Is reinforcement learning for portfolio management robust to financial shocks?

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Abstract

Over the past two decades, the development of automated trading strategies via Reinforcement learning (RL) has been an active area of research. Though RL has met with success in this domain, most of the test sets utilized for experiments have been collected during times when the markets were relatively stable. However, there is very little work available in academia that assesses the robustness of policies learnt via RL to shocks in the financial system. Hence, we investigate the performance of automated trading strategies obtained via RL in presence of financial shocks on real world data with synthetic shocks and develop heuristics to improve the performance of RL in presence of market instability.

We find that more conservative policies - those that are regularized and have a lower learning rate - tend to perform better when instabilities are present in the market. Conversely more flexible models perform better with more stable market conditions.

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