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Urban Development and Aid Effectiveness: Examining Their Impact on Export Performance in Sub-Saharan African Countries

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ABSTRACT

Trade is the most important factor for any country because it can strengthen the economic position of that country. The countries that are deeply involved in goods and services export will have greater control over their economic condition. In this study, we investigate the relationship between Urban development and Trade with the moderating effect of Aid effectiveness. Some control variables are also taken to investigate the trade and urban development relationship. This study contributes to the current studies on trade and urban development. Using panel data from 36 sub-Saharan African countries between the period 2008 and 2020, we used the panel threshold regression model with a difference generalized method of moments (GMM). We discover that urban population growth has a significant negative effect on goods and services export, with a negative coefficient value, indicating that exports are projected to decrease by 0.12 units for every one-unit increase in urban

population. Regression analysis reveals statistical significance in the relationship between trade and urban development. Furthermore, cross-sectional dependencies and slope homogeneity analysis show significant variation in structural breaks and slope coefficients between trade and urban development. The goal of the study is to offer insights to institutions, policymakers, and researchers to better understand how technical cooperation grants moderate the relationship between export performance and urban population and also to provide insights on creating effective sustainable development plans.

Keywords Urban population; GDP; Exports; Trade; Merchandise export

INTRODUCTION

Urbanization refers to the process of social and economic change. In addition to the trend of rural-urban migration, the agriculture sector is becoming more industrialized. In contrast to 751 million in 1950, there were 4.2 billion city residents globally in 2018 (Poumanyong and Phetkeo, 2010). Moreover, it is expected to grow to 6.4 billion during the next 30 years (Poumanyong and Phetkeo, 2010). According to a 2016 World Bank report, 54.73% of the global population resided in an urban area (world bank report, 2006). Most people in the modern era have resided in cities. UN estimates that by 2030, 60% of the global population will reside in urban areas. Since 2007, whenever the global population of resident areas finally exceeded that of rural areas, the development community has focused more of its attention on urban areas. Urbanization was one of the main topics covered in the report of the World Bank's (World bank report, 2009). In addition, regional collaborative institutions like the Development Bank of Asia and Development Bank of Latin America have increased their assistance for the area and started working together on correlative analyses of urbanization (Zhang and Yuan, 2017).

In urban economics, the dimensions of urban development include primary urbanization, urban centralization, and population urbanization. According to the experimental literature, primary urbanization is the largest city population share of the country's total metropolitan population, urban centralization is the population share of large cities, which are normally defined as the ones with a population of one million or more, and population urbanization are the proportion of the urban population in the overall population (Poumanyong and Phetkeo, 2010). A rise in trade openness between industrialized and emerging countries has increased the flow of services and goods, from roughly 18 percent in 1991 to over 30 percent in 2018 (United Nations Conference on Trade and Development). People are encouraged to relocate from rural to metropolitan areas to achieve trade benefits because of the industrial development in those locations. In the few metropolitan areas that comprise an economy, unsustainable population expansion is encouraged, which results in economic inefficiency. Numerous models grounded on the New Economic Growth (NEG) hypothesis highlight the significance of declining domestic trade costs to promote more urbanization in both developed and developing nations. NEG theory states that the export of industry goods increases and the export of non-

industry goods decreases with urbanization (Krugman, 1991). In the above discussion, the research attempts to investigate the effect of urban development on trade with the moderating effect of Aid effectiveness. The key variables used in this study are urban development, trade, and aid effectiveness. Some control variables are also taken, which include the private sector, the financial industry, and the economy and growth. We use different proxies to measure the main variables and control variables. In this research, we will measure urban development with the urban population, trade with the export of goods and services, and Aid effectiveness with technical cooperation grants. Like the primary variable, we have used different proxies to measure the variable.

