Does GDP per capita growth correlate to the female infant mortality rates in countries of different economic classifications? How do these correlations compare?

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Motivation

- Growth in gross domestic product (GDP) means that the economy of a country is growing, and thus the availability of resources to the people in the country–employment, goods and services, wages–increases
- An increase in personal wages and services such as health care probably increases the likelihood of infants getting their fundamental nutritional/health needs met and being able to receive proper medical care when needed
- An increase in these resources to infants would likely decrease the rate of infants deaths

- According to the UN, all countries can be classified into one of three broad economic categories: Developed Economies; Economies in Transition; and Developing Economies
- No matter the economic classification of a country, growth in GDP would likely decrease the infant mortality rates
- However, the rate at which GDP evolves in a country might be influenced by its economic classification, which would affect the rate at which infant mortality rates evolve

Hypothesis & Data

- Hypothesis: There exists a strong negative correlation between GDP per capita growth (annual %) and female infant mortality rates (per 1,000 live births). Countries with developing economies will have the strongest correlation, countries with economies in transition will have the second strongest correlation, and countries with developed economies will have the weakest correlation
  - Countries with Developed Economies: Austria, Bulgaria, Norway, Japan, United States
  - Countries with Economies in Transition: Albania, North Macedonia , Armenia, Azerbaijan, Belarus
  - Countries with Developing Economies: Algeria, China, Barbados, Costa Rica, Argentina

- Data for GDP per capita growth (annual %) and female infant mortality rates (per 1,000 live births) for each country was retrieved from World Bank Database
  - 31 data points
  - Sampled yearly from 1991 to 2021

GDP Per Capita Growth (Annual %) vs. Female Infant Mortality Rate (Per 1,000 Live Births): Developed Economies

Austria

Correlation Coefficient (r)	0.2250
95% Confidence Interval of Correlation Coefficient (r)	[-0.1405, 0.5366]
p-value	0.2236

Bulgaria

Correlation Coefficient (r)	-0.2732
95% Confidence Interval of Correlation Coefficient (r)	[-0.5722, 0.0898]
p-value	0.1369

Norway

Correlation Coefficient (r)	0.5822
95% Confidence Interval of Correlation Coefficient (r)	[0.2871, 0.7764]
p-value	5.9e-04

