Budgeting for SDGs: A Data-driven Approach

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Main Takeaways

- Data-driven framework to identify those expenditure categories that matter the most to improve the Sustainable Development Goals (SDGs) indicators.
- The framework can help treasuries around the world in incorporating the SDGs into their budget planning and thinking about potential spillovers of government programmes.
- Importance of open fiscal data.

Incorporating SDGs into Budget Planning

- Need for a mapping between SDGs and public spending.

- Challenging task: possible spillovers across development programmes and complex interdependencies between SDGs targets.

- Data-driven approach. Two steps:

  - Predictive model for the SDGs indicators.
  - Identify the most relevant expenditure categories.

Data Description

- Focus: Mexico
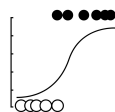
- 456 development indicators
- Period: 2008-2019

- 803 budget programmes
- Period: 2008-2019
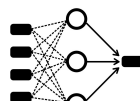- 41 macro-categories (*Ramos*)

- We allow for all possible combinations of development indicators and budget programmes in every year, obtaining 1118073 unique observations.

Predicting Improvements in SDGs Indicators

- Classification task: we predict an improvement in the development indicators given their historical trends and changes in public expenditure.

  - Logistic Regression
  - Accuracy: 0.632
  - AUC: 0.492

  - Deep Neural Network
  - Accuracy: 0.788
  - AUC: 0.865

  - Random Forest
  - Accuracy: 0.925
  - AUC: 0.979

Identify Top Expenditure Categories

- We rank *Ramos* in relative terms based on their Mean Decrease Impurity (i.e., Gini Importance).

  - Finance and Public Credit
  - Normalized Gini Importance: 1.000

  - Environment and Natural Resources
  - Normalized Gini Importance: 0.980

  - Public Education:
  - Normalized Gini Importance: 0.927

  - Communications and Transports
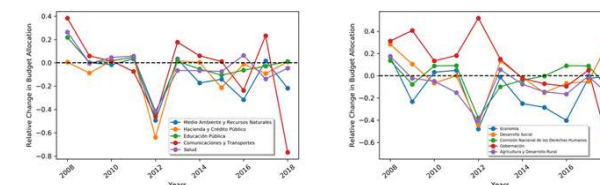 - Normalized Gini Importance: 0.876

  - Health
  - Normalized Gini Importance: 0.824

Trends in Budget Allocation

- In recent years, systematic disinvestment in those expenditure categories that are the most relevant to improving SDGs indicators.

Fig. 1 : Relative Change in Budget Allocation for Top Expenditure Categories

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