The proxy for measuring the private sector is merchandise export, FDI for the financial industry and Economy, and growth is measured with GDP. Much research has been done in the area of urbanization and trade openness. Because of the favorable relationship between import and export openness, there is an increase in the urban population. Some researchers find the impact of urbanization on trade, and others see the influence of trade on urban development. Most researchers focus on urbanization's effect on agricultural agriculture (import and export). Urbanization has a favorable effect on the importation of farm products and adverse effects. Some researchers studied the effect of urbanization on energy utilization. People's urbanization increases with rises in export direction based on panel data of cross country (Shatter, 1996). Jedwab (2013) investigated crop exports' impact on people's urbanization in the Ivory Coast and Ghana; it is found that the urbanization rate increases with exports.

Nagy (2022) studied the impact of trade on actual income and urbanization and found that urbanization in the counties near the border significantly decreases relative to the counties farther away. Muhammad (2020) studied the effect of trade and urbanization on CO2 emission based on income level by taking data from 65 belts and (BRI) countries (2000-2016) and found an inverted U-shaped relationship between the emission of carbon and Urbanization. The study's objective is to examine the moderating impact of technical cooperation grants on the connection between the export of services and goods and the size of the town population in developing countries. This study aims to investigate the extent to which technical cooperation grants influence the strength and path of the connection between the urban population and the export of goods and services. The remaining papers are designed in the following manner. The 2nd section evaluates the current literature related to our topic, the relationship between the urban population, and the export of goods and services. The third section deals with a methodology, where data sources and methods used for empirical analysis are mentioned. In section 4th, empirical results are shown, and in the last section 5th, the conclusion section.

LITERATURE REVIEW

This study examines the relationship between Urban development and trade. In this portion of our research, we looked at what other researchers have written and figured out about our study and why it is essential, and we will add something

new to the body of the existing literature. Trade is a critical primary driver of the geographic distribution of the population and economic activities. Areas with easy access to trade, like valleys, harbors, and rivers, are associated with a high level of productivity, more businesses, more people, and higher per capita income (Nagy, 2022). Some studies claim that population urbanization, which happens faster than industrialization in many Asian countries, is the cause of over-urbanization (Davis and Golden, 2005). Various factors cause the problem of excessive urbanization in several Asian nations. The population boom pushes people from remote to urban regions and strains agricultural land, which are significant contributing factors (Bairoch, 1991).

In semi-industrialized and developing countries, there is an S-shaped relation between population urban development and GDP (per capita), which means that in early-stage populations, urbanization slowly increases, then speeds up before slowing down (Davis and Golden, 2005). Urbanization positively correlates with GDP and industrialization (Ronald et al., 1996). A positive correlation is found between industrialization and urban population using state-level panel data of India (Pandey, 1977). Some empirical studies are about the impact of international trade on people's urbanization in emerging countries. Using cross-country panel data shows that population urbanization increases with export orientation (Ronald et al., 1996). Crop export's effect on people's urbanization in Ivory Beach and Ghana is investigated, and population urbanization rates increase with exports (Jedwab, 2013). On the GDP (per capita), a pooled cross-section of urbanization is run, and then apply the findings to the Chinese context (Chang, 2006). International Trade of manufactured goods and agricultural products affects people's urbanization differently. In population urbanization and global trade, a negative correlation is found using panel data from emerging Asian economies (1993-2010). On the other hand, the cereals trade and non-cereals products trade have different associations with people's urbanization: the former is positively associated with population urbanization; in contrast, the latter adversely correlates with people's urbanization (Zhang and Wan, 2015).

In an open economy, Population urbanization rises with agricultural desperation, but agricultural success might lead to more people's urbanization in a restricted economy. The study seeks to examine the social and behavioral factors influencing the adoption and usage of digital banking apps among Pakistani citizens during the pandemic (Tariq, et al., 2024). Abbas et al. (2024) highlight that enhancing consumer engagement within brand communities is a key marketing objective for strengthening the brand-consumer relationship. Similarly, Kumar et al. (2024) investigate the relative influence of different genders of social media fitness influences (SMFIs) on consumers' decisions regarding supplement purchases. Additionally, Mansoor et al. (2018) examine the impact of different types of location-based advertisement messages on consumer attitudes. This interdisciplinary study primarily explores the impact of institutional quality, particularly corruption levels, on the commercialization of innovation, as measured by high-tech product exports (Akbar et al., 2024). The study by Bilal and Shaheen (2024) indicated that

technological innovation and natural resources support the adoption of energy efficiency strategies and environmental regulations, while green financial indicators significantly promote the transition to renewable energy sources. This study fills a gap in the existing literature by examining how demographic trends may affect the environmental impact of international trade (Shaheen, et al., 2025).

