International Journal of Agriculture and Biosciences 2025 14(4): 574-581.
https://doi.org/10.47278/journal.ijab/2025.033

RESEARCH ARTICLE
eISSN: 2306-3599; pISSN: 2305-6622

Foreign Direct Investment in the Gulf Cooperation Council Countries: A Panel Data Analysis

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ABSTRACT

This study uses panel data analysis to investigate macroeconomic variables' impact on foreign direct investment (FDI) inflows to Gulf Cooperation Council (GCC) countries from 2010 to 2021. The fixed effects model, found to be the most suitable, reveals significant country-specific effects on FDI. Notably, Saudi Arabia attracts significantly more FDI than Bahrain, Qatar, and Oman, highlighting the importance of factors beyond macroeconomic variables. The analysis reveals a negative relationship between GDP growth and FDI within individual countries, suggesting that higher GDP may reduce reliance on foreign investment. However, this relationship varies across countries, indicating a complex interplay between GDP and FDI. Exports consistently emerge as a strong positive predictor of FDI, suggesting that robust export performance attracts foreign investors. Additionally, unemployment positively correlates with FDI, potentially due to lower labor costs or government incentives. Other factors like inflation, industrial employment, number of firms, and imports show less significant effects.

Keywords: Foreign direct investments, Panel data, Gulf Cooperation Council, Macroeconomics variables.

Article History
Article # 25-067
Received: 14-Feb-25
Revised: 20-Feb-25
Accepted: 26-Feb-25
Online First: 05-Mar-25

INTRODUCTION

Foreign direct investment (FDI) has experienced a dramatic upswing over the past three decades, skyrocketing from approximately $205 billion in 1990 to an astounding $1.54 trillion in 2019 worldwide (United Nations Conference on Trade and Development (Giroud & Ivarsson, 2020). This exponential growth underscores the pivotal role of FDI for multinational firms (MNF) and host countries. FDI, a potent catalyst for economic growth, can yield numerous benefits for host countries, including job creation, technology and knowledge transfer, and human capital development. This research underscores the profound impact of FDI on host countries, highlighting its criticality as a research area. Foreign Direct Investment (FDI) is widely seen as a key driver of economic growth, and its importance is significant for both host nations and international companies. However, there is a chance that its practical implementation may not succeed, especially in developing countries (Raihan, 2024). From the host country's perspective, FDI inflows enhance recipient countries' economic efficiency and productivity by allowing them to adopt new technologies and equipment in producing goods and services, often referred to as technology transfers. For instance, Svedin and Stage (2016) concluded that FDI positively impacts the efficiency of the Swedish manufacturing sector. Moreover, according to Arazmuradov (2015), FDI supports the promotion of development in the former Soviet republics, now known as Central Asian independent economies. Similarly, Blomström (1986) reached the same conclusion, asserting that foreign investments are positively associated with structural efficiency due to the competitive pressure foreign firms exert on domestic companies. Furthermore, several studies have demonstrated that labor productivity is higher in foreign-owned firms compared to domestically-owned ones (Haddad & Harrison, 1993; Kokko et al., 1996; Kathuria, 2000).

Cite this Article as: Aljohani ES, Alqunaibet MH, Alamri Y, Alsultan M, Almojel SA and Muddassir M, 2025. Foreign direct investment in the gulf cooperation council countries: a panel data analysis. International Journal of Agriculture and Biosciences 14(4): 574-581. https://doi.org/10.47278/journal.ijab/2025.033

A Publication of Unique Scientific Publishers

Previous studies have shown that Foreign Direct Investment (FDI) benefits host nations, including salary spillovers. These studies indicate that foreign-owned firms pay higher wages than their domestic counterparts. For example, (Lipsey & Sjoholm, 2001) and (Huber, 2018) demonstrated strong spillover effects on locally held firms, which play a vital role in the economic growth of developing nations. Other impacts of FDI include the introduction of new industries to the country (e.g., the automobile industry in Morocco), changes in the composition of production (e.g., South Korea transitioning from an agricultural to an industrialized economy) and host countries' access to the human or organizational capital of multinational firms. From the multinational firm's perspective, the motivations to expand internationally are multifaceted and strategic. One primary motivation is to gain a competitive advantage by relocating operations to countries where they have a technological and managerial edge over local competitors (Dunning, 2000). This allows the multinational firm to enjoy a competitive edge, leveraging cost efficiencies and enhancing the firm's ability to innovate and respond to market demands more effectively (Buckley & Casson, 2016).

