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Equity market timing and capital structure: International evidence

Arvind Mahajan [a,*], Semih Tartaroglu [b]

[a] Texas A&M University, College Station, TX 77843, USA
[b] Wichita State University, Wichita, KS 67260, USA

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Abstract

We investigate the equity market timing hypothesis of capital structure in major industrialized (G-7) countries. As claimed by its proponents, we find that leverage of firms is negatively related to the historical market-to-book ratio in all G-7 countries. However, this negative relationship cannot be attributed to equity market timing. We find no association between equity issues and market-to-book ratios at the time of equity financing decisions by Japanese firms. Firms in all G-7 countries, except Japan, undo the effect of equity issuance and the impact of equity market timing attempts on leverage is short lived. This is inconsistent with the prediction of the equity market timing hypothesis and more in line with dynamic trade-off model.

JEL classification: G32; G30; F39

Keywords: Equity market timing; Capital structure; Leverage; Dynamic trade-off; G-7 countries

1. Introduction

Empirical literature has unearthed many stylized facts regarding capital structure consistent with traditional theories. While most of the evidence is obtained from US data, capital structure theories have been tested in other economic environments either as a robustness test or as an attempt to clarify observed capital structure irregularities. In their prominent work, Rajan and Zingales (1995) investigate the capital structure across industrialized (G-7) countries and highlight the difference as well as the similarity of capital structure dynamics in G-7 countries.[1] The variables identified by Rajan and Zingales (1995) as robust determinants of capital structure are utilized by many subsequent studies, including those focused solely on the US.

Two traditional theories of capital structure, the trade-off theory and the pecking order theory, guide most of the capital structure studies. In trade-off theory, firms have a target capital structure, determined by the marginal benefits of debt (tax advantage of debt) and costs associated with debt (i.e. bankruptcy costs and agency costs, Jensen and Meckling, 1976; Myers, 1977). Thus, trade-off theory implies that firms adjust their capital structure in response to the temporary shocks that cause their leverage to deviate from the target. According to pecking order theory, due to asymmetric information (Myers and Majluf, 1984; Myers, 1984), firms follow a financing hierarchy; they finance their investments first with internal funds, then external debt, and finally with equity as a last resort.

A related strand of literature focusing on external financing decisions claims that managers attempt to time equity markets by issuing shares at high market prices

* Corresponding author. Address: Department of Finance, Mays Business School, Texas A&M University, College Station, TX 77843, USA. Tel.: +1 979 845 4876; fax: +1 979 845 3884.
E-mail address: mahajan@tamu.edu (A. Mahajan).

[1] G-7 countries include the most industrialized seven countries: Canada, France, Germany, Italy, Japan, UK and US.

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and repurchasing shares at low market prices.[2] Motivated by the collective evidence on equity market timing, Baker and Wurgler (2002) provide an alternative hypothesis explaining observed capital structure. According to the authors, "... capital structure is the cumulative outcome of past attempts to time the equity markets".[3] In their empirical analysis, Baker and Wurgler (2002) construct a historical market-to-book ratio (external finance weighted historical market-to-book ratio, EFWAMB) to capture firms' past equity market timing attempts.[4] They find that, controlling for firms' growth opportunities by using current market-to-book ratio, leverage is inversely related to historical market-to-book ratio, which they interpret as evidence supporting the equity market timing hypothesis. They further argue that the significance of historical market-to-book ratio in explaining leverage is inconsistent with the trade-off theory. In trade-off framework, as firms adjust to their optimal capital structure, temporary shocks such as market timing attempts should not have a long-lasting effect on firms' leverage.

The market timing hypothesis has generated significant controversy because it is at odds with extant theories of capital structure. Several recent studies question the persistent impact of market timing attempts as well as the interpretation of historical market-to-book ratio. Leary and Roberts (2005) show that a typical US firm rebalances its capital structure in three to five years following the equity issuance. Similarly, Flannery and Rangan (2006), Kayhan and Titman (2007), Alti (2006) and Hovakimian (2006) suggest that the impact of equity market timing on leverage is short lived. To the contrary, Huang and Ritter (2006) conclude that past security issues have a long-lasting effect on capital structure.

