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?

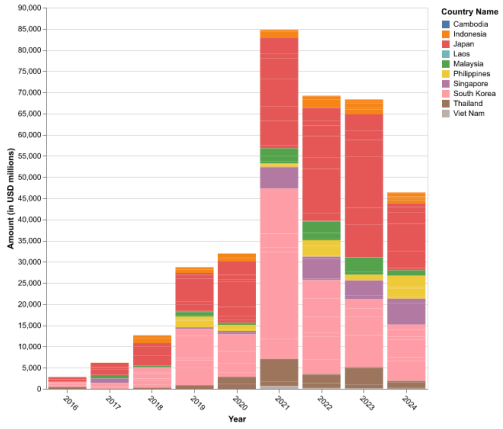
Approach

- 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

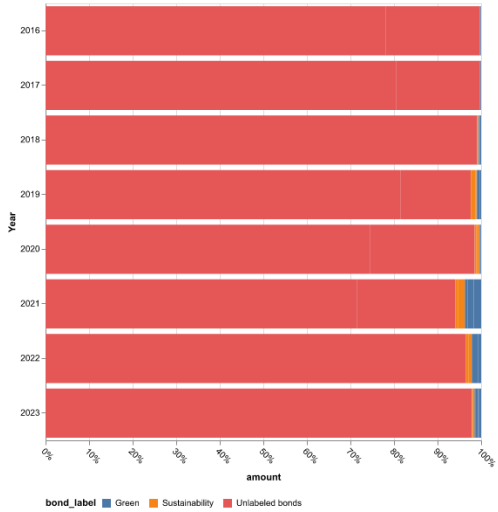
Findings

Rising issuance volume

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



(a) Consolidated issuance volume



(b) Share of GS bonds in total bonds

Figure 1: Bonds issuance volume and share, 2016-2024YTD

- But as the borrowing mix shows, notably the rate of these GS bonds are quite small as a percentage of overall borrowing volume.
- 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.

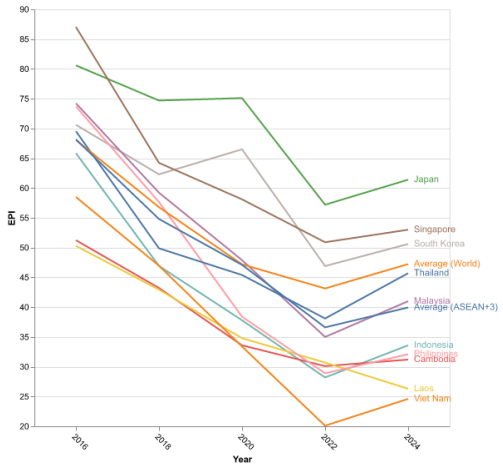


Figure 2: EPI scores, 2016-2024

- 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.

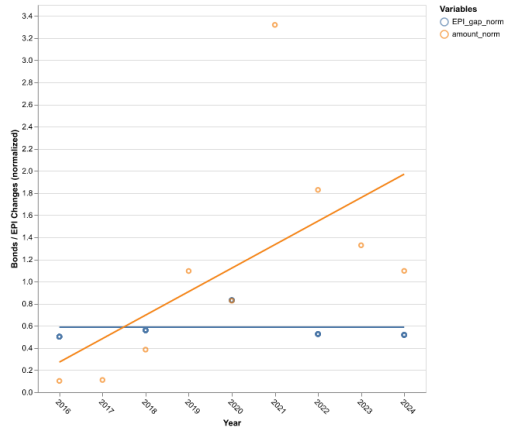


Figure 3: Linear Regression on time series data - South Korea (Consolidated issuance volume, EPI score, 2016-2024)

- 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)