Public Infrastructure:India and Indonesia

Shankar Mepparambath

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Introduction

The study's objective is to compare the two nations, India and Indonesia, on various public infrastructure indicators, namely, Life expectancy, MMR, Health_exp, Doctor_patient, OOP, Stunted_under5, GER_primary, Education Expenditure, Electrification Rural, Urban Households, and Fertility_rate. The data is taken from World Bank and from 2000 to 2019 considered as the study period. For some indicators, all the data points are not available, and it is treated as missing value than applying any imputation. Though data is time series, the study aggregated all the data points by country wise and computed mean score. The broad objective of the study is to compare the average of each indicator between India and Indonesia. Further Independent sample t-test is applied to prove the signficant difference between two nations.

Statement of the Problem

India and Indonesia obtained the "B" category across various credit rating agencies. However, the researcher attempted to how both nations performed in the public infrastructure for the past two decades, from 2000 - 2019. The study is attempted to investigate the research question through a scientific method like testing of hypothesis.

Data anlaysis

From the Annexure, table 1 showed India basic statistics, table 2 showed Indonesia's summary statistics, Table 3 showed the t-test, and graphs exhibited the average between two nations across the indicators.

- On GDP, India is slightly higher than Indonesia
- Life expectancy, GER Primary, Electrification rural is slightly higher in Indonesia while compared to India
- On Health expenditure, Indian people are spending more than Indonesia
- Stunted children under 5 are higher in India than in Indonesia

Testing of Hypotheses

Further to confirm the significant difference between India and Indonesia, testing of hypothesis is done @ 5% level.

Ho: On average, All the public infrastructure is similar or equal between India and Indonesia

Ha: On average, All the public infrastructure is not similar or equal between India and Indonesia

Results of t test

Above table 3 shows the result of the independent sample t-test. except for MMR, where null hypotheses are not rejected, in all other indicators, the study result supported to reject the null hypotheses, Hence proving, there is a significant difference between India and Indonesia

- India not performing better than Indonesia: Health_exp, OOP, Stunted_under5, GER primary, Electrification Rural, and Urban_HH

- India does perform better in the indicators: Fertility rate and Doctor-patient ratio.

In conclusion, from the test result, it is clear that India needs more investments in public infrastructure; in the long run, it enhances economic growth and development. Bayraktar and Moreno-Dodson (2015) showed stronger countries with fast growth dynamics where countries are open to the private sector. The relationship between public infrastructure and economic growth depends upon selecting the country.

Limitations of the study

Though data is time series, the researcher did simple cross-section analysis just using t-test for academic exercises. However, there is enormous scope to do time series or panel analysis for the given data. Also, a study like Antonelli and De Bonis (2019) suggested Data envelopment analysis assess the efficiency of the European countries on public infrastructure.

