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THE INFLUENCE OF FINANCIAL DEVELOPMENT AND FDI INFLOWS ON ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM GCC COUNTRIES USING PMG-ARDL APPROACH

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ABSTRACT

This study investigates the long-run relationship between economic growth, foreign direct investment (FDI), and financial development (FD) in the Gulf Cooperation Council (GCC) countries over the period 1980–2023. The PMG-ARDL technique is used to estimate an extended panel growth model, which includes trade openness (TO) as control variable and an interaction variable (INT) calculated as the product of FDI and FD. The estimated results of the long-run cointegration relationship reveal negative effects of FD and the interaction variables, whereas, the FDI and trade openness exert positive effects on GCC countries' economic growth. Moreover, we apply Dumitrescu and Hurlin (2012) heterogeneous Granger causality technique, and identify a total of six bi-directional short-run links among LRGDP and FD, LRGDP and INT, LRGDP and LFDI, LRGDP and LTO, FD and INT, LFDI and LTO, whereas three unidirectional short-run causalities are observed among certain variables such as, LFDI to FD, LTO to FD, and LFDI to INT. Besides, we identify a long-run bidirectional causality among LRGDP. and the error correction mechanism. The study recommends that the GCC countries must put make additional efforts to regulate their financial sector and stimulate private investment and private consumption and diversify their economies to attract FDI.

Keywords: *Economic growth, Foreign direct investment, Financial development, Trade openness, Panel cointegration, GCC countries*

1. INTRODUCTION

The main advantage of the financial development is that it enables the financial sector to mobilize and allocate savings into various capital needs, through different means such as providing information, monitoring investment, facilitating trade, and diversifying and managing risk. The ultimate goal of these means is to promote efficient capital allocation that would help enhancing economic growth in the host country (Naeem et al., 2016). However, the causal direction of the relationship between foreign direct investment, financial development, economic growth, and other macroeconomic variables has been a controversial issue in the economic literature, applied research and policy makers. The main concern of such controversial rests on the FDI impact on economic growth. The debate centers around the question whether FDI or FD can be the leading force in the economy or whether they follow the economic growth of the country (Ghali, 1999). It is well recognized in applied economic literature that in order for host countries to capture the benefits of FDI, they should have a certain minimum level of FD. The clear-cut relationship between FDI and economic growth has also not been confirmed by applied empirical research (Chien-Chiang and Chun-Ping, 2009). The enormous volume of applied economic research has been mainly divided between focusing on the impact of FDI on economic growth and on exploring the role of financial development. However, some recent studies have not extensively considered the interrelationships among FDI, FD, and economic growth.

Based on the above argument, the present study addresses the role of FD in demonstrating the positive effect of FDI on economic growth in the context of GCC countries. Moreover, the GCC countries are in the process of diversification of income from oil-based industries. A necessary precondition for the success of this process is to attract more FDI and integration into the world economy. It is expected that integration in the world economy through attracting FDI inflows would ensure economic growth for the GCC countries. Therefore, investment by foreign companies in the GCC countries can indeed be the beginning of a successful transition to a diverse economy, enhance economic growth in these countries, and offset the reduction in revenues resulting from the reduction in oil exploration and exportation.

Regarding the GCC countries, to the best of our knowledge, previous studies that examined the threshold of the financial sector development in enhancing the FDI impact on economic growth are rare. Although there is considerable empirical research investigating the relationships among FDI, FD, and economic growth (e.g., Naeem et al., 2016; Khodeir and Sarah 2016; Bassam, 2015), these studies did not estimate the threshold level of FD in Arab countries, except Omran and Bolbol (2003). Hence, estimating the threshold is expected to improve the link between FDI and economic growth as well as reflect the host country's absorptive capability of the FDI benefits (Chee-Keong et al., 2004). Another study by Al-Abdulrazag (2017) shows that if the host country can maintain a certain level of financial market development, it may attract FDI to boost economic growth and the threshold level is 55.6%. In addition, the present study focuses on a longer period spanning from 1980 to 2015, which includes the financial market development process that took place in the last two decades in the Gulf region (Naeem et al., 2016). Moreover, the study is expected to significantly contribute to the existing literature on the role of FD in enhancing the FDI-growth nexus, and assist policy makers in GCC countries to adapt appropriate policy measures for FD to enhance the performance of FDI and economic growth.

This study improves the analytical framework for analyzing the FDI-growth link by employing the Pooled Mean Group-Autoregressive Distributed Lag (PMG-ARDL) estimator (Pesaran et al., 1999; Blackburne & Frank, 2007). Prior research on the GCC (e.g., Alguacil et al., 2011; Salahuddin et al., 2015) has predominantly employed static panel models or rudimentary dynamic models, which are insufficient for effectively capturing the complex, varied short-run dynamics and long-run equilibria inherent in macroeconomic data (Eberhardt and Teal, 2011). The PMG-ARDL method represents a substantial improvement by simultaneously modeling heterogeneous short-run adjustment processes and a consistent long-run relationship among GCC member states, a plausible assumption given their coordinated economic policies and structural similarities. This allows us to distinguish between temporary fluctuations and the lasting, policy-relevant effects of FDI and financial development, a differentiation that previous techniques have muddled.

