

The urbanization-economic growth nexus in Egypt: the mediation role of FDI

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Abstract

As global migration from rural to urban areas increases, bringing diverse effects on human well-being, urbanization has become a key focus in global development policies and initiatives. This study examines the relationship between economic growth and urbanization in Egypt, concentrating on the role of foreign direct investment (FDI) as a mediator factor. using annual data from 1980 to 2023. The analysis applies the ARDL model to assess both short- and long-term relationships, with robustness checks conducted using FMOLS and CCR methods. Although urbanization and foreign direct investment (FDI) individually showed a positive impact on economic growth, their interaction (URB*FDI) had a negative effect. These findings suggest that rapid urbanization without sufficient planning may reduce the effectiveness of foreign investments in supporting economic growth. According to these results Policymakers should manage urban growth and foreign investment to benefit the economy by improving infrastructure and preventing overcrowding. Also, foreign investments should be directed toward high-value-added productive sectors, such as advanced manufacturing and technology.

Keywords: urbanization, economic growth, FDI, ARDL, FMOLS, CCR

1- INTRODUCTION

Global urbanization has become an unavoidable reality, placing sustainable urban development that supports economic growth as a primary priority. According to (World Bank, 2023), Today, 54% of the global population lives in cities, and this number is expected to grow to six billion by 2045. With rising global rural to urban migration and its multifaceted impacts on human well-being, urbanization has emerged as a central theme in global development policies and programs (World Bank, 2023). Consequently, literature has increasingly focused on issues related to sustainable urban economic growth (United Nation, 2019).

Urbanization is a global phenomenon that varies in speed and level depending on geographic location, development status, and country size. Major cities face environmental and social challenges such as deteriorating housing quality, pollution, crime, and congestion, but they also offer significant opportunities for cultural development and innovation.

city is defined as a large population center with greater importance than a town or village (Bloom et al., 2010). The inclusion of an independent goal dedicated to cities and urban settlements underscores the recognition of urbanization's pivotal role in advancing the global sustainable development agenda. Goal eleven, which emphasizes communities and sustainable cities, along with its related objectives, aligns with and supports other Sustainable Development Goals, serving as a critical tool to address their multidimensional aspects (United Nation, 2019). Urbanization has become a focal point in both policy and empirical discussions, particularly due to its rapid expansion in developing regions and its implications for achieving sustainable development objectives (Jemiluyi and Jeke, 2024).

According to (Cohen, 2004), Urban areas are categorized by three main concepts: the legally defined city area within administrative boundaries, which may extend beyond them; the urban agglomeration, characterized by high population density regardless of administrative borders; and the metropolitan area, encompassing the city's main urban zone and the surrounding regions that are closely tied to it. Despite the importance of these classifications, urban studies face challenges in collecting accurate data, as censuses often underreport due to ongoing population mobility and the difficulty of tracking it (Jemiluyi and Jeke, 2024).

Over time, urbanization has been a key factor in driving progress and growth, serving as a key driver of human advancement (Bairoch, 1988). The strong interconnection between urbanization and development suggests that one cannot be achieved independently of the other. However, the causal relationship remains ambiguous (Jacobs, 1969). according to (Gallup et al., 1999) Urbanization is not merely a consequence of economic development but also one of its drivers.

As urbanization continues to expand, projections indicate that cities will account for over 80% of global GDP. However, the relationship between urbanization and economic development varies across nations, prompting questions about causality, whether economic growth drives urbanization, urbanization promotes economic growth, or the two are independent of each other.

Historical records show clear shifts in this relationship. For example, United States urbanization and per capita income rose in tandem until around 1940. However, after urbanization surpassed 60%, the pace of income growth per person increased significantly (Nguyen and Nguyen,2018). In contrast, China and India exhibited a different pattern during 1980–2006. Rural population shares declined by 26% in China and 8% in India, while per capita income rose by 88% in China and 65% in India (World Bank ,2009), reflecting a strong link between economic growth and urbanization in these countries.

Conversely, (Fay and Opal, 2000) found that Kenya underwent urbanization without significant economic growth. In 1960, the urbanization level was very low at 7%, and despite rapid increases, it remained relatively low, reaching only about 20% by 2000. In the case of some small African countries, (Collier's ,2006) study demonstrated that these nations experienced urbanization without economic growth, with geographic factors and national borders playing a critical role in shaping this phenomenon.

urbanization influences economic growth through multiple channels. Firstly, urbanization reduces production costs by concentrating firms and individuals, which promotes internal specialization and economies of scale (Krugman, 1991; Fujita et al., 1999; Kumar & Kober, 2012). Secondly, cities offer opportunities in education, employment, and healthcare, enhancing human capital and fostering the development of new technologies (Aghion and Howitt, 2023; Jemiluyi and Jeke 2024). Thirdly, urbanization positively impacts rural areas through migration and urban-rural interactions, enhancing the transfer of skills, knowledge, and financial resources (Cali and Menon, 2009; McKenzie and Sasin, 2007). Lastly, it facilitates access to finance and encourages business ideas by providing larger markets, making cities more attractive for businesses (Glaeser et al., 2010; Loughran & Schultz, 2005). The prosperity of cities also depends on their ability to attract and develop skilled workers (Bacolod et al., 2010).

On the other hand, FDI has generally been found to positively influence economic growth, especially in the long run through capital accumulation and technology transfer (Gökçeli et al,2022; Kostoulis,2023). However, short-term effects can vary, with some studies showing mixed results (Gao and Shao,2016). Despite these uncertainties, the majority of studies support the view that FDI plays a crucial role in stimulating economic growth.

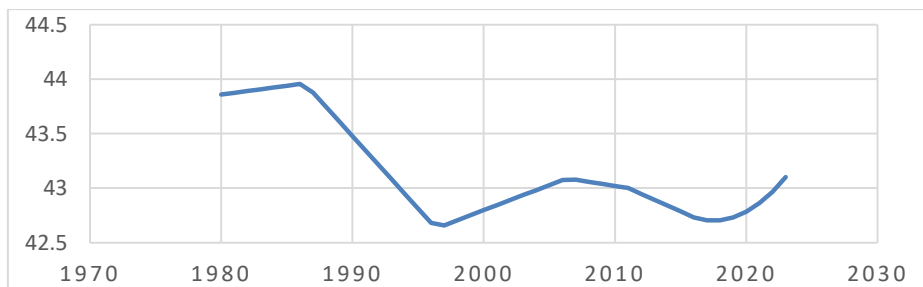
Egypt is one of the most densely populated countries in the Middle East and North Africa region. Since 1952, the country has experienced rapid population growth, doubling its population significantly. In 1950, the population was 21.2 million, reaching 42.6 million in 1980, reflecting significant growth in just thirty years (Zinkina and Korotayev,2013). In the following three decades, the population nearly doubled again, reaching 112.72 million in 2023 (World bank ,2024) nearly quadrupling since 1952.

During the twentieth century, Egypt also experienced significant urban development in parallel with the modernization phase. Between 1897 and 1976, the urban population grew ninefold, while the total population increased fourfold. Cairo played a prominent role in this growth, with its population reaching 20.4% of the total population in 1966, constituting half of the country's urban population. The urban population represented 40.4% of the total population at that time (Zinkina and Korotayev,2013).

Figure 1 illustrates the trend in urban population as a percentage of the total population from 1970 to 2030. The data reveals a fluctuating pattern over the observed years. Initially, from 1970 to the late 1980s, the urban population experienced a slight increase, peaking around 1985. However, a sharp decline is evident from the late 1980s through the 1990s, reaching its lowest point around 2000. This downward trend may be attributed to various socio-economic or policy factors, such as rural-urban migration patterns, urban planning challenges, or changes in the population's geographical distribution.

