

## Referee Report for “A model of the IMF as a coinsurance arrangement”

### *Summary*

This paper examines the role of an IMF-like institution in the world financial system. The Fund acts as a delegated monitor of a coinsurance arrangement among countries. Specifically, the IMF, along with administering the common pool of funds, undertakes country surveillance to limit the moral hazard problem implicit in the coinsurance agreement with endogenous risk. The proposed model consists of a two period moral hazard setting where the IMF acts as Principal and the country as Agent. The mandate of the IMF consists in safeguarding its resources and caring about the welfare of borrowing countries. There is asymmetric information inasmuch as the IMF cannot observe the policy effort exerted by the country to avoid a crisis and to recover from it, but only the policy outcome. In this framework, the authors argue that the optimal lending contract that is the contract which elicits the higher effort by the borrowing country-is an ex-ante contract that establishes annual and overall access limit to resources and that penalizes the program country in case of low output and rewards it if the output is high. The problem is that this contract is not time consistent: namely, it is in the interest of both parties to renegotiate the contract once shocks are realized. The authors argue that the time inconsistency problem could be solved in a repeated lending setting in which the IMF builds a reputation for enforcing the ex-ante optimal contract.

### *General Comment*

The main result of the paper is standard and well known: in a moral hazard setting the optimal contract between the Principal and the Agent should provide the Agent appropriate incentives to increase his effort. In the specific case examined by the authors, this standard result implies that the IMF should reward the program country, which realizes a high output, by reducing debt repayment (debt forgiveness), and punish the country, by asking full repayment, in case of low output. In this way it is possible to maximize the effort exerted by the country to recover from a crisis. Furthermore, since the authors assume that the risk that a crisis erupts is endogenous as well, the IMF should also pre-commit to assist the country with a limited amount of resources (access limits).

The authors rise but do not address the problem of time inconsistency. If it had been properly addressed, the authors could have tried to answer the following crucial questions:

Response: We did not explicitly model the time consistency issue in the paper. The paper did not intend to extend its analysis into a fully dynamic model. This would be an interesting area for future research considering the recent developments in dynamic contracts.

- 1) since the presence of an international LLR has been recognized to be crucial to avoid “liquidity runs”, are access limits consistent with the role of the IMF as a sort of international LLR? How large country quota levels and access limits should be to avoid liquidity run?;

Response: we think the trade-off between too low limits (less moral hazard and more runs) and too high limits (less runs and more moral hazards) is an interesting point to consider in future research.

- 2) how can be enforced an incentive contract between the IMF and the program country?

Response: We did not explicitly include enforcement problems in the paper. This would be an interesting extension for future research.

As for the second question the authors generically refer to mechanisms based on reputation. But in a context of asymmetric information between the IMF and global taxpayers (IMF stakeholders) it is very difficult to refer to reputation building arguments. Indeed, much of the literature concerning the role of the Fund tackles the problem of the credibility of lending conditionality<sup>1</sup>, but the authors do not refer at all to these contributions.

Response: We agree that we did not consider the credibility of conditionality. We did try to model tranches of IMF loans as a feature of conditionality contract.

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<sup>1</sup> In the paper framework, the size of the loan is the only dimension of the contract. In a more realistic setting the authors should introduce conditionality and deal with the problem of conditionality enforcement.

*Detailed comments.*

Pages 6 to 13: textbook presentation of the advantages of coinsurance arrangements and of the problems of moral hazard related to the presence of endogenous risk. This part should be drastically reduced.

Response: We will reduce the well-known results to the minimum.

The role of the IMF as delegated monitor is quite obscure. The authors assume that the IMF – that is a monitor-does not observe the policy effort but only policy outcomes. This means that policy outcomes are not publicly observable. This is a strong assumption. Would not be better to assume that the IMF imperfectly observes policy effort?

Response: We think this can be an extension of the model. We predict that imperfect observation of effort rather than no observation of effort will quantitatively reduce room for moral hazard but the qualitative results will not change.