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Firms' debt–equity decisions when the static tradeoff theory and the pecking order theory disagree

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ABSTRACT

This paper tests the static tradeoff theory against the pecking order theory. We focus on an important difference in prediction: the static tradeoff theory argues that a firm increases leverage until it reaches its target debt ratio, while the pecking order yields debt issuance until the debt capacity is reached. We find that for our sample of US firms the pecking order theory is a better descriptor of firms' issue decisions than the static tradeoff theory. In contrast, when we focus on repurchase decisions we find that the static tradeoff theory is a stronger predictor of firms' capital structure decisions.

1. Introduction

The capital structure literature has been dominated by two theories. The first theory, known as the static tradeoff theory, implies that firms have a target debt ratio and try to move towards this target.[1] Alternatively, the pecking order theory (Myers, 1984; Myers and Majluf, 1984) argues that, due to asymmetric information, firms adopt a hierarchical order of financing preferences so that internal financing is preferred over external financing. If external financing is needed, firms first seek debt funding. Equity is only issued as a last resort. In the words of Myers (1984, p. 585): "*you will refuse to buy equity unless the firm has already exhausted its "debt capacity"—that is, unless the firm has issued so much debt already that it would face substantial additional costs in issuing more.*"

In various cases the two theories have similar predictions. For example, if a firm issues a security and its debt ratio is currently below its target debt ratio, both the static tradeoff theory and the pecking order theory predict the firm to issue debt: the static tradeoff theory implies that a firm moves towards its target, while in a pecking order world a firm will always cover its external financing needs with debt as long as it is not constrained by its debt capacity. Also, when a firm wants to repurchase securities and has a debt ratio above its target, both theories predict that the firm buys back debt.

In this paper we focus on the empirical relevance of both theories when they have conflicting predictions on firms' debt–equity decisions. We construct a simple framework that allows us to identify situations in which the pecking order theory and the static tradeoff theory disagree. This is the case in two regions. For issuing decisions, the theories disagree when the current debt ratio is above the target ratio but below the debt capacity. In this case, the static tradeoff theory predicts a decrease of leverage, whereas the pecking order theory predicts that a firm would still increase leverage. For repurchase decisions the theories disagree when the firm's current debt ratio is below the target debt ratio. The pecking order model predicts that the firm repurchases debt and therefore decreases leverage, whereas the static tradeoff model predicts a move towards the target and therefore an increase of leverage. By identifying the observations in these two regions, we are able to test which of the two theories provides the most accurate predictions.

Our sample period is 1985–2005, and we limit our sample to US firms with investment grade ratings, which reduces the probability that the firms in our sample are restricted by their debt capacity.

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[1] Myers (1984) focuses on the tradeoff between tax benefits and bankruptcy costs when describing the static tradeoff theory. Several other papers incorporate more factors into the static tradeoff theory, like agency costs (see, e.g., Flannery and Rangan, 2006).

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For issue decisions, we find that only a small minority of the firms that have above-target leverage in a given year issue equity instead of debt. Hence, most firms increase their leverage, even when they are already above their estimated target. Depending upon the particular specification of the target debt ratio, we find that somewhere between 78.5% and 83.0% of the firm-years exhibit financing decisions that are inconsistent with the static tradeoff theory. This relatively simple test therefore shows that the static tradeoff theory is not a strong predictor of firms' issuing decisions.

For repurchase decisions, we focus on below-target firm-years: the static tradeoff theory predicts that firms in this situation repurchase equity to increase their leverage, while the pecking order theory predicts that firms repurchase debt. We take into account that firms can only repurchase debt when they actually have debt outstanding. We find that in only between 31.0% and 36.4% of these observations firms repurchase debt. These low percentages are evidence in favor of the static tradeoff theory, and are strong evidence against the pecking order theory for repurchase decisions.

We extend our analysis by specifically taking into account that even investment grade firms are sometimes restricted by their debt capacity, in case of sufficiently large financing deficits. We construct a model explaining a firm's credit rating and use this to derive an estimate of the marginal debt ratio that would make a firm lose its investment grade rating. We interpret this debt ratio as an estimate for a firm's debt capacity. We then limit our sample to firms that issue securities and that have above-target debt ratios, but that would not surpass their debt capacity when they fill the complete financing deficit with debt. For this subsample, we find that the pecking order theory is able to explain between 79.5% and 84.7% of the issue decisions of the firms in our sample, depending on our measure of target leverage. We corroborate the strength of the pecking order theory for issue decisions in a multivariate setting. Controlling for a range of firm characteristics, we show that for firms with above-target leverage the debt–equity choice is more strongly affected by their debt capacity than their target debt ratio. We conclude that the pecking order theory is a strong predictor of firms' issue decisions, while the static tradeoff theory is better able to explain firms' repurchase decisions.

