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Exploring the Link between Urban Growth, Industrial Development, and Employment Challenges in Developing Nations: A Comprehensive Analysis

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ABSTRACT

Objective: This research aims to investigate the correlation between urbanization, industrialization, and unemployment in low- and middle-income nations, recognizing the critical role of the industrial sector in stabilizing their economies. The study seeks to contribute to the understanding of the dynamics between these variables and their implications for economic development and employment trends.

Research Gap: While the industrial sector's impact on unemployment rates in developing countries has garnered significant attention, there remains a gap in the literature regarding the specific relationships between urbanization, industrialization, and unemployment. This study aims to address this gap by conducting a comprehensive analysis using variable regression analysis, focusing on data from 1990 to 2021.

Design/Methodology/Approach: The study utilizes variable regression analysis as the analytical method and employs data on urban population, industrialization, total unemployment, GDP growth, total labor force, and inflation from the World Development Indicator database. The empirical investigation applies the generalized method of moments approach and utilizes the Augmented Dickey-Fuller test to assess the presence of a unit root in the data, ensuring robustness in the analysis.

The Main Findings: The findings demonstrate that urbanization correlates positively with GDP growth and the overall labor force but exhibits adverse relationships with unemployment, industrialization, and inflation. Conversely, unemployment shows positive associations with the labor force, urbanization, industrialization, and inflation. Furthermore, the results highlight a positive connection between industrialization and GDP growth, while indicating negative associations between industrialization and both urbanization and inflation.

Theoretical / Practical Implications of the Findings: These findings have theoretical implications for understanding the complex interplay between urbanization, industrialization, and unemployment in low- and middle-income countries. They underscore the need for policymakers to focus on enhancing industrialization to mitigate the adverse effects of urbanization and inflation on unemployment rates. Moreover, governments in these countries must prioritize addressing inflationary pressures to ensure sustainable economic growth and employment opportunities for their populations.

Originality/Value: By employing a rigorous analytical approach and utilizing comprehensive datasets, the study provides valuable data and practical implications for policymakers seeking to promote economic stability and reduce unemployment in these regions.

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1. Introduction

Urbanization involves the movement of a growing population from rural regions to urban hubs. It encompasses two primary elements: the rise in the proportion of people residing in cities and the expansion of city boundaries in terms of physical space. This trend is observed globally, including in developing nations. Urbanization brings several advantages like better job opportunities and improved access to healthcare and education. However, it requires thoughtful management to minimize its negative effects on people and the environment. Achieving this involves strategic investments in infrastructure, advocating for sustainable urban growth, and ensuring fair and inclusive urban spaces for everyone (Kavzoglu, 2008).

Researching urbanization poses challenges due to discrepancies in defining urban communities across various regions and the lack of current census data. This study delves into the evolution of the concept and explores diverse approaches to urbanization, examining their links to frameworks for economic growth. Rather than perceiving urbanization as a problem, this study centers on governance challenges and advocates for a complementary perspective on urban governance, underscoring the necessity for renewed attention. The urbanization process in developing nations calls for a strong focus on effective governance structures and policies. This includes addressing poverty, and offering expanded access to education, housing, transportation, employment opportunities, public health facilities, and other essential amenities. Policymakers and governing bodies must confront these challenges by crafting solutions tailored to the context, in the form of sustainable policies. The crucial step lies in effectively implementing and evaluating these policies at the national level (Yasin, Sattar, & Faiz 2021; Majeed & Tauqir 2020).

Unemployment refers to the situation where individuals are willing and capable of working but cannot secure employment opportunities. It's a prevalent economic challenge with potentially significant social and economic impacts. Unemployment manifests in various forms. Frictional unemployment occurs when individuals are transitioning between jobs, often seeking better positions or changing careers. Structural unemployment arises due to a mismatch between a worker's skills, qualifications, and available job opportunities. Cyclical unemployment is a result of a weak economy, prompting companies to lay off employees to save costs. Seasonal unemployment occurs when jobs, such as those in agriculture or tourism, are only available during specific seasons (Brown, 2013).

