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Speed of adjustment: Evidence from Borsa Istanbul☆

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Abstract

In this study, we investigate the speed of adjustment for leverage ratios of firms listed on Borsa Istanbul, in order to investigate the prediction of the trade-off theory, regarding capital structure rebalancing. For this purpose, we estimate the speed of adjustment by using Generalized Method of Moments system estimation technique. The results of this estimation suggest the speed of adjustment as approximately 29%. This significant speed of adjustment is consistent with the prediction of trade-off theory, which suggests that firms follow target capital structures and when the firms' leverage ratios deviate from these targets; they make financial decisions with the goal of closing the gap between the previous year's leverage and target leverage of the current period.

JEL classification: G32

Keywords: Target capital structure; Speed of adjustment; Trade-off theory

1. Introduction

There are numerous studies investigating the capital structure behavior of firms listed on Borsa Istanbul (Ata & Ağ, 2010; Bayrakdaroğlu, Ege, & Yazıcı, 2013; Güler, 2010; Sayılgan, Karabacak, & Küçükkocaoğlu, 2006; Sayılgan & Uysal, 2011). The main focus of most of these studies is the determinants of capital structures of public firms. In these studies, researchers analyze the potential determinants of capital structures of publicly traded firms, in various regression settings. Based upon the direction of the derived relationship between leverage variables and firm characteristics, researchers suggest whether the capital structure of publicly traded firms support the trade-off theory and/or pecking order theory.

In this study we take a different approach to investigate this issue. We do not investigate the explanatory power of various firm characteristics on leverage ratios, but actually utilize these firm characteristics, which have been documented to be significant determinants of leverage ratios, in order to estimate target leverage ratios for firms listed on Borsa Istanbul. Next, we investigate whether firms' actual leverage ratios deviate from these targets, and if they deviate how fast they close this deviation.

The investigation of whether or not public firms adjust their leverage ratios towards target leverage ratios, and if they do, how fast they adjust their leverage ratios towards these target would provide insights into understanding the behavior of firm management while considering financing decisions. In developed economies, such as US economy, firms have access to various types of funds, including but not limited to corporate bonds, long term credits from banks, and seasoned equity offerings. However, it is not typical for a public firm in Turkey

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to issue corporate bond. The same argument is valid for the case of seasoned equity offerings, as well. In addition, firms usually have access to debt that is in nature shorter term (Erol, 2004). According to Sorge and Zhang (2007), Turkey is among the top 3 countries in terms of companies' average short term debt to total debt ratios, with Malaysia and China. These factors could potentially affect the financing decisions of management and it might not be able to adjust leverage ratios towards target leverage ratios even if it intends to. Thus, we might observe a different behavior of firms compared to more developed economies, in terms of adjusting their capital structure. Based on the discussion in Antoniou, Guney, and Paudyal (2008), we believe that it is important to provide evidence from countries with different financing orientations and financing options availability. For example, Crnigoj and Mramor (2009) argue that compared to developed countries, different factors could be at work when firms make their capital structures decisions in emerging countries. Oztekin and Flannery (2012) suggest that legal and financial traditions in various countries correlate with adjustment speeds significantly. Lee, Oh, & Park (in press) provide evidence suggesting that the behavior of firms in terms of capital structure choices could be different than those in more developed economies.

In finance literature, trade-off theory has been one of the most widely discussed and investigated theories of capital structure decisions of firms. In addition, pecking order theory and market timing theory, which are beyond the scope of this paper, have also attracted significant attention for explaining the financial decisions of firms. The tradeoff model suggests that as a result of the trade-off between the potential benefits and costs of debt, firms would have optimal capital structures. Accordingly, managers should make financing decisions in such a manner that the firm reaches its optimal capital structure. Based on this argument, the main prediction would be that firms would have target capital structures and adjust their leverage levels towards the target, in order to maximize firm value. On the other hand, according to the alternative capital structure theories, leverage will not have a very important effect on firm value, and thus firms would not consider following target leverage ratios, at least not as a priority.

Investigating whether or not firms follow target leverage ratios, Fama and French (2002), Leary and Roberts (2005), Flannery and Rangan (2006), Kayhan and Titman (2007), Nieh, Yau, and Liu (2008), Huang and Ritter (2009), Harford, Klasa, and Walcott (2009), provide evidence in support of the prediction of trade-off theory that firms would follow target leverage ratios and they would rebalance their capital structures towards a target capital structure. On the other hand, Hovakimian (2004) and Denis and McKeon (2012) provide evidence suggesting the opposite; that firms' capital structure choices frequently move them away from their target capital structure, rather than moving them towards the target, as opposed to the prediction of trade-off theory.

As we have mentioned earlier, there are various studies investigating the capital structures of firms listed on Borsa Istanbul. In terms of findings in support of trade-off theory and/or pecking order theory, based on survey answers given by financial executives of firms listed on Borsa Istanbul, Arslan (2005) reports that majority of the firms set a target capital structure and the targets are followed systematically. Demirhan (2009) suggest that the capital structure behavior of firms listed on Borsa Istanbul support pecking order theory, whereas Sayılgan and Uysal (2011) suggest that the capital structure behavior of firms listed on Borsa Istanbul broadly support trade-off theory. On the other hand, Ata and Ağ (2010) suggest that the capital structure behaviors of firms listed on Borsa Istanbul are supportive of both trade-off theory and pecking order theory. In a more recent study, Bayrakdaroğlu et al. (2013) suggest that firms listed at Borsa Istanbul do not have target leverage ratios, and pecking order theory is more successful than trade-off theory in explaining capital structures of firms.

Different than the studies that investigate the capital structure behaviors of firms listed on Borsa Istanbul, we utilize the findings of these studies in terms of potential firm characteristics that explain leverage ratios of firms, and estimate target leverage ratios for firms. By employing these target leverages in speed of adjustment estimations, we are able to investigate whether firms follow target capital structures. Among all the potential variables utilized in these studies, we employ the variables suggested by Frank and Goyal (2009) as the most reliable factors in explaining leverage, which are employed in the most recent literature in studies such as Denis and McKeon (2012).

We conduct our analysis by investigating firms' leverage levels, details of which are discussed in the following section, for non-financial firms listed on Borsa Istanbul between the years 1998 and 2010. Our findings, which we discuss in greater detail in the results section, show that throughout the whole sample period, on average, the market leverage ratio is 0.280 whereas the target market leverage ratio, on average, is 0.264. In terms of book leverage ratios, on average, the book leverage ratio is 0.214, whereas the target book leverage ratio is 0.206. Naturally, these figures are just descriptive statistics, thus do not provide us with the opportunity to make any conclusions.

Therefore, we estimate the speed of adjustment for public firms' leverage ratios towards target leverage ratios. This is motivated by the discussion of Fama and French (2002) that pecking order theory predicts a SOA that is indistinguishable from zero, whereas trade-off theory predicts a SOA that is "reliably positive". The same argument could apply to the case of market timing theory as well.

In prior studies, speed of adjustment has been estimated by Fama and French (2002), Flannery and Rangan (2005), Lemmon, Roberts, and Zender (2008), and Huang and Ritter (2009). We employ 3 different estimation methods widely applied in the literature in speed of adjustment estimations, to investigate the firms traded at Borsa Istanbul. When the speed of adjustment is estimated using pooled OLS regressions, the speed of adjustment is estimated as approximately 15%, whereas it is estimated as approximately 49% when the speed of adjustment is estimated using firm fixed effects regressions. However, both these estimation methods have been criticized as being biased. Thus we also estimate the speed of adjustment by using GMM system estimation technique, which is widely

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