–290.

Kisgen, D. J. (2006). Credit ratings and capital structure. *The Journal of Finance*, *61*, 1035–1072.

Kisgen, D. J. (2009). Do firms target credit ratings or leverage levels?. *Journal of Financial and Quantitative Analysis*, *44*, 1323–1344.

Korteweg, A. (2010). The net benefits to leverage. *The Journal of Finance*, *65*, 2137–2170.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, *28*, 911–922.

Lartey, T., Danso, A., & Boateng, A. (2021). Co-opted boards and capital structure dynamics. *International Review of Financial Analysis*, *77*, p. 101824.

Leary, M. T., & Roberts, M. R. (2005). Do firms rebalance their capital structures? *The Journal of Finance*, *60*, 2575–2619.

Lemmon, M. L., Roberts, M. R., & Zender, J. F. (2008). Back to the beginning: persistence and the cross-section of corporate capital structure. *The Journal of Finance*, *63*, 1575–1608.

Lemmon, M. L., & Zender, J. F. (2010). Debt capacity and tests of capital structure theories. *Journal of financial and quantitative analysis*, *45*(5), pp. 1161–1187.

Li, D. (2000). On default correlation: A copula function approach. *Journal of Fixed Income*, *9*, 43–54.

Liao, L. K., Mukherjee, T., & Wang, W. (2015). Corporate governance and capital structure dynamics: An empirical study. *Journal of Financial Research*, *38*(2), pp. 169–192.

Lockhart, G. B. (2014). Credit lines and leverage adjustments. *Journal of Corporate Finance*, *25*, 274–288.

Marchica, M. T., & Mura, R. (2010). Financial flexibility, investment ability, and firm value: Evidence from firms with spare debt capacity. *Financial management*, *39*(4), pp. 1339–1365.

Martin, J. S., & Santomero, A. M. (1997). Investment opportunities and corporate demand for lines of credit. *Journal of Banking & Finance*, *21*, 1331–1350.

Miller, M. (1977). Debt and taxes. *Journal of Finance*, *32*(2), 261–275.

Mukherjee, T., & Wang, W. (2013). Capital structure deviation and speed of adjustment. *Financial Review*, *48*, 597–615.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*, 147–175.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*, 187–221.
Richardson, S. (2006). Over-investment of free cash flow. *Review of accounting studies*, *11*, pp. 159–189.
Steele, F. (2011). Multilevel discrete-time event history models with applications to the analysis of recurrent employment transitions. *Australian & New Zealand Journal of Statistics*, *53*, 1–20.
Strebulaev, I. A., & Yang, B. (2013). The mystery of zero-leverage firms. *Journal of Financial Economics*, *109*, 1–23.
Tang, T. T. (2009). Information asymmetry and firms' credit market access: Evidence from Moody's credit rating format refinement. *Journal of Financial Economics*, *93*, 325–351.
Vartia, L. (2004). *Assessing plant entry and exit dynamics and survival–Does firms' financial status matter?*. Mimeograph, European University Institute.
Warr, R. S., Elliott, W. B., Koëter-Kant, J., & Öztekin, Ö. (2012). Equity mispricing and leverage adjustment costs. *Journal of Financial and Quantitative Analysis*, *47*, 589–616.
William, D. (2020). Capital structure determinants, dynamics and speed of adjustment towards target leverage: A systematic literature review of empirical and theoretical disciplines. *International Journal of Recent Scientific Research*, *11*, 37517–37528.
Wojewodzki, M., Poon, W. P., & Shen, J. (2018). The role of credit ratings on capital structure and its speed of adjustment: An international study. *The European Journal of Finance*, *24*, 735–760.
Zhou, Q., Faff, R., & Alpert, K. (2014). Bias correction in the estimation of dynamic panel models in corporate finance. *Journal of Corporate Finance*, *25*, 494–513.

How to cite this article: Ebrahimi, T., & Al-Najjar, B. (2025). Financial flexibility and the persistence of extreme financial leverage policies: A new empirical approach. *Financial Markets, Institutions & Instruments*, 1–24. https://doi.org/10.1111/fmii.12211

AUTHOR BIOGRAPHIES

Tahera Ebrahimi is a senior lecturer in finance at Manchester Metropolitan University. She earned her PhD from the University of Hull. Her research focuses on empirical corporate finance, with specific interests in capital structure, management traits and bankruptcy. Her work has been published in various journals, including *Quantitative Finance, Review of Quantitative Finance and Accounting, International Journal of Finance & Economics, International Journal of Disclosure and Governance* and others.

Basil Al-Najjar is a professor of finance at the Department of Finance and Economics at Manchester Metropolitan University and the departmental research lead. He specialises in corporate finance and corporate governance. His research appears in different journals, such as the *British Journal of Management, Technological Forecasting and Social Change, Abacus, Review of Quantitative Finance and Accounting, International Journal of Finance and Economics, Journal of International Accounting, Auditing and Taxation, Tourism Management, Journal of Small Business Management, International Business Review, Business Strategy and the Environment*, amongst others.