Financial hardship due to unemployment can make it challenging for individuals and families to cover essential needs such as housing, food, and medical care. The reduced spending capacity of the unemployed leads to a decrease in demand for goods and services. Moreover, the dissatisfaction resulting from limited job prospects and discontent with government policies due to unemployment can lead to social unrest and political instability. Long-term unemployment can further exacerbate the situation by causing skill deterioration and reduced employability, making it increasingly difficult for individuals to secure jobs in the future (Shahid, 2014).

Industrialization had a profound impact on society during the Industrial Revolution, a period that unfolded in Europe and North America during the 18th and 19th centuries, revolutionizing agriculture, transportation, and communication. The advent of steam power, new organizational structures, and the advancement of technology gave rise to new industries like textiles, iron and steel, and coal mining. These changes reshaped the social and economic fabric of the time. Industrialization remains a major driving force behind economic growth and development in numerous nations today, particularly in Asia and Africa. However, it also brings about adverse effects on both the social and natural landscape, such as income inequality, urbanization, and environmental pollution. To mitigate these detrimental impacts, many countries are implementing policies and regulations to ensure that industrialization is both equitable and sustainable (Hussain & Zhou 2022; Ahmed, Ahmad & Ahmed, 2022; Khan et al., 2020; Yasin, Ahmad & Chaudhary, 2021).

1.1. Objectives of the Study

The objective clearly articulates the primary aim and intention of the researcher in carrying out a research plan. Providing answers to research questions and devising strategies to address a specific problem

constitutes the central goal of the study. In addition to this overarching objective, the study outlines several specific objectives such as: investigation of the interconnection or relationship between urbanization, industrialization, and unemployment and offering policy recommendations regarding the correlation between urbanization, industrialization, and unemployment. It aims conducting empirical evaluations to determine the long-term relationship between urbanization, industrialization, and unemployment in developing countries.

2. Literature Review

Phillips (2004) conducted an in-depth analysis of how politics influenced changes in unemployment rates across 13 industrialized democracies from 1960 to 1999. Their study introduced innovative tests to assess opportunistic and partisan business cycle models, utilizing comprehensive data and robust specifications, thereby advancing beyond prior research in this area. Additionally, the research explored the relationship between political stability and economic stability by drawing insights from both microeconomic and macroeconomic sources. The study's findings highlighted a distinctive partisan impact, revealing higher unemployment rates associated with "right" parties as opposed to "left" parties. These results significantly contribute to our comprehension of the intricate connection between political ideology and the dynamics of unemployment within industrialized democracies (Moore et al., 2003; Uzonwanne et al., 2015).

Kearney et al., (2023) discussed how nearly half of the global population now resides in urban settlements, emphasizing the significance of cities in providing improved employment opportunities, education, healthcare, and diverse cultural experiences. These urban centers make substantial contributions to the economies of developing countries. The primary focus of their study was to investigate the global impact of urbanization on public health. The research underscored that rapid and often uncontrolled urban growth is typically accompanied by a host of challenges, including poverty, environmental degradation, heightened population demands, and increased unemployment rates. The available data reveals numerous health hazards associated with urban living, including inadequate housing, overcrowding, air pollution, crime, poverty, and unemployment. Addressing these complex challenges necessitates the dedicated attention and collaborative efforts of local and national governments, as well as multilateral organizations (Patil, 2014).

Castells-Quintana and Royuela (2012) delved into the correlation between unemployment and long-term economic growth, placing particular emphasis on income disparities and urbanization. The study employed cross-sectional international data from 1980 onwards to explore this relationship. The key variables examined in the study comprised GDP, education levels, life expectancy, inequality, unemployment rates, and urbanization rates. The researchers' analysis revealed that elevated levels of unemployment, in conjunction with escalating income disparities, exerted an adverse effect on subsequent long-term economic growth. These outcomes underscore the criticality of addressing both unemployment and income inequality to facilitate enduring economic growth.

Ravi, Kapoor, and Ahluwalia (2012) conducted an assessment of the effects of the National Rural Employment Guarantee Scheme (NREGS) on different facets linked to urbanization in India. These aspects encompassed rural-urban migration, urban unemployment, inequality, and other related challenges. Through data analysis, the study presented compelling evidence showcasing that the NREGS played a significant role in decreasing rural-to-urban migration in India, achieving a reduction rate of 27.9 percent. Moreover, the scheme significantly contributed to a substantial decrease in urban unemployment, with a reduction rate of 38.7 percent (Mahajan 2015; Mani et al., 2014; Srinivasan 2014).

