Relationship between Population Demographics and Economic Growth in Belt and Road Countries

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Abstract: The Belt and Road Initiative is a program that aims to hamper trade and investment across nations by improving connectivity across economies. The research aims to assess the association between population demographics and economic growth in BRI nations. For this purpose, the study incorporates an analysis of panel data across all BRI nations from 2001 to 2020. It includes the Hausman test, the RE model, and the FE model. The results of the analysis represent an increase in the urbanization rate among BRI economies causing an addition to the GDP as it raises employment and technological advancement across nations. Similarly, the age distribution in BRI nations stimulates the nation's economic growth as the working-age population adds to the GDP. However, a rise in population affects the GDP growth rate in BRI nations negatively as it leads to resource scarcity and creates competition in the market. The research highlights policy recommendations such as a rise in urbanization by the government, along with an increase in working population dynamics to foster the nation's GDP growth. At the same time, it also highlights government policies like a rise in political stability, government effectiveness, a rise in government measures to reduce the rising population, etc can further hamper BRI economies' growth.

Keywords: *population demographics, Economic growth, BRI, urbanization, age distribution*

1: Introduction

1.1 Background of the Belt and Road Initiative

In December 2023, 151 nations joined the Belt and Road initiatives by signing a Memorandum of Understanding with China. Initially, the BRI was introduced by President Xi Jinping in 2013 in order to foster economic cooperation from the Western Pacific to the Baltic Sea and to break the connectivity bottleneck through infrastructure investments in Asia (Pallis, et al., 2020). The BRI program is the central program of the foreign policy and domestic economic strategy of China. The Chinese government unveiled its action plan in March 2015. It incorporates a land-based Silk Road Economic Belt including a zone to influence on both sides of the Belt and a 21st-century Maritime Silk Road. The BRI will help the Chinese economy to ensure safe navigation overseas and to improve strategic and economic relations with neighboring and far-west nations. In addition, it will help strengthen the presence of China in the Eurasian region, along with a commanding position over Asian nations. The BRI by China has attracted many nations in terms of economic, social, political, and demographical dynamics (Chen & Yip, 2018). The BRI aims to facilitate and fund infrastructural development in economies by building roads, ports, and telecommunication through an improvement in connectivity, which enhances the nation's economic growth. Additionally, BRI enhances trade and investment, which further promotes policy coordination by addressing barriers and fostering economic growth. At the same time, BRI projects also aim to provide support by including investments, government loans, and financial institutions in economies. In this context, the aim of the research is to determine the association between population demographics and economic growth in Belt and Road nations. The research incorporates an econometrical analysis using the panel data from 2001 to 2020.

1.2 Importance of analyzing population demographics and economic growth

It is crucial for a nation to determine its demographic variables as it provides important information that can be used in making better business, government, and social decisions for an economy. Moreover, it provides information to individuals regarding population characteristics (Sánchez-Romero, et al., 2018). It highlights that population demographics and their associations with economic growth are vital for effective policy-making decisions, and policy formation in an economy. This is because understanding population demographics can help in determining current and future economic challenges in an economy. In addition, it can also help in determining the allocation of resources in terms of the development of infrastructure, growth of population, urbanization, age distribution, etc (Coale & Hoover, 2015). It fu4rther allows the government to examine investment opportunities in a market by identifying FDI, interest rates, and lending rates. Population demographics are critical in the development

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of economic forecasting models as they provide an analysis of age structure, population growth, urbanization, etc, which helps in promoting the economic development of the nation. Thus, population demographics are useful in shaping economic dynamics, policy formation for government, and addressing challenges that can be faced by individuals and businesses in an economy in the long run. It also helps in capitalizing on the growth opportunities of the nation.

1.3 Objectives of the study

In order to determine the association between population demographics and economic growth, the research has laid down three research objectives.

- To determine the trend of population demographics with economic growth in BRI nations.
- To examine the effect of population demographics on the economic growth of BRI nations from 2001 to 2020.
- To investigate the policy actions that can be useful in hampering the economic growth through population demographics in BRI economies.

2: Literature Review and Research Hypotheses

To accomplish, the research objectives set for the study, this chapter undertakes previous studies of the literature with similar objectives. In addition, it also develops a hypothesis based on the research objectives of the study.