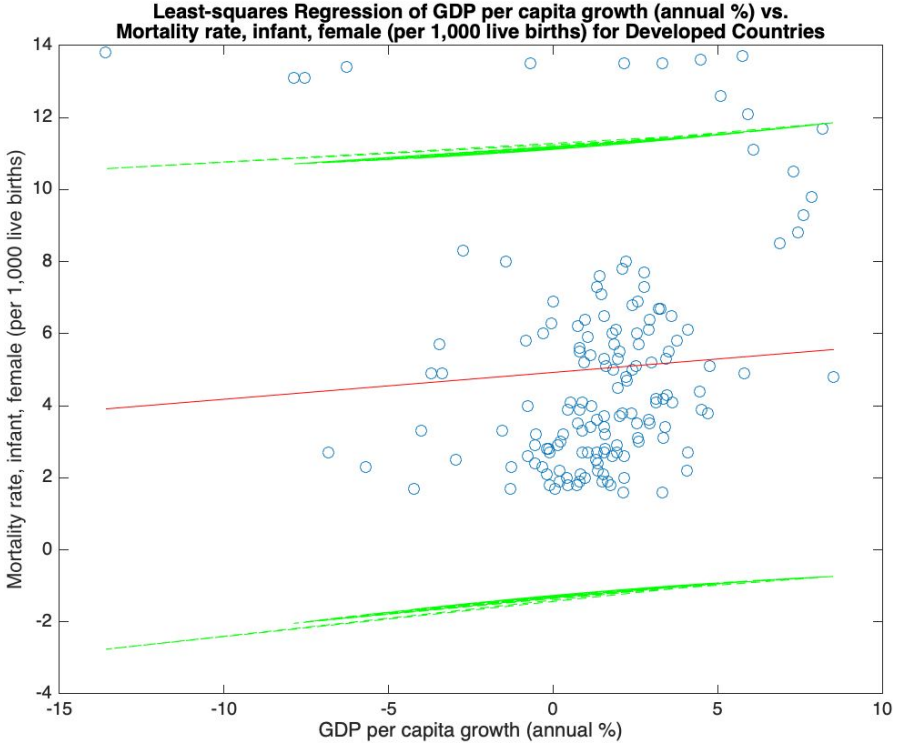
Japan

Correlation Coefficient (r)	0.1289
95% Confidence Interval of Correlation Coefficient (r)	[-0.2362, 0.4621]
p-value	0.4895

United States

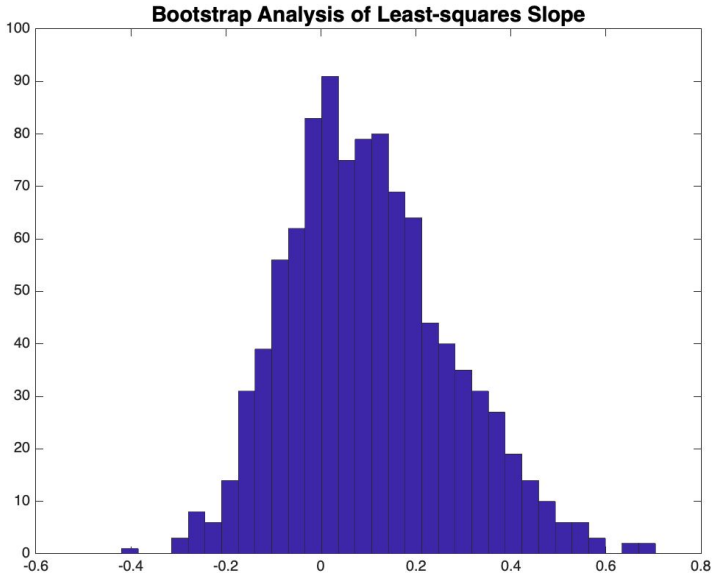
Correlation Coefficient (r)	0.0759
95% Confidence Interval of Correlation Coefficient (r)	[-0.2861, 0.4190]
p-value	0.6849

Least-squares Regression: Developed Economies

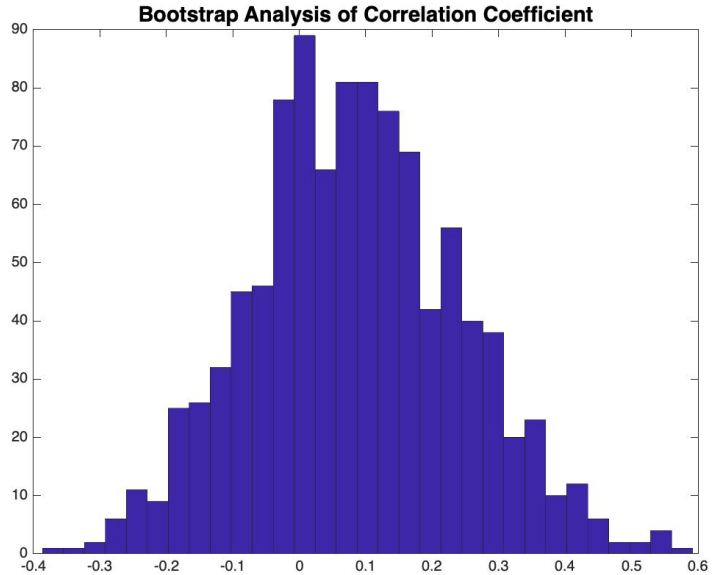


LSR Slope	0.0746
95% Confidence Interval of LSR	[-0.8091, 0.9582]
Correlation Coefficient (r)	0.0724
95% Confidence Interval of Correlation Coefficient (r)	[-0.0862, 0.2275]
p-value	0.3706

