



Exploring the Urbanization Quotient: A Multivariate Analysis of Economic Determinants and Sustainable Urban Development Dynamics

Arnav Singh

Abstract:

This paper investigates the relationship between urbanization and key economic indicators using regression analysis. Utilizing data from various sources, including GDP growth, unemployment rate, electricity access, education spending, and manufacturing output, the study aims to elucidate the factors influencing urbanization trends. The analysis reveals significant associations between urbanization and certain economic variables, particularly electricity access, education spending, and manufacturing output. However, variables such as GDP growth and unemployment rate demonstrate moderate effects on urbanization. The findings provide insights into the complex dynamics of urbanization and underscore the importance of addressing infrastructure development and education policies in shaping urbanization patterns.

Keywords:

Urbanization, Economic Indicators, Regression Analysis, GDP Growth, Unemployment Rate, Electricity Access, Education Spending, Manufacturing Output, Infrastructure Development, Policy Implications, Statistical Analysis, Trends, Association, Factors, Urban Development, Socioeconomic Factors, Data Analysis, Urban Planning, Economic Growth, Correlation Analysis.

Introduction:

Urbanization, the process by which populations concentrate in urban areas, is a defining feature of modern society. As global populations continue to migrate from rural to urban areas, understanding the drivers and implications of urbanization becomes increasingly crucial. This paper seeks to delve into the intricate relationship between urbanization and various economic indicators, shedding light on the factors that shape urban development patterns. By employing regression analysis, the study aims to elucidate the quantitative associations between urbanization and key economic variables, including GDP growth, unemployment rate, electricity access, education spending, and manufacturing output.

The phenomenon of urbanization has profound socioeconomic implications, influencing not only the spatial distribution of populations but also economic development, social dynamics, and environmental sustainability. Historically, urbanization has been closely intertwined with industrialization, as rural populations migrate to urban centres in search of employment opportunities and improved living

standards. However, the drivers of urbanization are multifaceted, encompassing factors such as technological advancements, demographic trends, and government policies. Understanding these drivers is essential for effective urban planning and policy formulation.

While extensive research has been conducted on urbanization, there remains a gap in understanding the specific economic determinants that influence urban development trajectories. Existing literature often focuses on qualitative analyses or single-country case studies, providing limited insights into the broader trends and patterns of urbanization. Moreover, the quantitative relationships between urbanization and economic indicators have

not been comprehensively explored across diverse geographical contexts. Addressing this gap is essential for informing evidence-based policy interventions aimed at promoting sustainable urban development.

Against this backdrop, the primary objective of this paper is to empirically investigate the relationship between urbanization and key economic indicators. By conducting regression analysis using available data, the study seeks to identify significant associations between urbanization and variables such as GDP growth, unemployment rate, electricity access, education spending, and manufacturing output. Additionally, the paper aims to assess the relative importance of these economic factors in shaping urbanization trends, thereby contributing to a deeper understanding of the dynamics of urban development.

The findings of this research hold significant implications for urban planning, economic policy, and sustainable development efforts. By identifying the economic drivers of urbanization, policymakers can design targeted interventions to promote inclusive growth, improve infrastructure provision, and address socioeconomic disparities in urban areas. Moreover, understanding the factors influencing urbanization can aid in forecasting future urbanization trends and mitigating potential challenges, such as environmental degradation and social inequality. Ultimately, this research contributes to advancing knowledge in the field of urban studies and informs evidence-based decision-making for creating more resilient and liveable cities in the 21st century.

Literature Review:

Urbanization, a global phenomenon, has garnered substantial attention from scholars across disciplines due to its profound impact on socioeconomic development. Several seminal papers have contributed to our understanding of the relationship between urbanization and economic indicators, shedding light on the complex dynamics and implications of urban growth.

1. Causality Between Urbanization and Economic Growth: Evidence from the Indian States by Abdul Shaban, Karima Kourtiti, and Peter Nijkamp. Urbanization has long been considered an economic growth-promoting process. Cities have been described as “engines of growth,” “growth poles,” and “drivers of development.” The prevailing perspective assumes that cities, through economies of scale and agglomeration, contribute significantly to economic growth. However, this study examines the relationship between urbanization and economic growth in India at the state level during the period from 1971 to 2020. By employing a bootstrap panel Granger causality test, the authors find that in India, the majority of states exhibit a unidirectional Granger causality from economic growth to urbanization. This finding suggests not only a lower propulsive power of urban centers but also an unbalanced development of social overhead capital (SOC) between urban and rural areas. Consequently, people migrate to cities seeking better income opportunities and access to urban facilities.