Following this period, the urban population percentage demonstrates a gradual recovery post-2000, marked by minor fluctuations. The trend appears relatively stable until a slight decline is observed again in the 2010s. By the 2020s, the data indicates a renewed upward trajectory, suggesting potential advancements in urbanization or improved urban infrastructure attracting populations back to urban areas.

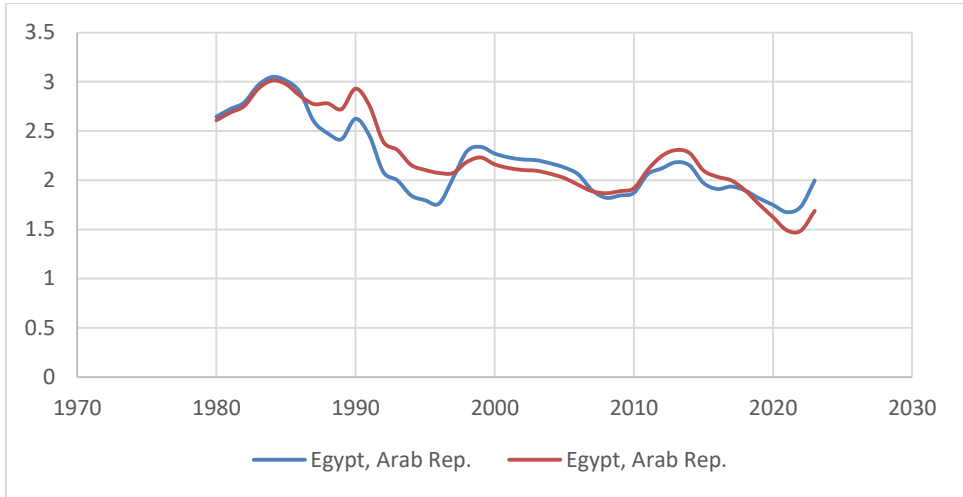
Fig. 1 urban population in Egypt



Source: prepared by author based on word bank database

Despite the significant increase in the urban population in absolute terms, rising from 19.5 million in 1980 to 35.5 million in 2009, the proportion of the urban population fluctuated, with rapid growth coinciding with a period of stability and a marked decline in the following years as shown in Figure 2.

Fig.2. population and urban population growth



Source: prepared by author based on word bank database

Figure 2 illustrates the annual growth rates of Egypt's urban population and total population from 1970 to 2030. Initially, during the 1970s and 1980s, urban population growth consistently surpassed total population growth, indicating substantial rural to urban migration or higher birth rates in urban areas. This trend reflects the urbanization process driven by economic opportunities and infrastructural development in cities. However, the 1990s marked a significant decline in both growth rates, due to economic reforms, family planning initiatives, or broader socio-economic transitions impacting population dynamics. The early 2000s witnessed stabilization, with the gap between urban and total population growth narrowing, suggesting a more balanced growth pattern, or reduced rural-to-urban migration. In the 2010s, both growth rates continued to decline, albeit with a slight recovery towards the end of the decade, which may be attributed to renewed urbanization trends or improvements in urban living conditions.

Urban areas in Egypt generate 75% of the country's GDP and account for 80% of employment. However, urbanization is progressing at a slow pace. Significant differences exist between Egyptian cities—while Cairo and Alexandria are expanding rapidly, other regions lag behind, creating disparities in opportunities. As a result, residents in less developed areas face limited prospects, which undermine social, economic, and environmental sustainability. Additionally, this uneven population growth has occurred alongside economic crises and periods of social and political instability, adding further complexity to Egypt's economic situation. (General Organization for Physical Planning, 2024).

Despite the significant importance of the relationship between economic growth and urbanization in Egypt, detailed and focused research on this topic remains scarce. Urbanization has been addressed in many studies, but it is often included as a control or auxiliary variable rather than as a primary variable of analysis. Frequently, urbanization is studied alongside other factors such as education, infrastructure, or foreign investments, without focusing on its direct impact on economic growth. These studies have not provided a

deep analysis of the relationship between urbanization and economic growth, making it difficult to understand the actual role urbanization plays in either promoting or hindering economic growth in Egypt. This research gap calls for more specialized studies that focus on urbanization as a main variable, offering more accurate insights into how urbanization affects sustainable economic development.

Based on the above, this study examines the nexus between economic growth and urbanization in Egypt, focusing on the role of FDI as a mediation factor between them, using annual data from 1980 to 2023. The remaining sections of the paper are as follows, section 2 literature review, section 3 methodology, section 4 results and discussion, section 5 conclusion and policy recommendations.

2- Literature review

Given the vital role of economic growth in achieving sustainable development and poverty eradication, economic literature extensively addresses the issue of low growth. This focus is also evident in urbanization literature, which emphasizes the relationship between economic growth and urbanization (Chen et al., 2014; Gross and Ouyang,2021). While there is broad consensus that urbanization fosters economic growth through creation of large labor and goods markets, innovation stimulation and economies of scale and the (Brunt and García-Peñalosa,2022; Shaban and Nijkamp ,2022; Storper and Venables,2004; Liu et al,2015).

While urbanization supports economic growth, some studies highlight potential challenges, especially in developing countries where insufficient infrastructure and unplanned urban expansion can pose significant obstacles (Chen et al,2014; Di Clemente et al,2021; Nathaniel and Bekun,2021).

The relationship between urbanization and economic growth has been extensively studied through both panel data and time series analyses, with results that vary across studies. Several previous studies have found a strong relationship between per capita GDP and the level of urbanization (Henderson, 2003; Chen et al,2014; Gross and Ouyang,2021; Nguyen and Nguyen,2018). It is commonly accepted that economic growth drives the expansion of modern industries, which in turn increases the urban population; urbanization, therefore, further stimulates economic growth.

(Zheng and walash, 2019) using data from Chinese provinces, found that urbanization plays a significant role in boosting economic growth in China. (Hao, 2018) examines and contrasts the effects of both traditional and contemporary urbanization patterns on growth in China, concluding that while both patterns contribute to economic growth, the newer pattern has a more sustained impact. The study also explores the direction of causality between urbanization and economic growth.

(Sarker and Mannan, 2016) explored the relationship in South Asia, with findings indicating a long-term causal relationship between urban population growth and economic growth. (Nguyen and Nguyen ,2018) discovered that urbanization positively influences economic growth, but the connection isn't linear. Once urbanization exceeds a certain level, it can negatively affect growth. Their findings suggest this threshold is 67.94% in the dynamic model and 69.99% in the static model.

(Brunt and García-Peñalosa ,2022), (Wang and Fang ,2018) highlighted that urbanization boosts economic growth in Europe by fostering innovation, knowledge exchange, and achieving economies of scale. In their study, (Da Mata et al., 2007) investigated the effect of economic growth on urbanization in Brazil, showing that various economic factors, such as labor quality, market potential, and income generation opportunities, significantly influenced city development.

(Leitao,2013) examined the relationship between economic growth and urban accumulation in Europe, Japan, the United States, Mexico and New Zealand from 1990 to 2008. The findings revealed that urban accumulation boosts economic growth, with a 1% increase in urban accumulation leading to a 3.19% rise in per capita GDP. (Ciccone, 2002) supported this with estimates for Germany, Spain, France, England and Italy. indicate that a twofold increase in the urban population could boost productivity by 4.5%. Additionally, (Rosenthal and Strange, 2006) discovered that doubling city size might increase productivity in certain industries by 3% to 8%.