Uzonwanne, Iregbenu, and Ezenekwe (2015) conducted a study on the challenges associated with urbanization and urban unemployment in Nigeria within the context of sustainable development. The researchers collected data from reputable sources, including the Central Bank of Nigeria. Employing a descriptive statistical technique, they analyzed the data to examine the relationship between urbanization, urban unemployment, and sustainable growth. Additionally, the researchers utilized Harris-Todaro's model of migration and unemployment to support their arguments and provide a theoretical framework for their

investigation. The study's findings shed light on the detrimental impact of urban unemployment and urbanization on the sustainable development of the Nigerian economy (Sun et al., 2023).

Chandrasekhar and Sharma (2015) assessed the spatial patterns of internal migration and urbanization in India. Despite being one of the world's top 10 economies, India had a relatively low urbanization rate of 31.16 percent in 2011, underscoring the necessity of comprehending the dynamics of urbanization within the country. To gather pertinent data, the researchers relied on reputable sources such as the Census of India for the years 2001 and 2011, as well as the All-India Household Survey of Employment, Unemployment, and Migration Particulars, which is periodically collected by the National Sample Survey Organization (NSSO). The study yielded two significant findings. Firstly, it revealed a decrease in population growth within megacities from 2001 to 2011 when compared to the previous decade of 1991-2001, indicating a shift in population dynamics within urban areas. Secondly, the study highlighted that internal migration in India is predominantly characterized by state migration, particularly rural-rural migration (Ali et al., 2021).

Yuan and Guanghua (2015) delved into the interconnections among grain surplus, international trade, and urbanization, examining both closed and open economy contexts, with a particular focus on emerging countries in Asia. The research spanned the period from 1993 to 2010 and utilized a theoretical model to explore the dynamics between grain surplus and urbanization. The study's findings uncovered a comprehensive negative correlation between international trade and the level of urbanization. However, when delving into specific trade types such as cereal and non-cereal trade, unique patterns surfaced. Cereal trade demonstrated a historically positive correlation with urbanization, whereas non-cereal trade showcased a negative correlation. These insights shed light on the complex interplay between grain surplus, international trade, and urbanization within the specific context of emerging Asian countries (Ali & Ejaz 2021).

Gollin, Jedwab, and Vollrath (2016) undertook a thorough investigation into the effects of urbanization under distinct conditions, particularly with and without industrialization. Their study encompassed a sample of 116 developing nations. The analysis spanned a substantial timeframe, from 1960 to 2010, enabling a comprehensive examination of the research variables. To evaluate the relationship, the researchers utilized a cross-sectional estimation approach, considering various variables such as natural resource exports, urbanization rate, manufacturing, and services. The study's findings unveiled a positive correlation between natural resource exports and urbanization. This implies that countries heavily reliant on natural resource exports tend to experience higher levels of urbanization.

Yasin, Sattar, and Faiz (2021) delved into the connection between rapid urbanization and social-ecological degradation in Pakistan. The main objective of their research was to investigate the repercussions of unplanned and disorderly expansion, with a specific focus on the emergence of environmental issues such as pollution, insufficient drainage systems, substandard drinking water, and unclean environments. To collect data for their study, the researchers utilized a self-administered questionnaire and implemented a multistage sampling technique, resulting in a sample of 200 respondents. The findings underscored the pressing necessity for monitoring and managing the influx of migrants from rural to urban areas, while also highlighting the importance of providing fundamental facilities and services in rural regions.

3. Data Methodology

In this research, the analysis was conducted using time panel data based on secondary sources. The study involved various variables, including urban population, log of industry value added, total unemployment, GDP growth, total labor force, inflation Consumer Price, and GDP growth. The research incorporated different methods such as Augmented Dickey-Fuller (ADF), Generalized Method of Moments (GMM), unit root tests, and Autoregressive Distributed Lag (ARDL) models to estimate the correlation, linearity, or non-linearity among these dependent and independent variables. Specifically, the GMM technique was utilized to examine the relationship or link between urbanization, industrialization, and unemployment

nexus. The analysis encompassed a data collection period from 1990 to 2021. The data used in this study were sourced from the World Development Indicators (WDI) database.

