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The Effect Of Population And Macroeconomic Indicators On Economic Growth In OIC Countries

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ABSTRACT
This study examines the impact of population growth and macroeconomic conditions on economic growth in the five most populous OIC member states: Bangladesh, Pakistan, Egypt, Indonesia, and Nigeria. Utilizing data spanning 2000 to 2022 from the World Bank and official State Bureaus of Statistics, a random effects model is employed to analyze these relationships. The primary objective is to evaluate the effects of population growth, foreign direct investment (FDI), consumption expenditure, export growth, inflation, and exchange rates on economic growth. The results indicate that population growth and inflation do not have statistically significant negative impacts on economic growth. In contrast, FDI, consumption expenditure, and export growth exhibit significant positive effects, whereas the exchange rate does not demonstrate a significant positive effect. These findings contribute to a deeper understanding of the intricate dynamics among these variables and provide essential insights for the formulation of evidence-based policies aimed at fostering sustainable economic development. By concentrating on the most populous OIC member states and utilizing recent data, this study offers timely and relevant contributions to economic analysis and policy formulation.

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INTRODUCTION

The dynamics of population growth and its impact on the economic conditions of OIC member countries have garnered significant attention in recent years. The Organization of Islamic Cooperation (OIC) encompasses diverse countries marked by varying levels of economic development, demographic trends, and social challenges. Unlike developed regions experiencing declining or negative population growth, some Sub-Saharan African countries, such as Nigeria, have population growth rates surpassing their economic expansion (Adeosun and Popogbe, 2021). Nigeria, for instance, is experiencing rapid population growth and is projected to become the third most populous country in the world by 2050, according to recent United Nations estimates (UNDP, 2023). Meanwhile, Pakistan stands out as the largest Muslim-majority country in South Asia, whereas Indonesia, the world's largest Muslim-majority country, boasts substantial economic growth among OIC member countries (Susilowati et al., 2019). The global significance of population growth is underscored by its implications for increased demand for essential resources such as water, food, housing, and

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energy, particularly in developing countries (Azam, Khan and Khan, 2020). Effective population management emerges as a crucial factor influencing social and economic outcomes (Hasnawati et al., 2023). The challenge lies in balancing demographic growth with sustainable development strategies to mitigate adverse effects on economic growth and resource availability (Widiastuti et al., 2022). While developed countries typically benefit from controlled and productive population growth policies, developing countries often face challenges in managing population growth vis-à-vis economic strategies and infrastructure investment (Ahmed and Ahmad, 2016). Critics argue that uncontrolled population growth strains savings, worsens dependency ratios, burdens healthcare and education systems, and pressures food production, contributing to environmental degradation (Azam, Khan and Khan, 2020). The debate continues regarding the economic implications of population growth, with differing views on its role as an impediment or catalyst for economic development (Furuoka, 2018).

Empirical studies supporting the hypothesis that economic growth is driven by population growth indicate that population growth stimulates economic growth and development. (Azam, Khan and Khan, 2020) confirmed this through the application of Kremer's theory, which posits that population growth will enhance economic growth in both the short and long term. Similar findings were reported by (Efuntade and Efuntade, 2020). (Jan, Ullah and Ahmed, 2021) found in Pakistan that population growth, coupled with better human capital, boosts the economy. Rapid population growth plays a minor role in creating certain problems, such as indirect negative impacts on labor productivity and economic growth (Ghanem, 2018). (Adeosun and Popogbe, 2021) supported this in their empirical study, finding that the Optimistic theory does not apply in Nigeria, as increased population growth rates do not translate into a higher number of people employed in the labor market. This is because the impact of labor supply on unemployment counteracts the demand effect for labor. Reciprocal tests by (Kuhe, 2019) confirmed that some countries with smaller populations achieve strong economic growth, whereas countries with larger populations experience lower economic growth. Therefore, lower population growth and limited migration can rapidly enhance economic growth and reduce economic inequality (Khan et al., 2021).

In recent decades, positive economic trends have been observed among OIC member countries, particularly those classified as developing countries, driven in part by increased international economic relations and advances in technology and global trade (OIC, 2016). Economic progress is often measured by Gross Domestic Product (GDP), highlighting the crucial role of economic policies and external factors in shaping development outcomes (Yuliadi, 2019). The Harrod-Domar theory underscores the critical role of investment in driving economic growth by stimulating demand and promoting production and employment opportunities (Megasari and Saleh, 2021). Foreign direct investment (FDI) has emerged as a significant driver of productivity and economic growth in developing countries (Iamsiraroj, 2016; Jude and Levieuge, 2017), addressing gaps in technological expertise and capital accumulation necessary for resource optimization (Iamsiraroj and Ulubaşoğlu, 2015).