(Ivan and Gordon ,2013) explored the relationship between urbanization and economic growth in Africa and Asia. Their study concluded that the impact of urbanization on development and productivity levels varies significantly, with no linear relationship between economic growth and urbanization or between productivity city size. (Li, 2017) analyzed the relationship between urbanization and economic growth in China using a VAR model for the period 1980-2014. The findings indicated a one-way causal relationship, where urban population growth and economic growth mutually reinforce each other in the long term, with rapid economic growth driving urban development. (Bakirtas and Akpolat ,2018) examined the relationship between urbanization and economic growth in emerging economies. The results showed a positive causal link from urbanization to economic growth in these economies. Similarly, (Pradhane et al., 2021) studied the urbanization-economic growth relationship in G20 countries, concluding that urbanization promotes long-term economic growth when supported by the development of transport infrastructure and information and communication technology.

(Ngounou et al., 2024) highlighted the significant role of urbanization in fostering inclusive growth across Africa, except for South Africa. (Lewis ,2014) examined the link between economic growth and urbanization in Indonesia using time series data from 1960 to 2009, along with panel data from various regions. The findings revealed a positive correlation between economic growth and urbanization, although rapid changes in urbanization rates negatively impacted growth. Similarly, (Cali, 2008) identified a weak positive relationship between urbanization and economic growth in India. (Tripathi and Mahey ,2017) explored the economic growth - urbanization nexus in Punjab, India, through a micro-level analysis.

On the other hand, there is a growing debate in the literature suggesting that the impact of urbanization on economic growth depends on the role of certain macroeconomic factors such as human capital accumulation (Eaton and Eckstein, 1997; Jemiluyi and Jeke,2024) , foreign direct investment (Gao and Shao, 2016), institutional quality (Turok and McGranahan , 2013) , and natural resources (lu and song, 2021) . In this context, (Eaton and Eckstein ,1997) developed a model of urbanization and growth based on human capital accumulation in France and Japan. They indicated that major cities enhance the level of human capital and increase wages per worker.

In the same context, (Mehmood et al., 2021) emphasized that human capital is a critical factor in determining the output elasticity of urbanization in Pakistan. This idea aligns with the study by Jemiluyi and Jeke, 2024 which examined the role of human capital as an intermediary factor in the relationship between urbanization and economic growth in Nigeria during the period 1991-2022. The findings showed that urbanization alone does not contribute to enhancing economic growth, while the interaction between urbanization and human capital improves the impact, highlighting the importance of human capital in mitigating the negative effects of urbanization and promoting economic growth.

Similarly, (Arouri et al., 2014) examined the impact of urbanization on human capital formation and economic growth and in Africa. The study explored the causal relationship between urbanization and economic growth. They found that the relationship between economic growth and urbanization is non-linear (an inverted U-shape curve). The analysis indicated that urbanization increases up to 73%, beyond which additional urbanization is associated with a decline in GDP per capita if other factors remain unchanged.

In a review of the evidence on the impact of increased urbanization on growth in Asia and Africa, (Turok and McGranahan, 2013) highlighted that structural support and institutional quality are essential prerequisites for urbanization to effectively drive economic growth. In a similar assessment of the relationship in China, (Gao, and Shao, 2016) emphasized that foreign direct investment is crucial for urbanization to realize its potential in boosting economic growth. Recently, (Pradhan et al., 2021) found that an active urban system, supported by standardized transport infrastructure and information and communication technology, is a significant driver of growth in G20 countries.

Furthermore, several institutions support the views previously mentioned. For example, the (World Bank, 2009) states, “no country has achieved middle-income status without urbanization and industrialization, and no country has achieved high-income status without vibrant cities”. While the rapid urbanization in developing countries may seem chaotic, the World Bank sees “it as essential for fostering economic growth and development”.

Although there is evidence supporting the ability of urbanization to promote growth, there are also opposing results indicating a negative or insignificant impact of urbanization on economic growth. Recent evidence suggests that urbanization, which boosts economic growth, faces increasing challenges. For instance, (Fay and Opal, 2000) recorded instances of urbanization without economic growth in developing countries, contradicting the traditional notion that urbanization is typically associated with growth. (Bloom et al., 2008) also pointed out the lack of evidence supporting the impact of urbanization on economic growth, calling for a re-examination of the relationship between them. Additionally, (Glaeser, 2013) highlighted the phenomenon of 'urbanization in poor countries, where urban growth is concentrated in low-income nations. On the other hand, (Turok and McGranahan, 2013) emphasized that economic growth is not directly linked to urbanization but rather depends on the quality of infrastructure and institutional frameworks that support urban development.

Similarly, (Jedwab and Vollrath, 2015) found that most major cities are in poor countries. In a study by (Shaban et al., 2011) on Indian states, it was found that urban centers do not always serve as engines of growth. Using the Granger Bootstrap causality test, the authors discovered that causality flows primarily from growth to urbanization in Indian states. (Brulhart and Sbergami, 2009) also found that urbanization boosts economic growth

but only up to a specific level of development, after which negative factors begin to hinder economic growth, aligning with (Williamson's ,1965) hypothesis.

The positive impact of urbanization on economic growth is not always evident. According to (Henderson, 2003) Both theoretical and empirical research have shown a U-shaped relationship between urbanization and economic growth and. at the early stages of economic development, urbanization boosts economic growth, while in advanced stages, there is an inverse relationship between urbanization and growth. Rapid urbanization can have negative effects on the economy by putting pressure on infrastructure (Alam et al., 2007). Therefore, the relationship between economic growth and urbanization is complex and depends on various factors such as the the stage of urbanization, the nature of prevailing economic activities and level of development (Castells-Quintana and Royuela, 2014). This view is supported by (Di Clemente et al., 2021), who assert that while urbanization is linked to economic growth in the early stages of development, this connection diminishes in later stages.

A study by (Nathaniel and Bekun, 2021) indicated a negative relationship between economic growth and urbanization in Nigeria, aligning with (Ochinyabo, 2021) study, which showed that rapid population growth and unemployment negatively impact human development in Nigeria. Both studies emphasize that rapid urbanization and population growth can strain economic resources and infrastructure, leading to significant challenges in achieving economic growth and sustainable development in Nigeria.

The study by (Jamal and Jena ,2018) which focused on urbanization in Sub-Saharan Africa, highlighted that the consequences of urbanization are complex and intertwined with other issues such as climate change and migration. The study confirmed that, if properly managed, urbanization can boost growth, create jobs, and contribute to poverty reduction.

(Chen et al, 2014) found no significant correlation between economic growth and urbanization at the global level. (Shabu.,2010) study the relationship between economic growth and urbanization in ten developing countries. The results showed a dual relationship, where urbanization can both contribute to and hinder economic development. The study also concluded that there is a weak link between urban growth and economic development in developing countries. These findings align with (Frick et al., 2018), who indicated that urban concentration enhances economic growth only in advanced economies, not in developing ones.

The mixed results in previous studies suggest that these discrepancies may stem from varying moderating factors across countries. Based on available research, the relationship between economic growth and urbanization is influenced by factors such as the quality of institution, foreign direct investment, resource availability, human capital formation, infrastructure and communication and technology.

The review of previous studies showed that the literature on the relationship between urbanization and economic growth in Egypt is limited. To the best of our knowledge, no studies have explored the potential mediating role of foreign direct investment in this relationship.

3- Methodology

3.1. Data and variables

To achieve the study's aim, data for Egypt covering the period from 1980 to 2023 were utilized, obtained from the World Bank's Development Indicators database. Urbanization was assessed using the growth rate of the urban population¹ (URBG), while economic growth was represented by GDP (constant LCU). Foreign direct investment (FDI), measured as net inflows as a percentage of GDP, was incorporated as an intermediary variable to explore its role in the relationship between economic growth and urbanization.