Bootstrap: Developed Economies

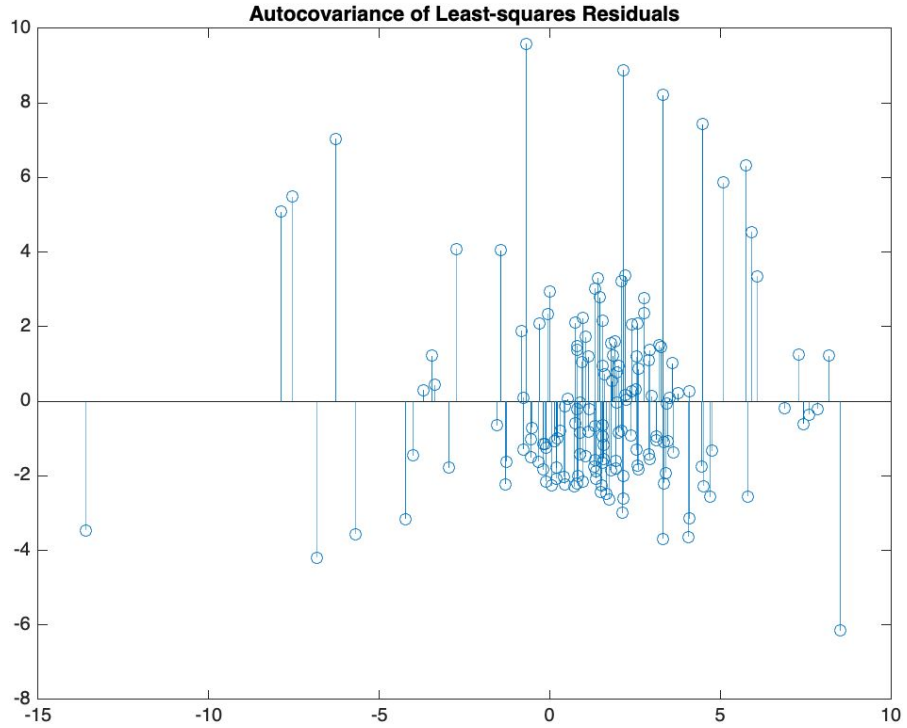


Mean	STD	95% CI
0.1012	0.1727	[-0.1922, 0.4842]



Mean	STD	95% CI
0.0847	0.1573	[-0.2186, 0.4109]

Autocovariance: Developed Economies



GDP Per Capita Growth (Annual %) vs. Female Infant Mortality Rate (Per 1,000 Live Births): Economies in Transition

Albania

Correlation Coefficient (r)	-0.1123
95% Confidence Interval of Correlation Coefficient (r)	[-0.4488, 0.2520]
p-value	0.5474

North Macedonia

Correlation Coefficient (r)	-0.6035
95% Confidence Interval of Correlation Coefficient (r)	[-0.7891, -0.3170]
p-value	3.25e-04

Armenia

Correlation Coefficient (r)	-0.3024
95% Confidence Interval of Correlation Coefficient (r)	[-0.5932, 0.0582]
p-value	0.0982

