Dynamic Portfolio Rebalancing with ADP

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I. Introduction

A. Overview

This paper seeks to implement a robust and systematic solution to the portfolio rebalancing problem using approximate dynamic programming on stochastic processes.

B. Practical Importance

Quite simply, anyone who invests money in assets, either directly or indirectly, owns a portfolio. Portfolios, like their underlying assets, have risk and return characteristics that evolve over time. The focus of portfolio rebalancing is then to help the investor successfully navigate a portfolio across market regimes towards a particular risk/return based objective.

The importance of asset allocation has been a frequently discussed topic in both the academic and professional investing communities. Most notably [3] identified that asset allocation explains 95% of the variation in total pension plan return between 1974-83. The Vanguard Group has been a preeminent voice in the professional community advocating for rebalancing as a means of reducing a portfolio's drift away from its initial asset allocation. "Portfolio drift" can result in the development of undesirable risk-return characteristics [1]. The registered investment advisor suggests that "investors' focus should be on the asset allocation choice and its implementation using broadly diversified, low-cost portfolios with limited market-timing" [4].

C. Rebalancing Strategies

a) Fixed Time:

b) Random Time:

References

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References

[1] Jaconetti, Colleen M, et al. Best Practices for Portfolio Rebalancing. Vangaurd, July 2010.

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