Aligned with prior research (Islam, 2021; Jemiluyi and Jeke, 2024; Akinlo and Jemiluyi, 2018) certain determinants of economic growth were included as control variables. Specifically, trade as a percentage of GDP (TRADE) and government final consumption expenditure (GEXP) were selected to capture the respective effects of trade openness and public spending on economic growth. A detailed description of all variables is provided in Table 1.

Table .1 definitions of variables

variable	Definition
lgdpc	Logarithm of GDP. (constant LCU)
URBG	Urban population growth rate (annual)
Fdi	Foreign direct investment (% GDP)
TRADE	Trade (% GDP)
G.EXP	General government final consumption expenditure (% of GDP)

Source: World bank development indicators

3.2. Descriptive statistics

Before estimating the model, we begin by summarizing and describing the data through descriptive statistics. Table 2 provides an overview of these summary statistics.

Table 2. Data description and statistics

variables	lgdpc	urb	FDI	Trade	gexp
mean	28.79130	2.197374	1.084092	48.45389	11.66237
median	28.81061	2.124137	1.064188	46.14612	11.35169
maximum	29.72748	3.047844	2.336848	74.45958	17.33931
Minimum	27.71458	1.675287	-0.228838	29.85697	6.786901
Standard deviation	0.577151	0.376708	0.496623	11.64086	2.478567
skewness	-0.106850	0.764334	0.278918	0.511663	0.110722

¹ -The concept of urban expansion is diverse, and its definitions and measurements vary across disciplines. For example, urban expansion can be measured by urban population size, the proportion of urban land, public urban expenditure, or the share of the industrial population. This paper considers population migration from rural to urban areas as a key characteristic of urban expansion. Therefore, the urbanization growth rate relative to the total population was used as a measure of this expansion.

kurtosis	1.856871	2.602334	3.809688	2.453035	2.898337
Jarque bera (prob)	2.479422 (0.289468)	4.574097 (0.101566)	1.772423 (0.412214)	2.468339 (0.291076)	0.108851 (0.947029)

Source: author calculations based on Eviews 12

3.3. Variance inflation vector test

The Variance Inflation Factor (VIF) test checks for multicollinearity in regression models. It assesses how much the variance of a predictor's coefficient is increased due to its correlation with other variables. A VIF value between 5 and 10 indicates moderate multicollinearity that might require consideration, while values exceeding 10 points to a significant problem. The results shown in table 3 indicate that all VIF values are below 5, indicating the absence of multicollinearity.

Table 3. Vif test

Variable	VIF
URBG	3.572009
TRADE	1.594101
GEXP	4.054865
FDI	1.301802
C	NA

Source: author calculations based on Eviews 12

3.4. Unit root test

Accurate analysis in econometrics requires selecting the right method, especially for time series data. The choice depends on data characteristics that affect the reliability of results, such as the stationarity of variables and the presence of long-term relationships between them. Stationary variables return to a long-term average and are not influenced by time, while non-stationary variables do not and show variance changes over time. Using non-stationary data can lead to misleading results, falsely suggesting relationships between variables when none exist. This issue is called spurious regression. To check for unit roots in variables, tests like the Augmented Dickey-Fuller (ADF) or Philip-Perron (PP) are commonly applied. The ADF test is formulated as follows:

$$\Delta y_t = \rho y_{t-1} + \alpha + \beta t + \gamma_1 \Delta y_{t-1} + \gamma_2 \Delta y_{t-2} + \dots + \gamma_p \Delta y_{t-p} + \epsilon_t \quad (1)$$

With a null hypothesis $H_0: \delta = 0$ (The time series contains a unit root), and an alternative hypothesis $H_1: \delta < 0$ (The time series is stationary).

While The Philip-Perron (PP) test accounts for autocorrelation and heteroscedasticity in the error term by removing the lags from the test statistics (Phillips & Perron, 1988). This results in a more accurate test for a unit root in the variable ΔY_t as shown in equation 2:

$$\Delta Y_t = \alpha + \rho Y_{t-1} + \epsilon_t \quad (2)$$

To ensure reliability, both ADF and PP unit root tests are used as shown in table 4. These tests are considered better than the Dickey-Fuller (DF) test because they address autocorrelation and are more robust to both autocorrelation and heteroscedasticity in the data.

Table 4. unit root tests

variables	ADF TEST		Pp test	
	level	1 st difference	level	1 st difference
lgdpc	-۳.۴۶۲۱۱**	-۴.۲۸۳۶۹۸***	-۳.۴۷۷۶۶۰**	-۴.۱۰۰۶۶۳**
urbg	-۲.۴۳۶۲۱۲	-۳.۰۶۳.۲۴**	-۱.۶۶۹۸۷۳	-3.155632***
FDI	-3.715844**	-۴.۶۹۱۳۳۴**	-۲.۸۰.۰۰۰۱	-۴.۴۹۸.۶۱***
Trade	-1.322346	-۴.۹۴۲۳۰۲**	-۱.۲۷۷۶۲۹	-4.940585***
gexp	-1.827431	-۰.۶۲۹.۲۸***	-۰.۷۶.۴۰۹	-۰.۱۶۱۸۲۰***

-the value represents from the unit root tests.

-*** and ** indicate 1% and 5% level of significance respectively.

in the table t-statistics

The ADF and PP test results as shown in table 4 indicate that the variables exhibit stationarity at either the level or first difference, with some being stationary at level (lgdpc & FDI) and others at first difference (urbg, trade and gexp) . Given these findings, the ARDL model can be used, provided that cointegration among the variables is confirmed first.

3.5. model specification and ARDL -ECM framework

Since the variables show mixed stationery, the best estimation approach is one that can efficiently manage these types of data. Therefore, this study adopts the Autoregressive Distributed Lag Error Correction Model (ARDL) as proposed by (Pesaran et al., 2001). The ARDL model is well-suited for dealing with variables that have different orders of integration. It is also more efficient than other co-integration methods, especially when dealing with small samples (Pesaran et al., 2001). Additionally, ARDL is particularly valuable in single equation estimators because it uniquely captures the long-run relationship from short-run dynamics. However, for ARDL to be applicable, the variables must be integrated, meaning their long-term relationship should remain stable beyond the current period.

Selecting the optimal lag is crucial for accurate model estimation. Table 5 illustrates the lag length selection. The optimal number of lags (2) is based on Akaike information criterion.

Table 5. lag length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-346.2677	NA	0.776813	16.77465	17.02289	16.86564
1	-85.65339	434.3572	1.79e-05	6.078733	7.816403*	6.715658
2	-30.15797	76.63654*	7.88e-06*	5.150380*	8.377480	6.333240*

Source: author calculations based on Eviews 12

To evaluate if there is a long run relationship between variables, several cointegration tests such as Johansen, the bounds test and Engle-Granger are commonly used. Among these methods, the bounds test is regarded as a better option. While the latter two require that all variables in the model be I (1), the bounds test is more robust and effective in detecting cointegration among variables that are either I (0), I (1), or a mix of both. Based on the selected variables for analysis, the analytical model is represented as follows:

$$\text{Lgdpc} = f(\text{urbg}, \text{FDI}, \text{Trade}, \text{gexp}) \quad (3)$$

The empirical model can be written in the following way:

$$\text{Lgdpc} = \beta_0 + \beta_1 \text{lgdpc}_{t-1} + \beta_2 \text{urbg} + \beta_3 \text{FDI} + \beta_4 (\text{urbg} * \text{FDI}) + \beta_5 \text{trade} + \beta_6 \text{gexp} + \epsilon_t \quad (4)$$

