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# What determines the speed of adjustment to the target capital structure?

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## Abstract

A dynamic adjustment model and panel methodology are used to investigate the determinants of a time varying target capital structure. Because firms may temporarily deviate from their target capital structure in the presence of adjustment costs, the adjustment process is also endogenized. Specifically, we analyse the impact of firm-specific characteristics as well as macroeconomic factors on the speed of adjustment to the target debt ratio. The sample comprises a panel of 90 Swiss firms over the years from 1991 to 2001. We document that faster growing firms and those that are further away from their optimal capital structure adjust more readily. The results also reveal interesting interrelations between the adjustment speed and well-known business cycle variables. Most important, the speed of adjustment is higher when the term spread is higher and when economic prospects are good.

# Notes

<sup>1</sup> See Andrés Alonso et al. ([2005](#)), for recent evidence.

<sup>2</sup> See also Bhaduri ([2002](#)) and Panno ([2003](#)).

<sup>3</sup> Consistent with Myers' ([1984](#)) pecking order theory, Hovakimian et al. ([2001](#)) document that profitability is a predictor of observed debt ratios in the short-run. Nevertheless, firms make financing and repurchase decisions that offset these earnings-driven changes in their capital structure. This supports the static trade-off theory of the capital structure and the existence of a target debt ratio. However, the latter may not be a primary goal of firms' decision-makers (see Panno, [2003](#); Leary and Roberts, [2004](#)).

<sup>4</sup> Gaud et al. ([2005](#)) and Drobetz and Fix ([2005](#)) adopt this approach for Swiss data.

<sup>5</sup> See Heshmati ([2001](#)) for similar results using a sample of Swedish micro and small firms.

<sup>6</sup> Baker and Wurgler ([2002](#)) also document that firms tend to raise equity when their market values are high relative to book and past market values. The resulting effects on capital structure are persistent, suggesting that capital structure is the cumulative outcome of past attempts to time the equity market.

<sup>7</sup> According to Lööf ([2003](#)), overadjustment may reflect unanticipated changes in economic conditions.

<sup>8</sup> See [Table 3](#) for a correlation analysis of the respective variables.

<sup>9</sup> However, there is one caveat. In the estimations we observe that the time-specific effects,  $d_t$ , absorb most of the explanatory power of the macroeconomic determinants of adjustment speed. Therefore, when  $Z_{it}$  denotes a macroeconomic variable (see subsection C), Equation [5](#) is estimated without time-specific effects.

<sup>10</sup> Finally, it must be noted that  $Z_{it}$  not only impacts the adjustment speed, but also the time varying target debt ratio, as can be inferred from the second summation term in Equation [5](#). However, these dynamics are not of interest and do not further comment on this issue.

<sup>11</sup> An alternative to first-difference transformation is the within-transformation that is commonly used in the literature. Although this approach controls for fixed effects, it introduces correlation between the lagged dependent variables and the lagged error term, leading to biased estimates. The magnitude of this bias falls with the number of years in the sample (see Nickel, [1981](#)). However, only ten years of observations are used here and, hence, this problem will not vanish.

<sup>12</sup> Using first differences removes possible firm-specific effects by avoiding any correlation between unobservable firm-specific characteristics and regressor variables. See Verbeek (2004) for a textbook treatment.

<sup>13</sup> See Harris and Raviv ([1991](#) p. 335).

<sup>14</sup> Recently, Fama and French ([2002](#)) show how the predictions for book leverage carry over to market leverage. The trade-off theory predicts a negative relationship between leverage and investment opportunities. Since the market value grows at least in proportion with investment outlays, the relation between growth opportunities and market leverage is also negative.

<sup>15</sup> These conflicting results may be due to the fact that growth measures tend to be correlated with tangibility.

<sup>16</sup> Another question is again whether these predictions for book leverage carry over to market leverage (e.g., Fama and French ([2002](#))). The trade-off theory predicts that leverage increases with profitability. Since the market value also increases with profitability, this positive relation does not necessarily apply for market leverage. In contrast, the pecking order theory predicts that firms with a lot of profits and few investments have little debt. Since the market value increases with profitability, the negative relationship between book leverage and profitability also holds for market leverage.

<sup>17</sup> Note that Equation [5](#) also includes time-specific effects, denoted as  $d_t$ . However, to avoid that these time dummy variable absorb the explanatory power of the macroeconomic determinants of adjustment speed, they are excluded when  $Z_{it}$  denotes a macroeconomic variable.

<sup>18</sup> See Baker et al. ([2003](#)) for similar evidence. They document that firms borrow long when debt market conditions suggest that the relative cost of long-term debt is low.

<sup>19</sup> The evidence is not conclusive yet as to whether managers are in fact successful timers. Baker et al. ([2003](#)) report that firms tend to borrow long when excess bond returns are predictably low. Long-term debt issues predict lower excess bond returns, and short-term debt issues predict higher excess bond returns. In contrast, Henderson et al. ([2004](#)) only find weak evidence that the aggregate level of the quantity of new debt issued predicts future changes in interest rates.

<sup>20</sup> Drobetz and Fix ([2005](#)) look at a larger (balanced) panel of Swiss firm over the shorter period from 1997 to 2001. However, to give a better picture of the adjustment process, which is the main focus of the present analysis, a longer, albeit smaller, sample of firms is used.

<sup>21</sup> In Switzerland this should not be important because pension liabilities need not be expensed in the balance sheet. In contrast to most other continental European countries, pension money is managed in separated entities.

<sup>22</sup> For a more detailed discussion and international comparison of Swiss data see Drobetz and Fix ([2005](#)).

<sup>23</sup> Alternatively, total assets could be used, but possibly net sales is a better proxy for size, because many firms attempt to keep their reported size of asset as small as possible, e.g., by using lease contracts.

<sup>24</sup> Note that a sample split-up allows that all the coefficients in the model are different between the two subsamples, whereas a dummy variable approach usually only allows that selected coefficients differ between the subsamples.

<sup>25</sup> Detailed results are available upon requests from the authors.

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