Final Project

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Background

- Green, Social, and Sustainability Bonds
  - Financial securities issued by organizations to raise funding for a portfolio of projects…
  - …that are expected to generate "green" or "social" (or both!) benefits
  - Borrowers are expected to provide allocation and impact reports
- Environmental Performance Index (EPI)
  - Provided by Yale and Columbia
  - Uses 58 performance indicators across 11 issue categories
  - Ranks 180 countries on climate change performance, environmental health, and ecosystem vitality

Research question

- What is the relationship between the amount of debt funding raised through Green and Sustainability (GS) bonds and a country's EPI score?

Approach

- Dataset 1: GS Bond issuances
  - GS bond issuance volumes (USD millions)
  - Total local currency bond issuance volumes (USD millions)
    - We could not find consolidated data for foreign currency bond issuance volumes which would have been important in calculating a more accurate borrowing mix profile
  - Broken down per issuer (Government and Corporate) and bond label (Green and Sustainability)
  - Limited to ASEAN+3 economies
    - droped China as outlier
  - Taken from the Asian Development Bank's AsianBondsOnline portal
- Dataset 2: EPI
  - Aggregated into a score
  - Comprehensively covers a wide range of environmental issues, not just a single or limited issues
  - Though this analysis is focused on ASEAN+3, dataset contains global information which can be useful especially when comparing against world standards
  - Two-year time horizon which does not directly match Bond data

Findings

Rising issuance volume

- Nominal borrowing amounts for GS bonds follow an upward trend.

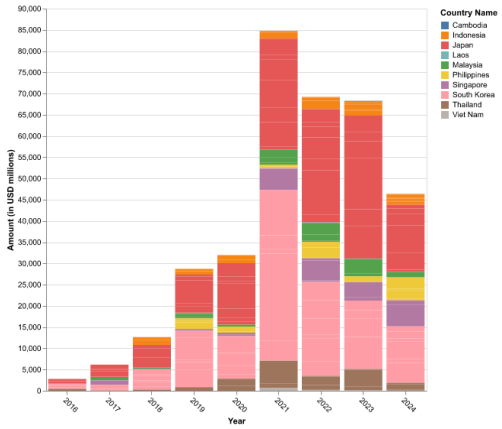

Figure 1: Consolidated issuance volume, 2016-2024YTD

- From Dashboard: By filtering countries on bar chart over time, we can see whether this trend is common to all countries within the region.
  - JP, SK contributes to forming the trend with large and increasing volume
  - But other countries such as SG, ID, PH, KH generally increases the issuance based on their own size of volume
- But as the borrowing mix shows, notably the rate of these GS bonds are quite small as a percentage of overall borrowing volume.

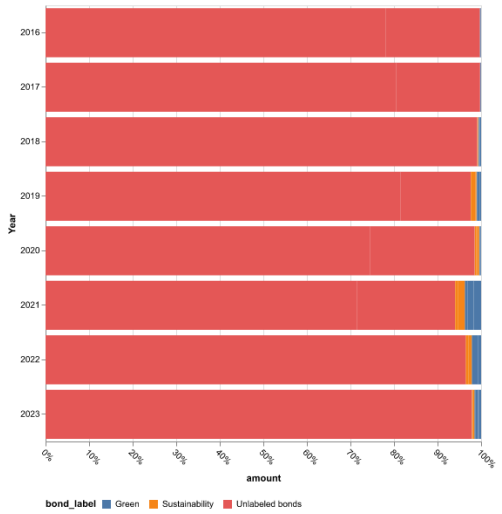

Figure 2: Share of GS bonds in total bonds, 2016-2024YTD

- Possible reasons:

- To fund projects that will help countries meet their nationally determined contributions under the Paris Agreement.
- To explore alternative indigenous energy sources in response to a looming energy crisis exacerbated by geopolitical conflicts
- To take advantage of the growth of capital markets dedicated to Environment, Social, and Governance (ESG)
- More generally, to meet higher deficit requirements initially caused by the COVID-19 pandemic

Global downtrend in EPI

- There is a regional (and global) drop in EPI scores, followed by a slight recovery in 2024.

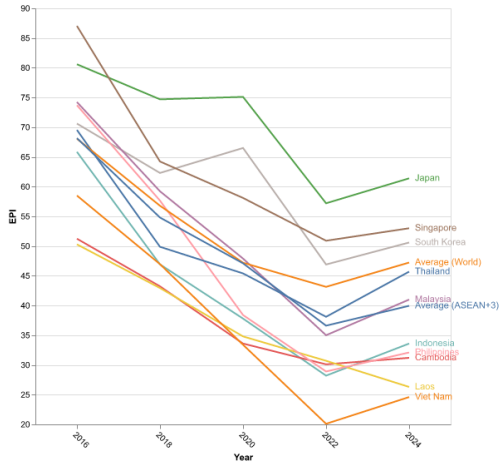

Figure 3: EPI scores, 2016-2024

- From Dashboard: We can switch from using nominal EPI to EPI gap from world average to compare the scores relative to a global benchmark. As we see the relative performance of each countries, the scores of ASEAN+3 countries other than JP, SK and SG are lower than the average, and the whole ASEAN+3 trend is still on downtrend.
- Possible reasons:
  - Shift in scoring criteria that require higher standards for performance
  - More developments focused on economic growth rather than environmental targets

Weak to negative relation between the two variables

- In the South Korea example, we can see that EPI scores remain stagnant despite a rise in GS bond issuance volume.

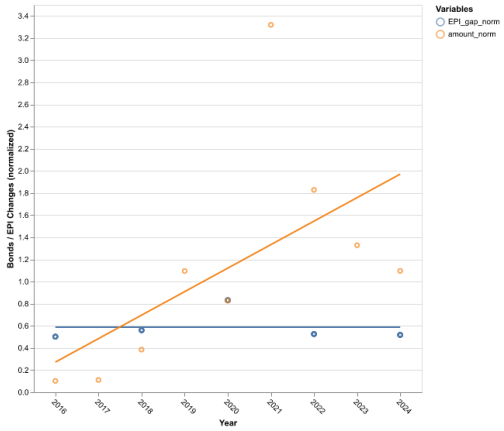

Figure 4: Linear Regression on time series data - South Korea (Consolidated issuance volume, EPI score, 2016-2024)

- From Dashboard: We can select each country and make the trend comparison for each.
- Linear regression on time series data to draw trend lines
- Normalized data for more meaningful comparison
  - Bonds are expressed in USD millions
  - EPI scores are 0 to 100

Summary and areas for further research

- Summary
  - Lower scores are observed despite higher GS issuance volumes.
  - It is possible that EPI scores would have decreased even more if not for these investments.
  - This could be a signal of "greenwashing" which refers to bond issuers using the GS label to oversell their environmental commitments to raise funding.
- Areas for further research
  - Use of project-level data or more specific categorization of use of proceeds to derive a more accurate relationship between funds raised and specific projects funded.

– Explore other potential determinants of EPI scores (e.g. GDP, specific investments into renewable energy, etc.) to help explain observed EPI trends.
– Make relevant peer comparisons between economies based on other factors aside from region (e.g. emerging economies)