This research presents a significant theoretical enhancement by explicitly modeling and empirically assessing the interactive effect between financial development (FD) and foreign direct investment (FDI) through the incorporation of an interaction term (FD × FDI). Current literature, both internationally and regionally, frequently regards foreign direct investment (FDI) and financial development (FD) as separate, additive elements in growth regressions, emphasizing their direct linear effects (e.g., Borensztein et al., 1998; Alfaro, Chanda et al., 2004). This study asserts and empirically confirms that their influence is synergistic and inseparable, a concept derived from the foundational absorptive capacity theory (Cohen & Levinthal, 1990). The coefficient on the interaction term explicitly evaluates whether a developed financial system serves as the essential 'absorptive capacity' that enables FDI to effectively stimulate growth, a mechanism proposed by Hermes and Lensink (2003). This transcends the inquiry of 'Do FDI and FD matter?' to address the more intricate question: 'At what degree of financial development does FDI yield optimal productivity for growth?' Thus, this establishes a robust, conditional theoretical framework that has undergone global testing yet is notably lacking in rigorous, methodologically sophisticated panel studies pertaining to the GCC bloc, where previous analyses have neglected this essential interaction (e.g., Samargandi et al., 2014; Salahuddin et al., 2015).

The objective of the present study is to investigate the long-run relationship among foreign direct investment (FDI), financial development (FD), and economic growth in GCC countries. The study employs the panel cointegration approach as well as the PMG-ARDL technique, and Dumitrescu and Hurlin (2012) heterogeneous Granger causality technique. The remainder of the paper is structured as follows. Section 2 provides a literature review. Section 3 presents the methodology and data. Section 4 is designated for the empirical results and findings, and section 5 provides the conclusion and policy implications.

2. LITERATURE REVIEW

2. 1. THEORETICAL FRAMEWORK: FINANCIAL DEVELOPMENT, FDI, AND ECONOMIC GROWTH

The interaction of Financial Development (FD), Foreign Direct Investment (FDI), and Economic Growth is a vital subject of inquiry in international finance, providing an essential framework for examining the distinct dynamics of the Gulf Cooperation Council (GCC) nations. Classical economic theory, based on the Supply-Leading Hypothesis (Schumpeter, 2021), asserts that a strong financial sector stimulates growth by effectively mobilizing savings, optimizing capital allocation, and reducing communication and transaction costs (Levine, 1997). In contrast, the Demand-Following Hypothesis (Robinson, 1952) posits that the expansion of the financial sector is a reaction to the requirements of an expanding real economy. The current trend toward diversification policies in GCC states, exemplified by Saudi Arabia's Vision 2030, signifies a strategic effort to utilize the supply-leading function to foster non-hydrocarbon sector development, transcending the conventional dependence on external oil money.

The impact of foreign direct investment on the economic growth of host countries is most effectively analyzed through the framework of Endogenous Growth Theory. Although foreign direct investment (FDI) offers an immediate cash influx (Neo-Classical perspective), its principal long-term influence is transmitted through beneficial externalities or "spillover effects." These spillovers include the transfer of sophisticated technology, managerial skills, and enhancement of human capital, therefore elevating the host nation's long-term growth and productivity rate (Borensztein et al., 1998). Nevertheless, within the context of the GCC region, the Resource Curse literature presents a significant caveat: Foreign Direct Investment (FDI) primarily focused on the capital-intensive oil and gas industry may restrict wider local connections and technical assimilation within the non-oil economy, thereby hindering overall growth advantages (Abdelkawy, 2024; Elheddad et al., 2021)

The efficacy of foreign direct investment as a growth stimulant is contingent upon the host nation's absorptive capacity, with financial development serving as a critical requirement. This establishes the foundation of the Complementarity Hypothesis (Alfaro et al., 2004), which asserts a substantial interactive effect: the advantages of FDI are optimized solely in the context of a robust and advanced financial system. The financial sector, comprising banks and capital markets, enables the local assimilation of foreign technology by supplying domestic enterprises with essential loans and services for expansion, investment, and integration into the value chain created by Multinational Corporations (MNCs). Although GCC financial systems are typically well-capitalized owing to significant sovereign wealth, the critical analytical inquiry is whether this financial depth results in effective resource allocation that optimizes the non-resource FDI spillover effects vital for enduring economic diversification and stability (Al-Malkawi et al., 2012).

2. 2. FINDING OF PRIOR STUDIES ON FINANCIAL DEVELOPMENT, FDI AND ECONOMIC GROWTH

The role of a robust financial sector in emerging nations has been a debated issue in the literature that analyzes the correlation between foreign direct investment (FDI) and economic growth (Nobakht and Seyedashkan, 2014). This debate arises from the argument that technology spillovers generated by foreign direct investment are more efficiently enabled when host nations have a resilient financial infrastructure (Esfandyari, 2015; Hermes and Lensink, 2003; Chee-Keong and Lam, 2012). Therefore, the causal relationships among foreign direct investment (FDI), financial development (FD), and various macroeconomic variables have attracted considerable academic attention since the late 20th century. The empirical work conducted by Chee-Keong et al., (2004) have thoroughly examined the role of foreign direct investment (FDI) in promoting economic growth, with the majority of empirical evidence confirming its beneficial effects.

Recent empirical studies have increasingly examined the role of advanced domestic financial systems on the mediation of the FDI-growth link (Alfaro et al., 2006; Hermes and Lensink, 2003). Issouf and Fulbert (2015) expanded this discussion by investigating the reciprocal relationship between foreign direct investment (FDI) and financial development in 29 emerging nations from 1994 to 2006 and they identified a bidirectional causal relationship between foreign direct investment (FDI) and stock market development (assessed through capitalization and market value ratios), while no significant correlation was observed between FDI and banking sector development.

