Analytical Plan for Linear relationship between Maha stock price and the WTI oil price

DOCUMENT: SAP-2023-011-HM-v01

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Analytical Plan for Linear relationship between Maha stock price and the WTI oil price

Document version

Version	Alterations
01	Initial version

1 ABBREVIATIONS
- CI: confidence interval
- SD: standard deviation

2 CONTEXT

2.1 Objectives

To evaluate the strength of the linear relationship between Maha stock price and the WTI oil price.

2.2 Hypotheses

Maha stock price changes are linearly dependent on WTI oil price changes.

3 DATA

3.1 Raw data

The original data base had 3 variables collected on 21 observations.

3.2 Analytical dataset

After the cleaning process 4 variables were included in the analysis. The total number of observations excluded due to incompleteness and exclusion criteria will be reported in the analysis. Table 1 shows the structure of the analytical dataset.

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Table 1 *Analytical dataset structure after variable selection and cleaning.*

id	day	maha	wti
1			
2			
3			
…			
N			

All variables in the analytical set were labeled according to the raw data provided and values were labeled according to the data dictionary for the preparation of production-quality results tables and figures.

4 STUDY PARAMETERS

4.1 Study design

Cross-sectional.

4.2 Inclusion and exclusion criteria

N/A

4.3 Exposures

WTI oil price change in percent.

4.4 Outcomes

Specification of outcome measures (Zarin, 2011):

1. (Domain) Capital markets
2. (Specific measurement) Maha stock price change
3. (Specific metric) End-value
4. (Method of aggregation) Average

Primary outcome

Maha stock price change in percent.

4.5 Covariates

N/A

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5 STATISTICAL METHODS

5.1 Statistical analyses

5.1.1 Descriptive analyses

Price changes   will be described as mean (SD).   The distributions of price changes' characteristics will be summarized in tables and visualized in exploratory plots.

5.1.2 Inferential analyses

All inferential analyses will be performed in the statistical models (described in the next section).

5.1.3 Statistical modeling

An explanatory linear regression model will be fitted to investigate how much the WTI price change explain the changes in Maha stock prices.

5.1.4 Missing data

No missing data imputation will be performed. All evaluations will be performed as complete case analyses. Missing data counts and proportions will be reported in tables.

5.2 Significance and Confidence Intervals

All analyses will be performed using the significance level of 5%. All significance hypothesis tests and confidence intervals computed will be two-tailed.

5.3 Study size and Power

N/A

5.4 Statistical packages

This analysis will be performed using statistical software R version 4.2.1.

6 OBSERVATIONS AND LIMITATIONS

N/A

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7   REFERENCES

- **SAR-2023-011-HM-v01** – Linear relationship between Maha stock price and the WTI oil price
- Zarin DA, et al. The ClinicalTrials.gov results database – update and key issues. N Engl J Med 2011;364:852-60 (https://doi.org/10.1056/NEJMsa1012065).
- Gamble C, et al. Guidelines for the Content of Statistical Analysis Plans in Clinical Trials. JAMA. 2017;318(23):2337–2343 (https://doi.org/10.1001/jama.2017.18556).

8   APPENDIX

This document was elaborated following recommendations on the structure for Statistical Analysis Plans (Gamble, 2017) for better transparency and clarity.

8.1   Availability

All documents from this consultation were included in the consultant's Portfolio.

The portfolio is available at:

https://philsf-biostat.github.io/SAR-2023-011-HM/

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