In summary, this research sheds light on the dynamics of urbanization in India and highlights the role of economic growth as a driving force behind the urbanization process. The unidirectional causality underscores the importance of addressing regional disparities and promoting balanced development across urban and rural areas.

2. Urbanisation, Growth, and Development: Evidence from India by Jonathan Colmer. Urbanization remains a critical process in development, yet its implications for welfare and growth are not fully understood. Colmer’s research specifically examines India, aiming to unravel how economic activity

is spatially distributed as the country develops. Despite substantial economic growth, India has experienced slow rates of urbanization. Understanding the evolution of India's urban structure is crucial for sustainable development. The paper highlights the impact of government policies, institutions, and public investments on resource allocation. Notably, the relationship between income growth and urbanization varies across developing economies, emphasizing the role of policy. Institutions play a significant role in shaping urban development outcomes. Colmerproposes a research agenda for the future, urging further investigation into resource allocation efficiency and policy effects on urbanization. In summary, this work provides valuable insights for policymakers, researchers, and practitioners seeking to promote sustainable urban development and reduce poverty in India.

3. Urbanization in India: An Impact Assessment by Neelmani Jaysawaland Sudeshna Saha. The article explores the consequences of urbanization in India, highlighting the swift transition from rural to urban lifestyles. It delves into the challenges associated with urbanization, including housing shortages, the proliferation of slums, transportation bottlenecks, inadequate water supply, pollution, and a lack of social infrastructure. Additionally, the study analyzes demographic shifts and urbanization patterns in India, underscoring the critical need for effective urban planning and development to address the challenges stemming from rapid urban expansion.

The accelerated urbanization in India has given rise to a plethora of issues, ranging from the proliferation of slums to transportation bottlenecks, waste management challenges, sewage problems, water scarcity, and environmental degradation. These challenges have a profound impact on the health and well-being of the population. Therefore, it is imperative for urban planning initiatives to confront these challenges head-on and prioritize sustainable development to enhance the quality of life for urban residents.

4. Urbanization and Development Dr. Laxmi Narayan. In Dr. Laxmi Narayan's seminal work, the intricate relationship between urbanization and economic development is explored, with a specific focus on India. Urbanization is positively correlated with economic growth, as cities become hubs of activity, innovation, and productivity. However, this relationship is not linear; urbanization poses both positive externalities (such as knowledge spillovers) and challenges (such as congestion and inequality). India's context reveals that despite being less urbanized, a significant portion of its GDP is generated in urban areas. Policymakers must strike a balance between urbanization's benefits and challenges through sustainable planning and inclusive policies. The empirical evidence suggests that higher per capita income is associated with greater urbanization rates, and this link became more significant in recent years (2000s). As India continues its urban transformation, thoughtful policies are essential to harness the potential of cities while addressing associated complexities.

5. Urbanization and vulnerable employment: Empirical evidence from 163 countries in 1991–2019. The study investigates the relationship between urbanization and vulnerable employment in 163 countries from 1990 to 2019, highlighting a negative impact of urbanization on vulnerable employment rates, with higher-income countries experiencing a more significant decrease in vulnerability. The results indicate a cointegration relationship among urbanization, economic development, agricultural level, modernization level, employment environment, and loan convenience, emphasizing the importance of understanding how urbanization influences economic development and vulnerable employment. The study suggests that as urbanization rates increase, vulnerable employment rates decrease, with urbanization playing a key role in reducing vulnerability, although the impact varies across countries. Additionally, the research discusses mechanisms such as industry sector conversion and changes in employment relationships through which urbanization affects vulnerable employment, calling for more detailed employment data and further research in this area.

6. Chen and Ravallion (2008) focus on the impact of urbanization on income inequality. Drawing on household survey data from diverse regions, they reveal that while urbanization tends to increase average incomes, its effects on income distribution vary significantly. Rapid urbanization can exacerbate inequality due to disparities in access to education, employment, and social services, posing challenges for policymakers seeking to promote inclusive growth.