Another factor influencing economic growth is investment, exports, and inflation. Strong correlations have been found between investment and economic growth in developing

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countries (Iamsiraroj and Doucouliagos, 2015). Developing countries need advanced technology, research, and development (Iamsiraroj, 2016). There are two possibilities for countries to acquire advanced technology: foreign investment. However, it is still debated whether foreign investment is beneficial for the economy. The impact of foreign direct investment on economic growth depends on the absorptive capacity of the recipient country, considering factors such as skilled human resources, technology, infrastructure, trade policies, institutional reforms, and political conditions (Rahman, 2015). (Hossain, 2021) emphasized that foreign investment could be a game-changer for capital-poor countries like Bangladesh. Capital formation strengthens a country's production capacity and external competitiveness (Ahmad, Draz and Yang, 2018; Reza et al., 2018). In Indonesia, positive effects of foreign direct investment on economic growth have been found (Mukhlis and Qodri, 2019; Wulandari and Zuhir, 2019). Similar findings have been reported in Pakistan, where FDI has a significant positive impact on economic growth (Rehman, 2016).

Exports play an important role in a country's economy, acting as a driver of economic growth by expanding the production capacity of goods and services to foreign markets, thereby increasing domestic output. For example, in Bangladesh, exports are a cornerstone of the economy (Hasan, Hossain and Sayem, 2022; Rahman, 2015). One of its main export products is the ready-made garment industry, contributing 83.5% of total exports and 11.2% of GDP ((Hossain and Uddin, 2021). Previously, Mahmoud (2022) and (Dey, 2018) examined the relationship between export earnings and GDP, finding a bidirectional relationship between GDP and export earnings. Recently, similar results were found in Bangladesh (Hasan, Hossain and Sayem, 2022). (Olayungbo and Olayemi, 2018) found that non-oil revenue positively affects Nigeria's economic growth. Furthermore, agricultural exports significantly positively impact Nigeria's economic growth (Busari, Kehinde and Ayanboye, 2022). Oil revenues also positively influence Nigeria's economic growth (Olayungbo and Olayemi, 2018). In Indonesia, industrial sector exports positively impact economic growth, although, in aggregate, they do not significantly affect economic growth (Asbiantari, 2016). More recently, no significant impact of exports on economic growth has been found due to slow export growth in Indonesia (Mukhlis and Qodri, 2019; Wulandari and Zuhir, 2019; Kurniawan and A'yun, 2022). In Egypt, significant positive impacts of exports on economic growth have been found (Sulaiman, Baharin and Al-Hadi, 2019), with exports playing an important role in gross capital formation (Saad, 2019). Similar findings have been reported in Pakistan, where exports positively impact economic growth (Azam and Khan, 2020; Panigrahi et al., 2020)). Lastly, inflation, as (Adeniyi, 2020) found in a study of five random African countries, has varying effects on economic growth. Inflation in Egypt significantly positively impacts economic growth, while in Nigeria, it negatively affects economic growth.

This study aims to examine the effects of population growth and macroeconomic conditions, including foreign direct investment (FDI), consumption expenditure, export growth, inflation, and exchange rates on economic growth in five OIC member countries with the largest populations. Given the inconsistent results of previous studies, this research is crucial for providing a more comprehensive understanding of the existing economic dynamics with the latest data in Bangladesh, Pakistan, Egypt, Indonesia, and Nigeria. Additionally, it

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aims to provide evidence-based insights to support the formulation of effective and sustainable economic policies.

METHODS

Panel data regression analysis following (Yuliadi, 2020) was used in the study to determine the impact of total population, level of foreign investment, exchange rate, inflation rate on the economy of 5 countries (Indonesia, Bangladesh, Pakistan, Egypt, and Nigeria) from the latest year 2000-2022 with a total observation of 115 data. Secondary data is obtained from the publications of official institutions of the Worldbank, International Monetary Fund, and World Trade Organization. Because the research data is a set of time series and cross-country, it is appropriate to use penel analysis (Basuki and Prawoto, 2015). Processed using the Eviews10 application to obtain the estimation results of the observed research variables. The following is the estimation of panel analysis in the economic model:

$$Y = \alpha + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \beta_6 X6_{it} + \epsilon \quad (1)$$

$$GDP = \alpha + \beta_1 POP_{it} + \beta_2 FDI_{it} + \beta_3 CON_{it} + \beta_4 EXP_{it} + \beta_5 INF_{it} + \beta_6 LogER_{it} + \epsilon \quad (1)$$

Y = Economic Growth (GDP)
α = Constant
X1 = Total Population (POP)
X2 = Foreign direct investment (FDI)
X3 = Consumption (CON)
X4 = Exports (EXP)
X5 = Inflation (INF)
X6 = Exchange rate (ER)
β1 - β6 = Coefficient variable
ϵ = Error Term
t = Time
i = Country

