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# Capital investment and determinants of financial constraints in Estonia

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### ABSTRACT

Unlike previous empirical work concerning investment behavior and the determinants of liquidity constraints, we use a switching regression framework when sample separation is unknown and endogenous and firms are assumed to operate either in the financially constrained or in the financially unconstrained regime. By using new panel data for Estonian companies during 1993–2002 we find that: (i) investment behavior is characterized by two distinct regimes; (ii) the likelihood of being financially constrained is higher in firms that are recently privatized, small and where ownership is concentrated in the hands of insiders and the state; (iii) the actual probabilities of operating in the financially constrained regime are quite high and essentially stable during the whole period under consideration; (iv) ownership structure affects investment beyond its indirect effects through financial constraints.

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## 1. Introduction

It has long been accepted that access to capital is an important determinant of investment rates. While an empirical literature has begun to emerge that investigates issues surrounding liquidity constraints in firms' investment decisions, the main motivation for this paper is that the dominant strategies used in the empirical investment literature suffer from several shortcomings. By using new panel data for Estonian firms during the period 1993–2002, we respond to some of these deficiencies.

The point of departure for standard empirical approaches is the recognition both of the importance of liquidity constraints in firms' investment decisions and the fact that the effect of liquidity constraints is not evenly distributed across firms, with some firms facing higher costs when raising capital than others. These arguments lead to a financing hierarchy or pecking order hypothesis, whereby, when undertaking investments, financially constrained firms first prefer internal financing to more expensive external financing and then, if external financing is needed, prefer low-risk debt financing to new equity issues. In testing these hypotheses empirical research usually follows a strategy in which, initially, a standard investment demand model (e.g., accelerator or neoclassical or Tobin's Q) is augmented with financial variables to proxy for the degree of financial constraints. Alternatively, structural investment equations are derived from optimization of the firm's objective function under debt and equity constraints, and the sample is divided, a priori, into financially constrained and unconstrained firms using alternative classification criteria. Finally, separate equations are estimated for each group of firms. Support for the financing hierarchy hypothesis is provided if financial variables present in investment equations are found to be significant for financially constrained firms, while either insignificant or of significantly lower sensitivity for financially unconstrained firms.

Yet this empirical strategy has its problems.<sup>1</sup> In this paper, we address the biases that arise in testing for the presence of financial constraints, independently of how investment decisions are modeled, when the sample splitting criteria that are used may be inappropriate. In most of the empirical literature a single quantitative or qualitative indicator, such as dividend payout ratios, bond rating, degree of bank affiliation, firm size, firm age, or ownership structure, is used to partition firms into those that are or are not potentially financially constrained. The implication of these approaches is that the estimation results would be highly sensitive to the criteria and threshold values chosen. The conflicting findings in the existing literature, reviewed, for example, in Schiantarelli (1996), provide ample support for this implication.

Another and perhaps a more important consideration is that, independently of the number of indicators used in partitioning the sample or in choosing the threshold values, a firm is exogenously classified as financially constrained or not. In addition, firms are kept in that regime over the whole sample period. In general, the partition indicator will be correlated with the dependent variable, which causes endogenous selection problems. The *ad hoc* selection of partition criteria is, therefore, likely to cause what might be called static misclassification. Furthermore, as financial constraints change, over time firms might move from one regime to the other. Thus, even if the classification method avoids problems of static misclassification, over time the issue of what might be called dynamic misclassification arises. This issue becomes more important as the time period under consideration lengthens. In the paper, both the static and dynamic misclassification problems are tackled by introducing a switching regression approach with endogenous and unknown sample separation.

Our paper makes several important contributions. First, it accounts for the effect of governance structures in investment decisions through their role in mitigating or exacerbating informational asymmetries and agency costs. To our knowledge no prior study addresses this issue in the same

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<sup>1</sup> First, the performance of investment demand models, even after being augmented with financial variables, is often not satisfactory in that they leave a large part of investment variation unexplained. Second, as Zeldes (1989) stresses, the use of structural models, especially in short panels, might fail to detect financial constraints when their tightness is almost constant over time. Further, there is some evidence of poor forecasting performance and parameter instability over time when estimating such equations as evidenced by Chirinko (1988), Hayashi and Inoue (1991) and Oliner et al. (1995, 1996). Third, reliance on internal finance might not reflect financial constraints but rather behavior resulting from managers' and/or insider owners' preferences, such as aversion to outside control, and/or the use of an objective function other than maximization of dividends or even be due to Jensen's (1986) "free cash flow" hypothesis. Empirically it is difficult to disentangle these effects because they involve unobservables and, unsurprisingly, the available evidence, reviewed in Schiantarelli (1996), is mixed.

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