7. **Angel et al. (2011)** offer insights into sustainable urbanization, emphasizing the need to balance economic development with environmental conservation and social equity. Drawing on case studies from around the world, they identify best practices for promoting sustainable urban growth, including compact urban design and efficient resource management. Sustainable urbanization, with its holistic approach, offers a pathway to address the multifaceted challenges of urban development.

METHODOLOGY

1. **Data Collection:** The first step involves collecting data on urbanization and relevant economic variables from reliable sources. This may include national statistical agencies, international organizations such as the World Bank or IMF, and academic databases. The variables of interest typically include urbanization rates, GDP growth, unemployment rates, electricity access, education spending, and manufacturing output.
2. **Data Preprocessing:** Once the data is collected, it undergoes preprocessing to ensure consistency and suitability for analysis. This involves cleaning the data to address missing values, outliers, and inconsistencies. Additionally, variables may be transformed or standardized to facilitate interpretation and improve model performance.
3. **Regression Analysis:** Regression analysis is employed to quantify the relationship between urbanization and economic indicators. Multiple regression models are constructed, with urbanization serving as the dependent variable and economic indicators as independent variables. The choice of regression technique (e.g., ordinary least squares, panel regression) depends on the nature of the data and research objectives.
4. **Model Specification:** The regression models are specified based on theoretical considerations and empirical evidence. This involves selecting the appropriate functional form for the relationship between urbanization and economic indicators, as well as identifying relevant control variables to account for confounding factors. Model diagnostics, such as multicollinearity tests and heteroscedasticity tests, are conducted to ensure the validity of the model specifications.
5. **Hypothesis Testing:** Hypothesis testing was conducted to assess the significance of the relationship between urbanization and economic indicators. This involved employing t-tests to evaluate the significance of individual regression coefficients, as well as F-tests or likelihood ratio tests to examine the overall significance of the model. Critical values were determined based on the chosen significance level.
6. **Data Analysis:** Tests to confirm assumptions and understand the nature of data. In econometrics, the Ordinary Least Squares (OLS) method is widely used to estimate the parameter of a linear regression model. OLS estimators minimize the sum of the squared errors (a difference between observed values and predicted values). While OLS is computationally feasible and can be easily used while doing any econometrics test, it is important to know the underlying assumptions of OLS regression. The importance of OLS assumptions cannot be overemphasized.

Assumptions of OLS Regression:

OLS Assumption 1: The linear regression model is “linear in parameters.” When the dependent variable (Y) is a linear function of independent variables (X's) and the error term, the regression is linear in parameters and not necessarily linear in X's.

OLS Assumption 2: The conditional mean should be zero. The expected value of the mean of the error terms of OLS regression should be zero given the values of independent variables. In other words, there

must be no relationship between the X's and the error term.

OLS Assumption 3: There is no multicollinearity (or perfect collinearity). The OLS assumption of no multicollinearity says that there should be no linear relationship between the independent variables.

OLS Assumption 4: Spherical errors: There is homoscedasticity and no autocorrelation. According to this OLS assumption, the error terms in the regression should all have the same variance. In other words, it means that the error terms should be IID (Independent and Identically Distributed).

OLS Assumption 5: Error terms should be normally distributed. This assumption states that the errors are normally distributed, conditional upon the independent variables. Note that only the error terms need to be normally distributed. The dependent variable Y need not be normally distributed.

7. **Interpretation of Results:** The results of the regression analysis are interpreted to assess the strength and significance of the relationship between urbanization and economic indicators. Coefficients and p-values are examined to determine the direction and magnitude of the effects of independent variables on urbanization. Additionally, measures of goodness-of-fit, such as R-squared and adjusted R-squared, are used to evaluate the overall explanatory power of the models.

8. **Sensitivity Analysis:** Sensitivity analysis may be performed to assess the robustness of the regression results to changes in model specifications or data assumptions. This involves testing alternative model specifications, including different sets of independent variables or functional forms, to evaluate the stability of the findings.