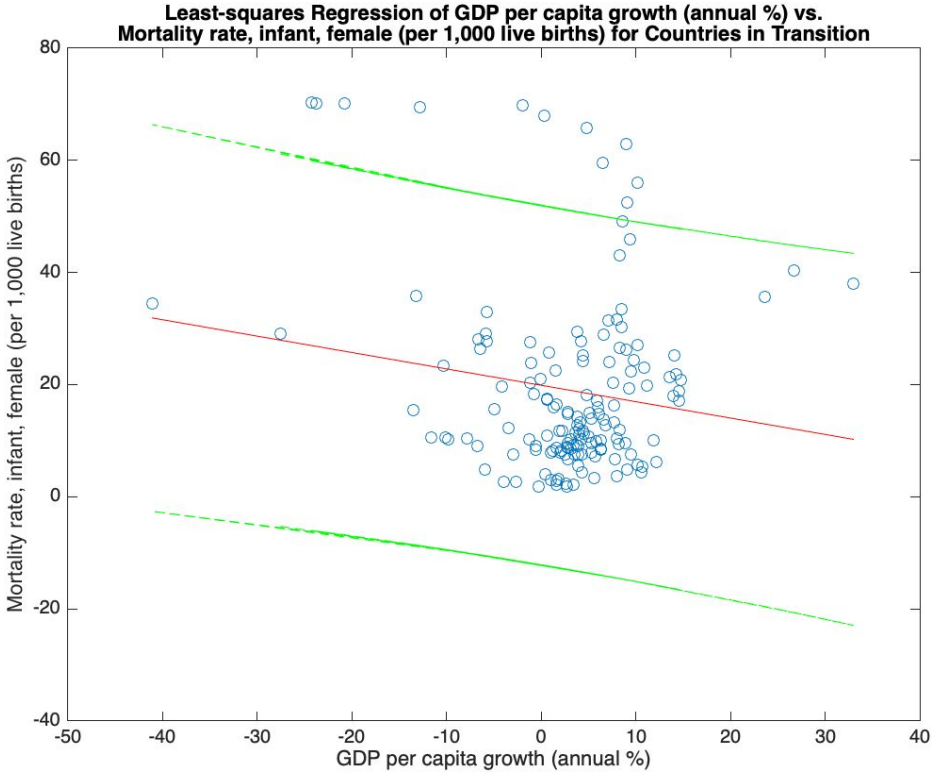
Azerbaijan

Correlation Coefficient (r)	-0.2812
95% Confidence Interval of Correlation Coefficient (r)	[-0.5780, 0.0812]
p-value	0.1254

Belarus

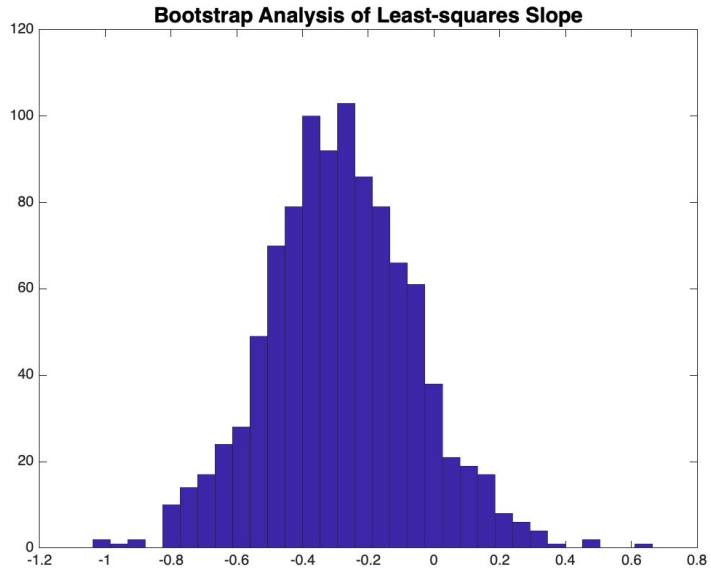
Correlation Coefficient (r)	-0.2078
95% Confidence Interval of Correlation Coefficient (r)	[-0.5236, 0.1582]
p-value	0.2620

Least-squares Regression: Economies in Transition

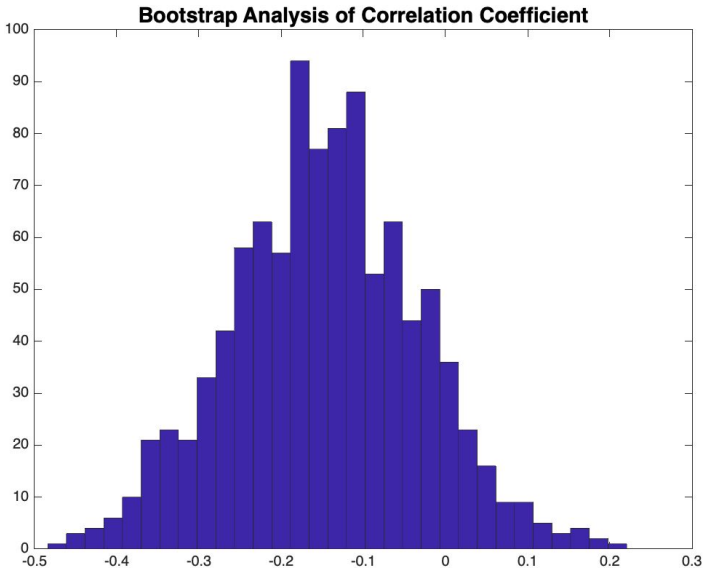


LSR Slope	-0.2922
95% Confidence Interval of LSR	[-1.8464, 1.2620]
Correlation Coefficient (r)	-0.1597
95% Confidence Interval of Correlation Coefficient (r)	[-0.3095, -0.0021]
p-value	0.0472

