A template for Quantitative Finance Research Replication

A Preprint

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January 20, 2022

Abstract

Enter the text of your abstract here. Consider your précis from the summary and add 1-3 sentences about your conclusions. 6-10 sentences.

***K*eywords** trading strategies · quantitative analysis · machine learning · these are optional and can be removed

1 Introduction

This is a template for Research Replication projects following the process outlined in Peterson (2016). This template uses Rmarkdown (Xie 2017). The sample bibliography file was generated via *Jabref.* (2021) . The additional comments in this template will be inserted as comments, and will not be included in the compiled output. Alternately, Jupyter Notebooks with Executable Books Community (2020) and (**jupytext?**) can be used, but I feel that RMarkdown (even with python code blocks) is easier.

2 Paper Summary

Start with a single paragraph in précis form. See Peterson (2016) p. 1-2 for details. Complete this section with paragraphs describing each major point in the paper. The entire summary will be 4-10 paragraphs.

3 Hypothesis Overview

Formally detail the paper's key hypotheses. See Peterson (2016) p. 2 for details.

4 Literature Review

Write your literature review. See Peterson (2016) p. 2-4 for details. This section must include paragraphs at least for the 3-5 key references for the paper to be replicated, similar work, implementation references, more recent references where available, and any references with attempt to refute the hypotheses of the replicated work. A full literature review may contain 20-50 references. Not all will be covered in the same level of detail. Important references probably warrant an entire paragraph, but similar work can probably be covered together in 1-2 paragraphs for multiple related works.

5 Replication

Now we move on to the actual replication. The sections included here are all necessary, but the may not be sufficient. Add additional sections and sub-sections as required to describe your work and make your analytical case.

5.1 Data

Describe the approach that the replication is taking to Data. See Peterson (2016) p. 4-5 for details. Describe both the data used in the original paper, and the data you are using for replication. For your replicated data, include detailed descriptions of obtaining, parsing, and cleaning the data to prepare it for use. Describe data quality issues.

5.2 Replication of Key Analytical Techniques

Model the Key Analytical Techniques from the paper to be replicated. See Peterson (2016) p. 5-6 for details. This section will vary significantly based on the paper being replicated. Describe your process as you work, documenting the steps you are taking, referencing any libraries, websites, or third party code that you use as part of your replication, and the decree to which your replication agrees or disagrees with the source material. Be sure to include summary statistics used in the original paper, as well as any additional summary statistics that you feel are relevant for checking the quality of your replication.

5.2.1 Technique 1

5.2.2 Technique 2

5.2.3 Technique 3

5.3 Hypothesis Tests

After replicating the initial work, it is time to evaluate the hypotheses of the replicated work. Those hypotheses were identified above, before you started replication. Describe, in detail, the statistical tests you perform to refute or validate the hypotheses in the replicated work. This should go beyond any explicit tests performed in the original paper.

5.4 Extended Analysis

Extend the analysis with more (recent) data or additional asset classes, and/or replicate similar or extended techniques and compare them to the original paper's methods. See Peterson (2016) p. 6-7 for details.

5.5 Overfitting

Analyze the likelihood that the original paper is overfit. Include data considerations, experiment design, model assumptions, parameterization, and biases, out of sample results, etc. Assess how changes to these affects results, and produce an opinion on whether and how the original work is overfit, as well as what might be doable to reduce the degree of overfitting, and whether the main results would hold if the level of overfitting were reduced.

6 Future Work

What additional work on this topic should be performed in the future, if this project were to be picked up again or continued?

7 Conclusions

Summarize the project and describe your conclusions. This sections can range from 1-2 paragraphs to 1-2 pages.

Figure 1: CC-BY

References

Executable Books Community. 2020. *Jupyter Book* (version v0.10). Zenodo. https://doi.org/10.5281/zenodo.4539666.

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