In line with (Pesaran et al., 2001), the ARDL model can be expressed as shown in equation 5:

$$\begin{aligned} \Delta \text{Lgdpc} = & \alpha_0 + \sum \alpha_1 \Delta \text{Lgdpc}_{t-i} + \sum \alpha_2 \Delta \text{urbg}_{t-i} + \sum \alpha_3 \Delta \text{FDI}_{t-i} + \\ & \sum \alpha_4 \Delta (\text{urbg} * \text{FDI})_{t-i} + \sum \alpha_5 \Delta \text{trade}_{t-i} + \sum \alpha_6 \Delta \text{gexp}_{t-i} + \varphi \text{ECT}_{t-1} + \\ & \beta_1 \text{lgdpc}_{t-1} + \beta_2 \text{urbg}_{t-1} + \beta_3 \text{FDI}_{t-1} + \beta_4 (\text{urbg} * \text{FDI})_{t-1} + \beta_5 \text{trade}_{t-1} + \\ & \beta_6 \text{gexp}_{t-1} + \epsilon_t \end{aligned} \quad (5)$$

By adding the interaction term (urbg* FDI) in Eq. (4), it becomes possible to analyze how the relationship between economic growth and urbanization may change due to variations in FDI. This approach allows for investigating the role of FDI as a moderator in the connection between economic growth and urbanization. the mediating effect of foreign direct investment is evaluated through the long-term parameters of urbanization (β_2) and the interaction term (β_4). There are four possible results for these terms:

- If β_2 and β_4 are positive (>0), it indicates that urbanization contributes to economic growth, and the level of FDI strengthens and enhances this positive relationship.
- If β_2 and β_4 are negative (<0), it suggests that urbanization hinders economic growth, and the level of FDI worsens this negative effect.
- If β_2 is positive (>0) and β_4 is negative (<0), it means that urbanization fosters economic growth, but the level of FDI acts as a barrier to this growth.
- If β_2 is negative (<0) and β_4 is positive (>0), it implies that urbanization has a negative impact on economic growth, but the level of FDI helps reduce this negative effect.

To determine whether cointegration exists, the F-statistics is compared against two critical bounds provided by (Pesaran et al., 2001) the lower bound (I(0)) and the upper bound (I(1)). If the F-statistics is below the lower bound, the null hypothesis of no cointegration is accepted. Conversely, if the F-statistic exceeds the upper bound, the null hypothesis is rejected, indicating the presence of cointegration. However, when the F-statistic falls between the lower and upper bounds, the test results are inconclusive. Table 6 shows the results of the cointegration test. The F-statistics of 5.813635 exceeds the upper critical bound

for I (1) at all significant levels, show that the null hypothesis of no level relationship between the variables is rejected at all significant levels.

Table. 6 Bound cointegration test

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.813635	10%	2.26	3.35
k	5	5%	2.62	3.79
		2.5%	2.96	4.18
		1%	3.41	4.68

Source: author calculations based on Eviews 12

3.6. ARDL – ECM results

Once cointegration is confirmed in table 6, (ECM) is used to estimate how quickly the dependent variable returns to equilibrium after short-run deviations. The ECM associated with Eq. (5) is then specified as follows in Eq (6):

$$\Delta \text{Lgdpc} = \alpha_0 + \sum \alpha_1 \Delta \text{Lgdpc}_{t-i} + \sum \alpha_2 \Delta \text{urbg}_{t-i} + \sum \alpha_3 \Delta \text{FDI}_{t-i} + \sum \alpha_4 \Delta (\text{urbg} * \text{FDI})_{t-i} + \sum \alpha_5 \Delta \text{trade}_{t-i} + \sum \alpha_6 \Delta \text{gexp}_{t-i} + \varphi \text{ECT}_{t-1} + \varepsilon_t \quad (6)$$

Table.7 ARDL-short and long run results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Short run estimation				
C	0.673932	0.236327	2.851689	0.0077
LGDP(-1)	-0.026045	0.008193	-3.179131	0.0033
URBg	0.068092	0.026393	2.579925	0.0148
FDI(-1)	0.156980	0.052496	2.990326	0.0054
URBg*FDI(-1)	-0.061550	0.024276	-2.535427	0.0165
TRADE	-0.000477	0.000325	-1.469805	0.1517
GEXP(-1)	-0.002405	0.002186	-1.100214	0.2797
D(FDI)	0.076477	0.047857	1.598030	0.1202
D(URBg*FDI)	-0.026820	0.022038	-1.216992	0.2328
D(GEXP)	-0.008947	0.003751	-2.385426	0.0234
D(GEXP(-1))	0.010852	0.003530	3.074140	0.0044
CointEq(-1)	-0.026045	0.004092	-6.364582	0.0000
Long run estimation				
URBg	2.614370**	1.112111	2.350818	0.0253
FDI	6.027209***	1.865931	3.230136	0.0029

URBg*FDI	-2.363187**	0.837165	-2.822846	0.0082
TRADE	-0.018323*	0.009942	-1.843112	0.0749
GEXP	-0.092330	0.085024	-1.085929	0.2859

Note: ** and *** indicate 5% and 1% level of significance level

Source: author calculations based on Eviews 12

The detailed results of ARDL (1,0,1,1,0,2) are presented in table 7. The short-run results reveal dynamics in the economic growth equation. The coefficient of the lagged GDP per capita (LGDPC (-1)) is statistically significant at the 1% level, with a value of -0.026. This negative sign indicates the presence of a stable adjustment mechanism, where short-term deviations from the long-term equilibrium are gradually corrected. Specifically, a 1% increase in LGDPC (-1) reduces GDP by 0.026% in the short run, underscoring the self-correcting nature of the economy.

Urbanization (URBg) is positively associated with GDP in the short run, with a coefficient of 0.068, significant at the 5% level. Foreign Direct Investment (FDI (-1)) contributes positively to GDP, with a coefficient of 0.157, significant at the 1% level. This indicates that a 1% increase in FDI inflows leads to an approximately 0.16% rise in GDP in the short run.

However, the interaction term between urbanization and FDI (URBg*FDI (-1)) shows a negative and significant coefficient of -0.062 (at the 5% level). This implies that while urbanization and FDI individually promote economic growth, their combined effect may lead to diminishing GDP. For every 1% increase in the interaction between urbanization and FDI, GDP decreases by 0.062% in the short run.

Trade openness (TRADE) has a negative but statistically insignificant impact in the short run, with a coefficient of -0.0005. This suggests that trade policies do not yield immediate effects on GDP. Similarly, government expenditure (GEXP (-1)) is insignificant in the short term, indicating that fiscal spending takes time to influence economic performance effectively. Conversely, the lagged difference of government expenditure (D (GEXP (-1))) has a positive and significant coefficient of 0.011 (at the 1% level), suggesting that delayed fiscal spending reforms can have a cumulative positive impact on economic output. The error correction term (CointEq(-1)) is highly significant ($p < 0.01$) and has a value of -0.026. This indicates that 2.6% of any short-run disequilibrium is corrected in each period, reflecting a relatively slow adjustment process toward the long-term equilibrium.

In the long run, urbanization (URBg) retains its positive and significant influence on GDP, with a coefficient of 2.614 (significant at the 5% level). This suggests that a 1% increase in urbanization leads to a 2.61% increase in GDP over the long term. Foreign direct investment (FDI) emerges as a critical driver of long-term growth, with a highly significant coefficient of 6.027 (at the 1% level). This implies that a 1% rise in FDI inflows results in a 6.03% increase in GDP in the long run.

The interaction term (URBg*FDI) exhibits a significant negative coefficient of -2.363 (at the 1% level). This suggests that the combined effects of urbanization and FDI are not always complementary in the long run. Trade openness (TRADE) has a marginally significant

negative coefficient of -0.018 (at the 10% level), indicating that greater trade openness might slightly reduce GDP in the long term.

