

Portfolio selection theory began in 1952, with Harry Markowitz developing the CAPM model.¹ It started with a simple premise: maximize return while minimizing risk. That theory has been expanded and built upon since then, and one of the new premises developed is the mean reversion theory. The theory predicts that all stocks will revert to the mean growth rate of the market, hence the name. As such, stocks that perform above the average are predicted lose that additional growth, and stocks performing poorly are predicted to grow more to return to the mean. Two algorithms which seek to take advantage of mean reversion theory are Anticor² and OLMAR³. Anticor takes advantage of market fluctuations through reallocating wealth in stocks performing better than the market to options anti-correlated with the initial stock's performance. It finds this correlation by comparing historical trends ranging from the present day minus w days to the present day.

[ADD DETAIL]

OLMAR takes a similar approach, but uses Passive Aggressive learning by checking if the expected return is high enough to meet a given constraint. If it isn't, then the algorithm will aggressively move towards a new portfolio to meet the condition while still attempting to remain close to the previous portfolio.

References

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3. Li, Bin, and Steven CH Hoi. "On-line portfolio selection with moving average reversion." *arXiv preprint arXiv:1206.4626* (2012).
4. Helmbold, David P., et al. "On-Line Portfolio Selection Using Multiplicative Updates." *Mathematical Finance* 8.4 (1998): 325-347.
5. Das, Puja, Nicholas Johnson, and Arindam Banerjee. "Online Lazy Updates for Portfolio Selection with Transaction Costs." *AAAI*. 2013.