Follow (Basuki & Prawoto, 2015) and (Yuliadi, 2020) that there are three models for estimating panel data analysis, first, the Fixed Effect Model (FEM) assumes that there are constant differences between observed units that cannot be explained by the observed independent variables. Differences between studies can be accommodated by differences in intercepts with the same slope. The fixed effect model equation:

$$Yit = \alpha + i\alpha_{1t} + Xt1_{it}t\,\beta + \epsilon_{it} \quad (3)$$

Second, the Random Effect Model (REM). This approach estimates that residuals may be interconnected across time and individuals. In this model, differences in intercepts are accommodated by their respective error terms. Random effect model equation:

$$Y = \alpha + \beta_1 X1_{it} + \epsilon_{it} \quad (4)$$

Third, the Common Effect Model (CEM). This is the simplest approach compared to FEM and REM because it only combines time series and cross-country data. This model uses OLS estimation with the following equation:

$$Y = \alpha + \beta_1 X1_{it} + \epsilon \quad (5)$$

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Explanation:
Y= dependent variable
a = constant
β = coefficient
X = independent variable
i = cross section
t = time
ϵ = error term

Panel Data Test Method Selection

To determine the best model in the general model of panel data analysis. It is necessary to conduct the Chow-test (Likelihood) and Hausman-test. The Chow test is used to determine the best model between the Fixed Effect Model (FEM) and the Common/Pool Effect Model. If the result indicates the acceptance of the null hypothesis, the best model to use is the Common Effect Model (CEM). However, if the result indicates the rejection of the null hypothesis, the best model to use is the Fixed Effect Model, and the testing will proceed to the Hausman test.

The Chow test is a test to determine whether the Common Effect or Fixed Effect model is more appropriate for estimating panel data. The hypothesis in the Chow test is:

H0 : CEM (p-value >0.05)
H1 : FEM (p-value <0.05)

The Hausman test is used to determine whether the Fixed Effect or Random Effect model is more appropriate for estimating panel data. The hypothesis in the Hausman test is:

H0 : REM (p-value > 0.05)
H1 : FEM (p-value < 0.05)

If the result of the Hausman test indicates acceptance of the null hypothesis, then the best model to use is the Random Effect Model. However, if the result indicates rejection of the null hypothesis, then the best model to use is the Fixed Effect Model.

RESULTS AND DISCUSSION

Results

Table 1 Descriptive statistics

	GDP	POP	EXP	CON	FDI	ER	INF
Mean	4,937014	1,814512	7,158703	5,39763	1,483178	2296,283	8,673112
Min	-2,065	0,64	-33,3515	-13,7636	-2,75744	3,47205	1,56013
Max	15,32916	3,092079	86,0433	57,70378	9,348567	14849,85	29,50661
Std. Dev.	2,266884	0,606619	18,83637	7,294053	1,550104	4539,527	4,866904
Obs	115	115	115	115	115	115	115

Description: GDP: Economic Growth; POP: Population Growth; EXP: Export Growth; CON: Consumption Expenditure Growth; FDI: Foreign Investment Inflows; ER: Exchange Rate; INF: Consumer Price Inflation.

A statistical overview is presented in table 1. Research conducted in lower middle-income or developing countries shows that average population growth is 1.8 percent and

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average economic growth is 4.9 percent. Inflation is in the low category with an average of 8.6 percent.

Table 2 Chou Test

Test	Prob.
Chow Test	0,0006
Hausman Test	0,1579

Based on table 2, it can be concluded that the Random Effect Model (REM) is the best model for estimating panel data model analysis.

Table 3 Random Effect Model (REM)

Variabel	Koefisien	Std. E	t-Stat	Prob.
C	4,6191	0,9829	4,6994	0,0000
POP	-0,3298	0,3787	-0,8707	0,3858
FDI	0,2655	0,1273	2,0854	0,0394
CON	0,1378	0,0283	4,8607	0,0000
EXP	0,0419	0,0110	3,8269	0,0002
INF	-0,0609	0,0438	-1,3907	0,1672
LOG(ER)	0,0014	0,0893	0,0158	0,9874
R^2		0,2540		
Adjusted R^2		0,2126		
F-statistik		6,1287		
Prob (F-statistik)		0,0000		

Interpretation
POP: -0.3298 (p = 0.385), H1 Rejected
FDI: 0.2655 (p = 0.0394), H2 Accepted
CON: 0.1378 (p = 0.000), H3 Accepted
EXP: 0.0419 (p = 0.0002), H4 Accepted
INF: -0.0609 (p = 0.1672), H5 Rejected
LOG(ER): 0.0014 (p = 0.9874), H6 Rejected