Furthermore, foreign direct investment (FDI) is a crucial mechanism through which multinational firms minimize transaction costs associated with partnership arrangements such as exporting or licensing (Gómez-Mera & Varela, 2024; Hsiao et al., 2024; Narula, 2014) and gain significant control over their operations abroad. By investing directly in foreign countries, firms can bypass intermediaries, thereby reducing costs and complexities associated with cross-border transactions (Rugman & Verbeke, 2004). This control leads to improved quality control and better alignment with the firm's overall strategic objectives (Cantwell & Piscitello, 2015), a practical implication of our research. Additionally, FDI enables multinational companies to capitalize on host nations' unique advantages, such as resources, skilled labor and favorable regulatory environments (Beugelsdijk et al., 2010; Bhattacheryay, 2020; Dornean et al., 2021; Moore et al., 2024). By doing so, they can diversify their markets, mitigate risks, and accelerate growth by acquiring strategic assets (Cui & Jiang, 2012; Meyer & Thaijongrak, 2013). Recent research has also emphasized the importance of FDI in knowledge-intensive sectors and enhancing R&D capabilities and innovation potential (Giroud, 2023).

The Gulf Cooperation Council (GCC), established in 1981 by Saudi Arabia, the United Arab Emirates, Qatar, Kuwait, Oman, and Bahrain, has experienced a surge in foreign direct investment (FDI) inflows since 2000. According to (Giroud & Ivarsson, 2020) Fig, FDI inflows to the region increased from $0.4 billion in 2000 to more than $48 billion in 2009 before dropping to approximately $18 billion in 2016. The distribution of FDI across the GCC countries is a crucial aspect. From 2000 to 2016, Saudi Arabia received more than 44% of the total FDI in flows to the region, followed by the UAE, which received around 28% of the total FDI in flows to GCC nations. Kuwait and Oman, on the other hand, received the smallest proportion, accounting for less than 4% of the overall FDI flows to GCC nations. Previous research on FDI inflows attributes the disparity in FDI distribution to various microeconomic, macroeconomic and institutional variables. For instance, (Alshamlan et al., 2021) shed light on the factors that make the UAE an attractive FDI destination, including political stability, geocentric location, well-developed infrastructure, stable currency, well-developed financial system, the global crowd-pulling event the Expo 2020 and the proactive and investor-friendly policies of the government (Santos, 2023; Zélity, 2024). The macroeconomic method explains the distribution of FDI inflows using factors such as GDP, inflation rate, unemployment rate, and imports-exports or exchange rate. The macroeconomic or industrial organization approach delves into FDI inflow behavior in terms of market structure (number of businesses in the market), market size, and the human capital of the host nation and the phenomena of agglomeration economies. The institutional approach argues that institutional variables such as political risk, trade agreements, trade rules, tax policy, and capital market liberalization play a significant role in explaining FDI in flows. This article uses panel data analysis to evaluate how macroeconomic factors affect foreign direct investment inflow to GCC countries. This will help to understand the importance of each factor in attracting FDI and may assist in developing policies to improve each country's ability to attract more FDI. This paper is organized as follows: section two introduces the empirical model used in the study. Section three provides details on the data and addresses empirical considerations. The results are presented in section four, and the paper concludes with section five.

MATERIALS & METHODS

The Model

The Theoretical Model

This paper presents an empirical analysis that contributes to understanding the economic process linking FDI to its determinants. We apply panel data techniques to foreign direct investments as a dependent variable, allowing to discover the factors influencing FDI in flows while accounting for each nation's uniqueness and the dynamic impacts that cross-section data does not capture. The disparity in FDI in flows to the six Gulf Cooperation Council nations is estimated using the basic statistical model below.

