

## **PROJECT EXECUTIVE SUMMARY**

The development project chosen is to add White's Reality Check to the Loop Pairs Trading Program to qualify the "good" Equity Curves. Our project includes two parts: the PowerPoint Presentation and the code developed.

Our PowerPoint Presentation included seven parts. The first part is an introduction, including the topic we chose, the seed codes and data we used, and the methodology. For the seed codes, we used `ReversionYesLoopMod_DISTRIBUTED.py`, `ReversionNoLoopMod_DISTRIBUTED.py`, `detrendPrice.py`, and `WhiteRealityCheckFor1.py` from week 9. The database we used is `PythonData.db` from the `sqlite` package. The time period we used is from Jan 1, 2011 to Jan 1, 2021. The five tickers we used to test our programs are Silver, Convertibles, Chinese Renminbi, Agriculture, and Government Credit. The methodology we used is to combine White's Reality Check with the Loop Pairs Trading program. Then, we add the feature of selecting the "best" equity curves among all the "good" equity curves which are generated from the program.

The second part is the concepts behind the program. We included some background knowledge and theories related to the program, including White's Reality Check, Pairs Trading, and how we define "Good" Equity Curves and the "Best" Equity Curve. In our program, constraints have been added to the plot and print the results, which have White's Reality Check p-value less than 0.1 and Sharpe Ratio larger than 0.5. We defined the "best" equity curve as the pair with the highest Sharpe Ratio from the "good" equity curve list instead.

The third part is codes and comments. We provided screenshots of the code we submitted and added detailed comments on our steps to achieve our goal.

The fourth part is the results of the program tested with the five tickers we chose. We included the "Best" Equity Curve generated from our program, as well as the best pairs' full company names and the asset class, category, focus, and niche they belong to. We also included the metrics, which is what the program returned, of the tickers' Sharpe Ratios, pairs traded, p-values

as well as the best ETF Pair. The equity curve of the best pair for each selected theme is also provided.

The fifth part of our presentation is the conclusion, where we discussed the results. We checked our results from the program manually and concluded the effectiveness of our program. The results returned by the program are the same as what we will select as the best equity curves manually, which means that the program we developed is efficient.

The sixth part is future developments, and we included four different approaches of how we think this program can be improved more. We could build a checking system and change ways to find the best equity curve for improving our program. The last part is the references.