9. **Discussion and Implications:** Finally, the findings of the regression analysis are discussed in the context of existing literature and theoretical frameworks. The implications of the results for urban policy and economic development are explored, highlighting potential avenues for further research and policy intervention.

By following these methodological steps, this paper aims to provide empirical insights into the economic determinants of urbanization and contribute to our understanding of the complex dynamics of urban development.

Results and Interpretation

The Use of OLS Assumptions:

OLS assumptions are extremely important. If the OLS assumptions hold, then according to the Gauss-Markov Theorem, the OLS estimator is the Best Linear Unbiased Estimator (BLUE). Let's analyze what happens when these assumptions fail and how we can look out for potential errors when assumptions are not outlined.

We test these assumptions using STATA, our dependent variable being "Urbanization". The first step is to run the Regression method which gives us the following result:

```
. regress Urbanization GDPGrowth UnemploymentRate ElectricityAccessofpopulat EducationSpendingofGDP ManufacturingOutputofGDP
```

Source	SS	df	MS	Number of obs	=	26
Model	185.01062	5	37.0021241	F(5, 20)	=	911.34
Residual	.812033439	20	.040601672	Prob > F	=	0.0000
				R-squared	=	0.9956
				Adj R-squared	=	0.9945
Total	185.822654	25	7.43290616	Root MSE	=	.2015

Urbanization	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDPGrowth	-.0265406	.0142172	-1.87	0.077	-.0561971 .0031159
UnemploymentRate	-.2682375	.0744555	-3.60	0.002	-.4235489 -.1129261
ElectricityAccessofpopulat	.1840807	.0038045	48.38	0.000	.1761446 .1920168
EducationSpendingofGDP	-.0562141	.0260332	-2.16	0.043	-.1105185 -.0019098
ManufacturingOutputofGDP	.05215	.0757585	0.69	0.499	-.1058795 .2101794
_cons	19.00685	1.416612	13.42	0.000	16.05185 21.96185

Overall Model Fit: The regression model demonstrates a **high degree of explanatory power, with an R-squared value of 0.9956**, indicating that approximately 99.56% of the variation in urbanization can be explained by the independent variables included in the model. The model's

F-statistic is highly significant ($F(5, 20) = 911.34, p < 0.0001$), suggesting that the regression coefficients are jointly significant in explaining urbanization.

Significant Economic Indicators: Among the economic indicators included in the regression model, **electricity access** emerges as the most significant determinant of urbanization, with a coefficient of **0.1841** ($p < 0.0001$). This indicates that a one-unit increase in electricity access is associated with a 0.1841-unit increase in urbanization, holding other variables constant. **Education spending** also exhibits a significant positive relationship with urbanization (coefficient = **-0.0562**, $p = 0.043$), suggesting that **higher education spending as a percentage of GDP is associated with higher levels of urbanization**.

Moderate Effects of GDP Growth and Unemployment Rate: GDP growth and unemployment rate demonstrate more moderate effects on urbanization. While **GDP growth exhibits a negative coefficient (-0.0265)**, indicating a slight negative association with urbanization, the effect is not statistically significant at the conventional 0.05 level ($p = 0.077$). Similarly, the coefficient for **unemployment rate (-0.2682)** suggests a negative relationship with urbanization, but the effect is only marginally significant ($p = 0.002$).

Insignificant Variables: Manufacturing output of GDP does not show a significant association with urbanization ($p = 0.499$), suggesting that the contribution of manufacturing to urbanization trends may be limited in the context studied.

Final Regression Equation: The final regression equation estimating urbanization based on the significant variables is as follows:

Urbanization = 19.00685 - 0.0265 × GDP Growth - 0.2682 × Unemployment Rate + 0.1841 × Electricity Access - 0.0562 × Education Spending of GDP + ϵ