2.1 Previous Studies on Population Demographics and Economic Growth in Belt and Road Countries

The BRI project by China is one of the most ambitious infrastructure investment projects in history, leading to regional economic growth stimulation in Asian, European, and African nations. The research by Jiang, et al. (2018) examines the effect of population on the GDP growth rate in the BRI nations. For this purpose, the research incorporates cross-country panel data. The results of the research indicate that the population and the BRI nations nearly made up 62.3% and 31.2% of the total global economy in 2016. It highlights the importance of determining the association between population demographics and economic growth in BRI economies. However, South Asian and Southeast Asian nations along with the Maritime Silk Road depict a larger economic total but a lower GDP per capita because of the high-density population. However, the forecasting model used by the research represents that the percentage of the population in the total global economy will reduce, along with an increase in GDP in the long run. As the results highlight both long-run and short-run perspectives, it makes the study insightful. In addition, another research identifies

the effect of both urbanization and population on economic growth in BRI nations (Jing, et al., 2020). The nations throughout the BRI account for more than 60% of the global economy. The results of the research depict that future changes in BRI nations will significantly impact economic growth globally. Additionally, the research indicates that the urban population proportion to the total population and GDP were included to highlight urbanization, and economic growth, respectively. For this purpose, the study incorporates the IPCC framework, along with socioeconomic pathways. As per the results, the urbanization rate will increase by 1.4% to 7.5% /10a in BRI nations, along with an increase in population by 2% to 8% /10a, resulting in an overall increase in the GDP of BRI nations by nearly 17% to 34%/ 10a from 2020 to 2050. The research has been considered as it indicates that population and urbanization have a direct effect on the GDP of BRI nations in the long run.

Apart from urbanization and population, age distribution is another population demographic that is crucial in determining a nation's economic growth. The research by Chen & Yip (2018) explores the effect of age distribution on economic growth in 65 nations in the B&R economies. It includes a graphic visualization, population age structure, and demographic transition effects on economic growth. It has been done by the inclusion of a cluster model for the classification of B&R nations into 2 categories. The first group consists of the nations with younger populations, access to lower education, and a large gender gap in the nation. On the other hand, the second group comprises nations with aged populations and better education levels, female labor force participation, and better economic development. The results highlight a very complicated curvilinear association between wealth and well-being, highlighting that BRI nations should not just focus on economic growth but also human well-being. The research also depicts that age distribution is significantly impacted by the proportion of individuals in particular age groups. It means that the data of age structure distribution allows the growth rate to be associated with the economic development of the population. Another study also provides an analysis of the various demographic variables, which affect the GDP per capita of BRI (Bruni, 2019). The research provides an analysis based on 65 BRI nations which are largely widespread and the demographic transitions. The analysis depicts that in a few nations, the working-age population has a significant direct effect on GDP while in other cases it indicates a negative effect. The research is crucial as it shows that it is essential for the BRI nations to incorporate age distribution as a demographic variable while considering economic growth as it significantly impacts the GDP of a nation. In addition, the research investigates the effect of population growth

on economic growth (Headey & Hodge, 2009). The research includes 471 econometrical regressions from 29 prominent economic growth types of research using meta-regression analysis. The findings of the study show that more than ½ of the population's variations in growth impacts are observed from the previous literature, and the study represents the indirect association between the dependent and independent variables. Additionally, it also highlights the implication for policymakers as it indicates that changes in population growth lead to a reduction in economic growth. Moreover, it depicts the rising negative impacts of population growth in the post-1980 years, highlighting that governments should warrant demographic issues with greater attention as they affect the economy adversely. Moreover, another research by Menike (2018) identifies the relationship between population growth and economic development as the population is rising globally. The research is based on qualitative analysis as it undertakes analysis on the basis of the previous studies of literature. The results of the study represent that though the steady growth of the population might be considered an obstacle to the economic development of a nation but majority of nations have considered the population growth as a blessing as it positively affects the economic growth of nations. This is because many previous studies of the literature depicted that population growth adds to the workforce of the nation, which increases access to labor in an economy. More labor in an economy signifies more manufacturing of goods and services, which in turn leads to the stimulation of economic growth in nations. Thus, population growth causes the expansion of labor and products, which hamper the economy's growth in the long run. Moreover, the growth of the population is also beneficial as it increases the total consumption by individuals in the nation. A rise in total consumption is directly association with the GDP growth rate of the nation. Therefore, the research represents that though there are both positive and adverse effects of population growth on the economic growth of the nation, but the majority of nations have witnessed positive effects due to population growth in the global economy.