Bootstrap: Economies in Transition

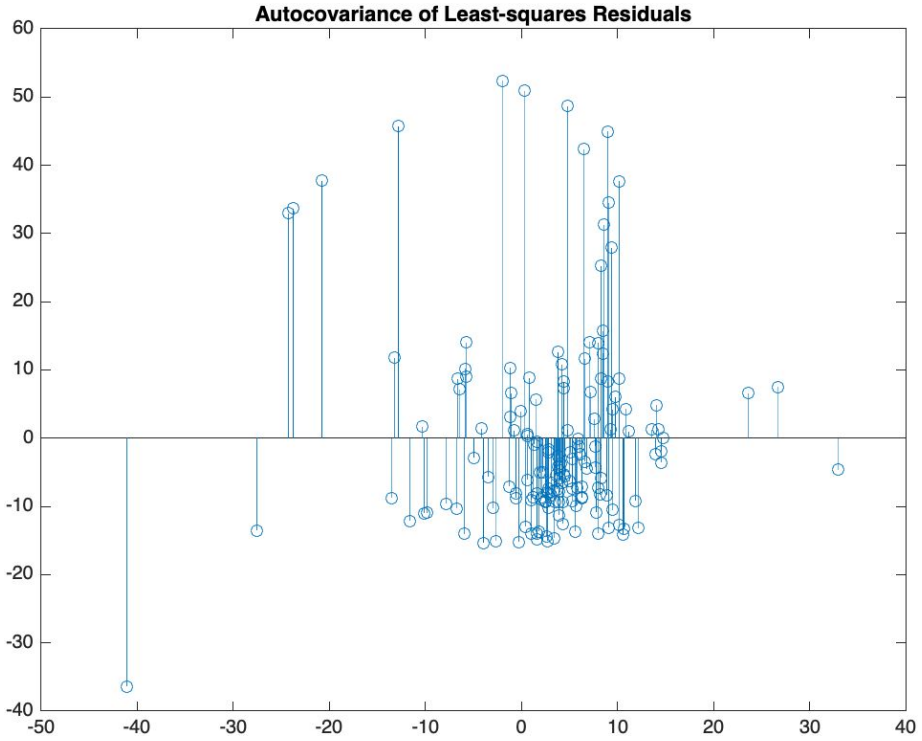


Mean	STD	95% CI
-0.2708	0.2289	[-0.6958, 0.1637]



Mean	STD	95% CI
-0.1507	0.1176	[-0.3701, 0.0878]

Autocovariance: Economies in Transition



GDP Per Capita Growth (Annual %) vs. Female Infant Mortality Rate (Per 1,000 Live Births): Developing Economies

Algeria

Correlation Coefficient (r)	-0.0303
95% Confidence Interval of Correlation Coefficient (r)	[-0.3806, 0.3275]
p-value	0.8713

China

Correlation Coefficient (r)	0.4654
95% Confidence Interval of Correlation Coefficient (r)	[0.1330, 0.7037]
p-value	0.0083

Barbados

Correlation Coefficient (r)	0.2214
95% Confidence Interval of Correlation Coefficient (r)	[-0.1442, 0.5339]
p-value	0.2313