The remainder of this paper is organized as follows. Section 2 discusses the related literature and outlines our contributions. Section 3 describes the data and the measures for target leverage. Section 4 presents the empirical results on firms' debt–equity choices, and Section 5 investigates the role of firms' debt capacities. Section 6 concludes.

2. Related literature and contribution

Although many previous studies have examined the pecking order theory and the static tradeoff theory, there is no consensus on the superiority of one of the theories. Regarding the pecking order theory, Shyam-Sunder and Myers (1999) estimate a simple regression of a firm's net debt issued on the financing deficit, and find that for a small sample of firms that survive the entire 1971–1989 period, the pecking order model is an excellent first-order descriptor of financing behavior. However, Frank and Goyal (2003) estimate the same regression for a more comprehensive data set, and conclude that the pecking order theory is a poor descriptor of firms' financing behavior. Agca and Mozumdar (2007) and Lemmon and Zender (forthcoming) find evidence in favor of the pecking order theory when they control for firms' debt capacities. However, Leary and Roberts (2010) investigate the empirical relevance of the pecking order theory in cases where a firm is financing investment expenditures, facing asymmetric information and is not constrained by debt capacity or financial distress concerns, and find evidence that even when controlling for the debt capacity the pecking order theory is never able to accurately characterize even half of firms' financing decisions.

Evidence on the static tradeoff theory is also mixed, as some papers find that firms move relatively quickly towards their target debt ratio (see for example Flannery and Rangan, 2006), while other studies conclude that mean reversion happens "at a snail's pace" (Fama and French, 2002). Also, a substantial part of the evidence based on target adjustment models has recently been criticized by Chang and Dasgupta (2009). They show that it is possible to observe supposed target adjustment behavior, even when the samples are generated through simulations in which no target behavior is assumed. See Frank and Goyal (2007) for a more extensive overview of the literature on the pecking order theory and the static tradeoff theory.

Our approach differs from most previous papers by focusing on financing decisions for which the static tradeoff theory and the pecking order theory have different predictions. This is in line with recommendations of Shyam-Sunder and Myers (1999), who argue that to establish the underlying theory for firms' financing decisions it is essential to incorporate the inferences of the pecking order theory when addressing the relevance of the static tradeoff theory, and vice versa. Papers that solely focus on the static tradeoff theory could potentially conclude that their findings are in line with this theory, even when firms follow the pecking order theory (Shyam-Sunder and Myers, 1999), or make random financing decisions (Chang and Dasgupta, 2009). By construction, the results of the empirical tests in this paper can only be explained by one of the two main capital structure theories.

Some other studies that examine conflicting predictions of the static tradeoff theory and the pecking order theory focus on conflicting *indirect* predictions, like the expected effect of profitability on leverage. Fama and French (2002) examine these predictions, and conclude that the evidence is mixed. We contribute by focusing on a conflicting *direct* prediction of the theories on debt–equity choices.

Our study is mostly related to Byoun (2008). He examines the speed of target adjustment, and, like us, distinguishes between surpluses and deficits, and between above-target and below-target firms. He finds that the speeds of adjustment are highest for below-target firms that face a financing deficit, and above-target firms that have a financing surplus. These findings are consistent with both the static tradeoff and the pecking order theory. We contribute to Byoun (2008) by focusing on the regions in which the predictions differ. Also, we contribute by including firms' debt capacities. Finally, we differ from Byoun (2008) in that our results do not mainly rely on target adjustment models, as these models have been criticized by Chang and Dasgupta (2009).

Our paper further relates to Agca and Mozumdar (2007), de Jong et al. (2010), Leary and Roberts (2010), and Lemmon and Zender (forthcoming), as these studies also deal with the influence of the debt capacity. We firstly contribute to these studies in that our goals are different: we specifically focus on those debt–equity decisions in which the static tradeoff theory and the pecking order theories have different predictions. Secondly, our debt capacity measure is expressed as a debt–assets ratio. It allows us to test the relevance of the debt capacity for a particular debt–equity choice by taking into account the firm's current leverage and the firm's financing need. That is, we can examine whether the firm is predicted to be limited by its debt capacity when it finances its complete deficit with debt. Lemmon and Zender (forthcoming), who predict whether firms have rated debt outstanding and use this prediction as their measure of debt capacity, have to admit that "dynamic versions of the pecking order suggest that it is the distance a firm is from its debt capacity that is of interest. This distance is difficult to measure, and the likelihood of having rated debt is a noisy proxy of this quantity." Our measure is able to esti-