

Invited Reader Comment on
Discussion Paper 2007-38:
"Modeling the Effects of Financial Constraints on Firm's Investment"
by Gian Maria Tomat

The paper introduces two financial constraints in a standard optimal investment problem with capital adjustment costs. The first is an exogenous debt limit, and the second a non-negativity restriction on the firm's cash flow each period. The key assumption is that capital adjustment costs decrease with the capital stock. The interest rate is assumed to be lower than the firm's discount factor, so in the absence of the debt limit the firm would want to borrow an infinite amount. Financial constraints distort the optimal investment choice because they generate an upper bound on investment. On the other hand, increasing the capital stock allows to relax future financial constraints because, by lowering the capital adjustment costs, it increases future cash-flows. This in turn increases the upper bound on investment in future periods. The key variable in the analysis is the shadow price q of the capital accumulation equation (2.1). In the absence of financial constraints, this shadow price reflects the marginal profitability of an additional unit of capital net of the gain in terms of the reduction of the capital adjustment cost. With financial constraints, the shadow price includes an extra term which reflects the additional gains of the added capital in relaxing the financial constraints in subsequent periods.

The paper is in general well-written, but it is not clear to me (as a general reader) what the contribution relative to the existing literature is. The key question is whether the above mechanism is important in actual investment decisions. Is there evidence for this? Without it, the paper lacks substance. Perhaps the model can be used to explain some interesting observations regarding firms' investment decisions. All I am saying is that this is not in the paper.

Also, as the referee points out, allowing to accumulate cash flows and transfer these funds across periods would be another way to relax future financial constraints (as precautionary savings do in the case of the consumer literature in footnote 13). It may be useful to seek evidence to disentangle which of the two proposed mechanisms is more relevant.

I also have some specific comments:

-The optimization analysis is hard to follow. It would help to: define the multipliers associated to each of the constraints clearly (e.g. in p. 8 the multipliers q and q^B are defined without reference to a constraint); write the Hamiltonian (or the Lagrangian) explicitly; state the complementary slackness conditions correctly (in the current version, they are not; see 3.3 and 3.4). It may also help to justify that the second order conditions hold and a solution exists.

-The assumption that the borrowing limits do not depend on the capital stock seems strong ("larger" firms may get different credit limits). Is there evidence for these constant borrowing limits?

-The main propositions describe how the firms optimal strategy depends on the (endogenous) shadow prices. It would help to go beyond and relate the optimal strategy to the fundamentals.

-It may be useful to remind the general reader what the "marginal q " is (sentence 3 in the abstract).

- I don't understand why (6.2) is a "no arbitrage condition" on q^B , which is a shadow (and not a market) price (page 17 below (6.2)). I read it as a first-order condition that the optimal shadow price must satisfy.