

Forecasting Airline and Oil Company Prices using Statistical Mean Reversion CSC 265 Final Project

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Abstract

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1 Introduction

1.1 Project Goal

1.2 Data

1.3 Terminology and Formulas

2 Pairwise Mean Reversion

2.1 Pairwise Correlations

2.2 Pairwise OLS

2.3 Residual OLS for Forecasting

2.4 Profit and Loss Analysis

3 Principal Component Basket Mean Reversion

3.1 Dimensionality Reduction

AIRLINE PC1 Full Lasso AAL 0.003519 0.003487 0.003487 DAL 0.002762 0.002725 0.002725 LUV 0.002839 0.002819 0.002819 ALGT 0.003561 0.003554 0.003554 UAL 0.002931 0.002902 0.002902

OIL PC1 Full Lasso CVX 0.002338 0.002136 0.002136 MRO 0.004708 0.004647 0.004647 MUR 0.004573 0.004536 0.004536 XOM 0.002240 0.002047 0.002047 DVN 0.004302 0.004281 0.004284

AIRLINEOIL PC1 Full Lasso AAL 0.004306 0.003475 0.003478 DAL 0.003450 0.002721 0.002722 LUV 0.003363 0.002809 0.002809 ALGT 0.003865 0.003552 0.003553 UAL 0.003602 0.002896 0.002896 CVX 0.002320 0.002124 0.002125 MRO 0.004851 0.004640 0.004641 MUR 0.004661 0.004530 0.004530 XOM 0.002231 0.002044 0.002044 DVN 0.004414 0.004275 0.004278

FULL PC1 Full Lasso AAL 0.004301 0.003458 0.003458 DAL 0.003446 0.002713 0.002713 LUV 0.003359 0.002801 0.002801 ALGT 0.003863 0.003543 0.003545 UAL 0.003598 0.002891 0.002891 CVX 0.002316 0.002104 0.002105 MRO 0.004854 0.004634 0.004635 MUR 0.004666 0.004530 0.004531 XOM 0.002227 0.001996 0.001996 DVN 0.004418 0.004271 0.004275 SPY 0.001469 0.001329 0.001330 TLT 0.001574 0.001546 0.001546

3.2 Basket OLS

3.3 Basket Lasso for Feature Selection

3.4 Profit and Loss Analysis

4 Discussion

5 Conclusion