Government expenditure (GEXP) is statistically insignificant in the long run, with a coefficient of -0.092. This suggests that public spending, as currently structured, does not have a direct and sustained impact on economic growth.

3.7. Robustness test

(Phillips and Hansen,1988) introduced the FMOLS method to integrate the most precise cointegration measures. FMOLS enhances the least squares approach by adjusting for the impacts of cointegration on serial correlation and endogeneity in the independent variables. The FMOLS test is effective in revealing causal relationships between the variables across a wide range of values (Pedroni ,2001). This method offers multiple advantages, such as validating results from the cointegration test. It can address issues like autocorrelation and shifts in variance across different dimensions. In this approach, the constant term considers the potential relationship between the differences in error terms and the explanatory variables.

This study also uses the Conversion Matrix Regression (CCR) method as an alternative for calculating the coefficients. Developed by (Park,1992), the CCR method addresses errors in the least squares approach by applying data transformed through the long-range covariance matrix. This adjustment aims to eliminate the asymptotic internality caused by long-range correlation. In many respects, CCR is similar to FMOLS, particularly in theory. The key difference is that CCR utilizes stationary data transformations to reduce the impact of random shocks on the cointegration equation over the long term.

Both FMOLS and CCR results, as shown in table 8, show similar trends across the variables. URB (Urbanization) has a positive but statistically insignificant coefficient in both models, indicating no major impact on economic growth. FDI (Foreign Direct Investment) is consistently significant with a positive coefficient in both models, suggesting a strong positive effect on economic growth. TRADE shows a negative and significant coefficient in both methods, indicating that increased trade openness slightly reduces LGDPC. The interaction between URBg*FDI (Urbanization and FDI) is consistently negative and significant in both models, implying that the combination of urbanization and FDI negatively impacts LGDPC. Lastly, GEXP (Government Expenditure) has a very small and insignificant negative effect on both models, highlighting its limited role in influencing LGDPC. The constant term in both models is significantly large, indicating a strong baseline level of LGDPC.

Table 8. Robustness test

	FMOLS	CCR
URBg	0.681897(0.918)	0.796 (0.923)
FDI	3.427** (2.627)	3.585** (2.433)
URBg*FDI	-1.475475** (-2.411)	-1.549** (-2.233)
TRADE	-0.024783*** (-3.291)	-0.025*** (-3.522)

GEXP	-0.005076 (-0.095)	-0.0069 (-0.117)
C	28.351	28.144
R-squared	0.753	0.752

Note: ** and *** indicate 5% and 1% level of significance level

3.8. Diagnostic test

The fit of the ARDL model was assessed through a series of diagnostic and stability tests. These tests checked for issues like homoscedasticity, serial correlation, normality and heteroscedasticity. The results, shown in Table 9, indicate no problems with normality figure (3), heteroscedasticity, or autocorrelation, confirming the validity and reliability of the findings. Additionally, the CUSUM and CUSUM squared tests in Figure 4 show a stable regression line with minimal fluctuation, further supporting the consistency of the model. This evidence suggests that the relationship between the variables is stable, making the model reliable for future predictions and decisions.

Fig.3. Results of normality test

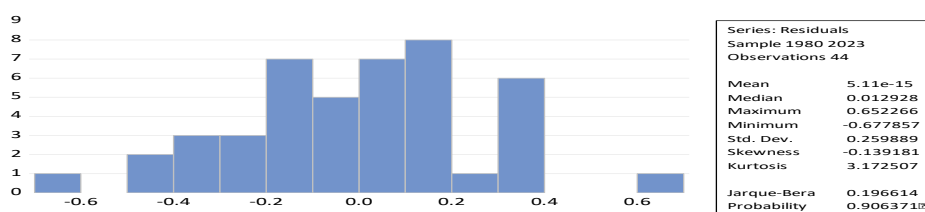
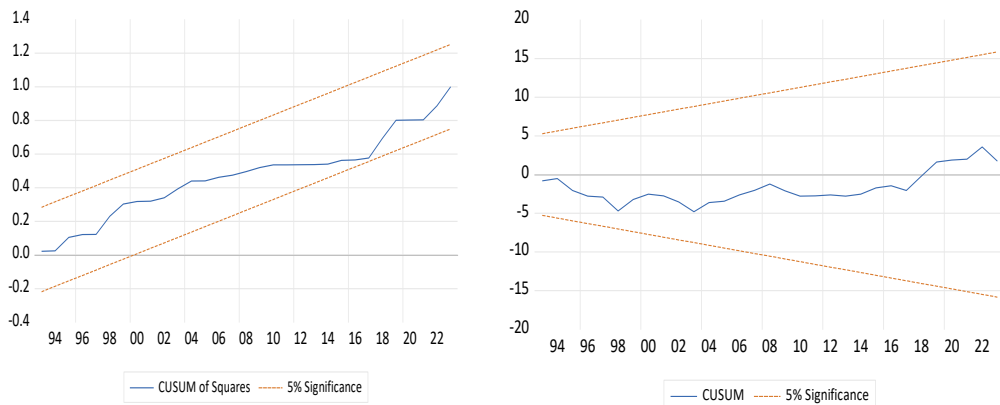


Table 9. Diagnostic test results

Statistic test	Null hypothesis	Test statistic	p-value
Breusch-Pagan-Godfrey	: Homoskedasticity	1.425141 (f-stat)	0.2155
Breusch-Godfrey Serial Correlation LM Test	No serial correlation	0.440149	0.6482
Ramsey RESET Test(F)		2.492005	0.1249
Normality (Jarque bera)	Residuals are normality distributed	0,196614	0,906371

Figure 4. CUSUM and CUSUM of squares tests



4- Discussion

There is growing debate about the impact of urbanization on economic growth, with some arguing that this relationship depends on various economic factors such as human capital, foreign direct investment (FDI), infrastructure, and other elements. Based on this, the present study aims to examine the relationship between economic growth and urbanization in Egypt, concentrating on the role of FDI as a mediating factor between them. using annual data covering the period from 1980 to 2023. The analysis relies on the (ARDL-ECM) model, and the robustness of the results was tested using Fully Modified Ordinary Least Squares (FMOLS) and Canonical Cointegration Regression (CCR).

The study has demonstrated a positive relationship between urbanization and economic growth in both the short and long term. urbanization contributes to economic growth by enhancing production efficiency and concentrating economic activities in urban areas, where the aggregation of labor and capital leads to economies of scale. Furthermore, urbanization improves infrastructure, creates diverse job opportunities, and expands markets, all of which stimulate local demand and drive economic development. These findings align with (Zheng and walash, 2019; Nguyen and Nguyen,2018; Leitão 2013; Ngounou et al. 2024; Cali 2008; World Bank ,2009).

There is also a positive relationship between foreign direct investment and economic growth in both the short and long run, this result is consistent with economic theory, which suggests that foreign direct investment (FDI) plays a crucial role in promoting economic growth by enhancing capital inflows, fostering technology transfer, and stimulating competition within the domestic market. This result aligns with (Gökçeli et al,2022; Kostoulis,2023).

On the contrary, the interaction term between urbanization and FDI (URBg*FDI) exhibits a negative and significant coefficient. This result suggests that while both urbanization and FDI individually contribute to growth, their combined influence may have a diminishing or counteracting effect in the short run. This can be explained by the challenges that arise when combining rapid urban growth with foreign investments, such as inadequate infrastructure

(such as roads, water, electricity) or urban congestion may limit the ability of foreign direct investment (FDI) to enhance economic growth. Without sufficient infrastructure. Additionally, the interaction between urbanization and foreign direct investment (FDI) can increase demand for local resources (such as land, water, and energy). This, in turn, raises production costs and reduces the effectiveness of investments. These findings suggest that rapid urbanization without sufficient planning may reduce the effectiveness of foreign investments in supporting economic growth.

