

# Unlocking Economic Insights: GRDP Predictions through Temporal Disaggregation

## Introduction

- The demand for more detailed data, particularly strategic data like GRDP, is increasing. Local governments are eager for more comprehensive economic indicator series.
- However, providing high-frequency economic indicator series for smaller economies poses its own challenges:
  - Limited availability of data to calculate sectoral growth at a lower regional level.
  - Big data might help, but there are constraints in accessing and utilizing it.
- Temporal disaggregation may offer a solution by breaking down low-frequency series into high-frequency ones, it's an unprecedented approach that requires careful scrutiny on how to execute it effectively.

## Question

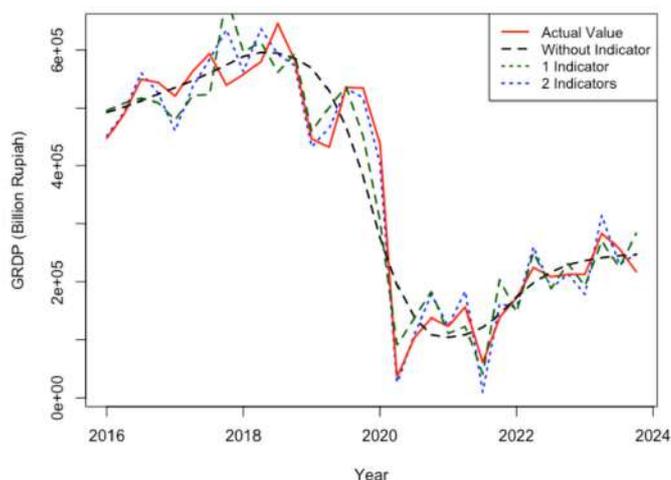
- How reliable is the temporal disaggregation technique for GRDP?
- What factors determine the quality of the predicted disaggregated series?
- Can big data help?

## Method

- The empirical strategy entails evaluating the accuracy of the quarterly high-frequency series generated via the temporal disaggregation process applied to the low-frequency annual series.
- Simulation is conducted on the GRDP of Sumatera Barat province, focusing specifically on the agricultural and accommodation sectors.
- The existing quarterly GRDP series will be juxtaposed against the predicted values to gauge the efficacy of this statistical intrapolation. The comparison will be evaluated using:
  - MAPE
  - Spearman correlation coefficient : used to measure the degree of alignment between the two series regarding their quarterly sign change movements.
- Temporal disaggregation is conducted twice both without additional indicators and with other indicators. The additional indicators are as follows:
  - Agricultural sector: the quarterly series of rice production.
  - Accommodation sector: the Google Trend index (Keyword: "Hotel") and the number of tourist arrivals at the local airport (administrative data)
- For Agricultural sector, this study attempts to break down the low frequency series of GRDP into high frequency series on different levels:
  - Parent Sector: Agriculture, Fishing, and Forestry
  - Subsector: Agriculture
  - Sub of subsector: Food Crops

## Result

### Accommodation Sector



Model	MAPE	Spearman Correlation
Without Indicator	27.75%	0.28
Google Trend (GT)	18.85%	0.48
GT + Adm. Data	11.12%	0.54

### Agricultural Sector

Target Variable	Model	MAPE	Spearman
Parent Sector (~20%)	Without Indicator	1.24%	NA
	Rice Production	2.85%	-0.31
Subsector (~26%)	Without Indicator	1.31%	0.29
	Rice Production	2.23%	-0.15
Sub of Subsector (~70%)	Without Indicator	4.06%	-0.23
	Rice Production	4.85%	0.65

Figure in parenthesis represents the share of value rice accounts in each level

## Conclusion

- Intrapolating without using additional information leads to oversmoothing the high-frequency series.
- Indicators accounting for higher share in the target variable of prediction tends to result in better predicted series.
- Promising field in utilizing easily accessed big data indicator in GRDP intrapolation



Gracias!