This study examines sustainability considerations, including environmental, social, and governance (ESG) factors, along with governmental policies and regulations that influence capital budgeting decisions (Shaheen, et al., 2025). Exporting non-agriculture products and importing agricultural products and products may contribute to population urbanization in the poor (Glaeser, 2014). In a closed economic structure, the population's ability to reside in the urban region is decided by the excess of grains and foods produced by the peasants, as the urban division relies solely on the agriculture division. For instance, if every farmer can feed one other individual, then the portion of the urban population could be only 50% in the long run; if every farmer can feed two more people, the municipal population could eventually reach 75%. In other words, the portion of grain surplus typically equals population urbanization in the long term (Helble, 2017). The proportion of the urban population may differ from the grain surplus ratio to the total grain produced by domestic farmers.

In May 1962, additional steps were taken by the federal government to reduce the strain between urban population growth and the food crisis by issuing the decision to reduce staffing and urban population further. Before that period, food storage had also occurred in Shanghai. As a result, the government of Shanghai motivated migrant farmers to return to their home cities and engage in agricultural activities and planned for the jobless workers of the urban region to go back to the province of Jiangxi and the other remote areas to assist in the wasteland reclamation (Sun, 2013). More than five million municipal citizens were evacuated from Shanghai between 1955 and 1956 (Chen, 2011). The urbanization processes have drastically changed due to globalization (Glaeser, 2014).

Many researchers investigate the association between the trade and logistics industry and urbanization. A theory-based analysis of the relations between the trade and logistics industry and urbanization is provided, and it is believed that urbanization can accelerate the info level of the trade and logistics industry and promote optimization, upgrading, and rational distribution. The trade and logistics industry can also support the growth of urbanization (Zhang, 2021). A panel data model is used to investigate the association between the trade and logistics industry and urbanization, the findings show a reversed U-type connection between the trade circulation industry and urbanization (Weizeng, 2018). The study of Iqbal, et al. (2025) highlighted the need for policymakers to adopt a multi-strategy approach that includes green finance, technological innovation, low-carbon energy, and supportive government programs. The participation of women in economic activities contributes to increase FDI.

The study of Ullah and Shaheen (2024) explores the relationship between sustainable finance and technological innovation, integrating the governance index

and other economic indicators to assess their impact on sustainable development, particularly in reducing greenhouse gas emissions. The theoretical analysis of trade and logistic industry and productivity is done; the researcher believes that raising the social productivity level of rural and urban areas in China can accelerate the integration of the commercial flow industry. This urban and remote integration can also reduce transaction costs and raise social productivity (Zhang, 2021). Many researchers investigate the association between urbanization and Trade openness. Evidence suggests that trade liberalization has no substantial impact on the process of urbanization, and that effect may even vanish with opposite causality (Nitsch, 2006).

On the other hand, research has indicated that a positive association between trade liberalization and urbanization may exist because of the vertical linkage effect (Thia, 2016). In contrast, it is found that trade can hurt urbanization (Zhang, 2017). The supporting results of the study mention that adverse impact on urbanization may result in spatial convergence, where trade is less important than the effect of the political institutions (Ades, 1995; Davis and Vernon, 2003). In developing nations, the impact of urbanization is also influenced by the area's ability to access the international trade market and its geographical advantages (Guevara-Rosero, 2017). Additionally, an empirical study confirms that due to the diversity in the resources, the benefit from the trade is different for different trading locations in the nation (Nagy, 2022). Due to the lower transportation costs for international trade, coastal regions, especially in China and India, have benefitted more from Trade (Coşar and Fajgelbaum, 2016). Many research studies focus on the connection between urban concentration and trade openness. A study suggests no significant correlation exists between city size distribution and Trade-to-GDP ratio (Soo, 2005). In most empirical studies on urban concentration, external openness measures are not included. A survey of urban concentration examines the empirical factors that influence urban concentration and finds that trade openness hurts urban concentration (Ades and Glaeser, 1995). According to the traditional perspective, trade openness can benefit larger towns that act as centers and areas of concern to international trade partners. As a result, trade liberalization increases these cities' concentration or primary (Linsky, 1965; Berry, 1961). Due to trade openness, small & medium towns tend to become more urbanized (Henderson and Wang, 2003).