Trade openness also has a negative and marginally significant impact on GDP in the long run. This result may reflect structural challenges, such as a reliance on imports or a lack of competitive export sectors, which could hinder the long-term benefits of trade. Government expenditure has an insignificant effect on GDP in the long run. This result suggests that the efficiency and allocation of public spending are critical determinants of its effectiveness in promoting growth. Policymakers should focus on optimizing expenditure allocation to achieve better long-term outcomes. This result aligns with (David and Jeffrey,1999; Hausmann et al,2007; Buthelezi,2023).

5- Conclusion and policy implication

This study examines the role of foreign direct investment (FDI) as a mediator in the relationship between urbanization and economic growth in Egypt, using annual data from 1980 to 2023. The analysis applies to the ARDL model to assess both short- and long-term relationships, with robustness checks conducted using FMOLS and CCR methods. The findings indicate that both urbanization and FDI positively impact economic growth in the short and long run. However, when combined, their interaction has a negative impact on economic growth. Additionally, the study reveals that foreign trade and government spending negatively affect economic growth in both the short and long term.

According to these results the policy implications can be outlined as follows. Firstly, Policymakers should focus on managing urban growth and foreign investment in a way that benefits the economy. It is necessary to improve infrastructure and make both cities and smaller areas attractive for investment to avoid overcrowding. Secondly, while foreign investment supports growth, its combination with urbanization may create inefficiencies. To avoid this, FDI should be directed toward sectors that support urban development, such as technology, clean energy, and advanced manufacturing, instead of industries that worsen urban problems, like speculative real estate. Offering incentives to attract investment to underdeveloped areas can help ensure a fairer distribution of economic benefits Thirdly, trade policies should support local businesses and promote a variety of exports to reduce reliance on a few sectors. Fourthly, since government spending negatively affects growth, it should be directed toward useful areas like roads, education, and technology. Finally, policymakers should focus on promoting balanced urbanization, attracting FDI, improving trade policies, and optimizing government spending. By carefully managing these factors, Egypt can achieve more sustainable and inclusive economic growth in the future.

References

- Aghion, P., & Howitt, P. (2023). The Creative Destruction Approach to Growth Economics. *European Review*, 31(4), 312-325.
- Akinlo, A. E., & Jemiluyi, O. O. (2018). Economic growth nexus in Nigeria: evidence from Nonlinear ARDL and causality approaches. *Review of Innovation and Competitiveness: A Journal of Economic and Social Research*, 4(2), 5-26.
- Alam, S., Fatima, A., & Butt, M. S. (2007). Sustainable development in Pakistan in the context of energy consumption demand and environmental degradation. *Journal of Asian Economics*, 18(5), 825-837.
- Arouri, M. E. H., Youssef, A. B., Nguyen-Viet, C., & Soucat, A. (2014). Effects of urbanization on economic growth and human capital formation in Africa. PGDA Working Paper No. 119, Harvard University.
- Bacolod, M., Blum, B. S., & Strange, W. C. (2010). Elements of skill: traits, intelligence, education, and agglomeration. *Journal of Regional Science*, 50(1), 245-280.
- Bairoch, P. (1988). *Cities and economic development: from the dawn of history to the present*. University of Chicago Press.
- Bakirtas, T., & Akpolat, A. G. (2018). The relationship between energy consumption, urbanization, and economic growth in new emerging-market countries. *Energy*, 147, 110-121.
- Bloom, D. E., Canning, D., Fink, G., Khanna, T., & Salyer, P. (2010). *Urban settlement: data, measures, and trends* (No. 2010/12). WIDER Working Paper.
- Brühlhart, M., & Sbergami, F. (2009). Agglomeration and growth: Cross-country evidence. *Journal of Urban Economics*, 65(1), 48-63.
- Brunt, L., & García-Peñalosa, C. (2022). Urbanisation and the onset of modern economic growth. *The Economic Journal*, 132(642), 512-545.
- Buthelezi, E. M. (2023). Impact of government expenditure on economic growth in different states in South Africa. *Cogent Economics & Finance*, 11(1), 2209959.
- Calì, M. (2008). *Urbanization, inequality and economic growth: Evidence from Indian states and towns*. background note for the World Development Report, London: Overseas Development Institute.
- Calì, M., & Menon, C. (2013). Does urbanization affect rural poverty? Evidence from Indian districts. *The World Bank Economic Review*, 27(2), 171-201.
- Castells-Quintana, D., & Royuela, V. (2014). Agglomeration, inequality and economic growth. *The Annals of Regional Science*, 52, 343-366.

- Chen, M., Zhang, H., Liu, W., & Zhang, W. (2014). The global pattern of urbanization and economic growth: evidence from the last three decades. *PloS one*, 9(8), e103799.
- Cohen, B. (2004). Urban growth in developing countries: a review of current trends and a caution regarding existing forecasts. *World development*, 32(1), 23-51.
- Collier P (2006) Africa: geography and growth. *Journal TEN*, Federal Reserve Bank of Kansas City, Fall 2006.
- Da Mata, D., Deichmann, U., Henderson, J. V., Lall, S. V., & Wang, H. G. (2007). Determinants of city growth in Brazil. *Journal of urban economics*, 62(2), 252-272.
- David, R., & Jeffrey, A. F. (1999). Does Trade Cause Growth? *American economic review*, 89(3), 379-99.
- Di Clemente, R., Strano, E., & Batty, M. (2021). Urbanization and economic complexity. *Scientific Reports*, 11(1), 3952.
- Eaton, J., & Eckstein, Z. (1997). Cities and growth: Theory and evidence from France and Japan. *Regional science and urban Economics*, 27(4-5), 443-474.
- Fay, M., & Opal, C. (2000). Urbanization without growth: A not so uncommon phenomenon (Vol. 2412). *World Bank Publications*.
- Frick, S. A., & Rodríguez-Pose, A. (2018). Change in urban concentration and economic growth. *World development*, 105, 156-170.
- Fujita, M., Krugman, P., & Mori, T. (1999). On the evolution of hierarchical urban systems. *European Economic Review*, 43(2), 209-251.
- Gallup, J. L., Sachs, J. D., & Mellinger, A. D. (1999). Geography and economic development. *International regional science review*, 22(2), 179-232.
- Gao, Y. Y., & Shao, S. (2016). Empirical Research on Relationship among Urbanization, FDI and Economic Growth: A Case of China from 1999 to 2015. *Applied Economics and Finance*, 3(3), 185-192.
- General Organization for Physical Planning. (2024, November 7). National Urban Policy: The new constitution of urbanization in Egypt. *World Urban Forum*. Available at : <https://wuf.unhabitat.org/event/wuf12/national-urban-policy-new-constitution-urbanization-egypt>
- Glaeser, E. L. (2014). A world of cities: The causes and consequences of urbanization in poorer countries. *Journal of the European Economic Association*, 12(5), 1154-1199.
- Glaeser, E. L., Rosenthal, S. S., & Strange, W. C. (2010). Urban economics and entrepreneurship. *Journal of urban economics*, 67(1), 1-14.

Gökçeli, E., Fidrmuc, J., & Ghosh, S. (2022). Effect of foreign direct investment on economic growth and domestic investment: evidence from OECD countries. *European Journal of Business Science and Technology*, 8(2), 190-216.

Gross, J., & Ouyang, Y. (2021). Types of urbanization and economic growth. *International Journal of Urban Sciences*, 25(1), 71-85.