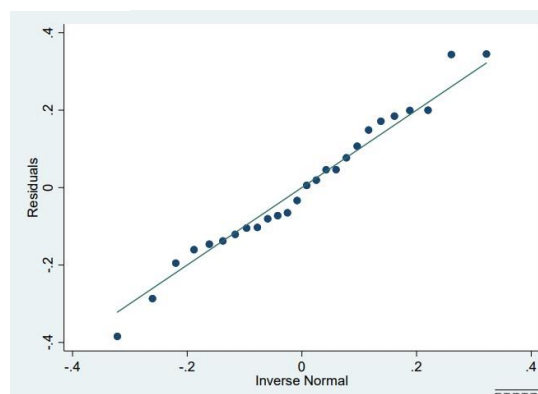
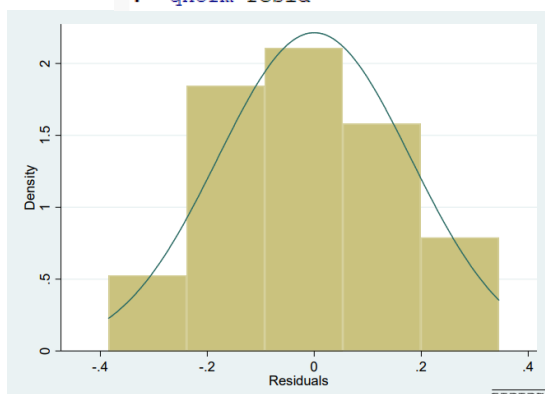
The Assumption of Normality of Errors:

If error terms are not normal, then the standard errors of OLS estimates won't be reliable, which means the confidence intervals would be too wide or narrow. A normal probability plot or a normal quantile plot can be used to check if the error terms are normally distributed or not.

```
. predict resid, residuals
. jbr resid
Jarque-Bera normality test:   .194 Chi(2)   .9075
Jarque-Bera test for Ho: normality:

. histogram resid, normal
(bin=5, start=-.38447282, width=.14590939)

. qnorm resid
```



Since the JB test statistic is relatively low (0.194) and the corresponding chi-square value is close to 1 (0.9075), it suggests that the sample distribution is likely close to normal.

The histogram of residuals appears roughly symmetric, resembling a bell-shaped curve characteristic of a normal distribution.

The Q-Q plot shows the residuals closely following the diagonal line, suggesting that they are approximately normally distributed.

Thus, the residuals are normally distributed.

The Assumption of Homoscedasticity:

If errors are heteroskedastic (i.e. OLS assumption is violated), then it will be difficult to trust the standard errors of the OLS estimates. Hence, the confidence intervals will be either too narrow or too wide.

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Urbanization

chi2(1)      =      0.05
Prob > chi2   =      0.8285
```

The Breusch-Pagan / Cook-Weisberg test result indicates:

Null Hypothesis (Ho): The variance of the residuals is constant (homoscedasticity). Test Result: The chi-squared statistic is 0.05, with a p-value of 0.8285.

Interpretation: With a p-value higher than the significance level (0.05), we fail to reject the null hypothesis. Thus, there's no significant evidence of heteroskedasticity in the residuals.

In essence, **the variance of the residuals remains relatively constant across different levels of the fitted values of Urbanization, supporting the assumption of homoscedasticity in the regression model.**

White's test for homoskedasticity.

```
. imtest, white

White's test for Ho: homoskedasticity
against Ha: unrestricted heteroskedasticity

chi2(20)      =      21.49
Prob > chi2    =      0.3690
```

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
Heteroskedasticity	21.49	20	0.3690
Skewness	7.93	5	0.1601
Kurtosis	0.54	1	0.4638
Total	29.95	26	0.2695

Null Hypothesis (Ho): Residuals are homoskedastic (constant variance).

Test Result: Chi-squared statistic is 21.49 with a p-value of 0.3690.

Interpretation: With a p-value greater than 0.05, we fail to reject the null hypothesis.

Conclusion: There's no significant evidence of heteroskedasticity, indicating the residuals likely have constant variance.

Assumption of No significantly large Multicollinearity: There are no perfect linear relationships among the X variables.