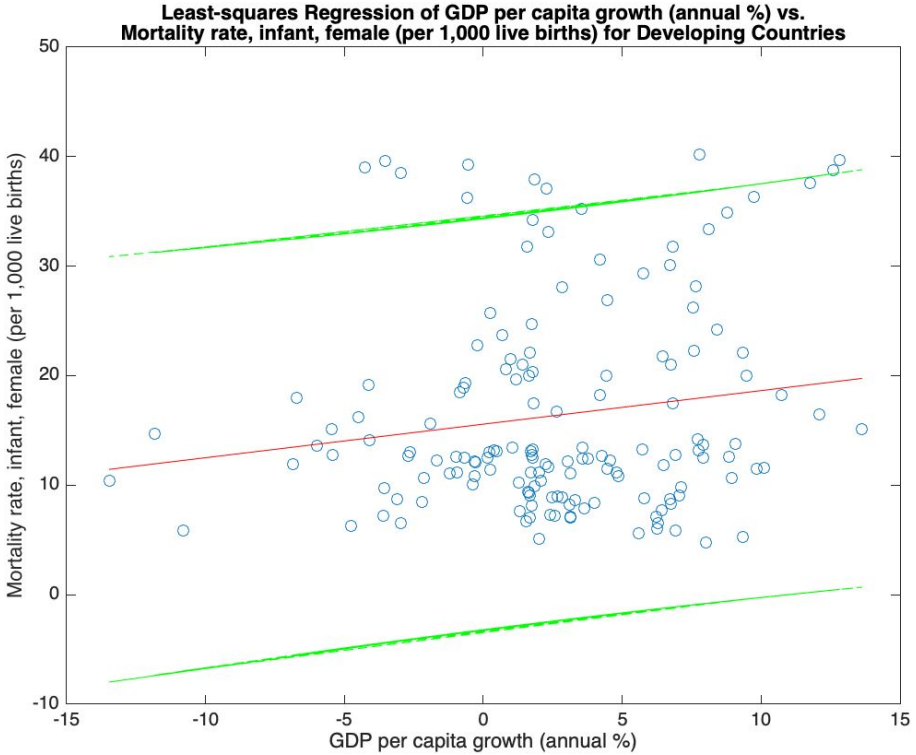
Costa Rica

Correlation Coefficient (r)	0.0568
95% Confidence Interval of Correlation Coefficient (r)	[-0.3037, 0.4030]
p-value	0.7617

Argentina

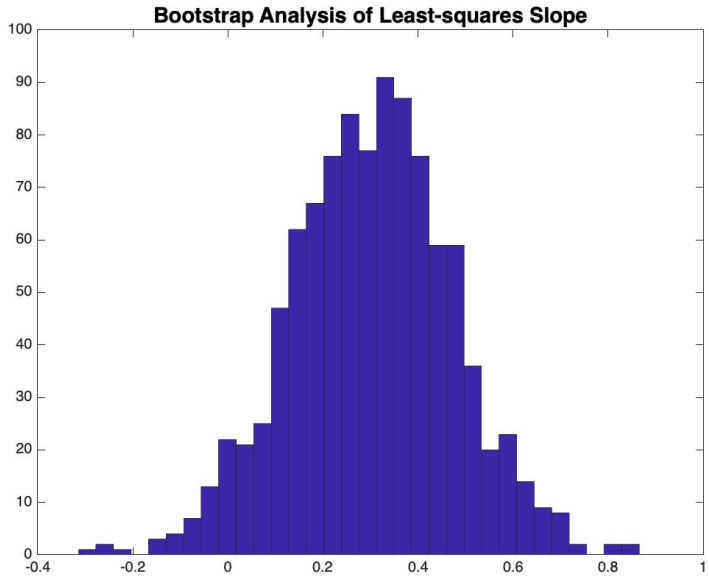
Correlation Coefficient (r)	0.2697
95% Confidence Interval of Correlation Coefficient (r)	[-0.0936, 0.5696]
p-value	0.1424