Subsequent empirical investigations have examined the three-way relationship between foreign direct investment, financial development, and economic growth. Esfandyari (2015) evaluated the data from D8 nations (2004–2013), and determined that foreign direct investment significantly affects growth, especially when coupled with financial sector development at a threshold of 3.39%. In contrast, Nobakht and Seyedashkan (2014) utilized dynamic panel Generalized Method of Moments (GMM) for upper-middle-income nations (1990–2011) and illustrated that the advancement of the financial sector promotes growth by enabling technology spillovers generated by foreign direct investment (FDI). Nonetheless, trade openness was determined to adversely influence these spillovers. Sharafat (2014) found a negative link between FDI and growth, although established short-run unidirectional causality from FDI to growth by analyzing the data from Pakistan (1972 to 2013). Conversely, Shahbaz and Rahman (2012), employed ARDL for Pakistan (1990–2008), and identified bidirectional causality among FDI, financial development, imports, and growth, hence corroborating the feedback theory.

Chee-Keong and Lam (2012) conducted an analysis of 70 industrialized and developing economies from 1988 to 2002 using GMM and established that a required level of financial knowledge is vital for foreign direct investment to stimulate growth. Omran and Bolbol (2003) similarly discovered particular foreign direct investment thresholds (13.8% for domestic credit and 47% for commercial bank assets) in Arab nations (1975–1999) below which the growth effects of FDI remain unrealized.

Khodeir and Al Nuwaiser (2016) employed ARDL for Saudi Arabia (1990–2014) and discovered that FDI adversely related to industrial employment, although inflation and trade openness exerted long-term positive effects. Naeem et al., (2016) utilized panel methodologies for GCC countries (1975–2012) and found that financial sector development, as indicated by M2/GDP and private credit/GDP, positively impacted growth, but FDI and its connection with financial development were unimportant.

Rani, R., and Kumar, N. (2019) examined the long-term relationship and causal direction between economic growth, trade openness, and gross capital formation in the BRICS nations: Brazil, Russia, India, China, and South Africa by adopting ARDL and VECM. The authors demonstrated a long-run relationship between economic growth, trade openness, and gross capital formation. Besides, the granger causality analysis indicated a unidirectional causal relationship from trade openness to economic growth in India, while Brazil's results align with the trade-led growth hypothesis whereas the authors observed a bidirectional causality is observed between trade openness and economic growth in China. Moreover, they also found a unidirectional causality from economic growth to trade openness in South Africa supporting the growth-led trade hypothesis.

Akadiri et.al., (2020) investigated the causal relationship between foreign direct investment (FDI) and economic growth in 25 African nations by using trade openness inside a model that utilizes recent panel data from 1980 to 2018 and applying panel bootstrapping cointegration methods. Their research revealed a long-term equilibrium relationship among the variables, as well as a bidirectional causality between foreign direct investment, trade openness, and economic growth.

Olorogun et al., (2022) investigated the FDI-led growth hypothesis in Nigeria, using financial development, labor force, and capital formation as supplementary variables. Utilizing time-series data from 1970 to 2018, the authors applied sophisticated econometric methodologies, including Bayer-Hanck cointegration, ARDL bounds testing, and Toda-Yamamoto causality, to evaluate long-term correlations. Principal findings affirmed the beneficial influence of foreign direct investment on GDP and underscore financial development, especially banking-sector metrics, as a crucial predictor of growth.

Appiah et al., (2023) examined the correlation among financial development (FD), foreign direct investment (FDI), and economic growth (EG) in promoting industrialization in Sub-Saharan Africa from 1990 to 2017, utilizing an innovative composite FD index and sophisticated panel estimators (AMG/CCEMG) to account for cross-sectional dependence. The authors demonstrated that foreign direct investment (FD) is the most significant driver for industrial growth, emphasizing the necessity for enhanced financial inclusion and capital market advancement, whereas economic growth (EG) exhibited a comparatively weaker positive impact, consistent with structural transformation theory. Besides, the study showed that foreign direct investment (FDI) demonstrated a detrimental effect, due to the predominance of resource-seeking FDI and insufficient absorptive capacity, indicating the necessity for focused FDI policies that support high-spillover sectors. The causality tests validated bidirectional ties between foreign direct investment and industrialization, confirming Schumpeterian theory, as well as unidirectional relationships between economic growth and foreign direct investment and industrialization.

Handayani et al. (2024) examines the correlation among foreign direct investment, financial development, and economic growth in ASEAN nations from 1999 to 2019. Furthermore, it seeks to examine the impact of inflation, exchange rates, and human capital on economic growth. The research methodology employs panel data analysis utilizing the Fixed Effect Model (FEM). The research findings indicate that foreign direct investment, currency rates, and human capital exert a favorable and considerable influence on economic growth. Inflation adversely and substantially affects economic growth. Financial development enhances the impact of foreign direct investment on economic growth. Consequently, domestic financial development must be enhanced to optimize the advantages derived from foreign direct investment (FDI).