$$FDI_{it} = x_{it}^{'}\beta + C_i + E_{it} \quad (1)$$

Where $x_{it}^{'}$ is a vector of regressors or explanatory variables not including the constant or intercept, C_i is a country specific effect that can include variables that time invariant and specific to each country, and $\epsilon_{it}$is the usual error term that varies across countries and across time. Traditionally, there are at least three ways to model the country specific effect $C_{i.}$[1] the pooled model, the fixed effects model and the random effects model. In the pooled model, the country specific effect is ignored and the resulting model can be presented as follows:

$$FDI_{it} = \alpha + x_{it}^{'}\beta + C_i + E_{it} \quad (2)$$

This model assumes the variables in x'_{it} are exogenous and the error terms are homoskedastic and serially uncorrelated. That is, $E[\epsilon_{it}|x_{it}] = 0$, $Var[{\epsilon_{it}}^2|x_{it}] = {\sigma_\epsilon}^2$ and $cov[\epsilon_{it}, \epsilon_{is}|x_{it}] = 0 \; \forall t \neq s$. The preceding model can be consistently and effectively estimated using the ordinary least squares (OLS) technique under the exogeneity of the explanatory variables x, homoscedasticity and no autocorrelation of the error components.

In the fixed effects (FE) model, the heterogeneity across countries is modeled using country dummy variables as intercept shifters. In this model, we assume that differences in the intercept can capture differences across countries. The FE model is represented by

$$FDI_{it} = \alpha_i + x'_{it}\beta + E_{it} \quad (3)$$

The FE model can be consistently and effectively estimated using the OLS technique, provided the assumptions of exogeneity, homoscedasticity and absence of autocorrelation are fulfilled.

In the random effects model (RE), the unobserved country heterogeneity or country specific effect enters the model through the error terms, yielding:

$$FDI_{it} = \alpha + x'_{it}\beta + (\mu_i + E_{it}) \quad (4)$$

Here, we assume that $E[\epsilon_{it}|x_{it}] = {\sigma_\epsilon}^2$, $E[u_i|x_{it}] = {\sigma_u}^2$ and $E[\epsilon_{it}u_i|x_{it}] = 0$.

The equation model (4) is still linear with a compound error term (sometimes called the error components method). However, the homoscedasticity assumption no longer holds, and the OLS method is inefficient. The model given by equation (4) is estimated using the feasible generalized least squares, which is consistent and efficient.

a. The Empirical Model

For the purposes of this investigation, we estimate the following models:

1. Pooled model

$$FDI_{it} = \alpha + \beta_1 GDP_{it} + \beta_2 Infl_{it} + \beta_3 Unemp_{it} + \beta_4 EmpInd_{it} + \beta_5 Firms_{it} + \beta_6 Exp_{it} + \beta_7 Imp_{it} + E_{it} \quad (5)$$

2. FE model

$$FDI_{it} = \alpha_i + \beta_1 GDP_{it} + \beta_2 Infl_{it} + \beta_3 Unemp_{it} + \beta_4 EmpInd_{it} + \beta_5 Firms_{it} + \beta_6 Exp_{it} + \beta_7 Imp_{it} + E_{it} \quad (6)$$

Or equivalently

$$FDI_{it} = \alpha + \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_3 + \alpha_4 D_4 + \alpha_5 D_5 + \beta_1 GDP_{it} + \beta_2 Infl_{it} + \beta_3 Unemp_{it} + \beta_4 EmpInd_{it} + \beta_5 Firms_{it} + \beta_6 Exp_{it} + \beta_7 Imp_{it} + E_{it} \quad (7)$$

3. RE model

$$FDI_{it} = \alpha + \beta_1 GDP_{it} + \beta_2 Infl_{it} + \beta_3 Unemp_{it} + \beta_4 EmpInd_{it} + \beta_5 Firms_{it} + \beta_6 Exp_{it} + \beta_7 Imp_{it} + (\mu_i + E_{it}) \quad (8)$$

Where GDP_{it} is the gross domestic product, $Infl_{it}$ the inflation rate, $Unemp_{it}$ is the unemployment rate, $EmpInd_{it}$ is the industry employment, $Firms_{it}$ is the total number of firms, Exp_{it} is the total value of the exports and Imp_{it} is total value of imports for country i at time t. $D_1, D_2, \ldots, D_5$ are country dummy variables.[2]

To choose between the three models, this paper uses a pairwise approach as follows. To choose between the pooled model and the FE model, we use an F − test to test the following null hypothesis and against the alternative one:

$$H_0 \;\; \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$$
$$H_0 \text{ At least one is not true} \quad (9)$$

The *F − statistic* is given by

$$F = \frac{(SSE_R - SSE_U/J}{SSE_U/(N-K)} \sim F_{(J,N-K),} \quad (10)$$

where J is the number of restrictions in the null hypothesis of equation (9), N is the total number of observations used, K is the number of parameters to be estimated, SSE_R is the sum of squared errors of the restricted model given by the pooled model of equation (5), and SSE_U is the sum of squared errors of the unrestricted model represented by the RE model of equation (7).

