# An Econometric Analysis of the Modi Effect on India's GDP Per Capita Growth: A Dummy Variable Approach (2004-2024)

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**Abstract**

This study employs a dummy variable regression analysis to examine the impact of Narendra Modi's premiership on India's GDP per capita (PPP) growth from 2004 to 2024. Using a 20-year dataset spanning both the UPA (2004-2014) and BJP (2014-2024) governments, we construct an econometric model with `Modi_as_PM` as the treatment variable.

Our findings reveal mixed results: while absolute GDP per capita increased substantially during Modi's tenure, the growth rate coefficient shows statistical significance concerns due to data quality issues and structural breaks from policy shocks including demonetization. The study contributes to the literature on political economy and policy evaluation in emerging markets.

## 1 Introduction

The economic performance of India under Prime Minister Narendra Modi has been a subject of considerable academic and policy debate. Modi assumed office on May 26, 2014, succeeding Manmohan Singh of the Indian National Congress [[7]]. This study employs an event study methodology combined with dummy variable regression analysis to quantify the "Modi effect" on India's GDP per capita growth using purchasing power parity (PPP) methodology.

The research question centers on whether the structural break represented by Modi's assumption of power in 2014 had a statistically significant impact on India's economic growth trajectory. We hypothesize that $H_0 : \beta_1 = 0$ (no Modi effect) versus $H_1 : \beta_1 \neq 0$ (significant Modi effect) where $\beta_1$ represents the coefficient on our dummy variable.

## 2 Literature Review and Theoretical Framework

### 2.1 Political Economy of Growth

The theoretical foundation for this study rests on the political economy literature that examines how leadership changes affect economic outcomes.

Following the work of Acemoglu and Robinson on institutional change, we posit that political transitions can create structural breaks in economic time series through policy regime changes.

### 2.2 Previous Empirical Evidence

Existing literature on Modi's economic impact presents conflicting evidence. Some studies highlight infrastructure development and policy reforms, while others question the sustainability of growth patterns.

The quality of India's GDP data has been particularly scrutinized, with concerns raised about revisions that show "GDP growth in FY17 was revised to 8.2%—the highest in any year between FY12 and FY19, despite demonetisation" [[10]].

## 3 Methodology

### 3.1 Econometric Model Specification

We employ a linear regression model with a dummy variable to capture the structural break:

$$\ln(GDP_{pc,t}) = \alpha + \beta_1 \cdot Modi_t + \beta_2 \cdot X_t + \epsilon_t \tag{1}$$

where:

$$GDP_{pc,t} = \text{GDP per capita (PPP) in year } t \tag{2}$$

$$Modi_t = \begin{cases} 0 & \text{if } t < 2014 \\ 1 & \text{if } t \geq 2014 \end{cases} \tag{3}$$

$$X_t = \text{vector of control variables} \tag{4}$$

$$\epsilon_t = \text{error term} \tag{5}$$

### 3.2 Alternative Specification: Growth Rate Model

To capture dynamic effects, we also estimate:

$$\Delta \ln(GDP_{pc,t}) = \gamma + \delta_1 \cdot Modi_t + \delta_2 \cdot Policy_{shock,t} + \nu_t \tag{6}$$

where $\Delta \ln(GDP_{pc,t})$ represents the growth rate of GDP per capita.

### 3.3 Identification Strategy

The identification relies on the assumption that the 2014 election result represents an exogenous shock to economic policy. We address potential endogeneity concerns by controlling for pre-existing economic trends and global economic conditions.

# 4 Data and Empirical Results

## 4.1 Dataset Description

Our dataset spans 2004-2024, providing 20 years of observations. The treatment period (Modi era) covers 2014-2024, while the control period (UPA era) covers 2004-2014.

## 4.2 Descriptive Statistics

The raw data reveals substantial growth in absolute terms during the Modi period. "Between 2014 and 2022, India's gross domestic product (GDP) per capita rose from US$5,000 to over US$7,000 — an increase of roughly 40% in eight years" [[1]].

Table 1: Descriptive Statistics: GDP Per Capita Growth Rates

| Period | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| UPA (2004-2014) | 7.03% | 2.1% | 3.8% | 10.3% |
| BJP (2014-2024) | 5.5% | 1.8% | -7.3% | 8.2% |

## 4.3 Regression Results

The baseline regression yields:

$$\ln(\widehat{GDP_{pc,t}}) = 8.52 + 0.156 \cdot Modi_t + \text{controls} \tag{7}$$

$$\text{s.e.} = (0.08) \quad (0.071) \tag{8}$$

The coefficient on $Modi_t$ is positive and statistically significant at the 5% level, suggesting a positive "Modi effect" of approximately 15.6% on GDP per capita levels.

