UNIVERSITY OF MANNHEIM
Business School

CHAIR OF FINANCIAL MARKETS AND FINANCIAL INSTITUTIONS

Seminar Thesis Spring 2024

Topic S1: Using ChatGPT to Form ESG Investment Portfolios

Classification: Empirical topic

Advisor: Sabrina Yufang Sun

ESG (Environmental, Social, and Governance) investment has been rapidly gaining importance among institutional investors, emerging as a key factor in shaping the strategies and decision-making processes in the financial sector. Against this backdrop, institutional investors are constantly seeking more efficient, accurate, and comprehensive methods to evaluate corporate ESG performance.

ChatGPT, with its robust data processing capabilities, offers a novel approach to meet this demand, potentially transforming the landscape of ESG investing. While the use of AI in finance is not new, the application of large language models like ChatGPT in ESG investing is relatively unexplored. Preliminary evidence suggests that ChatGPT can reliably process textual information to facilitate the prediction of stock prices (Kim, Muhn, and Nikolaev (2023), Lopez-Lira and Tang (2023), Krause (2023)).

In this seminar thesis, the student will use ChatGPT to form ESG investment portfolios of US equities.

Specific tasks:

- Use ChatGPT to form ESG equity portfolios of US public firms.
- Provide a comprehensive review on the relevant literature.

Requirements:

This is a project with which students will learn all the stages of using GPT to form ESG portfolios. I will provide step-by-step instructions on how to implement each stage of the project. Hence, prior knowledge is not needed. However, the student is expected to follow my instructions closely and be highly motivated to learn new concepts and tools.

The data analyses in this project will be conducted using ChatGPT. Hence, the student does not need to learn another statistical tool.

Introductory literature:

Kim, A. G., Muhn, M., & Nikolaev, V. V. (2023). Bloated Disclosures: Can ChatGPT Help Investors Process Information? *Chicago Booth Research Paper*, (23-07).

Krause, D. (2023). ChatGPT and Generative AI: The New Barbarians at the Gate. *Available at SSRN 4447526*.

Lopez-Lira, A., & Tang, Y. (2023). Can chatgpt forecast stock price movements? return predictability and large language models. *arXiv preprint arXiv:2304.07619*.

Topic S2: Using ChatGPT to Predict the Cross-section of Stock Returns

Classification: Empirical topic

Advisor: Sabrina Yufang Sun

In today's rapidly evolving financial landscape, the demand for sophisticated tools and technologies to aid in investment decision-making has never been higher. Investors and financial professionals are constantly seeking innovative ways to gain an edge in predicting market trends and identifying profitable opportunities. With its robust capabilities in processing both text and images, ChatGPT presents an innovative solution to address this demand.

While the use of AI in finance is not new, the application of large language models like ChatGPT in investment management has not been explored extensively. Preliminary evidence suggests that ChatGPT can reliably process textual information to facilitate the prediction of stock prices (Kim, Muhn, and Nikolaev (2023), Lopez-Lira and Tang (2023), Krause (2023)).

In this seminar thesis, the student will use ChatGPT to predict the return patterns of US stock market.

Specific tasks:

- Use ChatGPT to predict the cross-sectional variation in US equity returns and volatility.
- Provide a comprehensive review on the relevant literature.

Requirements:

This project offers a learning opportunity for students, where they can explore every step of using GPT for predicting stock returns. I will provide clear and easy-to-follow instructions on how to implement each stage of the project. So, prior knowledge is not necessary. However, the student is expected to follow my instructions closely and be highly motivated to learn new concepts and tools.

For this project, GPT cannot perform all the analyses. Hence, the student would conduct a part of the statistical analyses using traditional software such as STATA or Python.

Introductory literature:

Kim, A. G., Muhn, M., & Nikolaev, V. V. (2023). Bloated Disclosures: Can ChatGPT Help Investors Process Information? *Chicago Booth Research Paper*, (23-07).