To choose between the pooled model and the random effects model, a Breush-Pagan test of heteroscedasticity is used to test the following hypothesis

$$H_0 : \alpha_\mu^2 = 0$$
$$H_1 : \alpha_\mu^2 \neq 0 \quad (11)$$

The statistic used is the Lagrange Multiplier test given by

$$LM = \frac{n \times T}{2(T-1)} \times \left[\frac{\sum_{i=1}^{n} \left[\sum_{t=1}^{T} \widehat{E_{it}}\right]^2}{\sum_{i=1}^{n} \sum_{t=1}^{T} \widehat{E_{it}}} - 1 \right]^2 \sim {\chi^2}_{(1)}. \quad (12)$$

Finally, a Hausman test is utilized to differentiate between the fixed effects model and the random effects model by determining whether the unobserved nation specific impact is uncorrelated with the explanatory variables. In other words, we test whether the RE model produces consistent parameter estimates or not. The Hausman test tests the following hypothesis

$$H_0 : \beta_{FE} = \beta_{RE}$$
$$H_1 : \beta_{FE} \neq \beta_{RE} \quad (13)$$

Using the Wald test given by

$$H = (\widehat{\beta_{FE}} - \widehat{\beta_{RE}})' [Var(\widehat{\beta_{FE}}) - Var(\widehat{\beta_{RE}})]^{-1} (\widehat{\beta_{FE}} - \widehat{\beta_{RE}}) \sim {\chi^2}_{(k)} \quad (14)$$

Data

The data used in this paper obtained from the World Bank and the Dubai Statistical Company. The GDP, unemployment rate, inflation rate, industry employment, exports and imports data are from the World Bank website. In contrast, the number of firms' data is from the Dubai Statistical Company. The GDP, expressed in current US dollars, represents the gross domestic product. The unemployment rate indicates the proportion of the labor force unemployed and actively seeking work. The consumer price index measures inflation and indicates the yearly percentage change in the cost to the typical consumer. Industrial employment refers to the number of working-age people engaged in any activity to create things or offer services for pay or profit, including mining and quarrying, manufacturing, building, and public utilities. The number of firms reflects the firms that will be listed on the stock market before the end of the year. Finally, exports and imports indicate the total US dollar worth of all products and other market services offered to and received from the rest of the globe.

Fig. 1 shows the distribution of FDI in flows among the six Gulf Cooperation Council countries in 2021. The United Arab Emirates received about half of all GCC in flows, with Saudi Arabia closely following. Together, these two

countries accounted for more than 84% of the region's FDI in flow. The remaining nations accounted for around 16%, with Bahrain receiving more than 50% of the residual FDI in flows within the GCC.

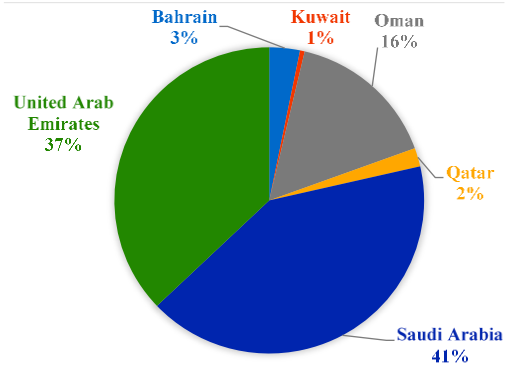

Fig. 1: Distribution of FDI across GCC Countries for 2021.

While the data does not provide detailed information on the distribution of FDI across different industries, it is known that the flow of FDI to Saudi Arabia is primarily directed toward the production and manufacturing sectors. In contrast, the inflow of FDI to the UAE is directed mainly toward general services, particularly financial services.

Over time, there has been a positive trend in the flow of FDI to the region, with FDI in flows to the UAE experiencing the most significant reduction (Fig. 2). Saudi Arabia is experiencing a modest but noticeable increase in FDI inflows.

