LEHIGH UNIVERSITY

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Financial Engineering Project

(ISE 441)

Effectiveness of Rebalancing Techniques

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1 Overview

Like a number of important issues in a finance, there is debate between whether or not rebalancing portfolio techniques are valuable to increase its performance in terms of long-term returns and/or long-term returns vs. risk. To address questions in this direction, researchers typically consider three types of rebalancing strategies: *buy-and-hold*, in which assets are held without switching, and investment income is reinvested in each respective asset class; *regular rebalancing*, in which assets are switched at regular rebalancing intervals to reinstate fixed market value proportions, investment income is reinvested in each respective asset class, market value proportions are allowed to drift between rebalancing dates; and *continual rebalancing*, in which assets are switched as often as necessary in order to maintain fixed market value proportions at all times. However, this studies have returned different conclusions. For example, at a high level, Edesess (2016, 2014) conclude that there is little value in rebalancing, while on the other hand, Kitces (2015) evidences the value of rebalancing. The conclusions of Edesess (2016, 2014) are supported by the more academic article by Wise (1996); while conclusions along the lines of those in Kitces (2015) are supported by academic work by Gabay and Herlemont (2007), Bouchey et al. (2012). However, there is a rich amount of literature on this topic, which has been recently reviewed in Cuthbertson et al. (2016).

The main purpose of this project is to discuss, based on existing literature, and your own theoretical and empirical analysis, whether rebalancing is an effective tool for modern portfolio management, and if that is the case, what are the benefits of rebalancing over executing a buy-and-hold strategy. In particular, consider questions regarding value of the portfolio, risk, and returns, as well as other measures of performance that are valued in practice.

As a start point to start working on this project, it is advised that you read the high level articles:

- Edesess (2016)
- Edesess (2014)
- Kitces (2015)

2 Deliverables

Your team of students is tasked with the following activities as part of the project:

1. **Review of state of knowledge**. First, you should collect and review additional references (beyond the ones provided so far) that might be interesting to address the questions to be investigated in the project. Then following what is typically done in the introductions of the articles you will be reading, you should summarize and **connect** the results of your literature review. Consider a line of thought that goes from discussing the different high level rebalancing techniques that are typically studied to showing the different conclusions (and how) that have been reached in the literature. Definitely discuss with the Faculty advisor additional literature that you are planning to consider as part of your review.

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2. **Existing and new empirical evidence**. Using detailed information from the articles you have reviewed, discuss the evidence that has been obtained to support or invalidate the benefits of rebalancing. Moreover, come up with your own theoretical analysis and/or empirical evidence to either support or invalidate different conclusions made about the benefits of rebalancing. For that purpose, you should:

   - **Experimental Design**. Collect the data and information necessary to make empirical tests regarding the different ways in which rebalancing affects the performance of a portfolio. You should setup the data so you can make experiments involving data sets that have not been considered in the corresponding literature.
   - **Computer simulations**. Using this data, you should code the necessary procedures to run the different rebalancing experiments (`MATLAB` is highly recommended for this), in order to obtain and support your conclusions.

3. **Extensions**. Clearly, a large number studies have been done in relation to rebalancing. Think of something that you could further contribute to this topic. For example, for theoretical simplicity, most of the time transaction costs are ignored. You could investigate what happens when transaction costs are considered.

3 Required Readings (papers to review for first summary)

It is up to your group to decide which articles to review for the fist summary submission. The ones named above are good suggestions for this purpose.

4 Recommended Reading (papers to review for second summary)

Besides the articles referenced above, discuss with the Faculty Advisor any other references that you might be reviewing.

5 Text Processing

It is highly encouraged that you use `LaTeX` as the text editor with `BibTeX` to manage your references. The best projects delivered in the course will be considered for further work in collaboration with the Faculty and Industry advisor to aim at publishing the article in a appropriate journal. For that purpose, having the project in `LaTeX` is extremely helpful. Also, if you have not used `LaTeX` before, it is a great skill to add to your skill set.

References

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