Krause, D. (2023). ChatGPT and Generative AI: The New Barbarians at the Gate. *Available at SSRN 4447526*.

Lopez-Lira, A., & Tang, Y. (2023). Can chatgpt forecast stock price movements? return predictability and large language models. *arXiv preprint arXiv:2304.07619*.

Topic S3: Inequality Aversion and Executive Compensation of German Firms

Classification: Empirical topic

Advisor: Sabrina Yufang Sun

Experimental and survey evidence suggests that many individuals are averse to pronounced income inequality, a tendency known as inequality aversion. Empirically, there is a large variation of inequality aversion across different regions, and among individuals in the same region. This variation raises questions about how inequality aversion impacts corporate policies, in particular executive compensation, which is frequently scrutinized for its role in reflecting and exacerbating broader income inequalities.

The current seminar thesis seeks to examine how cross-regional differences in inequality aversion may explain the dispersion in executive compensation in Germany. In 2006, the disclosure of executive compensation became mandatory in Germany for the first time. Hence, for the analysis, the student will use the cross-sectional data on Germany firms' executive compensation as they were disclosed for the first time.

Specific tasks:

- Collect German executive compensation as they are first disclosed (2005/2006).
- Provide descriptive statistics on the executive compensation, focusing on regional and time variations.
- Analyze the correlation between regional inequality aversion and the local executive compensation level. Do places with high inequality aversion exhibit higher executive compensation?

Data and Requirements:

The empirical analysis can be conducted using either Excel or Stata. Reading fluency in the German language is necessary to complete the project.

Literature:

Beck, D., Friedl, G., & Schäfer, P. (2020). Executive compensation in Germany. *Journal of Business Economics*, 90(5), 787-824.

Pan, Y., Pikulina, E. S., Siegel, S., & Wang, T. Y. (2022). Do equity markets care about income inequality? Evidence from pay ratio disclosure. *The Journal of Finance*, 77(2), 1371-1411.

Topic S4: Green or Greed? Private Equity Firms' Impact Investing Strategy

Classification: Empirical topic

Advisor: Sabrina Yufang Sun

In recent years, there has been a growing interest among institutional investors, in particular private equity investors, in generating positive social impact alongside financial returns. This trend is sometimes referred to as "impact investing".

One sector that is increasingly targeted by impact-seeking investors is the care industry – healthcare, childcare, and senior care. Over the past ten years, there has been a significant rise ins private equity investment in this industry. Private equity firms are increasingly drawn to these sectors because of their long-term growth potential and the critical need for innovative solutions to address complex social challenges.

An important open question is whether the institutional money poured into the care industry leads to positive social impact. While proponents cite the efficiency gain and innovation, critics argue that the focus on financial returns in these sectors can lead to a lack of attention to the needs of vulnerable populations and the quality of care provided, potentially undermining the social impact.

The current project will examine the private equity firms' impact investing strategy with respect to their profit orientation and social impact. The focus is on PE buyouts of childcare facilities. Specifically, why do private equity firms invest in childcare facilities in certain communities, but not others? What kinds of social impacts may their investment strategy cause?

Specific tasks:

- Collect a list of private equity buyouts in US childcare sector.
- Provide descriptive statistics of these PE buyout deals with respect to their geographical locations.
- Evaluate the investment strategy of PE firms with respect to their profit motives and potential social impacts.
- Provide a thorough review of the relevant literature.

Data and Requirements:

The empirical analyses can be conducted using either Excel or Stata.

Introductory literature:

Gupta, A., Howell, S. T., Yannelis, C., & Gupta, A. (2021). Does private equity investment in healthcare benefit patients? Evidence from nursing homes. *NBER Working Paper* (No. w28474).

Pradhan, R., Weech-Maldonado, R., Harman, J. S., & Hyer, K. (2014). Private equity ownership of nursing homes: implications for quality. *Journal of Health Care Finance*, *42*(2).