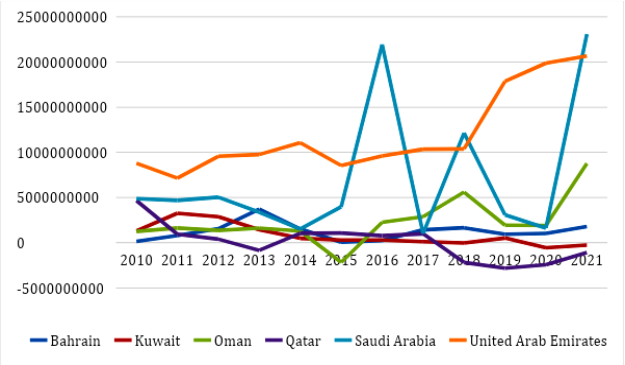

Fig. 2: Evolution of FDI (in US dollars) by Country During 2010-2021.

Table 1 presents the descriptive statistics for the variables utilized in the estimation provided in Table 1. The wide range and relatively high standard deviation of GDP indicate a diverse set of economies in the sample, potentially from different income levels or stages of development. With its low mean and high standard deviation, the FDI data suggests that foreign investment is concentrated in a few countries within this sample, as indicated in Fig. 1. This concentration could be due to resource endowments, policy attractiveness, or market size.

The average inflation rate is positive (1.6206) with a substantial standard deviation (1.9575), hinting at both inflationary and deflationary pressures within the sample. This could indicate policy challenges or external shocks affecting price levels differently across countries. Similarly, the average unemployment rate (2.5805) also shows significant variation, suggesting a range of labor market conditions, possibly due to differences in skills, demographics, or economic structures.

Table 1: Summary Statistics of Variables Used in the Estimation

Variable	Mean+SD	Minimum	Maximum
FDI($billion)	0.4772+0.5930	0.0021	2.9232
GDP($billion)	25.2982+23.8900	2.5713	83.3541
Inflation	1.6206+1.9575	-4.0283	5.8262
Unemployment	2.5805+1.8641	0.1000	7.4499
Industrial Employment	34.0128+10.2745	21.2900	56.3300
Number of Firms	105.3884+51.9033	42.0000	215.0000
Exports($billion)	15.3116+13.3244	1.78803	40.4046
Imports($billion)	10.5793+9.4014	1.3097	29.5599

The mean values of exports and imports and their standard deviations suggest active participation in international trade. The fact that the mean of exports is higher than that of imports could imply a trade surplus for the group as a whole, but individual countries could vary significantly. The mean of industrial employment (34.0128) indicates a significant industrial base, but the variation suggests that the relative importance of industry differs across countries. This could reflect diverse economic structures or stages of industrialization. The number of firms is relatively high on average but with a wide range, indicating varying levels of market competition and differing regulatory environments across countries.

RESULTS & DISCUSSION

This section will discuss the findings of the pooled, fixed and random effects models. We will then present the results of the statistical tests that helped us choose the best model for the data. Starting with the pooled model, we found that all the variables included in the model, except for inflation rate, industrial employment, and import of goods, are statistically significant at any level. The analysis in Table 2 shows the coefficients, representing the average change in the dependent variable, Foreign Direct Investment (FDI), for a one-unit change in each independent variable while keeping other variables constant. To evaluate the significance of these relationships, t-values and p-values are provided. The independent variables in this model encompass key economic indicators such as GDP, inflation, unemployment, industrial employment, and the number of firms, exports and imports. Recent research on Foreign Direct Investment (FDI) underscores the complex relationship between economic growth and sustainability in different regions. Aljohani & Fuad (2024) demonstrated that agriculture added value and trade openness/firms that significantly influence FDI in Saudi Arabia, while inflation plays no significant role. The contribution of agriculture and other firms that may contribute to GDP, employment creation and reduce the burden of import. A notable observation is the coefficient for GDP, which is -0.0110 and statistically significant (P=0.0253). This result suggests that a one-billion-dollar increase in GDP is associated with a decrease of 0.0110 billion dollars in FDI, implying that

larger economies may rely less on foreign direct investment for their growth. Raihan (2024) reveals that both FDI and CO2 emissions positively affect GDP in Vietnam, highlighting the need for policies that simultaneously promote economic growth and environmental sustainability. Anikeze and Igbokwe (2024) show that FDI enhances human capital and infrastructure in Nigeria, recommending policies to attract investment. It can be expected that various factors according to the country's situation that promote national GDP reduce dependency on FDI. Similar results have been observed in Saudi Arabia. On the other hand, the coefficient for inflation is -0.0229 and not statistically significant (P=0.4884), indicating insufficient evidence to support a significant impact of inflation on FDI in this context. It's important to note that the model does not account for other potential influences on FDI, such as political stability or exchange rates, which could affect the generalizability of these findings.