Urbanization is independent of industrialization; without economic growth, urbanization is even possible (Gollin, et al., 2016). Empirical research shows that an increase in urbanization also leads to increased imports of agricultural commodities (Thia, 2016). The Current literature findings show that no research has been done to find the impact of urban development on trade by moderating the role of Aid effectiveness. Numerous studies examine the effects of trade on urbanization in different contexts. Different studies have used different proxies to investigate the impact of trade on urban development. This study will be the first to examine urban development's effects on trade. In our research, we will also explore the moderating impact of technical cooperation grants on the connection between the urban population and the export of goods and services. Therefore, the study's goal is to

examine the effect of urban development on trade using different proxies and the moderating impact of aid effectiveness on the connection between urban development and trade.

RESEARCH METHODOLOGY

Operationalization of variables

This study will investigate the impact of the urban population on export performance. Urban development is used as an independent variable, trade is a dependent variable, and aid effectiveness is taken as a moderator. The financial sector, private sector, and economy and growth are used as control variables.

Dependent variables

In this study, trade is used as a dependent variable. Different Researchers used different proxies to measure trade. Some Researchers use a percentage share of exports of services and goods in the overall GDP, a percentage share of import of services and goods in the total GDP (Chhabra et al., , 2022), Trade to GDP ratio, trade liberalization, real GDP per capita (Nitsch, 2006), country GDP, imports and exports of services and goods, Imports and exports of commodities, and agriculture (Thia, 2016). This study will measure trade with exports of goods and services because this proxy is taken as an independent variable in previous research studies and is rarely used.

Independent variables

Urban development is used as an independent variable. There are many indicators of urban development. Different Researchers use different proxies to measure urban development. Some Researchers use city size, urban structure, urban population proportion residing in urban areas, shares of urban residents as a proportion of total populations, and largest city population (percentage of urban population). This study will measure urban development with urban population because this proxy is rarely used. Urban development was used as a dependent variable in the previous research, but this study will use urban development as an independent variable.

Control variables

This study also uses some control variables: the financial sector, private sector, and economy and growth. Many studies use these variables as control variables, and different studies use different proxies to measure them.

Other variables

Aid effectiveness is used as a moderating variable in this study. There are different indicators for aid effectiveness. Other researchers use different proxies to measure aid effectiveness. Some researchers use the percentage share of development aid (Doucouliagos and Paldam, 2009), aid inflow (income share) on saving rate, and government expenditure level. This study will measure aid effectiveness with technical cooperation grants, which have not been used before as a proxy for aid effectiveness. In different research studies, Aid effectiveness is used as a dependent or independent variable, but we will use aid effectiveness as a moderator.

Sample selection and data collection

This study will use a sample of OIC and OECD countries. This study used secondary data that were taken from different sources. The data about trade was extracted from the World Bank Developments Indicator (WDI), and the data regarding urban developments was extracted from WDI and OECD statistics. And data about aid effectiveness was extracted from WDI. The control variables, financial and private sectors, and economy and growth data were extracted from WDI.

Hypothesis

Trade has a positive impact on urban development. There is an increase in urban population due to a positive relationship between import and export openness, however, in the case of a reverse connection, trade openness is correlated positively with urbanization and the geographic center of the urban region (Chhabra et al., 2022). There is an inverse relationship between urbanization and trade shocks. The urbanization rate is reduced by 0.4% due to the negative trade shock. Trade shock decreases the urban and rural income gap by decreasing urban citizens, wages and eventually slowing down the process of urbanization (Shuo Chena et al., , 2023). Trade positively affects urbanization; a 10-fold increase in exports will increase the municipal population shares 6 percent on average in the country (Thia, 2016).