El Fakiri et al., (2024) investigates the relationship between foreign direct investment (FDI) and financial development (FD) in 16 chosen countries of the MENA region from 2000 to 2018. The authors utilize three proxies for financial development (FD) as established by the IMF: overall financial development (OFD), financial markets development (FM), and financial institutions development (FI). The results indicate that while no meaningful association is seen in the short term, the long-term coefficients of both the overall FD proxy and FM proxy are positive and statistically significant. Estimates indicate that a 1% rise in the total FD proxy and FM proxy leads to increases of 172% and 150% in FDI inflows to MENA region nations, respectively.

Pușcașu (2024) examines the influence of financial development on economic growth through panel regressions for European Union member states from 1990 to 2021. The findings indicate that financial development, via both the banking sector and capital markets, positively influences economic growth, provided there is alignment between invested funds and the output of the real sector.

Pandey (2024) analyzes the influence of financial development and foreign direct investment (FDI) on economic growth in SAARC nations, utilizing data from the World Bank and IMF from 1988 to 2021. The results demonstrate a statistically significant positive correlation between FDI and GDP growth, underscoring the relevance of both elements in economic policymaking. Financial development in the SAARC region has a statistically minor negative effect. Infrastructure is necessary for financial organizations to harness the advantages of financial development. The findings underscore robust institutional frameworks essential for fostering financial development and foreign direct investment to expedite economic progress.

An and Yeh (2025) examined the threshold effects of financial development (FD) in mediating the foreign direct investment (FDI)-growth relationship in emerging and developing Asia from 1996 to 2019 by adopting the IMF's multidimensional Financial Development Index and panel smooth transition regression (PSTR) models to identify nonlinear relationships. The authors found a dual-threshold effect of financial development (FD): moderate levels of FD augment the growth benefits of foreign direct investment (FDI), whereas excessive financial development undermines this positive correlation, corroborating the "too much finance" concept. Besides, the authors claimed that financial institutions had a more pronounced mediating effect than financial markets, with the growth impact of FDI exhibiting an inverted-U connection with financial depth but maintaining positive linear correlations with financial accessibility and efficiency.

Based on the above literature review, we confirm that no study has been conducted so far that we consider the effect of FD, FDI and interaction variables (FD and FDI), and the threshold analysis in the context of GCC region. Our study is an attempt to fill the research gap for supporting appropriate policies for regional economic growth and stability.

3. METHODOLOGY AND DATA

The empirical studies investigating the dynamic linkages between economic growth, FD, and FDI have used different econometric approaches, including the Dynamic Panel, ARDL, and VECM. Focusing on the GCC countries, this study adopts the panel ARDL cointegration approach to examine the influence of FDI and FD on economic growth.

3. 1. DATA SOURCE

The data set used in the study are panel series data spanning from 1980 to 2023 for the six countries in GCC region: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates. The data on t variables are obtained from World Development Indicators database (WDI 2025) and the United Nations Conference on Trade and Development (UNCTAD). Table 1 summarizes the descriptive variables adopted in this study and their sources.

Table 1. Variable descriptions

Variable Name	Symbol	Definition	Unit	Type	Source
Real Gross Domestic Product	LRGDP	Real gross domestic product	GDP at constant 2015 (US dollars)	Dependent	WDI (2025)
Financial Development	FD	It is represented by the domestic credit to private sector	FD (% of GDP)	Independent	WDI (2025)
Foreign Direct Investment	LFDI	Stock of Foreign Direct Investment	Constant 2015 US dollars	Independent	WDI (2025)
Interaction Variable (FD*FDI)	INT	FDI multiplied by FD		Control	WDI (2025)
Trade Openness	LTO	It shows the aggregate value of goods and services exported and imported,	Trade (% of GDP)	Control	UNCTAD (2025)

Source: Authors

3. 2. MODEL SPECIFICATION

This study focuses on the interplay between economic growth, FD, and FDI by using an extended finance-growth model, where trade openness and the interaction variable (FDI multiplied by FD) are included as macroeconomic factors[1].The main panel model is presented as follows:

$$RGDP_{it} = f\,(FDI_{it}, FD_{it}, TOP_{it}, INT_{it}) \qquad (1)$$

Given that each variable is in its natural logarithm, and after adding a random error term, the empirical model can be written as follows:

$$LRGDP_{it} = \beta_0 + \beta_1 LFDI_{it} + \beta_2 LFD_{it} + \beta_3 LTO_{it} + \beta_4 INT_{it} + \varepsilon_{it} \qquad (2)$$

Where $LRGDP_{it}$ represents the natural logarithm of real gross domestic product, $LFDI_{it}$ is the stock of FDI, FD_{it} is the financial development indicator as the domestic credit to private sector, LTO_{it} is the trade openness). The INT is the interaction variable ($FD_{it} \times FDI_{it}$) defined as FDI multiplied by FD, and ε_{it} is the stochastic error term, where *i* and *t* refer to the country and time respectively. All variables, except FD and INT, are converted into natural logarithms; therefore, the related coefficients are interpreted as long-run elasticities.

We perform preliminary tests to examine the influence of financial development and FDI inflows on economic growth. To achieve this objective, we first test the Cross-Sectional Dependence in panel data by the cross-sectional dependence (CD) test proposed by Pesaran et al., (2004). We therefore conducted a homogeneity test, as recommended by Pesaran and Yamagata (2008) to check the extent of homogeneity of the selected variables.

