

## **Risk bubbles and dynamic instability in a simple model of correlated assets**

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Portfolio theory maintains that investment should be diversified across assets in order to minimize risk. If investment has an impact on prices, it generates correlations between returns of assets, and hence modifies the risk measure which determines the optimal portfolio itself. Hence the correlations enter a feedback loop because they are generated by the very same strategies devised to exploit them. We introduce a simple phenomenological model which takes the impact of investment on the market explicitly into account. We show that the feedback on correlations gives rise to an instability when the impact of optimal portfolio investors exceeds a critical value. Close to the critical point, the model exhibits dynamical correlations very similar to those observed in real markets. Indeed fitting our model to real markets data, we find parameters close to the critical point. These results suggest that financial markets cannot be regarded as frictionless systems and that there is a limit to the amount of investment they are able to cope with.

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