Summary

The book “Portfolio Rebalancing” by Edward E. Qian presents a mathematical and empirical analysis of the portfolio rebalancing.

The first part of the book presents a mathematical analysis to the portfolio rebalancing. The book discusses how the portfolio rebalancing alpha, which the author defines as the difference between a fixed weighted portfolio and a buy and hold portfolio, can be break down into two separate effect, volatility effect and return effect. The author then analyzes the effect of each component and analyzes the condition where the total rebalancing alpha is positive.

The volatility effect, arises from pairwise return volatility of assets, can be also approximate by the well-known diversification return. The author further breaks down the volatility effect and proof mathematically that its always non-negative for long-only portfolio. Intuitively, the portfolio rebalancing involves buying the losers and selling the winners, so it naturally benefits from the mean reversion.

The return effect, on the other hand, is due to the differences in assets returns. The author proves that the return effect is always negative for a long-only portfolio and it is approximately proportional to the variance of assets’ geometric returns. Intuitively, the buying lower return asset and selling higher return asset nature in portfolio rebalancing drags down the total return of the portfolio. Moreover, the author also notes that since the cross-sectional serial correlation impacts the geometric return, it also has an impact on the return effect.

Combining the result for the two-separate effect, the author derives an approximation of rebalance alpha which is the net of the volatility effect and the return effect.

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