Another crucial aspect of the population demographics is financial and government policies, and their effectiveness. The study by Saud, et al. (2019) highlights the effect of financial development on the economic growth of BRI countries. Under financial development, the study considers FDI, trade, and electricity consumption using a cross-sectional analysis from 1980 to 2016. Furthermore, it also explores the Kuznets curve and an augmented Dickey fuller test. The results indicate that an increase in foreign direct investments and trade leads to a rise in the economic growth of BRI nations. In addition, another study highlights the association between trade and economic growth from 1991 to 2014 in various regions of East Asia, Europe, the Middle East, Central Asia, and Southeast Asia (Sun, et al., 2019). The results of the panel data show that trade affects the economic growth of nations positively in BRI countries. Apart from this, external shocks also affect the economic growth of economies. The research by Lee, et al. (2022) identifies the spillover impacts of real and monetary sector shocks on BRI nations. The study uses a panel vector autoregression model by considering the effects of trade and nominal interest rates on economic growth by incorporating a sample of 50 BRI nations from 2000 to 2017. The results of the study highlight that trade openness adds to the GDP of the BRI economies. Additionally, investment and political stability increase the annual GDP growth rate of countries in BRI nations. In addition, another research indicates that the rise in investment adds to the economic growth of the nation as it encourages infrastructural development, technological development, and optimization of resource allocation (Kong, et al., 2021). However, the study also shows that additional debt declines the economic growth of nations as it raises the liability on the economy to pay back. In addition, external factors like economic and political factors help provide stability to the nation, which further leads to a reduction in crimes and an enhancement in the economic growth of BRI nations. It means that the government's effectiveness and external factors are also important parameters that determine economic growth in nations. Thus, it represents that optimal financial strategy, along with effective government policies are vital in the determination of economic growth. This is because these factors not only stimulate economic growth but also provide an economy with stability in the long run. The research by Bird, et al. (2020) explores the effect of population growth, employment, trade, and infrastructure on the economic growth of BRI nations. The study includes 7 BRI nations and highlights that population growth leads to an increase in the economic growth of nations as it raises the manufacturing output in the nation. In addition, it also depicts that due to population growth, there is a positive impact on employment, which increases economic growth in nations. Lastly, the study also shows that a rise in trade and infrastructure leads to a rise in economic growth in countries. Additionally, the research shows that the BRI provides Central Asian regions with an improvement in connectivity with the rest of the world, hampering economic growth in nations.

The above past studies of literature have provided various crucial findings but this research is an addition to the future studies of literature. This is because this research includes all BRI nations, which were not incorporated by the majority of studies. In addition, this research is based on recent years from 2001 to 2020, which provides a

recent empirical analysis of the studies. Moreover, studies included only cross-sectional analysis and those studies which included panel data analysis did not incorporate the random effects and the fixed effects model based on the Hausman test, which adds to the present literature and will further be useful in future studies. Apart from econometrical analysis, this study also includes policy analysis and recommendations based on the results of the study.

2.2 Hypothesis Development

From the past studies of literature, it can be interpreted that urbanization, age distribution, and population are crucial determinants of the economic growth in BRI nation. Thus, the study undertakes these variables as explanatory variables to determine the association between population demographics and economic growth. The research hypotheses of the study are shown below:

H0: Population demographics, including age distribution, urbanization rate, and population significantly does not influence economic growth in Belt and Road countries.

H1: The demographic dividend resulting from favorable population demographics including age distribution, urbanization rate, and population significantly influence economic growth in Belt and Road countries.

If the p-value of coefficients is lower than 0.05, then there is a rejection of the null hypothesis. However, if the p-value is higher than 0.05, then the null hypothesis is not rejected, and it can be depicted that there exists no significant association between population demographics and economic growth in Belt and Road nations.

3.0 Methodology

This chapter highlights the research design that will be used to determine the association between population demographics and economic growth in BRI countries. It includes research strategy, econometrical model construction, and variable selection.

