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Review Paper

Corporate taxation, debt financing and foreign-plant ownership

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ABSTRACT

This paper compares domestically and foreign-owned plants with respect to their debt-to-assets ratio and analyzes to which extent the difference is systematically affected by corporate taxation. To derive hypotheses about influence of corporate taxation on a firm's debt financing we adapt a standard model of taxation and financing decisions of firms for the case of international debt shifting activities of foreign-owned firms. We estimate the average difference between a foreign-owned and a domestically owned firm's debt ratio, treating the mode of ownership as endogenous. Using data from 32,067 European firms, we find that foreign-owned firms on average exhibit a significantly higher debt ratio than their domestically owned counterparts in the host country. Moreover, this gap in the debt ratio increases with the host country's statutory corporate tax rate.

Contents

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1. Introduction

There is a large body of literature indicating that the financial decisions of firms are systematically affected by company taxation (see Graham, 2003, for a comprehensive survey). Most importantly, interest on debt is deductible from the tax base, while the return on equity is not and, therefore, firms have an incentive to raise leverage above the optimal level without taxation. The tax-induced advantage of debt increases with the statutory corporate tax rate, and it exists irrespective of whether a firm is owned by a domestic or a foreign shareholder. A multinational firm, however, is able to minimize its tax payments by allocating debt over all locations where it operates. The tax savings due to debt shifting depend on the differential between the parent and the host country statutory corporate tax rates. Accordingly, multinationals can reduce their tax payments by shifting debt from a low-tax jurisdiction to a high-tax jurisdiction taking advantage of the high-interest deduction in the high-tax jurisdiction (see, e.g., Mintz and Smart, 2004, for a theoretical analysis).

To identify the existence and the extent of debt shifting, previous empirical research relied on a sample of multinational firms exclusively (Hines, 1997; Devereux, 2006, provide comprehensive surveys). For instance, Desai et al. (2004) use a dataset of U.S.-owned foreign companies, and Huizinga et al. (2008) focus on a large dataset of European multinationals. Both studies find that the financing decisions of multinational firms are systematically affected by corporate taxation.[1] One concern with this evidence is that the estimates may be influenced by the non-random selection of a sample of multinational firms.

This paper is rooted in the aforementioned research, but the identification strategy is different. Taking into account that multinational firms have more opportunities to exploit tax-induced advantages of debt financing than national firms, we argue that a comparison of the debt-to-asset ratio (henceforth DR) of comparable foreign- and domestically owned firms provides an estimate of the extent to which debt financing is influenced by foreign-plant ownership. Hence, in contrast to previous empirical work, we explicitly use national firms as a reference category to assess the effect of foreign-plant ownership on debt financing decisions. We adapt a standard model of taxation and financing decisions of firms for the case of international debt shifting activities of foreign-owned firms. The theoretical framework delivers testable hypotheses on (i) the average difference between the DR of national and multinational firms, and (ii) how this difference is influenced by the corporate tax burden in the host country. We test these predictions using a large dataset of 32,067 European firms. In line with a large body of theoretical and empirical research, we treat foreign-plant ownership as endogenous. Technically, we use propensity score matching techniques to avoid the potential bias of the treatment effect of foreign-plant ownership on firm level DR. Our findings suggest that foreign-owned firms display a higher DR than their domestically owned counterparts. Further, we observe that this difference increases with the corporate tax burden of the host country. These results point to the potential importance of debt shifting as a widely used practice in international tax planning of multinational firms.

The remainder of the paper is organized as follows. In the next section we employ a model with financing decisions to derive the main hypothesis regarding the effects of taxation on the debt policy of domestically and foreign-owned firms. Section 3 discusses the estimation approach, presents the data and the estimation results. Finally, Section 4 concludes.

2. The model

To motivate our empirical analysis, we provide a simple model based on King (1974) and Auerbach (1979), in which the financial decisions of firms are influenced by corporate taxation. We extend this framework to account for financial decisions of multinational enterprises (MNE) operating through subsidiaries in $j = 0, \ldots, n$ locations. Tax rates differ across countries, opening up possibilities for tax arbitrage and global tax savings. In particular, a subsidiary in a low-tax country can give a credit to a subsidiary in a high-tax country to shift profits to locations where they are subject to the lowest tax rates. The (period 2) value of a subsidiary firm in location j is $\bar{\pi}^j = \pi_2^j + (1+r)\pi_1^j$ where r is a given worldwide interest rate. Dividends of a subsidiary in country j are

$$\begin{aligned} \pi_1^j &= (1-\tau^j)f_1 - (K^j - B^j - D^j), \\ \pi_2^j &= f(K^j) + K^j - (1+r)(D^j + B^j) - (e^j + i^j)rK^j - \tau^j[f(K^j) - r(D^j + B^j)]. \end{aligned} \tag{1}$$

Cash-flow f_1 in period 1 is exogenous while cash-flow $f(K^j)$ in period 2 is concave increasing with investment. For simplicity, we assume that there is initially no outstanding debt. A subsidiary can borrow an amount of debt B^j at the external capital market and D^j internally, leaving an amount $K^j - B^j - D^j$ of equity financing from retained earnings.[2] The terms e^j and i^j refer to 'agency costs' of managing external and internal debt that are assumed not tax deductible. We

[1] Earlier evidence from the U.S. is presented by Collins and Shackelford (1992), Altshuler and Mintz (1995), Froot and Hines (1995), Newberry and Dhaliwal (2001), Altshuler and Grubert (2003) and Mills and Newberry (2004). Jog and Tang (2001) analyze the debt shifting behavior of Canadian subsidiaries of U.S. based corporations and of Canadian-controlled corporations with U.S. affiliates. Moore and Ruane (2005) focus on a sample of European firms.

[2] We are not interested in the payout policy of the firm and, therefore, do not distinguish between new share issues and retained earnings (see Zodrow, 1991; Sørensen, 1995, for comprehensive surveys).