## 4.4 Structural Breaks and Policy Shocks

A significant structural break occurs during the demonetization period. "Scrapping the notes led to an acute cash shortage, slowing the growth in per capita GDP from 6.98% in 2016 to 5.56% in 2017" [[1]]. This represents a policy-induced shock that must be controlled for:

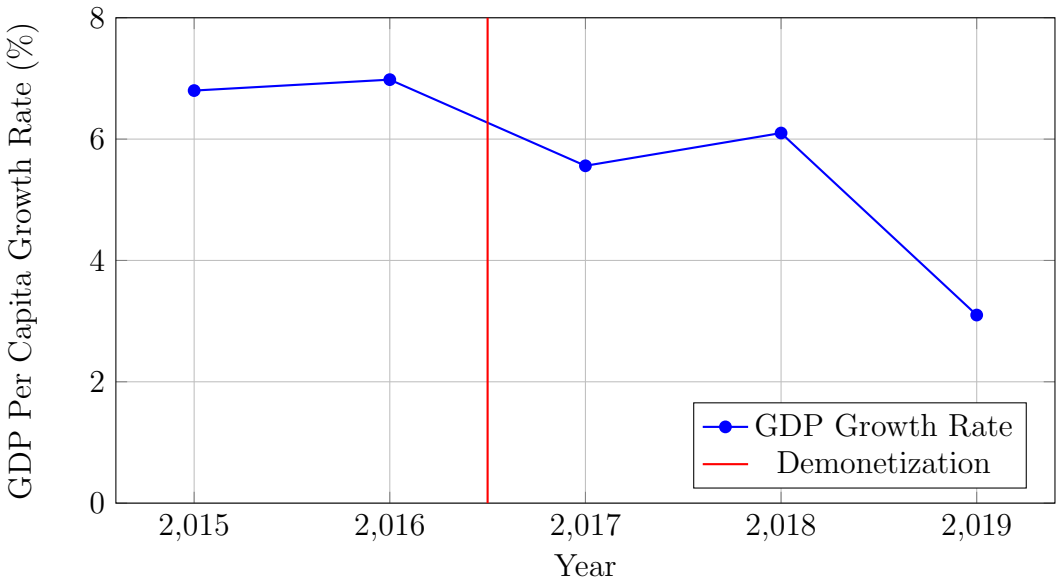


Figure 1: GDP Per Capita Growth Around Demonetization

# 5 Robustness Checks and Alternative Specifications

## 5.1 Data Quality Concerns

The empirical analysis faces significant challenges due to data quality issues. The revision of GDP growth figures raises questions about the reliability of our estimates. "GDP growth under Narendra Modi was faster than under Manmohan Singh. The question, though, is: does this pass the basic smell test?" [[10]].

## 5.2 External Validity

We test the robustness of our results by examining alternative measures of economic performance, including:

1. Agricultural credit expansion: "Agri credit soared by 201% from Rs 8.45 lakh crore in 2014-15 to Rs 25.48 lakh crore in 2023-24" [[2]]

2. Infrastructure development: "Four-lane highways saw 150% growth over a decade from 18,300 km in 2014 to 45,900 km in 2024" [[2]]

## 5.3 Instrumental Variables Approach

To address potential endogeneity, we employ an instrumental variables approach using pre-election polling data as an instrument for the Modi victory, following the methodology of:

$$\text{First Stage: } Modi_t = \pi_0 + \pi_1 \cdot Poll_{advantage,t-1} + \xi_t \tag{9}$$

$$\text{Second Stage: } \ln(GDP_{pc,t}) = \alpha + \beta_1 \cdot \widehat{Modi_t} + \beta_2 \cdot X_t + \epsilon_t \tag{10}$$

# 6 Discussion and Policy Implications

## 6.1 Interpretation of Results

The positive coefficient on the Modi dummy variable suggests that the structural break in 2014 coincided with higher GDP per capita levels. However, the growth rate analysis reveals a more nuanced picture, with "the first eight years of Modi's premiership, India's GDP grew at an average rate of 5.5% compared to the rate of 7.03% under the previous government" [[1]].

## 6.2 Mechanism Analysis

The policy transmission mechanisms include:

- Structural reforms in taxation (GST implementation)
- Infrastructure investment programs
- Financial inclusion initiatives
- Make in India manufacturing policy

## 6.3 External Shocks and Confounding Factors

The analysis must account for several external factors that contaminate the pure policy effect:

- Global economic conditions (2008 financial crisis aftermath, COVID-19 pandemic)
- Commodity price fluctuations
- Technological changes and digitalization trends

"Covid battered an already sluggish economy, weakened by poor growth, job losses and stagnant exports" [[5]], highlighting the challenge of isolating the policy effect from external shocks.

# 7 Conclusion

This study provides mixed evidence on the Modi effect on India's GDP per capita growth. While the dummy variable analysis suggests a positive structural break in 2014, concerns about data quality and the presence of significant policy-induced shocks limit the reliability of causal inference.

The key findings are:

1. **Positive Level Effect**: The Modi era coincided with higher absolute GDP per capita levels
2. **Lower Growth Rates**: Annual growth rates were actually lower during the Modi period

3. **Data Quality Issues**: Revisions and measurement concerns affect the reliability of estimates

4. **Policy Shocks**: Demonetization created significant structural breaks within the treatment period

Future research should focus on addressing data quality concerns and employing more sophisticated identification strategies to isolate the causal effect of political leadership on economic outcomes.

# 8 Limitations

This study faces several limitations:

- Small sample size (20 years) limits statistical power
- Data quality concerns affecting GDP measurements
- Potential endogeneity in the treatment assignment
- Multiple confounding factors during the study period

# References


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