

# Price model with common noise

Diogo Gomes

*King Abdullah University of Science and Technology, Saudi Arabia*

We consider the mean-field game price formation model introduced by Gomes and Saúde. In this MFG model, agents trade a commodity whose supply can be deterministic or stochastic. Agents maximize profit, taking into account current and future prices. The balance between supply and demand determines the price. We introduce a potential function that converts the MFG into a convex variational problem. This variational formulation is particularly suitable for machine learning approaches. Here, we use a recurrent neural network to solve this problem. In the last section of the paper, we compare our results with known analytical solutions.