Afterwards, the panel unit root tests are selected and performed based on the results of the CD and homogeneity tests to test the stationarity of considered variables. In the presence of cross-sectional dependence, it is appropriate to utilize second-generation unit root tests, such as the CIPS and CADF due to the advantages of effectively addressing the issue of cross-sectional dependence.

This study employs pooled mean group (PMG) estimation method to examine the influence of financial development and FDI inflows on economic growth in GCC countries. Besides, we adopt the panel ARD specifications which facilitate the identification of short-run and long-run dynamics. The PMG estimator may assess short-run relationships while accounting for heterogeneity and long-run equilibrium adjustments (adjustment speed). Pesaran et al., (1999) assert that the PMG estimate method which is based on the maximum likelihood technique offers a pragmatic advantage by delineating both short- and long-run coefficients and determining the long-run equilibrium relationship. The panel ARDL model can be specified within the following framework:

$$\Delta LRGDP_{it} = ß_0 + ß_1 LRGDP_{t-1} + ß_2 FD_{it-1} + ß_3 LFDI_{it-1} + ß_4 INT_{it-1} + ß_5 LTO_{it-1} + \sum_{i=0}^{n} \delta_1 \Delta LRGDP_{it-i} + \sum_{i=0}^{n} \delta_2 \Delta FD_{it-i} + \sum_{i=0}^{n} \delta_3 \Delta FDI_{it-i} + \sum_{i=0}^{n} \delta_4 \Delta INT_{it-i} + \sum_{i=0}^{n} \delta_5 \Delta LTO_{it-i} + \xi_{it} ECT + \varepsilon_{it} \quad (3)$$

Where: LRGDP serves as the dependent variable shows the real GDP in an economy; and ΔLGDP represents the growth of GDP, representing the economic growth for country 'i' at time 't.' ECT signifies the error correction term, whereas the β and δ *are the* coefficients respectively show the short - and long-run slope coefficient. The sign Δ denotes the first difference operator, ε signifies as the stochastic term, and ξ indicates the coefficient of error-correction term.

4. FINDINGS AND DISCUSSIONS

4. 1. DESCRIPTIVE STATISTICS

The descriptive statistics of individual and all countries in GCC is outlined in Table 2. Among the study variables, Real GDP demonstrated the most volatility followed by stock of FDI with a standard deviation of 173000 and 56373.18. As displayed, the highest level of RGDP is observed in Saudi Arabia (USD 443000 Million), while the lowest level is found in Bahrain (USD 19379.02 Million). The minimum FD, which is a proxy by the domestic credit to private sector (% of GDP) is recorded in Saudi Arabia (6.81 %) whereas the maximum is noticed in Qatar (138%). The table also shows that Kuwait (USD 11.90 Million) has the lowest level of FDI while Saudi Arabia (USD 268947 Million) has highest level of FDI.

Table. 2 Summary of descriptive statistics

Variables	Mean	Std. Dev	Min	Max
RGDP	443000	171000	200678	767097
FD	27.38	12.81	6.81	56.28
FDI	88900.09	97420.39	413.92	268947
TO	44.7	22.8	16.7	91
		Bahrain		
RGDP	19379.02	9773.26	8040	36989
FD	44.75	13.04	26.25	71.44
FDI	11919.31	12544.57	60.74	43084
TO	83.2	21.3	50.2	133
		Kuwait		
RGDP	73930.86	32218.81	20223	117939.00
FD	61.66	22.94	17.16	105.19
FDI	5422.76	7047.25	11.90	18144
TO	64	30.3	28.9	130
		Oman		
RGDP	48444.07	23991.77	11403	87385
FD	34.82	17.02	13.35	76.59
FDI	11799.15	15313.14	482.79	56069
TO	58.2	31	24.1	121
		Qatar		
RGDP	71629.48	62257.17	14453.00	175916.00
FD	48.99	29.25	12.90	138.86
FDI	12426.04	14612.80	57.89	39615
TO	53.8	28	18.9	118
		UAE		

Variables	Mean	Std. Dev	Min	Max
RGDP	228000	117000	82146	443709
FD	45.53	21.78	15.57	87.92
FDI	46238.19	62176.24	392.29	224987
TO	87.9	66	20.8	217
All GCC countries				
RGDP	147000.00	173000.00	8040.00	767097
FD	43.87	23.01	6.81	138.86
FDI	29450.92	56373.18	11.90	268947
TO	65.3	39.4	16.7	217

Source: Compiled by the authors

The log of the real gross domestic product (LRGDP), log of foreign direct investment (LFDI), financial development (FD), and log of trade openness (LTO) are plotted in Figs. 1–4 respectively. We observe that there is a common trending behavior indicating some relationship between the variables. Furthermore, the figures show that all variables have been increasing across time for all GCC countries except for trade openness. Additionally, we can observe that Saudi Arabia has the highest real GDP and FDI and the lowest financial development and trade openness. Likewise, Figs.1 and 4 indicate that the lowest real GDP is in Bahrain, which has the highest TOP, while Fig. 3 shows that the lowest FDI values are observed in Kuwait. Furthermore, we observe a significant decrease in real GDP and financial development for Kuwait in the early 1990s, which can be explained by the first Gulf War. In addition, there is a significant change in financial development and trade openness after the global financial crisis of 2007–2008 for all GCC countries under study.