Table 2: Least Squares Results of the Pooled Model

Variable	Coefficient Estimate	Standard Error	t-value	P value
Intercept	-0.0559	0.2625	-0.21	0.8320
GDP	-0.0110**	0.0048	-2.29	0.0253
Inflation	-0.0229	0.0329	-0.7	0.4884
Unemployment	0.2058**	0.0619	3.33	0.0015
Industrial Employment	0.0011	0.0049	0.23	0.8203
Number of Firms	-0.0040**	0.0018	-2.18	0.0330
Exports($billion)	0.0344**	0.0089	3.89	0.0002
Imports($billion)	0.0161	0.0131	1.23	0.2223
*R*2	0.6397			

(*): significance level at 10%, (**): significance level at 5%, and (***) significance level at 1%.

The coefficient for unemployment is particularly remarkable at 0.2058 and highly statistically significant (P=0.0015), demonstrating a strong relationship. This suggests that a one-unit rise in the unemployment rate is associated with a 0.2058 billion-dollar increase in FDI, possibly due to lower labor costs or government incentives. The coefficient for industrial employment is 0.0011 and lacks statistical significance (P=0.8203), indicating no strong evidence that it influences FDI within this model. The coefficient for the number of firms is -0.0040, which is statistically significant (P=0.0330). This negative relationship implies that an increase in the number of domestic firms may reduce the necessity for foreign investment. Exports have a positive coefficient of 0.0344, with high statistical significance (P=0.0002). This indicates that a one-billion-dollar increase in exports corresponds to a 0.0344 billion-dollar rise in FDI, suggesting that export-driven economies attract more foreign investment. Finally, the coefficient for imports is 0.0161. Still, it is not statistically significant (P=0.2223), indicating a lack of strong evidence that imports substantially impact FDI within this model.

Table 3 summarizes the findings of a fixed-effects regression analysis. This method considers differences across countries by including dummy variables for each country, which allows the intercept to vary. The coefficients in the table estimate the average change in foreign direct investment (FDI) associated with a one-unit change in the independent variables while considering country-specific effects. An increase and a decrease in Outward Foreign Direct Investment have positive and significant effects on Romania's economic growth, with a greater effect rising from the increase in OFDI (Amin et al., 2022).

The coefficients on the country dummy variables signify the average difference in FDI between each country and the reference country, Saudi Arabia. For example, the coefficient for Bahrain (-1.6308) suggests that, on average, Bahrain attracts 1.6308 billion dollars less FDI than Saudi Arabia, with this difference being statistically significant (P=0.0084). On the other hand, the coefficient for UAE suggests it attracts 0.5710 billion dollars more than Saudi Arabia, but this is not statistically significant (p-value=0.5597). Similar interpretations apply to the other country's dummies. Negative coefficients for Qatar and Oman suggest they attract less FDI than the reference country, while the coefficients for UAE and Kuwait are not statistically significant.

Table 3: Least Squares Results of the Fixed Effects Model

Variable	Coefficient Estimate	Standard Error	t-value	P value
Bahrain Dummy Variable	-1.6308**	0.5981	-2.73	0.0084
UAE Dummy Variable	0.5710	0.9735	0.59	0.5597
Qatar Dummy Variable	-1.6834**	0.5823	-2.89	0.0054
Kuwait Dummy Variable	-0.3802	1.0529	-0.36	0.7193
Oman Dummy Variable	-2.5740**	0.8259	-3.12	0.0028
Intercept	4.9564**	1.8188	2.73	0.0084
GDP	-0.0345**	0.0154	-2.24	0.0289
Inflation	-0.0272	0.0248	-1.09	0.2784
Unemployment	0.1869***	0.0955	1.96	0.0551
Industrial Employment	-0.0919***	0.0466	-1.97	0.0533
Number of Firms	-0.0022	0.0032	-0.7	0.4884
Exports($billion)	0.0414**	0.0180	2.3	0.0252
Imports($billion)	-0.0350	0.0319	-1.1	0.2767
*R*2	0.7263			
F test for no fixed effects	$F - Value = 3.73, p - Value < 0.0053$			

(*): significance level at 10%, (**): significance level at 5%, and (***): significance level at 1%.