Annexure A: Basic Statistics - Country wise

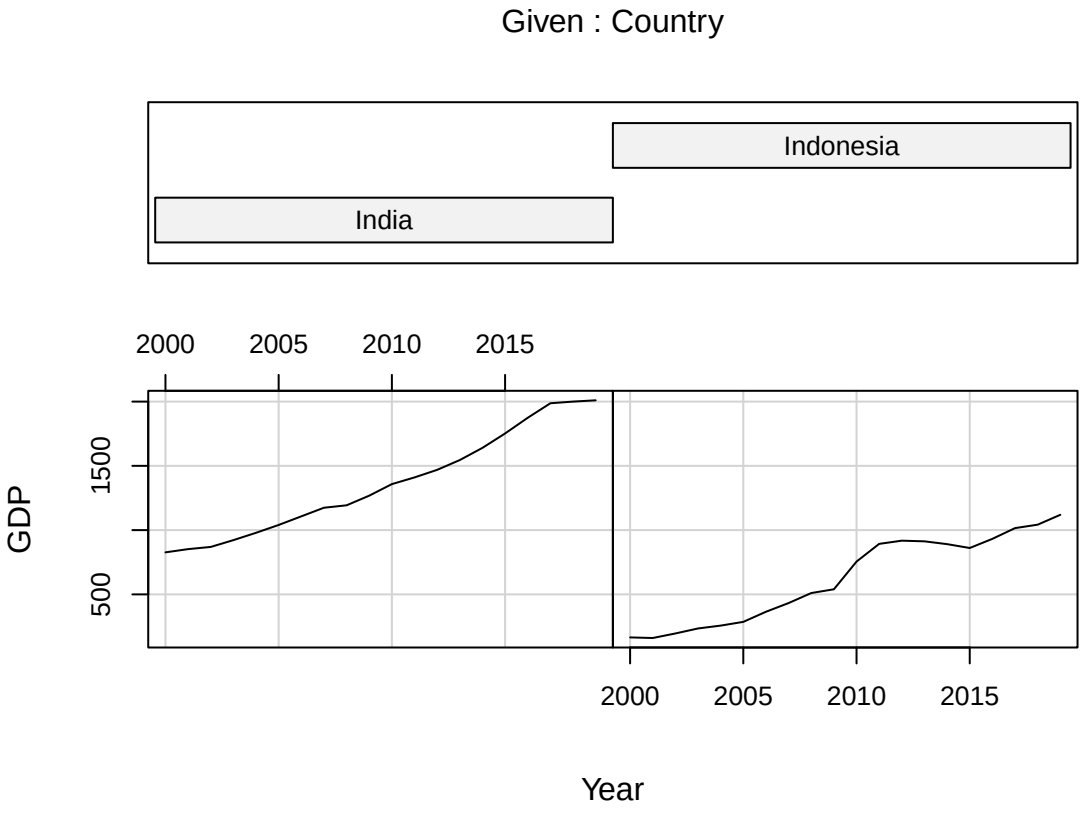


Table 1: India

	n	mean	sd	min	max
GDP	20	1363.8	405.7	827.0	2010.0
Life_exp	20	66.3	2.3	62.5	69.6
MMR	20	232.4	74.8	145.0	370.0
Health_exp	20	3.7	0.3	3.2	4.2
Doctor_patient	20	0.7	0.1	0.5	0.9
OOP	19	68.2	4.4	62.2	74.1
Stunted_under5	20	43.2	5.9	32.1	49.8
GER_primary	20	103.8	7.3	93.5	114.5
Edu_Exp	16	3.5	0.3	3.1	4.3
Electricification_Rural	20	67.4	15.7	43.5	96.7
Urban_HH	20	30.9	2.1	27.7	34.5
Fertility_rate	20	2.7	0.4	2.2	3.3