The market-to-book ratio of equity plays a dual role in empirical studies. It is used as a measure of market mis-valuation (over or under-pricing) and is utilized as a proxy for future growth opportunities in the trade-off framework. Firms with higher growth opportunities, which typically have higher valuations, may prefer to lower their leverage to maintain their financial flexibility (Myers, 1977). Baker and Wurgler (2002) utilize historical market-to-book ratio to capture the cumulative effects of equity market timing attempts and the current market-to-book ratio to control for firm's growth opportunities in their empirical tests. According to Baker and Wurgler, the significance of historical market-to-book ratio in explaining capital structure contradicts the trade-off theory. However, if firms' growth opportunities are measured with error by the current market-to-book ratio, then historical market-to-book ratio may be a firm characteristic that also captures growth opportunities. The dynamic trade-off models (such as Fischer et al., 1989) suggest long adjustment periods and large deviations from target capital structure in the presence of even small adjustment costs. Hence, slow adjustment imposes a relation between historical ratios and leverage. The simulations of Hennessy and Whited (2005) suggest that in a dynamic trade-off model with no adjustment costs, historical market-to-book ratio has an inverse relation with leverage. Similarly, Liu (2005) and Hovakimian (2006) argue that a negative coefficient for historical market-to-book ratio is more consistent with models of trade-off with adjustment costs than with the equity market timing hypothesis. However, Chen and Zhao (2004) argue that past market-to-book ratios can explain leverage through persistent financing policies, which is more consistent with market timing hypothesis. In summary, based on the results from US data, the validity of the market timing hypothesis remains unresolved. In this paper, we test the null hypothesis of the equity market timing hypothesis and the robustness of historical market-to-book ratio as market timing proxy by analyzing comprehensive data from G-7 countries.

Recent studies have linked capital structure with the nature of institutions existing within countries (Giannetti, 2003; Demirguc-Kunt and Maksimovic, 2002) and with the prevailing macroeconomic conditions (Korajczyk and Levy, 2003; Drobetz et al., 2006). Even if the US based evidence was consistent, it would be hard to assess if this evidence was simply spurious correlation, let alone whether it supported one theory over another, if its robustness was not evaluated in other environments. G-7 countries comprise a rich set of economic environments to test the market timing hypothesis. These countries are quite homogeneous in their level of economic development, and according to Standard and Poor's Global Markets Factbook (2004), they comprised more than 75% of global equity markets during our test-period. Though highly developed, these countries differ from each other on many institutional dimensions (such as legal, regulatory, financial systems, governance mechanisms, etc.) and face different economic conditions. A finding of non-uniform results across countries will allow us to understand why alternative capital structure theories may be valid in different countries and how country specific differences contribute to this. Conversely, obtaining results that systematically support a particular hypothesis across countries despite their differences will strengthen our belief in that hypothesis.

[2] Support for managerial market timing comes from various sources: equity offerings coincide with high market valuations (Taggart, 1977; Jung et al., 1996; Pagano et al., 1998), low returns follow equity issues (Ritter, 1991; Loughran and Ritter, 1995) and high equity issuance as a fraction of total external financing predicts low subsequent returns (Baker and Wurgler, 2000). Finally, survey evidence obtained by Graham and Harvey (2001) also suggests that managers try to time the equity market.

[3] Baker and Wurgler (2002, p. 1).

[4] EFWAMB captures the firm within variation in market-to-book ratios. External finance weighing scheme gives higher weights to higher market-to-book ratios that prevailed when significant external financing decisions were made. Therefore, firms issuing equity due to mis-pricing (high market-to-book ratio) will have high EFWAMB. This variable is further explained in Section 2.2.