3.1. Descriptive Analysis

Descriptive analysis is a statistical method used to summarize and characterize the essential features of a dataset or sample. Its purpose is to provide a concise summary of important traits, aiding in a better understanding of the fundamental elements of the data. Descriptive analysis aims to offer a succinct and insightful description of the data, enabling researchers or analysts to grasp the prominent characteristics of the dataset. To achieve this, descriptive analysis calculates various measures and statistics to explain the central tendency, variability, and distribution of the data.

Table 1: Descriptive Analysis

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
UPG	2.7005	2.7085	3.3573	2.1211	0.2747	0.1420	3.0894
UNT	5.3732	5.4267	6.5928	4.2570	0.5082	-0.3919	3.8712
LFTP	63.6767	64.2982	66.9160	58.3254	2.4714	-0.4746	2.1167
GDPG	4.8046	4.9001	8.8608	-1.2599	2.1260	-0.4403	3.6708
INVL	28.9869	28.9671	30.1530	27.8549	0.8145	0.0078	1.3314
ICP	6.3373	4.8926	22.1472	2.7055	4.0066	2.1976	8.6725

Source: Authors' Calculation

The value of UPG represented as 2.7005 in this table, is displayed as a percentage. UPG experienced an increase from a minimum value of 2.1211 to a peak value of 3.3573. Its skewness value is 0.14, indicating a slight asymmetry and its kurtosis value is 3.0894, suggesting a relatively peaked distribution. On the other hand, UNT, with a median value of 5.3732 percent, also displayed a rise from a minimum value of 4.2570 to a maximum value of 6.5928. Its skewness value is -0.3919, indicating a negative skew and its kurtosis value is 3.8712, indicating a relatively sharp peak and heavy tails. LFT has an average value of 63.67 percent, and the LFTP ranged from a minimum of 58.3254 to a maximum of 66.9160. The skewness value for LFT is -0.4746, indicating a negative skew and its kurtosis value is 2.1167, suggesting a moderate peak and tails. GDPG has an average value of 4.8046 percent, fluctuating from a minimum of -1.2599 to a maximum of 8.8608. Its skewness value is -0.4403, indicating a negative skew and its kurtosis value is 3.6708, signifying a relatively peaked distribution with heavy tails. Lastly, INVL has an average value of 28.9869 percent, ranging from a minimum of 27.8549 to a maximum of 30.1530. Its skewness value is 0.0078, suggesting a nearly symmetric distribution and its kurtosis value is 1.3314, indicating a moderate peak.

Table 2: Correlation Analysis

	GDPGA	UPG	UNT	LFTP	INVL	ICP
GDPG	1.0000					
UPG	-0.0888	1.0000				
UNT	0.4530	-0.7386	1.0000			
LFTP	-0.0463	0.9368	-0.5988	1.0000		
INVL	0.0860	-0.8911	0.4878	-0.9571	1.0000	
ICP	-0.1818	0.6966	-0.6579	0.6288	-0.6302	1.0000

Source: Author's Estimation by using E-views 9

The Gross Domestic Product Growth (GDPG) shows a negative connection with Low Foreign Trade Performance (LFTP), Individual Consumption Per Capita (ICP), and Unemployment Rate (UPG), but it has a positive link with Urbanization Rate (UNT) and Investment Level (INVL). The Unemployment Rate (UPG) is positively related to Individual Consumption Per Capita (ICP) and Low Foreign Trade Performance (LFTP), while GDPG is negatively associated with Investment Level (INVL) and Low

Foreign Trade Performance (LFTP). The correlation between Urbanization Rate (UNT) and GDPG, LFTP, and UNT is positive, whereas the correlation between Investment Level (INVL) and ICP and UPG is negative. In contrast to its unfavorable association with Investment Level (INVL) and Urbanization Rate (UNT), Low Foreign Trade Performance (LFTP) exhibits positive correlations with GDPG, ICP, and UPG. Investment Level (INVL) correlates positively with GDPG, ICP, and LFTP, but negatively with UPG. GDPG, UPG, and Individual Consumption Per Capita (ICPA) all demonstrate positive correlations with ICP, while UNT and INVL have negative correlations.