Fig. 1: RGDP - Log Level

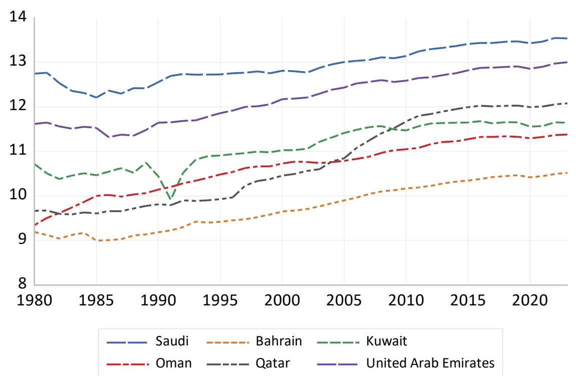


Fig. 2: FD - Level

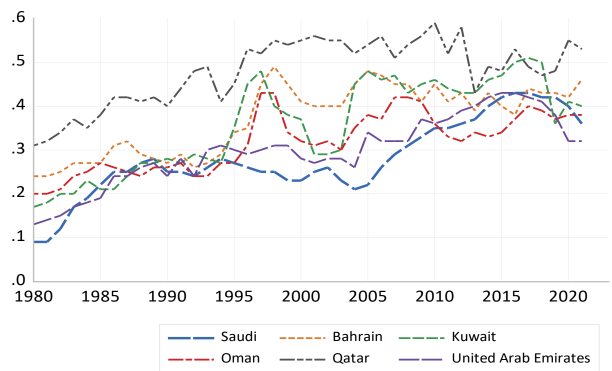


Fig. 3: FDI - Log Level

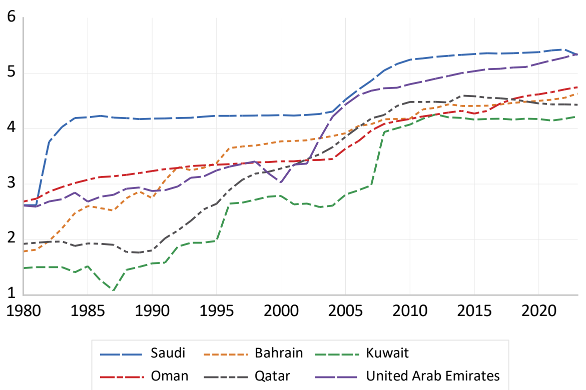
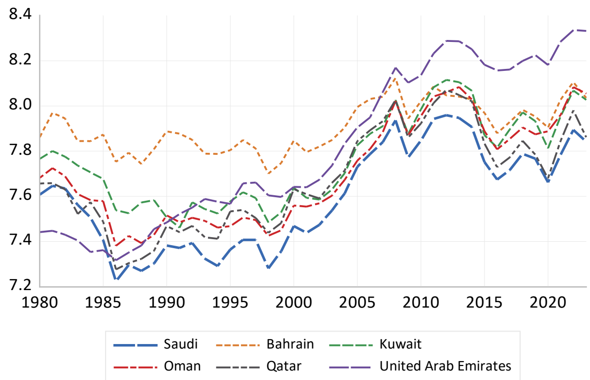


Fig. 4: TOP - Log Level



Source: Compiled by the authors

4. 2. RESULT OF CORRELATION AND MULTICOLLINEARITY ANALYSIS

The results presented in Table 3 demonstrate a strong correlation between LRGDP and LFDI, evidenced by a positive coefficient of 0.660 and a p-value of 0.000. Additionally, a moderate correlation exists between LRGDP and FD, indicated by a positive coefficient of 0.165 and a p-value of 0.010. Similarly, a comparable correlation is observed between LRGDP and LTO, with a positive coefficient of 0.135 and a p-value of 0.029. INT does not exhibit a significant correlation with the LRGDP variable.

Table 3. Matrix of correlations

Variables	RGDP	FD	INT	FDI	TO
RGDP	1				
FD	0.071	1			
INT	-0.006	0.173^{**}	1		
FDI	0.849^{***}	0.276^{***}	0.151^{**}	1	
TO	0.194^{***}	0.493^{***}	0.456^{***}	0.418^{***}	1

Note: ***, ** and *denote the rejection of the null hypothesis at the 1%, 5% and 10% significance level, respectively

Source: Compiled by the authors

Furthermore, none of the variables exhibited a correlation coefficient exceeding 80%, indicating a lack of multicollinearity among them. Additionally, Table 4 displays the variance inflation factor (VIF) test value, indicating the absence of multicollinearity among the variables. The mean Variance Inflation Factor (VIF) of 1.54, which is below the threshold of 5, provides strong evidence for the absence of multicollinearity.

Table 4. VIF test for multicollinearity effects

Variables	VIF	1/VIF
LTO	2.03	.493
LFDI	1.409	.71
FD	1.397	.716
INT	1.316	.76
Mean VIF	1.538	

Source: Compiled by the authors

4. 3. RESULT OF CROSS-SECTIONAL DEPENDENCE, SLOPE HOMOGENEITY AND PANEL UNIT ROOT TEST

The analysis of non-stationarity and the integration properties of variables is essential for empirical studies, facilitating the identification of suitable estimation methods. Various panel unit tests have been developed for panel data to assess the integration order of variables, including those by Maddala and Wu (1999), Breitung (2000), Hadri (2000), Levin et al., Chu (2002), and Pesaran and Shin (2003). These unit root tests address the issues of homogeneity and heterogeneity in pooled cross-sectional data. Consequently, when substantial contemporaneous correlation exists among cross-sections, the previously mentioned panel unit root tests may exhibit low power, resulting in potentially misleading outcomes. The cross-section dependence test, developed by Pesaran (2004), facilitates the assessment of dependence in cross-section panel data. Pesaran introduces a cross-section dependence test utilizing the CD statistic.