The interpretations for GDP, inflation rate, unemployment and industrial employment, number of firms, exports, and imports are similar to those in the pooled model. Still, now they are specific to the effect within each country, controlling for any fixed factors that differ across countries. For instance, the negative and significant coefficient for GDP (-0.0345) suggests that, within each country, a one-billion-dollar increase in GDP is associated with a decrease of 0.0345 billion dollars in FDI.

The adjusted R-squared value (0.7263) indicates that this fixed effect model explains a larger proportion of the variance in FDI compared to the pooled model, suggesting that accounting for country-specific fixed effects improves the model's explanatory power. The F-test for no fixed effects is statistically significant (p-value < 0.0053), confirming that including the fixed effects significantly improves the model's fit. The fixed effects model greatly enhances estimation performance, making GDP, the value of goods and services exported, industrial employment, and the unemployment rate all significant at the 5% level. Ren et al. (2022) found that Outward Foreign Direct Investment can improve the green total energy efficiency GTFEE of the country by enhancing innovation, industrial structure and alleviating capital misallocation. But the researcher believes that the local

industrial growth is necessary for long term development of the country rather than dependency on FDI. Additionally, most country-specific impact dummy factors are highly statistically significant. All else being equal, the level of FDI in flows to Saudi Arabia is higher than in Bahrain, Qatar, Kuwait, and Oman, although not statistically significant for the latter. However, the level of FDI in flows to the UAE is positive and statistically significant compared to that of Saudi Arabia. In contrast to the findings of the pooled model, industrial employment and goods imports have a statistically significant negative effect on FDI in flows. This suggests that global multinationals in GCC countries prefer to hire fewer employees and encourage a decrease in imports.

Additionally, FDI in flows are influenced by GDP and inflation rate, with the decline being statistically significant for GDP. Exports and unemployment positively and statistically significantly influence FDI in flows, while other factors do not. The F-test result shows that the country-specific effects represented by the dummy variables are jointly statistically significant, indicating that the fixed effects model explains the data better than the pooled model.

The random effects or error component model occurs when country-specific effects are treated as an error term. The results in Table 4 show that GDP has a negative and statistically significant impact on FDI flows to GCC countries. The data indicates that an increase in the value of export products and services by $0.5 billion leads to a $0.03 billion increase in FDI to the GCC nations, all else equal. The Hausman test results in Table 4 allow us to reject the null hypothesis and conclude that the parameter estimates of the random effects model are inconsistent. Therefore, based on the available data, the fixed effects model is more suitable than the random effects model. However, the Breusch-Pagan test result fails to reject the null hypothesis provided by the equation in the final row of Table 4, indicating that the error component model is unnecessary.

Table 4: Feasible Generalized Least Squares Results of the Random Effects Model

Variable	Coefficient Estimate	Standard Error	t-value	P value
Intercept	0.9738	0.7899	1.23	0.2221
GDP	-0.0226**	0.0107	-2.11	0.0386
Inflation	-0.0274	0.0254	-1.08	0.2843
Unemployment	0.1885**	0.0844	2.23	0.0291
Industrial Employment	-0.0203	0.0173	-1.17	0.2456
Number of Firms	-0.0036	0.0031	-1.16	0.2485
Exports($billion)	0.0393**	0.0165	2.38	0.0202
Imports($billion)	0.0094	0.0276	0.34	0.7354
*R*2	0.7329			
Hausman test for random effects	H = 13.8, P<0.0679			
Breush Pagan test for random effects	LM = 2.66, P<0.2650			

(*): significance level at 10%, (**): significance level at 5%, and (***): significance level at 1%.

A comparison of the three models using the F-test, the Hausman test, and the Breusch-Pagan test demonstrates that the fixed effects model provides a better fit for the data and should be used for any prediction or inference.

In summary, the fixed and random effects models show significant differences in FDI attractiveness across countries that are not explained by economic variables. Higher GDP may be associated with lower FDI, but this relationship varies across countries. Countries with higher unemployment rates may be more attractive to foreign investors. Higher export levels tend to attract more FDI. Other factors like inflation rate, industrial employment, number of firms and imports had less pronounced effects. The Hausman test suggests that country-specific effects on FDI will likely be fixed. Policymakers should consider both general economic conditions and country-specific characteristics to attract FDI.