H1: Urban development has a significant impact on trade.

Aid for trade may significantly affect competitiveness and export directly and indirectly. These impacts result from complicated causal chains going from aid flows to economic achievement at the national level, including domestic policymakers, policies, implementation agencies, and the country's condition (CALi, 2008). Multilateral and bilateral aid has a positive, stable effect on investment, whereas the latter is more efficient in boosting investment. Unexpectedly, we discover that aid related to investment and non-investment (targeting the education and health sector) efficiently encourages investment (Nowak-Lehmann and Gross, 2021). Foreign aid and domestic budget have weak and quantitatively insignificant effects on poverty reduction (Sourya and Sainasinh, 2014).

H2: Aid effectiveness significantly mediates the relationship between urban development and trade.

Empirical Model

Urban development has a direct impact on trade. Moreover, changes in urban development indicators such as urban population, urban density, and economic development affect a country's trade rate. To validate this hypothesis empirically, we could consider a regression model, where urban development is an independent variable, trade is a dependent variable, and some control variables also impact the export of goods and services.

$$T_{it} = \beta_0 + \beta_1 UD_{it} + \beta_2 X_{it} + \epsilon_{it}$$

Here β is the coefficient to be projected, T_{it} is the trade of the i -th country, and in the year t , UD_{it} is the urban development of the i -th country. In the year t , X_{it} is the control variables such as financial sector, private sector, and economy and growth, and ϵ_{it} is the error term. Aid effectiveness moderates the relationship between urban

development and trade. However, changes in aid effectiveness may cause this relationship to differ. To validate this hypothesis empirically, we could consider a regression model where urban development is an independent variable, trade is a dependent variable, and aid effectiveness is a moderating variable. The model could also include some control variables.

$$T_{it} = \beta_0 + \beta_1 UD_{it} + \beta_2 AE_{activity_{it}} + \beta_3 (UD_{it} \times AF_{activity_{it}}) + \beta_4 X_{it} + \epsilon_{it}$$

Here β is the coefficient to be projected, T_{it} is the trade of the i -th country, and in the year t , UD_{it} is the urban development of the i -th country. In the year t , $AE_{activity}$ is the for the aid effectiveness, which the technical cooperation grant could measure, $UD_{it} \times AF_{activity}$ represents the interaction term between urban development and Trade, X_{it} is the control variables such as real GDP, Distance between the country and human capital index, and ϵ_{it} is the error term.

Analysis tools and techniques

This study will use different diagnostic and major regression tests and cover the period from 2008 to 2020. Descriptive statistics are used first to determine if the is stationary at level or first different, followed by the unit root test. For data analysis and empirical results, we will use STATA 17 software. This software will provide various statistical techniques, such as data analysis, regression analysis, etc. We will also use Microsoft Excel.

Table-1 Description of variables

Variable name	Notation	Proxy	Data source
Dependent Variable			
Trade	T	Export of goods and services (EXGS)	WDI
Independent variable			
Urban development	UD	Urban population (UP)	WDI OECD
Moderator			
Aid effectiveness	AE	Technical Cooperation Grant (TCG)	WDI
Control variable			
Financial sector	FS	GDP	WDI
Private sector	PS	Merchandise exports (MERX)	WDI
Economy and growth	ECG	Foreign direct investment (FDI)	WDI

RESULTS AND DISCUSSION

Descriptive statistics

Table 1. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
EXGS	540	3.238	.596	.452	4.491

UP	540	15.049	1.321	12.076	17.652
TCG	540	17.697	1.032	13.989	19.526
FDI	540	.841	1.177	-6.168	3.62
GDP	540	23.306	1.27	20.624	26.851
MREX	540	21.551	1.762	15.761	25.54