$$CD = \left[\frac{TN(N-1)}{2}\right]^{1/2} \underline{\hat{\rho}} \quad (4)$$

Where N and T are panel unit and sample size, respectively and $\bar{\hat{\rho}} = \left(\frac{2}{N(N-1)}\right) \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij}$ is indicated as the average of the pair-wise cross-section correlation coefficients of the residuals calculated from the ADF regression. The CD test is designed to assess independence under the null hypothesis in contrast to dependence under the alternative hypothesis. Bai and Ng (2004), Moon and Perron (2004), and Pesaran (2007), among others, proposed a second generation of panel unit root tests that incorporated cross-sectional dependence. The CIPS test, developed by Pesaran (2007), is an improved version of the Im, Pesaran, and Shin (IPS) unit root test, employing the cross-sectional Augmented Dickey-Fuller (CADF) model.

$$\Delta y_{it} = \alpha_{it} + k_i t + \beta_i y_{it-1} + \sum_{j=0}^{p} \gamma_{ij} \bar{y}_{t-j} + \sum_{j=1}^{p} \delta_{ij} \Delta y_{it-j} + \varepsilon_{it} \qquad (5)$$

Where y_{-t} is symbolized as the cross-sectional mean of y_{it} at time t, and p is the lag order. The CIPS test is designed to assess the presence of a unit root, with the null hypothesis H_0: $\beta_i = 0$ for all i contrasted against the alternative hypothesis H_0: $\beta_i < 0$ for some i. The CIPS test statistic is defined as the mean of the t-statistics of β_i in the ADF regression. The test statistic is presented as follows:

$$CIPS(N,T) = \frac{1}{N} \sum_{i=1}^{N} t_i(N,T) \qquad (6)$$

Table 5 presents the results of the CD test and the CIPS unit root test. The CD test results provide strong evidence against the null hypothesis of cross-section independence at the 1% significance level. Additionally, the CIPS test indicates that each variable possesses a unit root, while the first differences do not exhibit a unit root, denoting I(1).

Table 5 also demonstrates the results of three comprehensive assessments of cross-sectional dependence: (1) Pesaran's (2004) CD test, (2) Pesaran's (2004) scaled LM test, and (3) Baltagi et al.'s (2012) bias-corrected scaled LM test, all of which operate under the null hypothesis of cross-sectional independence among the observed units. The empirical results reveal significant cross-sectional dependence among nations for every variable at the 1% significance level, contradicting the independence suggested by Pesaran's (2004) CD test. The scaled LM test (Pesaran et al., 2004) and the bias-corrected scaled LM test (Baltagi et al., 2012) provide clear evidence of cross-sectional dependence. The observed correlation aligns with theoretical predictions, reflecting the substantial economic and financial interdependence among GCC nations. Consequently, these results necessitate the application of unit root tests that explicitly account for cross-sectional dependence.

Table 5. Cross-sectional dependence tests

	Pesaran CD		Pesaran scaled LM		Bias-corrected scaled LM	
Variable	statistic	p-value	statistic	p-value	Statistic	p-value
LRGDP	22.500	0.000	105.365	0.000	105.296	0.000
FD	16.673	0.000	52.762	0.000	52.692	0.000
INT	3.890	0.000	2.719	0.006	2.649742	0.008
LFDI	23.669	0.000	99.696	0.000	99.627	0.000
LTO	23.599	0.000	99.288	0.000	99.218	0.000

Note: *** and ** denote the rejection of the null hypothesis of cross-sectional independence at the 1% and 5% levels, respectively. Periods included: 44, Cross-sections included: 6, Total panel observations: 264

Source: Compiled by the authors

The Pesaran and Yamagata method is employed to evaluate the homogeneity of the variables shown in Table 6. The findings demonstrate that the panel displays heterogeneity. The null hypothesis of the Pesaran and Yamagata tests asserts that the panel demonstrates homogeneity. The test results demonstrate that the delta tilde (large sample) and corrected delta tilde (small sample) are not homogeneous, thereby leading to the rejection of the null hypothesis. This study employed heterogeneous panel estimations.

Table 6. The slope homogeneity tests

	Pesaran -Yamagata homogeneity test	
	Statistics	p-value
Δ~	17.492	0.000
Δ~- Adjusted	18.939	0.000

Source: Compiled by the authors

Table 7 summarizes the results from two distinct unit root tests: the cross-sectionally augmented Dickey-Fuller (CADF) and the cross-sectionally augmented IPS (CIPS). The CADF and CIPS tests address cross-sectional dependency by employing cross-sectional averages of lagged levels and initial differences.