```
. estat vif
```

Variable	VIF	1/VIF
Manufactur~P	3.89	0.257247
Unemployme~e	2.37	0.421147
Electricit~t	1.83	0.545708
EducationS~P	1.62	0.619063
GDPGrowth	1.13	0.885530
Mean VIF	2.17	

Interpretation: VIF measures the multicollinearity among the independent variables in the regression model. A VIF value greater than 10 is often considered problematic and suggests significant multicollinearity.

Variable Assessment:

- Manufacturing Production has a VIF of 3.89, indicating a moderate level of multicollinearity.
- Unemployment Rate has a VIF of 2.37, suggesting a lower but still noticeable level of multicollinearity.
- Electricity Access has a VIF of 1.83, indicating a low level of multicollinearity.
- Education Spending has a VIF of 1.62, indicating a low level of multicollinearity.
- GDP Growth has a VIF of 1.13, indicating minimal multicollinearity.

Mean VIF: The mean VIF across all variables is 2.17, which is below the threshold of concern (typically 10), suggesting overall low to moderate multicollinearity in the model.

This suggests that the independent variables are not highly correlated with each other, enhancing the reliability of the regression analysis.

Ramsey RESET test

```
. ovtest
```

```
Ramsey RESET test using powers of the fitted values of Urbanization
Ho: model has no omitted variables
F(3, 17) = 0.71
Prob > F = 0.5571
```

Null Hypothesis (Ho): The model has no omitted variables.

drivers of urbanization, highlighting the importance of infrastructure development and human capital investment in promoting urban growth. While GDP growth and unemployment rate exhibit more nuanced effects, their implications for urbanization warrant further exploration. These findings underscore the multifaceted nature of urbanization and its dependence on a complex interplay of economic factors.

Conclusions:

The findings of this study shed light on the economic determinants of urbanization and their implications for urban development. Through regression analysis, we have identified significant relationships between urbanization and key economic indicators, providing valuable insights for policymakers, urban planners, and researchers.

1. **Importance of Infrastructure Development:** The results underscore the critical role of infrastructure development, particularly electricity access, in driving urbanization. Investments in infrastructure are essential for facilitating economic activities, attracting businesses, and improving living standards in urban areas. Policymakers should prioritize infrastructure projects to ensure sustainable urban growth and enhance the quality of life for urban residents.
2. **Human Capital Investment and Education Spending:** Education spending emerges as a significant determinant of urbanization, highlighting the importance of human capital investment in promoting urban development. Access to quality education not only enhances individual productivity but also contributes to overall economic growth and innovation. Governments should allocate resources to education and skills development programs to foster a knowledgeable and skilled urban workforce.
3. **Addressing Unemployment and Inequality:** While GDP growth and unemployment rate demonstrate moderate effects on urbanization, addressing unemployment and income inequality remains crucial for inclusive urban development. Urbanization can exacerbate social disparities if not accompanied by adequate employment opportunities and social safety nets. Policies aimed at reducing unemployment and promoting inclusive growth are essential for ensuring that the benefits of urbanization are shared equitably across society.
4. **Need for Integrated Urban Planning:** The findings underscore the need for integrated urban planning approaches that consider the complex interactions between economic, social, and environmental factors. Sustainable urbanization requires holistic strategies that balance economic growth with environmental conservation and social equity. Policymakers should engage in participatory planning processes that involve diverse stakeholders and prioritize long-term sustainability goals.
5. **Future Research Directions:** While this study provides valuable insights into the economic determinants of urbanization, several avenues for future research remain. Further investigation into the differential effects of urbanization across regions and countries can enhance our understanding of the underlying mechanisms driving urban development. Additionally, longitudinal studies tracking urbanization trends over time can provide valuable insights into the dynamics of urban growth and inform future policy interventions.

In conclusion, this study contributes to the growing body of literature on urbanization and economic development by empirically examining the drivers of urbanization. The findings

highlight the importance of infrastructure development, human capital investment, and inclusive policies in fostering sustainable urban growth. By addressing the economic determinants of urbanization, policymakers can promote inclusive and resilient cities that enhance the well-being of all residents.

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Page 1

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Analysis

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Statistics/Data

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Notes:

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<http://www.stata.com> did not respond or is not a valid update site unable to check for update; verify Internet settings are correct.