3.1 Research Method

The research undertakes a quantitative research method for the investigation of the effect of population demographics on economic growth in BRI nations from 2001 to 2020 with the help of panel data. Quantitative analysis uses a set of techniques incorporating statistical and mathematical modeling, measurements, and research for understanding behavior (Holton & Burnett, 2005). It includes mainly four main types of quantitative research, namely, descriptive, correlation, causal-comparative, and experimental research to establish cause-effect association among variables. This research includes quantitative analysis incorporating descriptive statistics, correlation analysis, the OLS regression model, the random effects model (RE), the fixed effects model (FE), and the Hausman test. These tests have been performed using the Stata software. Before proceeding with the research, it is crucial to determine the study's research strategy. The study is based on a quantitative paradigm because the research includes a positivism approach which establishes facts and enumerations of logical associations in the research (Alharahsheh & Pius, 2020). Moreover, a positivism paradigm is based on measurements, which makes the reliability of the research as it is done on the basis of measurements and shreds of evidence. In addition, it incorporates econometrical and statistical tests on the basis of analysis. In this context, the research includes graphical and econometrical models of panel data analysis including scatter plots, descriptive analysis, correlation, OLS regression, the RE model, the FE model, and the Hausman test. The positivism paradigm is useful in determining the patterns and associations between population demographics and economic growth in BRI nations. Thus, the research includes a quantitative research method to explore the effect of population demographics on economic growth in BRI countries.

3.2 Variables and Econometric Model Construction

The first research objective of the study is to investigate the trend of population demographics with economic growth in BRI nations. This research objective has been undertaken with the help of scatter plots in Stata software. These scatter plots have been considered to highlight the trends of population demographics, which are urbanization, age distribution, and population, along with economic growth in BRI economies. These scatter plots will help in determining the rising or declining trend of age distribution, urbanization, and population in BRI nations. In addition, the second research objective is fulfilled on the basis of an econometrical model for analyzing the effect of population demographics on economic growth in BRI nations. For this purpose, the research has considered a dependent variable, along with various dependent and independent variables, which have been depicted in the form of the table below.

Table 1: Variables description

Variable Type	Name of Variable	Variable description
Dependent variable	GDP growth rate	GDP growth (annual %)
Independent variable	Population size	Population, total
Independent variable	Urbanization rate	Urban population growth (annual %)
Independent variable	Age Distribution	Population ages 0-14 (% of total population), Population

		ages 15-64 (% of total population), Population ages 65 and above (% of total population)
Control variable	Investment rate	Foreign direct investment, net inflows (% of GDP)
Control variable	Government policies	Government Effectiveness
Control variable	External shocks	Political Stability and Absence of Violence/Terrorism: Estimate, Merchandise trade (% of GDP), Interest rate spread (lending rate minus deposit rate, %), Lending interest rate (%), Unemployment, total (% of the total labor force) (modeled ILO estimate), Inflation as (GDP deflator (annual %))

Data for all variables have been collected from World Development Indicators. Under age distribution, various age groups ranging from 0-14, 14-64, and 65 and above have been selected to study the effect on economic growth. Moreover, under external shocks, geopolitical shocks including political stability and trade, financial shocks including interest rates and lending rates, along economic shocks incorporating unemployment and inflation have been considered. Thus, the econometrical model formed from the variables is highlighted in the form of an equation below:

$$GDP_{it} = \beta_0 + \beta_1 \cdot Population_{it} + \beta_2 \cdot Urbanization_{it} + \beta_3 \cdot AgeDistribution_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Thus, the model incorporating control variables will be:

$$GDP_{it} = \beta_0 + \beta_1 \cdot Population_{it} + \beta_2 \cdot Urbanization_{it} + \beta_3 \cdot AgeDistribution_{it} + \beta_4 \cdot Investment_{it}$$
$$+ \beta_5 \cdot GovernmentEffectiveness_{it} + \beta_6 \cdot externalfactors_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

The null hypotheses are rejected when the p-value of coefficients of population, urbanization, age distribution, investment, government effectiveness, and external factors is lower than 0.05, highlighting that GDP has been significantly affected by population, urbanization, and age distribution, investment, government effectiveness, and external factors.