Phillips, P. C., & Hansen, B. E. (1988). Estimation and inference in models of cointegration: A simulation study (No. 881). Cowles Foundation for Research in Economics, Yale University.

Hao, S. (2018). Analysis of the inverted U-Shaped relationship between China's new urbanization and economic growth-based on comparison with traditional urbanization. *Int. Bus. Manag.*, 16, 27-33.

Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters. *Journal of economic growth*, 12, 1-25.

Henderson, V. (2003). The urbanization process and economic growth: The so-what question. *Journal of Economic growth*, 8, 47-71.

Islam, M. S. (2021). Is the trade-led growth hypothesis valid for the Kingdom of Saudi Arabia? Evidence from an ARDL approach. *Fudan Journal of the Humanities and Social Sciences*, 14(3), 445-463.

Ivan, T., & Gordon, M. (2013). Urbanization and economic growth: the arguments and evidence for Africa and Asia. *International Institute for Environment and Development (IIED)*. Vol 25(2): 465–482.

Jacobs, J. (1969), *The Economy of Cities*, Random House, New York, NY.

Jedwab, R., & Vollrath, D. (2015). The mortality transition, Malthusian dynamics, and the rise of poor mega-cities. Processed, George Washington University.

Jemal, S.& Jena, S. (2018). *Urbanization in Sub-Saharan Africa Meeting Challenges by Bridging Stakeholders*. Centre for Strategic and International Studies, Washington DC, U.S.A, 1-7.

Jemiluyi, O. O., & Jeke, L. (2024). The role of human capital development in urbanization-economic growth nexus: A new insight on Nigeria. *Sustainable Futures*, 8, 100266.

Kostoulis, D. (2023). foreign direct investment and growth: a literature review from 1990 to date. *European Journal of Economic and Financial Research*, 7(2).

Krugman, P. (1991). Increasing returns and economic geography. *Journal of political economy*, 99(3), 483-499.

Kumar, A., & Kober, B. (2012). Urbanization, human capital, and cross-country productivity differences. *Economics Letters*, 117(1), 14-17.

- Leitão, N. C. (2013). A panel data modelling of agglomeration and growth: cross-country evidence. *Theoretical and Empirical Researches in Urban Management*, 8(1), 67-77.
- Lewis, B. D. (2014). Urbanization and economic growth in Indonesia: good news, bad news and (possible) local government mitigation. *Regional Studies*, 48(1), 192-207.
- Li, Y. Z. (2017). Urbanization and economic growth in China—empirical research based on VAR model. *International Journal of Economics and Finance*, 9(3), 210-219.
- Liu, T. Y., Su, C. W., & Jiang, X. Z. (2015). Is economic growth improving urbanisation? A cross-regional study of China. *Urban Studies*, 52(10), 1883-1898.
- Loughran, T., & Schultz, P. (2005). Liquidity: Urban versus rural firms. *Journal of Financial Economics*, 78(2), 341-374.
- Lu, S., Zhou, Y., & Song, W. (2021). Uncoordinated urbanization and economic growth—The moderating role of natural resources. *Growth and Change*, 52(4), 2071-2098.
- McKenzie, D. and Sasin, M. (2007). Migration, remittances, poverty, and human capital: conceptual and empirical challenges. Policy Research Working Paper No. 4272. The World Bank.
- Mehmood, R., Ullah, Z., & Lal, I. (2021). Human Capital, Urbanization and Dynamics of Economic Growth and Development. *Journal of Human, Earth, and Future*, 2(4), 382-394.
- Nathaniel, S. P., & Bekun, F. V. (2021). Electricity consumption, urbanization, and economic growth in Nigeria: New insights from combined cointegration amidst structural breaks. *Journal of Public Affairs*, 21(1), e2102.
- Ngounou, B. A., Tekam Oumbe, H., Ongo Nkoa, B. E., & Noubissi Domguia, E. (2024). Inclusive growth in the face of increasing urbanization: What experience for African countries? *Review of Development Economics*, 28(1), 34-70.
- Nguyen, H. M., & Nguyen, L. D. (2018). The relationship between urbanization and economic growth: An empirical study on ASEAN countries. *International Journal of Social Economics*, 45(2), 316-339.
- Ochinyabo, S. (2021). Rapid population growth and economic development issues in Nigeria. *Journal of Economics and Allied Research*, 6(3), 1-13.
- Park, J. Y. (1992). Canonical cointegrating regressions. *Econometrica: Journal of the Econometric Society*, 119-143.
- Pedroni, P. (2001). Fully modified OLS for heterogeneous cointegrated panels. In *Nonstationary panels, panel cointegration, and dynamic panels* (pp. 93-130). Emerald Group Publishing Limited.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335-346.

Pradhan, R. P., Arvin, M. B., & Nair, M. (2021). Urbanization, transportation infrastructure, ICT, and economic growth: A temporal causal analysis. *Cities*, 115, 103213.

Rosenthal, S. S., & Strange, W. C. (2006). The Micro-Empirics of Agglomeration Economies. *A companion to urban economics*, 7-23.

Sarker, S., Khan, A., & Mamur Mannan, M. (2016). Urban population and economic growth: South Asia perspective. *European Journal of Government and Economics*, 5(1), 64-75.

Shaban, A., Kourtiti, K., & Nijkamp, P. (2022). Causality between urbanization and economic growth: Evidence from the Indian States. *Frontiers in Sustainable Cities*, 4, 901346.

Shabu, I.T. (2010). The Relationship Between Urbanization and Economic Development in Developing Countries. *International Journal of Economic Development and Investment*, Vol. 1, No 2 &3.

Storper, M., & Venables, A. J. (2004). Buzz: face-to-face contact and the urban economy. *Journal of economic geography*, 4(4), 351-370.

Tripathi, S., & Mahey, K. (2017). Urbanization and economic growth in Punjab (India): an empirical analysis. *Urban Research & Practice*, 10(4), 379-402.

Turok, I., & McGranahan, G. (2013). Urbanization and economic growth: the arguments and evidence for Africa and Asia. *Environment and urbanization*, 25(2), 465-482.

United Nations - Habitat. (2019), Sustainable urbanization and sustainable development goals, available at: <https://unhabitat.org/sustainable-urbanization-sustainable-development-goals>

Wang, S., Li, G., & Fang, C. (2018). Urbanization, economic growth, energy consumption, and CO2 emissions: Empirical evidence from countries with different income levels. *Renewable and sustainable energy reviews*, 81, 2144-2159.

Williamson, J. G. (1965). Regional inequality and the process of national development: a description of the patterns. *Economic development and cultural change*, 13(4, Part 2), 1-84.

World Bank (2009). *World Development Report 2009: Reshaping Economic Geography*. The World Bank, Washington, DC.

World Bank Base (2024). available at:
<https://data.worldbank.org/indicator/SP.POP.TOTL?locations=EG>

World Bank (2025). *World Development Indicators*. Urban population (% of total population). available at:
<https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=EG> (dataset)



World Bank (2023), Urban development, World Bank, Washington DC, available at, <https://www.worldbank.org/en/topic/urbandevelopment/overview>.

Yang, S. P. (2024). The Determinants and Growth Effects of Foreign Direct Investment: A Comparative Study. Journal of Risk and Financial Management, 17(12), 541.

Zheng, W., & Walsh, P. P. (2019). Economic growth, urbanization and energy consumption—A provincial level analysis of China. Energy Economics, 80, 153-162.

Zinkina, J., & Korotayev, A. (2013). Urbanization dynamics in Egypt: factors, trends, perspectives. Arab Studies Quarterly, 35(1), 20-38.