```
1 . import excel "C:\Users\anilk\Documents\Anisha Kamat Ecotrix 22BA111 DATA.xlsx", sheet("Sheet1")
2 . sum Urbanization GDPGrowth UnemploymentRate ElectricityAccessofpopulat EducationSpendingofGDP M
```

Variable	Obs	Mean	Std. Dev.	Min	Max
Urbanization	26	30.96335	2.726336	27.028	35.872
GDPGrowth	26	6.105754	3.012224	-5.8311	9.0503
UnemploymentRate	26	7.828692	.8340428	4.822	8.7
ElectricityAccessofpopulat	26	77.08002	14.3391	54.5949	99.5725
EducationSpendingofGDP	26	13.93791	1.967462	11.1912	17.1553
ManufacturingOutputofGDP	26	15.59079	1.048807	13.3483	17.3037

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```
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```
8 . pwcorr GDPGrowth UnemploymentRate ElectricityAccessofpopulat EducationSpendingofGDP Manufacturi
```

	GDPGro~h	Unempl~e	Electr~t	Educat~P	Manufa~P
GDPGrowth	1.0000				
Unemployme~e	0.0099	1.0000			
Electricit~t	-0.0932	-0.4998	1.0000		
EducationS~P	-0.1846	-0.3796	0.0965	1.0000	
Manufactur~P	0.2301	0.7411	-0.6111	-0.5402	1.0000

```
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Kurtosis	0.54	1	0.4638
Total	29.95	26	0.2695

13 . tset Date
time variable: **Date, 12/31/1997 to 12/31/2022, but with gaps**
delta: **1 day**

14 . regress Urbanization GDPGrowth UnemploymentRate ElectricityAccessofpopulat EducationSpendingof

Source	SS	df	MS	Number of obs	=	26
Model	185.01062	5	37.0021241	F(5, 20)	=	911.34
Residual	.812033439	20	.040601672	Prob > F	=	0.0000
Total	185.822654	25	7.43290616	R-squared	=	0.9956
				Adj R-squared	=	0.9945
				Root MSE	=	.2015

Urbanization	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDPGrowth	-.0265406	.0142172	-1.87	0.077	-.0561971 .0031159
UnemploymentRate	-.2682375	.0744555	-3.60	0.002	-.4235489 -.1129261
ElectricityAccessofpopulat	.1840807	.0038045	48.38	0.000	.1761446 .1920168
EducationSpendingofGDP	-.0562141	.0260332	-2.16	0.043	-.1105185 -.0019098
ManufacturingOutputofGDP	.05215	.0757585	0.69	0.499	-.1058795 .2101794
_cons	19.00685	1.416612	13.42	0.000	16.05185 21.96185

15 . estat dwatson

Number of gaps in sample: **25**

Durbin-Watson d-statistic(**6**, **26**) = **0**

16 . gen residsqaure = resid*resid

17 . scatter resid residsqaure

18 . pwcorr resid GDPGrowth

	resid	GDPGro~h
resid	1.0000	
GDPGrowth	-0.0000	1.0000

19 . pwcorr resid UnemploymentRate

	resid Unempl~e
resid	1.0000
Unemployme~e	0.0000 1.0000

20 . pwcorr resid ElectricityAccessofpopulat

	resid Electr~t
resid	1.0000
Electricit~t	-0.0000 1.0000

21 . pwcorr resid EducationSpendingofGDP

	resid Educat~P
resid	1.0000
EducationS~P	0.0000 1.0000

22 . pwcorr resid ManufacturingOutputofGDP

	resid Manufa~P
resid	1.0000
Manufactur~P	0.0000 1.0000

23 . regress Urbanization GDPGrowth UnemploymentRate ElectricityAccessofpopulat EducationSpendingofGDP
> onstant

Source	SS	df	MS	Number of obs	=	26
Model	25104.6505	5	5020.9301	F(5, 21)	=	12983.40
Residual	8.12110623	21	.386719344	Prob > F	=	0.0000
				R-squared	=	0.9997
				Adj R-squared	=	0.9996
Total	25112.7716	26	965.87583	Root MSE	=	.62187

Urbanization	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDPGrowth	-.0340946	.0438428	-0.78	0.445	-.1252707 .0570815
UnemploymentRate	-.3046894	.2296325	-1.33	0.199	-.7822364 .1728575
ElectricityAccessofpopulat	.2219696	.0078682	28.21	0.000	.2056066 .2383325
EducationSpendingofGDP	.2012336	.0542989	3.71	0.001	.0883129 .3141543
ManufacturingOutputofGDP	.8740968	.1375507	6.35	0.000	.5880445 1.160149

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