3.3 Econometric Tests

The research includes descriptive analysis to determine the standard deviations, maximum, and minimum values of the variables selected. In addition, a correlation test identifies the form of association between variables. Thereafter, OLS regression is run to determine the association between the dependent variable and the explanatory variables. Then, the Hausman test is used to determine the model selection between the RE model and the FE model.

3.4 Data

The data for the dependent variable which is GDP growth is collected from the World Development Indicators. Similarly, the data for all explanatory and control variables are also collected from the World Development Indicators from 2001 to 2020 for 148 BRI nations. However, the data for a few variables is missing for a few nations but as the majority of data was available, it was not an issue for the analysis. Therefore, the research includes a panel data analysis with the help of Stata software to explore the effects of population demographics on economic growth in BRI economies from 2001 to 2020.

4.0 Results and Analysis

The chapter depicts the findings of the research obtained from Stata software. In addition, it also determines the results of scatter plots, and econometrical models considered by the study.

Objective 1: To explore the trend of population demographics with economic growth in BRI nations

The trend line in Figure 1 highlights the population trend based on the economic growth of the top 10 nations over the years. It considers years on the X-axis and the population of nations on the Y-axis. It highlights that among the top 10 nations based on GDP growth rate. It depicts that there has been a rise in population in nations such as Bangladesh, Egypt, Ethiopia, Iran, and Niger. On the contrary, other countries represent almost constant population from 2001 to 2020.
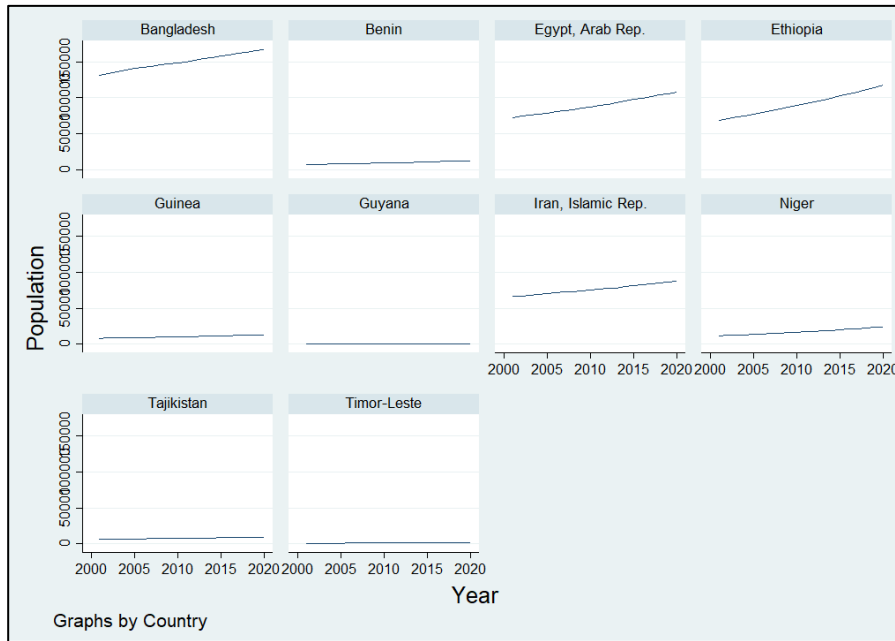
Fig 1: Trend line of population

The second trend plot depicts that among the top 10 GDP nations as of 2020, the highest urbanization has been depicted by Guyana from 2001 to 2020. However, other nations have not depicted much growth in their urbanization rates over two decades.
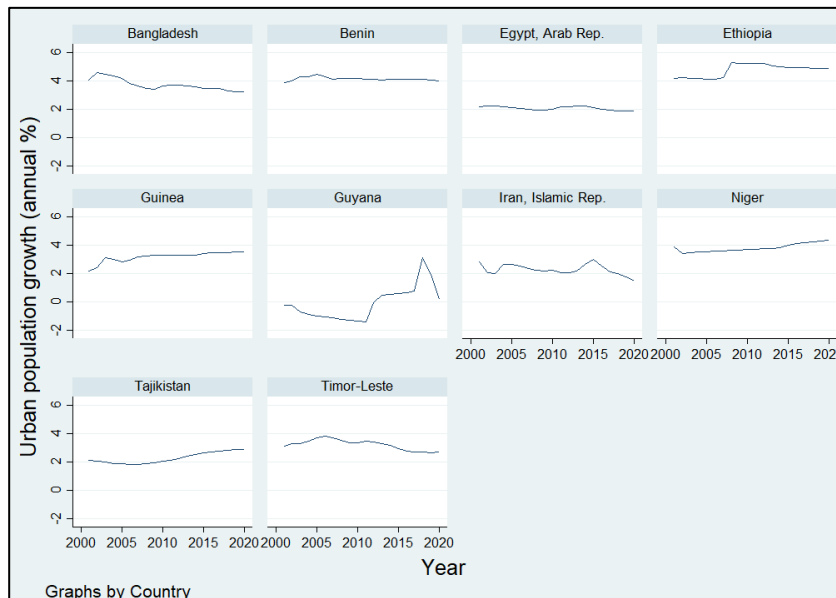