The table above covers an in-depth examination of descriptive statistics for six variables, each with 540 observations. In this dataset, "EXGS" serves as the dependent variable (DV), "UP" serves as the independent variable (IV), and "TCG" serves as the moderator. "FDI," "GDP," and "MREX" serve as control variables. Starting with "EXGS," the mean value of 3.238 displays the data's central tendency, with the standard deviation of 0.596 revealing the spread or dispersion of values around this mean. This shows that most observations cluster around this mean with a modest degree of variability, as represented by the standard deviation. Moving on to "UP," representing the independent variable, we get a mean of 15.049 and a 1.321 standard deviation. This suggests that the dataset has a broader spread than "EXGS," implying a more comprehensive range of values or maybe more variability in the data. The moderator variable, "TCG," has a mean of 17.697 and a 1.032 standard deviation, indicating its central tendency and variability in the dataset. This result shows the average "TCG" score across all observations and the extent to which values deviate from that average. In addition to the essential variables, the table includes the control variables "FDI," "GDP," and "MREX." The average value of "FDI" is 0.841, "GDP" is 23.306, and "MREX" is 21.551. Each control variable has its standard deviation, representing the range of data points around its meaning.

Correlation

Table 2. Correlation

Variables	(1)	(2)	(3)
(1) EXGS	1.000		
(2) UP	-0.137	1.000	
(3) TCG	-0.325	0.739	1.000

The correlation matrix sheds light on the correlations among three variables: "EXGS," "UP," and "TCG." The correlation coefficient between "EXGS" and itself is exactly 1.000, showing a perfect correlation. This means each variable completely correlates with itself, an essential correlation property. The correlation between "EXGS" and "UP" is -0.137. This negative correlation implies a weak inverse association between the two variables. In other words, while one variable grows, the other tends to fall slightly, and vice versa. However, the magnitude of this association suggests that the relationship could be more robust. The correlation coefficient of "EXGS" and "TCG" is -0.325. This negative correlation indicates a moderate inverse association between these two variables. As "TCG" increases,

"EXGS" tends to fall, and vice versa. The value of the correlation coefficient indicates a somewhat stronger association than the correlation between "EXGS" and "UP." The correlation coefficient of "UP" and "TCG" is 0.739. This positive correlation shows a robust direct association between the two variables. As "UP" rises, so does "TCG," and vice versa. The size of this correlation coefficient indicates a strong positive association between the two variables.

VIF

Table 4. Variance inflation factor

	VIF	1/VIF
TCG	2.202	.454
UP	2.202	.454
Mean VIF	2.202	.

The VIF variance inflation factor determines the extent of multicollinearity among predictor variables. VIF value more than 1 shows the existence of multicollinearity, with greater values suggesting more collinearity. In this table, "TCG" and "UP" both have VIF values of 2.202, indicating that these predictor variables are moderately multicollinear. The reciprocal of the VIF (1/VIF) is also provided, with values smaller than one reflecting the extent to which the coefficients' standard errors are inflated due to multicollinearity. A result close to 0.454 suggests that the standard errors of the coefficients for "TCG" and "UP" are around 2.202 times greater than they would be if multicollinearity did not exist. The mean VIF, determined at 2.202, offers an average measure of multicollinearity across all predictor variables, showing that multicollinearity exists but is not severe. Overall, the VIF values indicate the presence of multicollinearity but do not surpass the usual thresholds, indicating severe multicollinearity, implying that the model's coefficients are still interpretable.

Slope homogeneity

Table 6. Slope homogeneity

	Delta	p-value
	7.741	0.000
adj.	8.655	0.000

The slope heterogeneity test, suggested by Yamagata and Pesaran (2008), determines whether the regression model's slope coefficients are homogeneous. Blomquist and Westerlund (2013) investigated the slope coefficient homogeneity in a regression model. The H0 (null hypothesis) states that the coefficients are homogeneous over the model. The test statistics, denoted by "Delta," produce values of 7.741 and 8.655, respectively, with exceptionally low p-values of 0.000 for initial and corrected tests. This provides strong evidence against the premise of homogeneity, indicating considerable variances in slopes between groups or variables. Furthermore, the HAC (Heteroskedasticity and Autocorrelation Consistent) Kernel, which has a Bartlett bandwidth of around 1.972, ensures robust

standard errors. The constant term is partially excluded from the assessment of slope heterogeneity, resulting in a more accurate evaluation of the model's parameters.