Table 3: Augmented Dickey-Fuller Test

Variables	Level		1 st difference		Conclusion
	Intercept	Trend and intercept	Intercept	Trend & intercept	
GDPG	-4.0667* (0.0036)	-3.9122 (0.0235)	-6.2952 (0.0000)	-6.6726 (0.0000)	I (0)
LFTP	2.654667 (1.0000)	-2.1383 (0.5054)	-7.4411 (0.0000)	-8.6720 (0.0000)	I (1)
ICP	-2.704124*** (0.0847)	-3.5965 (0.0466)	-5.7723 (0.0000)	-5.6908 (0.0004)	I (0)
UNT	-1.6909 (0.4258)	-1.9425 (0.6085)	-5.7623 (0.0000)	-5.6462 (0.0004)	I (1)
UPG	0.2449 (0.9708)	-1.6746 (0.7375)	-3.3105** (0.0233)	-2.8129	I (1)
INL	0.0168 (0.9532)	-3.3273 (0.0849)	-3.9486 (0.0050)	-3.8792** (0.0258)	I (1)

Source: Author’s Estimation by using E-views 9

The table indicates that the GDPG variable is stable at the level, with a probability value of 0.0036. However, when considering a first-order difference, the GDPG variable exhibits a unit root, with a probability value of 0.0000. In the case of the LFTP variable, a unit root is observed with a first-order difference intercept, resulting in a probability value of 1.0000. Conversely, when it remains stable at the intercept, the likelihood is 0.0000. For the ICP variable, the probability of stability at the intercept point is 0.0847, while it demonstrates stationarity with a first-order difference intercept, yielding a probability value of 0.0000. The likelihood of the UNT variable being stationary with a first-order difference intercept is 0.000, compared to a probability of 0.4258 for stability at the level intercept. As for the UPG variable, it shows a unit root at the level intercept, with a probability value of 0.9708, and attains stability at the first-order difference intercept point, with a probability value of 0.0233. Likewise, the INL variable manifests a unit root at the level intercept, with a probability value of 0.9532, and achieves stability at the first-order difference intercept point, where the probability is 0.0050.

Table 4: Generalized Method of Moment Long-Run Estimates for Three Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UPG	-1.91	0.37	-5.16	0.00
LFTP	-0.14	0.06	-2.43	0.02
GDPG	0.08	0.01	5.25	0.00
INVL	-0.83	0.15	-5.32	0.00
ICP	-0.02	0.00	-3.70	0.00
C	43.98	7.64	5.75	0.00
R-squared	0.87			J-statistic 5.8139
Adjusted R-squared	0.85			Prob(J-statistic) 0.0159
Variable	Coefficient	Std. Error	t-Statistic	Prob.
UPG	-0.86	0.44	-1.91	0.06
UNT	-0.64	0.17	-3.70	0.00
GDPG	0.06	0.01	5.09	0.00
ICP	-0.02	0.00	-2.68	0.01
C	52.03	1.53	33.97	0.00

R-squared	0.95	J-statistic	5.21
Adjusted R-squared	0.95	Prob(J-statistic)	0.02

Source: Author’s Estimation by using E-views 9

The urban population is what we're trying to explain in this model. We're looking at factors like the unemployment rate, labor force participation rate, GDP growth, industrialization, and inflation to understand how they affect the urban population. The findings indicate that higher unemployment levels have a significant and negative impact on the urban population. Inflation, while noteworthy, doesn't show a strong statistically significant effect. On the flip side, the entire labor force has a notable positive impact on the urban population. Moreover, we've found a strong and positive relationship between GDP growth and the urban population.

In the second model, we are focusing on the total unemployment rate as the main factor we want to explain. We're considering factors such as the labor force participation rate, urban population, GDP growth, industrialization, and inflation to understand their influence. The empirical results indicate that the urban population has a notable and negative effect on the overall unemployment rate. Similarly, the overall labor force has a significant and negative impact. Additionally, we find that GDP growth has a substantial and positive effect on reducing unemployment. On the other hand, industrialization and inflation show a strong and negative correlation with unemployment.