Fig 2: Trend line of Urbanisation

Objective 2: To determine the association between population demographics and economic growth of BRI nations from 2001 to 2020.

Table 2 below highlights the descriptive statistics of variables taken into consideration. It depicts that the mean of GDP is 3.64 while the standard deviation is 5.74, representing very little variability in the dataset. Similarly, there is a very low variation in the dataset of urbanization as the mean is 2.30 and the standard deviation is 2.07.

However, there exists high variability in the population as the mean is 30200.41 while the standard deviation is 114589.00. Age distribution which has been divided into 3 groups from 0-14, 15-64, and 65 and above, along with FDI also represents some variability in the data. In addition, external factors that have been considered are political stability, government effectiveness, trade, unemployment, interest rates, and lending rates also highlight low variability in the dataset.

Table 2: Descriptive Table

Variable	Obs	Mean	Std. Dev.	Min	Max

GDP growth rate	2,915	3.64	5.74	-50.34	86.83
Population	2,960	30200.41	114539.00	68.15	1411100.00
Urbanization	2,960	2.30	2.07	-8.83	19.61
Age dis (0-14)	2,960	30.79	10.86	12.15	50.56
Age dis (15-64)	2,960	62.31	7.34	47.29	86.08
Age dis (65 and above)	2,960	5.89	4.21	0.11	20.94
FDI	2,872	5.73	18.97	-117.37	449.08
Govt. effectiveness	2,799	-0.28	0.83	-2.44	2.47
Political stability	2,805	-0.23	0.96	-3.31	1.64
Net Trade	2,921	65.96	36.12	8.32	343.49
Interest rate	1,859	7.16	6.67	-21.00	69.94
Lending rate	1,975	13.40	9.27	1.47	118.38
Unemployment	2,840	7.92	6.07	0.10	37.32

After descriptive statistics, the correlation table below depicts that there exists a low correlation between GDP growth with both explanatory and control variables. For instance, the correlation coefficient between population and GDP growth is 0.10 depicting a weak positive correlation. Similarly, the correlation coefficient between urbanization and GDP growth is 0.18, representing a positive weak correlation. Additionally, the correlation table also depicts that the age distribution of the age group 0-14 has a positive weak correlation with GDP growth while age groups of 15-64 and 65+ have a weak negative correlation with GDP growth. In addition, investments, trade, and interest rates are also positively correlated with GDP growth.

Table 3: Correlation Table

	GDP	Pop	Urban	(0-14)	(15-64)	(65+)	FDI	Govt.	Pol	Trade	Ir	Lr	Unemp
GDP	1												
Pop	0.10	1											
Urban	0.18	0.07	1										
(0-14)	0.11	-0.10	0.55	1									
(15-64)	-0.07	0.11	-0.38	-0.92	1								
(65+)	-0.14	0.06	-0.65	-0.78	0.49	1							
FDI	0.08	-0.07	-0.02	-0.07	0.04	0.09	1						
Govt.	-0.10	0.02	-0.24	-0.58	0.58	0.41	0.07	1					
Pol	-0.10	-0.17	-0.16	-0.36	0.34	0.28	0.11	0.63	1				
Trade	0.03	-0.13	-0.12	-0.36	0.38	0.19	0.23	0.40	0.32	1			
Ir	0.04	-0.08	0.11	0.25	-0.25	-0.16	0.07	-0.26	-0.11	-0.09	1		
Lr	0.05	-0.08	0.13	0.30	-0.32	-0.19	0.04	-0.36	-0.21	-0.20	0.85	1	
Unemp	-0.10	-0.11	-0.24	-0.15	0.07	0.22	0.00	0.08	0.08	0.07	-0.01	0.02	1

The Hausman test has been conducted to identify the best-fit model between the RE model and the FE model. The

p-value of the Hausman test is 0.00, which indicates that the null hypothesis that the RE model is the best-fit model is rejected. It means that the Hausman test depicts that the FE model is the best fit over the RE model in this case. Therefore, the FE model is considered for determining the association between GDP growth and demographic population in BRI nations.