Least-squares Regression: Developing Economies

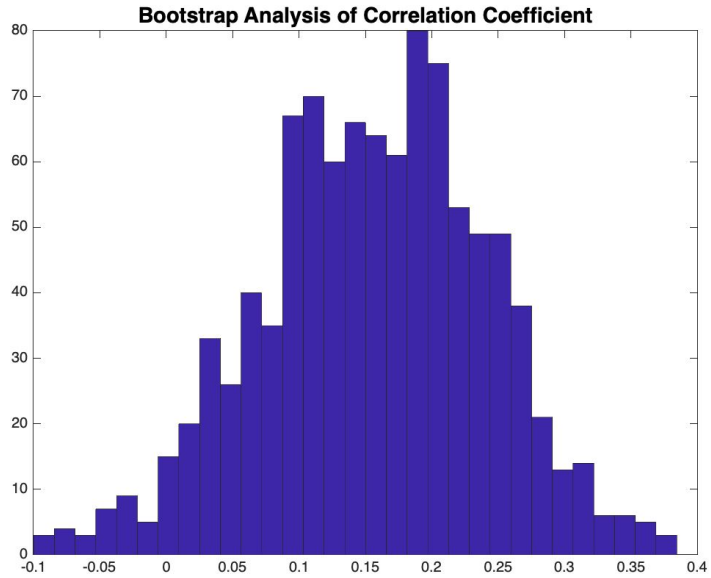


LSR Slope	0.3064
95% Confidence Interval of LSR	[-1.3726, 1.9855]
Correlation Coefficient (r)	0.1551
95% Confidence Interval of Correlation Coefficient (r)	[-0.0026, 0.3053]
p-value	0.0539

Bootstrap: Developing Economies

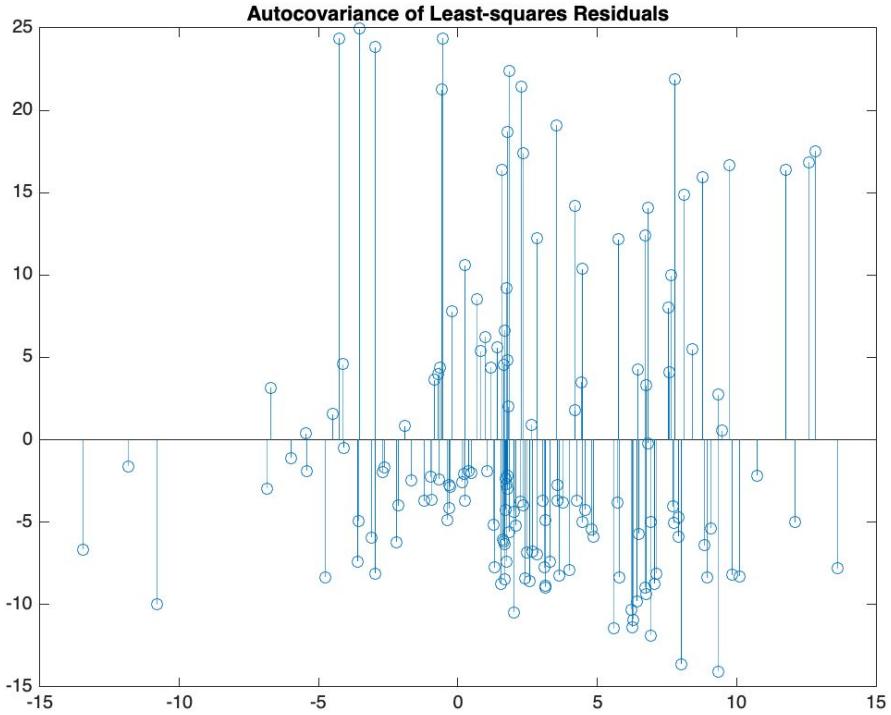


Mean	STD	95% CI
0.3028	0.1705	[-0.0319, 0.6378]



Mean	STD	95% CI
0.1558	0.0850	[-0.0260, 0.3158]

Autocovariance: Developing Economies



Conclusion

- For all countries in the three economic categories, there does not exist a strong negative correlation between GDP per capita growth (annual %) and female infant mortality rates (per 1,000 live births)
- Contrary to my prediction, economies in transition had the strongest correlation coefficient and developing economies had the second strongest correlation coefficient
- Developed and developing economies both had a positive correlation
- External factors that were not accounted for in this analysis contributed to the changes in female infant mortality rates (per 1,000 live births)

Questions?