Building a Financial Condition Indicator for Emerging Market Countries: An Interactive Visualization using R Shiny

2023/07/07

Project Summary

The objective of this project is to develop a comprehensive Financial Condition Indicator (FCI) for multiple emerging market countries (Egypt, Hungary, Nigeria, Poland and Romania) by integrating monthly bond-related, stock-related, and macroeconomic data series from reputable sources such as Haver and Data Buffet. The FCI will serve as a reliable tool for assessing the financial health and stability of these countries. The project will also involve creating an interactive R Shiny dashboard that visualizes the FCI, enabling users to explore and analyze the indicator in an intuitive and user-friendly manner. Students will have the opportunity to utilize the project results for public presentations, showcasing their work and knowledge in an ethical manner.

Project Scope

1. Data Collection: Acquire monthly bond-related data, stock-related data, and macroeconomic data series from 1995-01 (at least 2010-01) to the present for a selected set of emerging market countries.
2. Data Preprocessing: Clean, transform, and integrate the acquired data into a unified format suitable for analysis.
3. Financial Condition Indicator Development: Develop a robust methodology to calculate the Financial Condition Indicator by considering various financial metrics and incorporating statistical modeling techniques. Support will be provided through the examination of existing FCI methodologies, including Moody's FCI methodology for other Emerging Market countries and other relevant approaches. (please see the attachments)
4. R Shiny Dashboard Development: Design and develop an interactive R Shiny dashboard that presents the Financial Condition Indicator for each country, allowing users to explore the data, visualize trends, and compare different countries.

Project Deliverables

1. Comprehensive Financial Condition Indicator for multiple emerging market countries.
2. R Shiny dashboard with interactive visualizations of the FCI.

3. Documentation detailing the data collection process, preprocessing steps, FCI calculation methodology, and dashboard development.
4. Presentation materials and demonstrations to showcase the project's outcomes, allowing students to present their work in an ethical and responsible manner.

Project Timeline

- 2023/09: Data acquisition and preprocessing.
- 2023/10: Financial Condition Indicator methodology development.
- 2023/11: R Shiny dashboard development and testing.
- 2023/12: Documentation, finalizing the project, and preparing for presentations.

Project Stakeholders

- Student Capstone Team
- Faculty Advisors
- Moody's Investor Service Proprietary Data Analytics Team

Project Risks:

Data Availability and Quality: Regular data quality checks and alternative data sources will be considered to mitigate this risk, especially since the emerging market countries may have less available data history

Project Evaluation:

The success of the project will be evaluated based on:

- Accuracy and robustness of the Financial Condition Indicator.
- Moody's teams' feedback and satisfaction with the R Shiny dashboard.
- Learning outcomes and growth of the students involved.

This project provides an excellent opportunity for master students to work on a real-world data science project, learn about financial analytics, gain experience in data collection and preprocessing, develop statistical modeling skills, and build an interactive visualization tool. The project's use of monthly data series since January 2010 ensures a comprehensive analysis, capturing long-term trends and patterns. Additionally, students will have the opportunity to present their project results ethically and responsibly. Support will be provided through the

examination of existing FCI methodologies, including Moody's FCI methodology for other Emerging Market countries and other relevant approaches. The outcomes will contribute to the students' professional growth and prepare them for industry-level projects in the data science field.