The results of the FE model are depicted in the form of an equation below:

$$GDP_{it} = -473.28 + 0.00\ Population_{it}$$
$$+ 0.39\ Urbanization_{it}$$
$$+ 4.98\ AgeDistribution(0-14)_{it}$$
$$+ 4.75\ AgeDistribution(15-64)_{it}$$
$$+ 4.30\ AgeDistribution(64\ and\ above)_{it}$$
$$+ 0.07\ Investment_{it}$$
$$- 1.06\ Government\ Effectiveness_{it}$$
$$+ 1.19\ Political\ stability_{it} + 0.05\ Net\ trade_{it}$$
$$+ 0.20\ Interest\ rate_{it} - 0.15\ Lending\ rate_{it}$$
$$- 0.12\ Unemployment_{it} + \varepsilon_{it}$$

Table 4: The FE model

GDP growth rate	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Population	0.00	0.00	-0.9	0.37	0.00	0.00
Urbanization	0.39	0.13	3.07	0.00***	0.14	0.64
Age dis (0-14)	4.98	1.05	4.73	0.00***	2.91	7.04
Age dis (15-64)	4.75	1.07	4.43	0.00***	2.65	6.85
Age dis (65 and above)	4.30	1.14	3.79	0.00***	2.07	6.53
FDI	0.07	0.02	3.37	0.00***	0.03	0.11
Govt. effectiveness	-1.06	0.72	-1.47	0.14	-2.46	0.35
Political stability	1.19	0.44	2.72	0.01***	0.33	2.05
Net Trade	0.05	0.01	4.93	0.00***	0.03	0.07
Interest rate	0.20	0.07	2.85	0.00***	0.06	0.34
Lending rate	-0.15	0.05	-3.06	0.00***	-0.24	-0.05
Unemployment	-0.12	0.08	-1.58	0.11	-0.28	0.03
_cons	-473.28	105.79	-4.47	0.00	-680.79	-265.77

The results of the FE model highlight that there is a rise in urbanization by 1% causes an increase in GDP growth rate by 0.35%, keeping other factors constant. It depicts that the H0 is rejected and there exists a significant association between urbanization and GDP growth in BRI nations at a 1% significance level. Similarly, a rise in the age distribution population between 0 to 14 by a percent leads to a rise in the GDP growth by 4.98%, keeping other factors ceterius paribus. In addition, a rise in the age distribution population between 15-64 and, 65 and above leads to hampering of GDP growth rate by 4.75% and 4.30%, respectively. These results are significant at a 1% significance level as the p-value is 0.00. However, the results also highlight that population does not affect GDP growth as the coefficient is 0.00 but the p-value (0.37) is insignificant, highlighting there is no significant association between population and GDP growth rate. In addition, a rise in investment by a percentage point leads to an increase in GDP growth by 0.07%, and the results are significant at a 1% significance level. However, the results also depict that a rise in government effectiveness by a unit leads to a 1.06% reduction in GDP growth. However, the results are insignificant at a 5% significance level. In addition, the table identifies that there is a rise in

GDP growth rate by 1,19% due to an increase in political stability and a reduction in corruption by a unit in BRI economies, keeping other factors ceterius paribus. These results are also significant at a 1% significance level. Apart from this, a percent point rise in net trade leads to a 0.05% significant increase in GDP growth rate in BRI nations. The results are significant at a 1% significance level. A percentage point increase in unemployment leads to a reduction in GDP growth by 0.12% in BRI nations. In addition, there is an increase in GDP growth rate by 0.2% due to a rise in one percent interest rate along with an increase in GDP by 0.15% because of a fall in lending rate by 1%, keeping other factors constant. These results are significant at a 1% significance level. However, he R-square of the model is nearly 10%. Therefore, different external shocks have different impacts on the GDP growth rate in BRI economies.