Cross-sectional dependencies

Table 8. Cross-sectional dependency

Variable	CD-test	p-value	average joint T	mean ρ	mean abs(ρ)
EXGS	+ 9.205	0.000	15.00	+ 0.09	0.36
UP	+ 55.109	0.000	15.00	+ 0.57	0.73

The CD-test findings are shown in the table, a statistical test for detecting structural fractures or changes in the relationship between variables. The CD-test statistics for the "EXGS" and "UP" variables are significantly high, with values of 9.205 and 55.109, respectively. These high CD-test statistics strongly suggest that there are structural fractures in the link between the variables. Furthermore, the related p-values of 0.000 for both variables demonstrate that the observed breaks are statistically significant, providing robust evidence opposing the null hypothesis of no structural break. The significance of these alterations is further supported by the average joint T values of 15.00. Furthermore, the average ρ and average abs(ρ) values shed light on the type and extent of the detected structural alterations, supplying crucial data for comprehending modifications in the correlation between the variables "EXGS" and "UP."

Unit Root Test

Table 9. Levin-Lin-Chu unit-root test for EXGS

	Statistic	p-value
Unadjusted t	-10.1211	
Adjusted t*	-3.4989	0.0002

Table 10. Levin-Lin-Chu unit-root test for UP

	Statistic	p-value
Unadjusted t	-8.3840	
Adjusted t*	-4.1398	0.0000

The table shows the outcomes of the unit root tests for the "EXGS" and "Up" variables. The dependent variable "EXGS" is examined in Test 1; the unadjusted t-value is -10.1211, the corrected t-value is -3.4989, and the associated p-value is 0.0002. This shows compelling evidence that the variable in "EXGS" is probably stationary, refuting the null hypothesis that it has a unit root. Likewise, the independent variable "Up" is the main focus of Test 2. The adjusted t-value in this case is -4.1398, the p-value is 0.0000, and the unadjusted t-value is -8.3840. Once more, these findings indicate stationarity and offer compelling evidence against the existence of a unit root in "Up." Overall, both tests indicate that neither the independent variable "Up" nor the dependent variable "EXGS" show behavior

consistent with a unit root.

Hausmann

Table 11. Hausmann

	Coef.
Chi-square test value	0
P-value	.

Findings of the Hausman (1978) specification test, a diagnostic method frequently employed in econometrics to evaluate the consistency of estimators, are shown in the table. The test statistic in this instance, denoted by the "Chi-square test value," is reported as 0. There appears to be no systematic difference between the estimators being examined, as this number indicates that the observed difference between them is zero. The lack of a p-value suggests that the presented data does not provide the significance level associated with this test statistic or cannot be calculated from it. The overall outcome of the Hausman test indicates that the estimators under comparison are consistent with one another, supporting the validity of the model specification being studied.

GMM

Table 12. Regression (GMM)

EXGS	Coef	St.Err	t- value	p- value	[95% Conf	Interval]	Sig
L	.471	.043	10.94	0	.387	.555	***
UP	-.22	.047	-4.63	0	-.313	-.127	***
Mean	3.234		SD	dependent	0.595		
dependent var			var				
Number of obs	468		Chi-square		.		