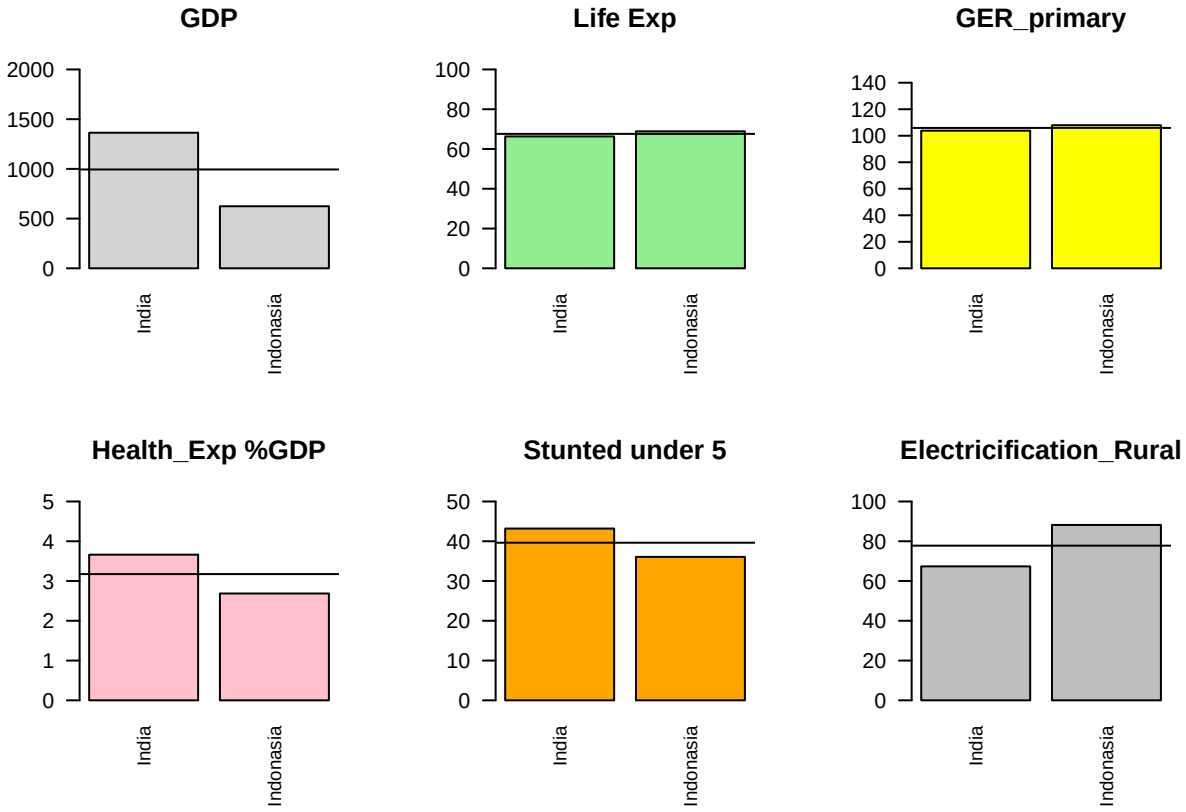
Table 2: Indonesia

	n	mean	sd	min	max
GDP	20	624.2	339.4	160.4	1119.1
Life_exp	20	68.9	1.9	65.8	71.7
MMR	20	226.8	32.5	177.0	272.0
Health_exp	20	2.7	0.4	1.9	3.1
Doctor_patient	11	0.2	0.1	0.1	0.4
OOP	19	46.3	6.7	34.9	57.0
Stunted_under5	20	36.1	3.1	32.0	41.5
GER_primary	19	108.0	1.5	105.6	109.9
Edu_Exp	14	3.1	0.3	2.5	3.6
Electricification_Rural	20	88.2	6.8	75.8	97.5
Urban_HH	20	49.3	4.4	42.0	56.0
Fertility_rate	20	2.4	0.1	2.3	2.5

Table 3: T - Test

	Mu_India	Sd_India	Mu_Indonesia	Sd_Indonesia	t_value	p_value
Life_exp	66.32	2.31	68.89	1.95	-3.81	0.00
MMR	232.45	74.79	226.85	32.50	0.31	0.76
Health_exp	3.66	0.29	2.69	0.37	9.27	0.00
Doctor_patient	0.66	0.10	0.25	0.11	10.52	0.00
OOP	68.21	4.38	46.26	6.65	12.01	0.00
Stunted_under5	43.19	5.88	36.06	3.08	4.80	0.00
GER_primary	103.82	7.35	107.96	1.52	-2.46	0.02
Edu_Exp	3.54	0.35	3.08	0.34	3.66	0.00
Electricification_Rural	67.37	15.72	88.21	6.79	-5.44	0.00
Urban_HH	30.86	2.11	49.26	4.38	-16.94	0.00
Fertility_rate	2.67	0.37	2.45	0.08	2.58	0.02

Annexure B: Graphical representation



Reference:

Antonelli, Maria Alessandra, and Valeria De Bonis. 2019. "The Efficiency of Social Public Expenditure in European Countries: A Two-Stage Analysis." *Applied Economics* 51 (1): 47–60.

Bayraktar, Nihal, and Blanca Moreno-Dodson. 2015. "How Can Public Spending Help You Grow? An Empirical Analysis for Developing Countries." *Bulletin of Economic Research* 67 (1): 30–64.