Objective 3: To investigate the policy actions that can be useful in hampering economic growth through population demographics in BRI economies.

From the above FE model, it can be interpreted that the government of a nation should focus on urbanization in BRI nations. This is because urbanization adds to access

to infrastructure and better amenities which help in raising the GDP growth rate of BRI nations. In addition, governments of BRI nations should focus on the distribution of work according to age as it helps stimulate the GDP growth of BRI economies. Moreover, investments in the BRI economies further help hamper economic growth as they create job opportunities in the nation, which raises the total income of individuals, along with a rise in total consumption. It further leads to a rise in savings and investments and creates an upward spiral in the nation, along with a significant positive effect on the economic growth of BRI nations. Moreover, the government should focus on reducing unemployment rates as they significantly have negative effects on the economic growth of BRI countries. This is because when there are more economic activities available to individuals in the nation, there is a rise in production and manufacturing, which leads to a rise in goods and services in the nation. At the same time, it also provides individuals with additional income to consume more, which hampers the economic growth in BRI nations in the long run. Additionally, economic shocks like political stability also have a significant positive effect on the GDP growth of the nation as they lead to increased prosperity and improvement in the quality of lives of individuals, along with social factors in the BRI nations. Therefore, the governments of the BRI nations must consider economic parameters' effects while making policies in the economy.

5.0 Conclusion and Policy Implications

5.1 Summary of Findings

The research aimed to analyze the association between population demographics and economic growth in BRI nations. In order to fulfill the research objectives, the study conducted a graphical analysis and a panel data analysis from 2001 to 2020 including the FE model, the RE model, and the Hausman test. From the findings of the result, it can be highlighted that population demographics impact the GDP growth rate in BRI nations. Firstly, there is a rise in the urbanization rate in the BRI nation, which leads to an increase in the GDP growth rate. This is because urbanization leads to the creation of technological and employment opportunities in the nation, leading to a rise in the GDP growth rate. In addition, age distribution adds to economic growth in BRI nations because the growth of the working-age population leads to economic propensity. It further causes an increase in the GDP growth rate in the long run. Apart from this, the population has a negative effect on the GDP growth rate because it causes the need to increase employment opportunities in the economy and leads to a rise in competition in the labor market. It further reduces the total income of individuals in the economy. In addition, due to a rise in population growth, there is a scarcity of resources in the economy, which causes a decline in the GDP growth rate of the

nation. Moreover, there is a need for more consumption because of a rise in population in the BRI nations. Additionally, investments hamper the GDP growth rate in the BRI nations. This is because a rise in investment leads to the creation of jobs in the nation, which adds to the national income leading to an increase in total consumption by individuals, thus raising the national income of BRI nations. In addition, a rise in unemployment causes a reduction in GDP growth as it reduces the total income and consumption of individuals. Thus, the above analysis depicts that different external factors have various different effects on the GDP growth rate in BRI nations.

5.2 Policy recommendations

The government of BRI nations can increase their GDP growth rate with the help of various population demographics. These include a rise in urbanization rate as urbanization impacts the GDP growth rate of BRI nations positively. Moreover, the government of BRI economies can categorize individuals into various age groups and allocate work as per their willingness and abilities, which hamper the economic growth of nations. In addition, a rise in population also impacts the economic growth in BRI economies indirectly. It highlights that the government of BRI nations can focus on not increasing the population as it generates the need to create more employment opportunities for the rising population in the economy. Moreover, an addition to investment leads hampers BRI nation's GDP growth rate. This is because it creates more job opportunities in the market, resulting in increasing consumption of individuals and economic growth. A rise in government effectiveness also adds to economic growth as the government ensures proper rules and regulations, along with the welfare of the economy, which raises the GDP growth rate of nations in the long run. Apart from this, political stability also adds to economic growth as it reduces crimes and ensures a political framework, along with the absence of terrorism and thefts in the nation. It helps in generating the GDP growth rate in the BRI nations. Therefore, it can be interpreted that a well-designed policy framework by the governments of BRI nations by the incorporation of population demographics policies can help hamper the GDP growth rate of economies in the long run.

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