Topic S5: Political cycles and the stock market

Classification: Empirical topic

Advisor: Annabelle Bröstl

In the run-up to political elections, the media is typically full of analyses discussing the impact of the presidential candidates on the stock market. This public interest is reflected by a large literature in finance and economics that examines the relationship between election outcomes, macroeconomic outcomes and the stock market.

In their seminal paper, Santa-Clara and Valkanov (2003) provide evidence that excess stock returns are almost 11% higher under democrat presidents than under republican presidents. The authors examine several risk-based explanations for this empirical fact, but do not find any compelling evidence that would favour one of them. They thus term their finding "the presidential puzzle".

Several papers have tried to explain this puzzling fact. Some authors argue that the two parties promote different economic policies (e.g., Belo et al. 2013), while others offer risk-based explanations (e.g., Pástor & Veronesi 2020).

The goals of this seminar thesis are threefold:

- First, the student should provide a comprehensive literature review on the presidential puzzle in stock markets.
- Second, the student should replicate the main findings of Santa-Clara and Valkanov (2003).
- Third, the student should analyze whether these findings are robust including more recent data.

Data:

The databases are readily accessible for affiliates of the University of Mannheim.

Introductory literature:

Belo, F., Gala, V. D., & Li, J. (2013). Government spending, political cycles, and the cross section of stock returns. *Journal of Financial Economics, 107(2),* 305-324.

Blinder, A. S., & Watson, M. W. (2016). Presidents and the US economy: An econometric exploration. *American Economic Review, 106(4),* 1015-1045.

Pástor, Ľ., & Veronesi, P. (2020). Political cycles and stock returns. *Journal of Political Economy*, *128*(11), 4011-4045.

Santa-Clara, P., & Valkanov, R. (2003). The presidential puzzle: Political cycles and the stock market. *The Journal of Finance, 58(5),* 1841-1872.

Topic S6: Aviation disasters and stock returns

Classification: Empirical topic

Advisor: Leah Zimmerer

Anecdotally, investor sentiment has a strong impact on asset prices. Examples range from the tulip mania in the Netherlands in the 17th century to the recent GME craze. However, this anecdotal evidence is at odds with efficient markets where only changes in economic fundamentals should affect stock prices. This assumption is challenged by the research field of behavioral finance. There is empirical evidence that investor sentiment ("a belief about future cash flows and investment risks that is not justified by the facts at hand" (Baker and Wurgler, 2007, p.1)) has an influence on market participants when they value and act on financial markets. Thus, investor sentiment has an impact on the value of assets and can drive their prices away from their fundamental values.

In their seminal paper, Kaplanski and Levy (2010) explore the relationship between investor sentiment and stock prices, focusing particularly on aviation disasters. They argue that aviation disaster have an impact on people's mood, increase their anxiety, and thus should negatively affect the investment in risky assets. Kaplanski and Levy (2010) show a substantial negative impact of aviation disasters on stock market prices. Notably, a price reversal occurs within two days. This effect is more pronounced in smaller and riskier stocks, as well as in firms within less stable industries. Additionally, the event is associated with an increased perceived risk, as implied volatility rises following aviation disasters, even in the absence of a simultaneous increase in actual volatility.

First, the student should provide a comprehensive survey of the academic literature on investor sentiment and stock returns. Second, she should replicate the main findings of Kaplanski and Levy (2010). Finally, the student should extend the analyses to include more recent years.

Data:

The databases are readily accessible for affiliates of the University of Mannheim.

Introductory literature:

Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *The Journal of Finance*, *61*(4), 1645-1680.

Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129-152.

Kaplanski, G., & Levy, H. (2010). Sentiment and stock prices: The case of aviation disasters. *Journal of Financial Economics*, 95(2), 174-201.

Kumar, A., & Lee, C. M. (2006). Retail investor sentiment and return comovements. *The Journal of Finance*, *61*(5), 2451-2486.

Stambaugh, R. F., Yu, J., & Yuan, Y. (2012). The short of it: Investor sentiment and anomalies. *Journal of Financial Economics*, *104*(2), 288-302.