Minority Game: replication of the basic results

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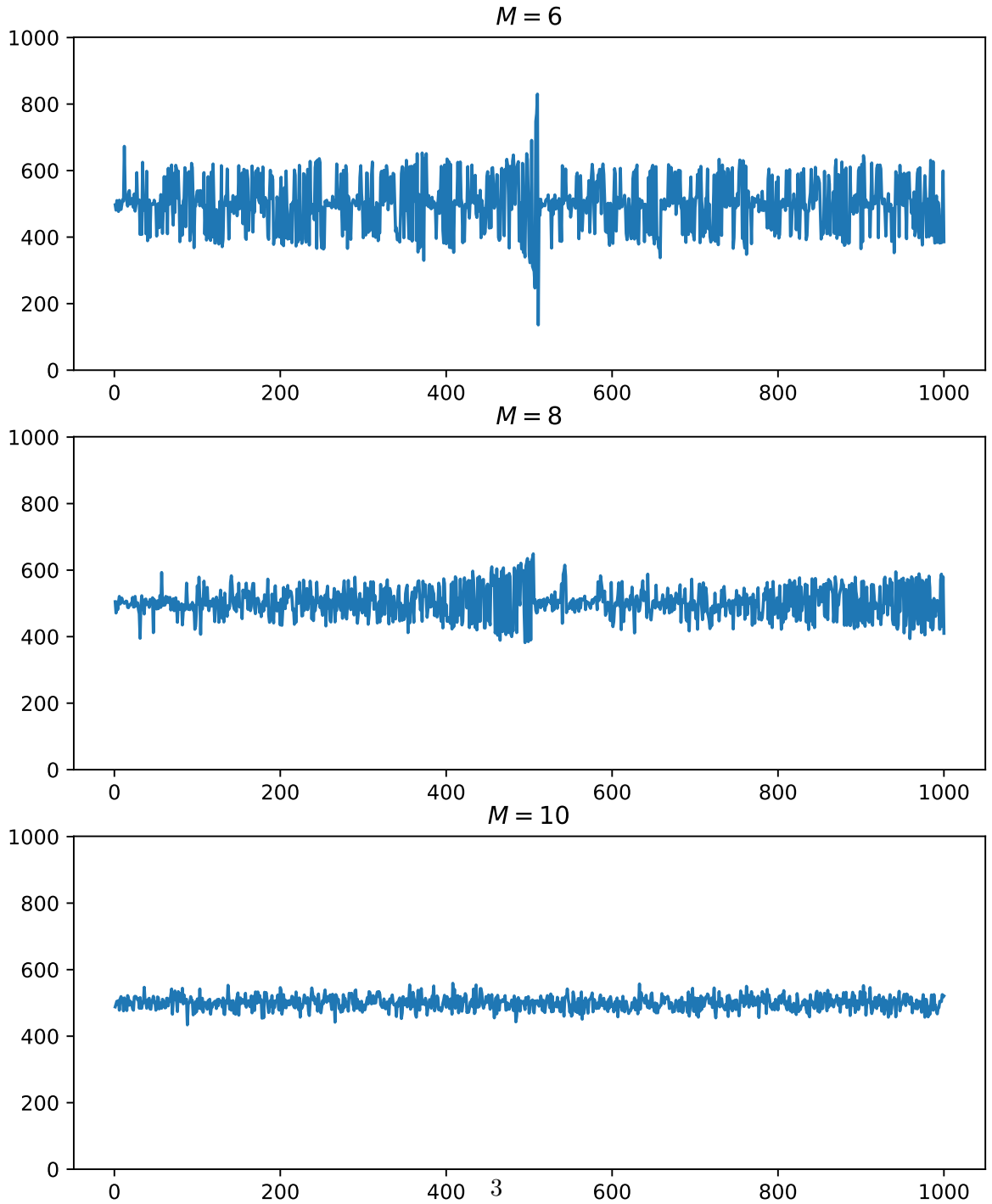
1 Overview

2 Replication of the basic results from the MG paper in Physica A

2.1 Fig. 1.



3 Replication of the results from the thesis

3.1 Fig. 2.1.

Here we study the relationship between normalized fluctuations

$$\frac{\sigma^2}{N} = \frac{\langle A^2 \rangle}{N}$$

with respect to a controll parameter $\alpha = 2^M/N$.

As evident in the figure below, replicated the results reported as Fig. 2.1. in the PhD thesis of Damien Challet. We see qualitatively identical pattern of decreasing normalized fluctuation, which after the minimum for medium values of α start to increase (slightly) again and reach normalized fluctuations of about 1, which is a value expected for random decisions. Thus, we observe the three different regimes as reported in the thesis.