In the third model of this study, we're considering explanatory factors like the urban population, overall unemployment, GDP growth, and inflation, with a focus on industrialization as the dependent variable. The findings reveal a significant and positive impact of GDP growth on industrialization. Conversely, the urban population has a notable and negative effect on industrialization. Furthermore, the total unemployment rate shows a considerable and negative impact on industrialization.

3.2 Diagnostic analysis

The phrase "diagnostic analysis" pertains to examining and assessing statistical models to ascertain their appropriateness, identify potential weaknesses or deviations from assumptions, and ensure the precision of the model's results. To assess the model's soundness and address any concerns or limitations, various diagnostic tests, and procedures need to be conducted.

Table 5: Diagnostic Test for Models

Name of Test	F-Statistic	Probability
Model 1		
Breusch-Godfrey correlation LM test	2.5092	0.0840
Heteroskedasticity	1.3253	0.2845
Model 2		
Breusch-Godfrey correlation LM test	2.5159	0.1019
Heteroskedasticity	2.3058	0.0734
Model 3		
Breusch-Godfrey correlation LM test	2.5159	0.0754
Heteroskedasticity	1.5610	0.2132

Source: Author’s Estimation by using E-views 9

Two tests are utilized in the diagnostic analysis of the models. For model 1, the Breusch-Godfrey Correlation LM Test yields an F-Statistics value of 2.5092 with a corresponding p-value of 0.0840. Additionally, the Breusch Pagan Godfrey Test for Heteroscedasticity results in an F statistic of 1.3253 with a probability value of 0.2845. In model 2, the F-Statistics value for the Breusch Pagan Godfrey Test for Heteroscedasticity is 2.3058, and the associated probability value is 0.0734. Simultaneously, the F statistic for the Breusch-Godfrey Correlation LM Test is 2.5159, yielding a p-value of 0.1019. Lastly, in model 3, the F-Statistics value of the Breusch-Godfrey Correlation LM Test stands at 2.5159 with a p-value of 0.0754, whereas the F statistic of the Breusch Pagan Godfrey Test for Heteroscedasticity is 1.5610, yielding a probability value of 0.2132.

4. Conclusion

In summary, the study sheds light on the notable and adverse correlation between the urban population, industrialization, and total unemployment. In the initial model, the urban population is designated as the dependent variable, while total unemployment, total labor force, GDP growth, industrialization, and inflation are treated as explanatory variables. The results demonstrate a substantial and negative impact of total unemployment on the urban population. Similarly, inflation displays a negative effect, though not statistically significant. Conversely, the total labor force exerts a significant and positive influence on the urban population. Moreover, GDP growth is identified as having a positive and significant relationship with the urban population.

Transitioning to the second model, the focal point is total unemployment as the dependent variable, while the urban population, total labor force, GDP growth, industrialization, and inflation serve as explanatory variables. The empirical results suggest a substantial and adverse effect of the urban population on total unemployment. Likewise, the total labor force significantly and negatively impacts unemployment. Furthermore, GDP growth is established to positively and significantly affect unemployment. However, inflation and industrialization display a negative and significant relationship with unemployment.

Shifting to the third model, with industrialization as the dependent variable, the study incorporates the urban population, total unemployment, GDP growth, and inflation as explanatory variables. The results reveal a notable and adverse impact of the urban population on industrialization, while GDP growth exhibits a positive and significant effect. Additionally, total unemployment is identified to have a negative and significant influence on industrialization.

4.1. Policy Recommendations

Advocate for sustainable urbanization policies prioritizing infrastructure enhancement, affordable housing, and improved access to essential services like healthcare and education. Invest substantially in skills development and entrepreneurship initiatives to facilitate a shift from conventional industrial activities to a more diverse and innovative economic landscape. Promote entrepreneurship and offer strong support to small businesses, fostering economic activity and generating numerous employment prospects.

Enhance collaborations between schools and businesses to ensure education and training are in sync with current market demands. Offer financial benefits and tax advantages to motivate companies to invest in key industrial areas. Promote investment in high-growth sectors like technology, manufacturing, and services, fostering job creation, attracting private funds, and stimulating economic growth, ultimately boosting GDP. Manage inflation by adopting strategies that maintain stable and reasonable prices for urban dwellers through prudent handling of the nation's monetary supply and government expenditure.

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