PMP - Technical Meeting 5
Exercise: Sustainable Investing

Deadline: Monday, June 16 (9 am)

Instructions: solve the following exercises using R. By June, 16 (9 am) send your solutions as a single zip file named TM4_GroupName.zip to giorgia.simion@wu.ac.at. The zip file should include the following files:

1. A pdf presentation including numerical results, comments, references, charts etc. It is very important to interpret your results.

2. Your **reproducible** code (Rnw or R script)

3. The dataset used for the exercises.

Assignments: Recent research (Albuquerque, Koskinen, Yang and Zhang, 2020; Lins, Servaes, Tamayo, 2017) has documented that firms with high sustainability ratings exhibit higher returns than firms with low sustainability ratings during crisis. Your task is to investigate this aspect during the COVID-19 pandemic.

Data: I provide three datasets:

- ESGData.xlsx obtained from Thomson Reuters Refinitiv, which contains data on all US stock with available ESG score as of 2018.

- StockData.xlsx obtained from CRSP via WRDS, which contains daily data on stock prices and stock holding period returns, as well the return on S&P Composite Index.

- CompustatAnnualData.xlsx obtained from Compustat via WRDS, which contains accounting data as of 2019.

You can obtain details on the type of data collected in Table A1 pag.618-619 of Albuquerque, Koskinen, Yang and Zhang, 2020 . [1] [2]

---

[1]Please note that the number of companies analyzed might differ.

[2]Differently from the paper, you are provided with ESG score, Enviromental Social Governance score, i.e including governance.

Task

Albuquerque, Koskinen, Yang and Zhang, 2020

1. Merge the three datasets using Companies' Ticker [3] and provide descriptive statistics similarly to Table 1, pag 601 of the paper (exclude the following variables from the statistics: Investor-based ES, ΔROA_qrt, ΔOPM_qrt, ΔAT_qrt, daily price range).

2. Using your dataset, run regressions as in Table 2, pag 605, and Table 4 pag 609. Note that the analysis involves cross-sectional regressions of the following form:

$$Performance_i = \beta_0 + \beta_1 ESG_i + \beta_2 FirmControls_i + \beta_3 IndustryFE_i + \epsilon_i \tag{1}$$

Use this specification to study the behavior of two different dependent variables: quarterly abnormal returns and return volatility.

3. Similarly to Figure 2 pag 607, plot the evolution of coefficients during the first quarter of 2020 from daily cross-sectional regressions of cumulative stock returns on the ESG ratings, Tobin's q, firm size, cash to assets, financial leverage, ROE, advertising expenditures, dividend yield, historical volatility and industry fixed effects. It plots the daily loading on ESG ratings, cash to assets, and leverage, and leverage with 90% confidence intervals based on heteroscedasticity-robust standard errors.

4. Using your dataset, run the regressions as in Table 3, pag 606. Note that the analysis is conducted during the first quarter of 2020 and involves diff-in-diff regressions of the following form:

$$StockPerformance_{i,t} = \beta_0 + \beta_1 ESG_{treatment_i} \times Post_{COVID_t}$$
$$+ \beta_2 ESG_{treatment_i} \times Post_{fiscal_t} + \beta_3 FirmFE_i + \beta_4 DayFE_i + \epsilon_{i,t}$$

5. Read the relevant literature. Comment and compare your results with the ones from the paper.

Literature

Albuquerque, Rui, Yrjo Koskinen, Shuai Yang, Chendi Z. (2020) Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash, The Review of Corporate Finance Studies, 9: 593–621.

Lins, Servaes, Tamayo, A. (2017), Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. The Journal of Finance, 72: 1785-1824.

---

[3]You might have to deal with missing data.