There are, however, some minor numerical differences. In our resuls the curves are less bended downwards so the minima are less pronounced than in the results reported in the thesis. It is not clear whether these stems from some differences in terms of implementation details or just from using somewhat different parameters (i.e. the thesis does not specify the number of times steps). Nonetheless, irrespective of these numerical differences, the qualitative results are the same.

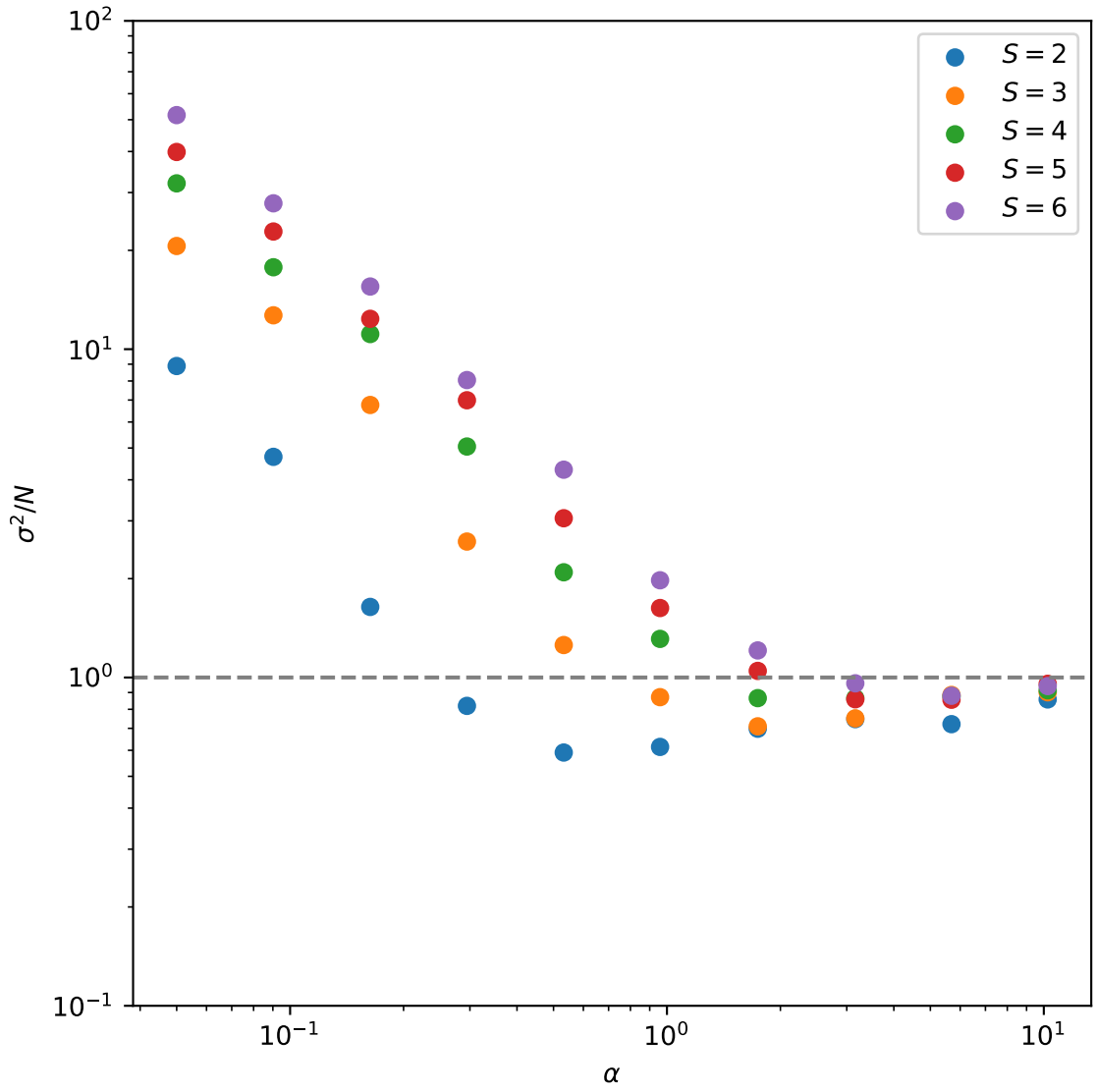


Figure 1: Normalized fluctuations with respect to $(M = 8, S = 2, ..., 6)$.