Discussion

In the Random Effects Model (REM) estimation, foreign investment, consumption, and exports significantly impact economic growth, while population growth, inflation rate, and exchange rate show insignificant effects on economic growth. First H1 Rejected, indicating that population growth has a negative but statistically insignificant impact on economic growth. The results of this study are in line with (Amornkitvikai et al., 2023; Azam et al., 2020; Efuntade & Efuntade, 2020; Kuhe, 2019; Minhaj & Imran, 2021; Ogunleye et al., 2018; Tartiyus et al., 2015; Utami et al., 2021; Yuliadi, 2020) pecifically found that population growth can enhance labor productivity, thereby boosting economic productivity, while (Amornkitvikai, Harvie and Karcharnubarn, 2023) highlighted the pivotal role of the working-age population in driving economic growth. However, not all segments of the population contribute equally to economic growth, as noted by (Adeosun and Popogbe, 2021), who observed that an increase in population growth rates does not necessarily translate into

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increased labor market participation. Moreover, (Widiastuti et al., 2022) pointed out that uncontrolled population growth can lead to economic challenges unless accompanied by improvements in population quality. (Adeosun and Popogbe, 2021) also emphasized that rapid population growth can decrease capital per worker, thereby negatively impacting economic growth.

Second H2 accepted, there is a positive and significant effect of foreign investment on the economy. This research is in line with (F. Ahmad et al., 2018; M. E. Hussain & Haque, 2016; Iamsiraroj & Doucouliagos, 2015; Mukhlis & Qodri, 2019; Reza et al., 2018). Foreign capital is indispensable such as technology transfer, skills, managerial for developing countries that need capital to improve the economy. (Mukhlis and Qodri, 2019). Increased foreign direct investment will result in capital formation and encourage the country's production and then encourage the country's economic growth (F. Ahmad et al., 2018).

Third H3 accepted, a significant positive effect of consumption variables on economic growth. This finding is the same as (Handriyani et al., 2018; Rafiy et al., 2018). In line with the Harrod-Domar theory which states that the increase in national income is not determined by the production capacity of society, but by public expenditure. This means that national income will increase if public spending increases (Rafiy et al., 2018).

Fourth H4 accepted, there is a positive and significant effect of export growth on economic growth. previously similar things were also found by (Elijah & Musa, 2019; Hasan et al., 2022) exports are an important factor for the economy, the results showed that export growth will increase productivity (Rehman, 2016). (Dey, 2018) found a casual relationship between exports and GDP which implies that export growth will determine GDP growth. Increased exports boost domestic productivity (Astuti and Fitri, 2018) and the emergence of large manufacturing industries as domestic demand increases (Rotinsulu, Sumual and Kumaat, 2020) so that there will be gross capital formation in facilitating economic growth (Saad, 2019).

Fifth H5 rejected, high inflation causes price uncertainty so that it will affect consumer spending, causing demand to fall and economic growth to weaken(Rahman, 2015; Bonsu and Muzindutsi, 2017). Inflation below 10% and stable will increase trade and prosperity, while high inflation will harm trade and economic growth (Ahmad, 2022).

Sixth H6 rejected, there is an insignificant positive effect of the exchange rate on economic growth. An increase in the foreign exchange rate increases the volume of net exports and as a result promotes economic development by increasing overall demand (T. Ahmad, 2022; Jehan & Irshad, 2020). The depreciation of a country's currency will make the country's export commodities cheaper so that international market demand increases, which in turn increases productivity and increases economic growth (Yuliadi, 2020). On the other hand, the negative impact of exchange rates can occur. (Astuti & Fitri, 2018) found a negative impact of the exchange rate on economic growth, where the depreciation of the domestic exchange rate against the dollar causes imported goods to be expensive which results in increased production raw materials and will reduce productivity which will reduce the output of goods produced, thereby reducing economic growth. In short, exchange rate depreciation will weaken the economy and vice versa (I. Hussain et al., 2019).

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CONCLUSION

Population growth is deemed to have no significant impact on economic growth when it is controlled, suggesting that managed population growth does not adversely affect the economy. Instead, the key drivers of economic growth include foreign direct investment, consumption, and exports. Inflation, which remained below 10% during the study period and falls into the low category (as per Table 1), also did not significantly affect the economy. Regarding the exchange rate, it was found to have a positive but insignificant effect on economic growth. Generally, fluctuations in the exchange rate can influence exports positively by making them more competitive in international markets but may also increase the cost of imported raw materials, thereby having mixed effects on the economy. Recommendations for the government as a policy maker, population growth will have a negative effect if it is not followed by the quality of the population, it is necessary to increase education and training for the population at productive age so that they can play a role in economic growth and development. Easing foreign investment policy is needed to increase capital growth such as lowering interest rates, encouraging consumption and exports to increase domestic productivity and domestic price stability in order to continue to play a role in encouraging sustainable growth.

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