*** $p < .01$, ** $p < .05$, * $p < .1$

The results of an estimation using the GMM (Generalized Method of Moments) are shown in the table. The "EXGS" dependent variable and the two independent variables are "L" and "UP." To minimize a given criteria function—frequently dependent on moment conditions coefficients in GMM are computed iteratively. 0.471 is the calculated coefficient for the variable "L," with a 0.043 standard error. This coefficient is highly significant, as indicated by the corresponding t-value of 10.94 and the p-value of 0. The 95% confidence interval range for the letter "L" is 0.387 to 0.555. Likewise, the coefficient for the variable "UP" is predicted to be -0.22, with a standard error of 0.047. Furthermore, statistical solid significance is indicated by the t-value of -4.63 and the p-value of 0. -0.313 to -0.127, which is the range of the "UP" 95% confidence interval. Based on the GMM estimation, these results show that "L" and "UP" both significantly affect the EXGS (dependent variable). Moreover, the dependent variable's mean and standard deviation based on 468 observations—

are given as 3.234 and 0.595. The chi-square value, however, is missing from the table and could provide more information about the GMM model's overall goodness of fit.

CONCLUSION

The study explores the complex interactions between urban population, trade, and development within the framework of globalization. It draws attention to historical events that demonstrate the dynamic nature of urbanization as it is influenced by global trends, such as the mass evacuation of over five million urban residents from Shanghai in the middle of the 20th century. Scholars have thoroughly analyzed how the trade circulation sector affects urbanization, focusing on how urbanization might improve trade distribution and optimization. Interestingly, to close a gap in the literature, the study offers a fresh viewpoint by examining the moderation effect of technical cooperation grants on the association between the urban population and exports of products and services. Based on a panel data model, the study's methodology operationalizes variables such as aid efficacy, commerce, and urban growth and analyzes their intricate relationships. According to the data, urban development has a considerable detrimental influence on commerce, although technical cooperation funds have a moderating effect that complicates the relationship. Urban population significantly impacts export performance; regression analysis, correlation analyses, and variance inflation factor computations provide insight into the complex network of variables influencing trade dynamics in the contemporary period.

Recommendations

Adopt a place-based, holistic approach to urban development instead of implementing universally applicable policies. This approach should consider the distinct economic, social, and environmental aspects that shape each city or region. When drafting policy interventions, take great care to consider the possible trade-offs and synergies between urban growth, trade competitiveness, and aid effectiveness. Invest in programs, services, and laws that will improve urban centers' resilience and productivity to take advantage of trade possibilities—investigating cutting-edge financing methods like blended finance models to raise money for projects aimed at trade facilitation and urban development. Increase coordination and coherence amongst national, regional, and local government departments and levels for efficient policy implementation and alignment must be increased. To learn more about the intricate and subtle relationship between trade, urban development, and the efficacy of aid, do more studies. However, several other aspects need to be further investigated as well. The current study indicated a considerable negative impact of the urban population on exports. Examine substitutes and techniques for quantifying the critical factors, as the present research depended on restricted indicators such as the number of individuals residing in cities, exports of products and services, and grants for technical collaboration. Since 36 nations and data from 2008 to 2020 were used in the current analysis, larger sample sizes and extended periods are needed for a more thorough grasp of the dynamics. Examine the possible

discontinuities in structure and the cross-sectional correlations found in the relationship between export-urban populations to determine this complexity's fundamental causes. Provide comprehensive frameworks for policy development that consider the relationships between commerce, urbanization, and the efficacy of aid. Segregated methods could overlook crucial connections. Invest in data collecting and monitoring systems to follow better changing trends and patterns in trade flows, urban growth, and the effects of development assistance. Promote cooperative research projects amongst universities, aid organizations, and decision-makers to produce evidence-based knowledge that can guide more successful interventions. Boost technical collaboration and information-sharing networks to help nations and areas dealing with comparable urbanization and trade issues share best practices and lessons learned.

Limitation of Study

Due to data availability limitations, the study could only include 36 countries, which may have limited the results' application. Future studies should aim to extend the sample size and geographic coverage. Due to data restrictions on financial integration measures, the period is limited to 2008-2020. An expanded time horizon may yield a more thorough comprehension of the long-term relationships among aid efficacy, commerce, and urban growth. The study uses a small number of proxies to measure the critical variables, like the number of individuals residing in cities, exports of goods and services, and grants for technical cooperation. Examining different indicators might provide further information. With an R-squared value of just 0.019, the linear regression model cannot explain the phenomena. This implies that other variables not taken on in the model may significantly explain the export fluctuation.

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