Modeling the Effects of Financial Constraints on Firm's Investment

Reply to referee report #2

The main suggestions made in this report were to provide a more extensive review of the literature on investment, foundations for the assumptions regarding the financing constraints used in the model and critical analysis of the empirical literature in light of the model findings.

All these suggestions have been broadly followed. The review of the theoretical literature in the present version includes the traditional investment literature along with references to the literature on asymmetric information and financing constraints. The paper provides also a more extensive review of the empirical literature on financing constraints and investment.

Following the suggestions in the reports more closely:

1. The financing constraint on the amount of new debt that the firm can issue in each period is described at more length in the present version of the paper (p. 6). This is a crucial assumption and actually most papers in the consumption and investment literature on financing constraints assume an upper bound on the amount of debt stock rather than on new debt. The assumption of an upper bound on new debt issue is grounded partly on technical grounds, given the continuous time framework adopted in the paper. In particular, note that the upper bound on new debt implies an upper bound on debt stock. Conversely, given an upper bound on debt stock an upper bound on debt issue must be satisfied almost everywhere on the real line. The assumption of an upper bound on new debt is therefore made for simplicity of exposition but is equivalent to the assumptions made in the related works cited in the paper, that typically use a discrete time framework.

In order to provide a stronger foundation to this assumption, in the present version of the paper some references are also made to the asymmetric information literature, where the financial constraint typically takes the form of an upper bound on the amount of debt that firms can issue in order to finance new investment projects.

Finally, it is stated in the paper that it would be natural to let the financial constraint depend on the size of the firm's net worth or assets. This assumption is clearly implicit in the model, it is not made explicitly only for simplicity of notation.

2. The model introduces a constraint on cash flow that can be justified along the lines described in the previous point. Constraints of other types

are not analyzed. This is certainly a matter worth of further study. In particular, the model could be extended to account for interest payments on debt stock that are an increasing function of the amount of the firm's debt stock. Preliminary computations show, however, that this extension would complicate the results regarding the external finance premium without adding much to the economic content of the model. In this stage therefore the analysis of all the consequences of such an assumption has been left for further research.

The subject of the proper restrictions on the firm possibilities for equity finance is in this context of course also important. The analysis at least in this stage would however bring the paper away from its main subject.

3. In the present version the analysis of the model is provided in the context of a more extensive review of the both the theoretical and the empirical literature. The review of the recent theoretical literature on the investment function, concerned in particular with the implications of non convexities in the adjustment cost function, has been extended. In addition, in order to complement the analysis, references to the asymmetric information literature on financing constraints and investment are provided.

4. The paper provides also a more extensive review of the empirical literature on the relation between financial constraints and investment. The model results are used in order to asses the main findings in the empirical literature. The analysis in this point however is kept at a preliminary level in order to avoid making statements that may later turn out to be contradicted by careful empirical scrutiny. Some of the statements that were made in the first version of the paper have been therefore corrected.

5. The introduction has been rewritten and the present version should be more effective in conveying the main contents and findings of the paper.