Various other studies provided deep insight of the relationship of various factors with FDI. For instance, Baloch et al. (2024) identified inflation, trade openness, and foreign debt as key drivers of Pakistan's GDP growth, with short-term effects from trade volume and foreign debt. In Norway, Udemba (2021) found that FDI contributes to reducing carbon emissions over time, supporting the pollution halo hypothesis. Tran et al. (2024) reveal that globalization increases Indonesia's ecological footprint, with negative changes in FDI having a stronger effect than positive ones. Mutai et al. (2025) demonstrate that remittances have a positive short-term impact on Kenya's growth, while FDI and imports become significant drivers in the long run. Abdi and Mohamed (2025) found that precipitation, FDI, and institutional quality enhance Somalia's agricultural exports, although currency depreciation's impact is mixed. Kenh and Wei (2025) affirm that FDI in sectors with a comparative advantage promotes economic growth in Cambodia. Lastly, Obani et al. (2025) reported a negative effect of environmental regulations on FDI, suggesting the need for improved infrastructure and regulatory frameworks to attract more foreign investment. Collectively, these studies emphasize the importance of policies that foster economic growth while ensuring environmental sustainability, taking into account both short-term and long-term considerations.

Conclusion

This study employed panel data analysis to examine the influence of macroeconomic factors on foreign direct investment (FDI) flows to Gulf Cooperation Council (GCC) countries. A comprehensive comparison of pooled, fixed-effects, and random-effects models revealed that the fixed-effects model best captured the nuanced relationships within the data, effectively accounting for unobserved country-specific heterogeneity. The fixed-effects model demonstrated that all else being equal, Saudi Arabia exhibits significantly higher FDI inflows compared to Bahrain, Qatar and Oman, highlighting the importance of country-specific factors in attracting FDI. While the UAE also showed a difference in FDI flows compared to Saudi Arabia, this difference was not statistically significant.

The analysis further revealed a negative and statistically significant association between GDP growth and FDI inflows within individual countries. This suggests that, as countries develop and their GDP increases, they might rely less on foreign investment for development. However, this relationship is not uniform across all GCC

countries, as evidenced by the random effects model, underscoring the need for further investigation into the complex interplay between GDP and FDI. Across all models, the value of exports emerged as a strong and consistent positive predictor of FDI inflows. This finding supports the notion that robust export performance signals to multinational corporations that the host country possesses the necessary infrastructure and market access to facilitate their global operations.

Interestingly, unemployment rate also demonstrated a positive and significant association with FDI inflows, particularly in the fixed-effects and random-effects models. This result could indicate that some multinational corporations are drawn to regions with available labor pools, potentially due to lower labor costs or government incentives. While the study considered additional factors like inflation, industrial employment, number of firms, and imports, their effects on FDI were not uniformly significant across all models. This suggests that their influence might be less pronounced, more context-specific, or potentially mediated by other unobserved factors. Despite these valuable insights, this study acknowledges certain limitations. First, the analysis did not explicitly incorporate other potentially relevant variables such as market structure, institutional quality, political stability, or regulatory environment. These factors could play a significant role in shaping FDI patterns and warrant further investigation. Second, the potential for simultaneity bias between FDI and macroeconomic variables like GDP remains a concern. Future research should explore using simultaneous equation models or instrumental variable approaches to disentangle the complex relationships between these variables and establish causality more rigorously. In conclusion, this study contributes to understanding the multifaceted determinants of FDI flows to GCC countries. By highlighting the importance of country-specific factors, GDP growth, exports, and unemployment rate, this research provides valuable insights for policymakers seeking to attract and leverage FDI for sustainable economic development. Future research that addresses the identified limitations and incorporates a broader range of variables can further refine our understanding of this intricate landscape.

Conflict of Interest Declaration: None.

Author's Contribution: ESA: Conceptualization, MHA: Writing, original draft preparation, MM: review and editing, YA: Project administration, MA: Formal analysis, Funding acquisition. SAA: Investigation, Methodology, EA: Formal analysis, Data gathering.

Funding: This research was funded by Researchers Supporting Project, King Saud University, Riyadh, Saudia Arabia: RSPD2025R819.

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