Table 7. Panel unit root tests

	Cross-Sectionally Augmented IPS (CIPS)		Cross-Sectionally Augmented Dicky-Fuller (CADF)	
Variables	Level	First differences	Level	First differences
LRGDP	-3.332***	-3.480***	-3.328***	-5.291***
LFDI	-2.018	-2.957**	-1.868	-4.805***
FD	-0.521	-2.306**	-1.581	2.842**
INT	-3.667***	-4.940***	-3.667***	-6.125***
LTO	-1.937	-4.515***	-3.002**	-6.240***

Note: The panel unit-root test was conducted under the null hypothesis wherein the variables are homogeneous non-stationary. ***, ** and * denote the rejection of the null hypothesis at the 1%, 5% and 10% significance level, respectively

Source: Compiled by the authors

The results reveal inconsistencies among the assessments; however, all variables exhibit stationarity only after first differencing [I(1)]. Despite the varied results, neither of the variables exhibit integration of order two or higher [I(≥2)], thereby justifying the use of the ARDL modelling framework in the current research.

4. 4. PANEL COINTEGRATION ANALYSIS

The above results of the panel unit root test indicate that all time-series are stationary at the first difference and have the same integration order, i.e. I(1). Consequently, the panel cointegration tests are used to determine whether a long-run relationship exists between the said variables. Kao (1999) and Pedroni (1999, 2004) propose several types of cointegration tests. According to Kao (1999), the ADF type tests for cointegration assume endogeneity between variables, while Pedroni (1999, 2004) proposes several tests for cointegration that allow for heterogeneity intercepts and trend coefficients across cross-sections.

The panel cointegration tests of Pedroni (1999) are developed by considering the following forms.

$$y_{it} = \alpha_i + \delta_i t + x_{it}\beta_i + \varepsilon_{it} \tag{7}$$

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + v_{it} \tag{8}$$

Where y_{it} and x_{it} are assumed to be non-stationary and integrated of order one. The parameters α_i and δ allow for the possibility of individual and trends effects respectively, and is the residuals term. Pedroni (1999, 2004) constructs seven statistics for testing the null hypothesis of no cointegration (H_0: ρ_i = 1), which implies that the residual of eq. 7 contains unit root, i.e. I(1).

Table 8. Pedroni panel cointegration tests

Tests	Statistic	Prob.	Statistic	Prob.
Alternative hypothesis: common AR Coefficients. (within-dimension).				
Panel v-Statistic	2.2534**	0.0121	1.2866*	0.0991
Panel rho-Statistic	0.5591	0.7120	1.6113	0.9464
Panel PP-Statistic	-2.7410***	0.0031	-0.0363	0.4855
Panel ADF-Statistic	-2.9845***	0.0014	-0.2048	0.4189
Alternative hypothesis: individual AR Coefficients. (between-dimension)				
Tests			Statistic	Prob.
Group rho-Statistic			1.5702**	0.0224
Group PP-Statistic			-1.1849	0.1180
Group ADF-statistic			-1.8046**	0.0356

Note: *** and ** denote the rejection of the null hypothesis of cross-sectional independence at the 1% and 5% levels, respectively. The automatic lag length selection is based on AIC Automatic lag length selection based on AIC with a max lag of 3, Newey-West automatic bandwidth selection, Trend assumptions: Deterministic intercept and trend

Source: Compiled by the authors

The Pedroni panel cointegration tests can be classified as within-dimension test (panel statistics test) or between-dimension test (group statistics test). The within-dimension test includes four statistics (panel *v*-statistic, panel *rho*-statistics, panel PP-statistics, and panel ADF-statistics) and assume common parameters under the alternative hypothesis, which is referred to as the homogeneous alternative hypothesis (H_1: $\rho_i = \rho < 1$ for all i). However, the between-dimension approach, which includes three statistics (group *rho*-statistics, group PP-statistics, and group ADF-statistics) allows for heterogeneity of the parameters across cross-sections under the alternative hypothesis (H_1: $\rho_i < 1$ for all i). Table 8 displays the results of Pedroni cointegration tests, which indicate that five panel cointegration tests reject the null hypothesis of no cointegration at both 1% and 5% significance level.

Alternatively, Kao (1999) proposes the DF and ADF type tests for cointegration, which take into account the endogeneity between variables. Kao considers the following model:

$$y_{it} = \alpha_i + x`_{it}\beta_i + \varepsilon_{it} \tag{9}$$

Where and are assumed to be integrated of order one and is the error term. The Kao panel cointegration test is constructed for no cointegration under the null hypothesis that is based on the unit root test for the residual term using the following unit root equation:

$$\varepsilon_{it} = \rho\varepsilon_{it-1} + \omega_{it} \tag{10}$$

Table 9 shows the results of the Kao panel cointegration test. The results confirm that the null hypothesis of no cointegration is rejected at the 1% significance level, and that the variables are cointegrated.

Table 9. Kao panel cointegration test

Test	t-Statistic	Prob.
ADF	-4.298314***	0.000
Residual variance	0.001371	
HAC variance	0.002084	

Note: *** Denotes the rejection of the null hypothesis of no cointegration at 1% significance level. Trend assumption: No deterministic trend. Automatic lag selection based on AIC with max lag of 3

Source: Compiled by the authors

4. 5. PANEL PMG-ARDL RESULTS

Table 10 displays both long-run and short-run relationships among the variables. In the long-run, financial development (FD) has a negative effect on GDP at the 5% significance level; an increase in the financial development by 1% is followed by a small but significant decrease in real GDP by 0.004%. From an economic theory perspective, this result seems counterintuitive, since FD should promote economic growth by enhancing capital allocation and efficiency. Apart from this, we observe that FDI has a positive and significant impact on real GDP at 5% significance level[4]. The results indicate that an increase in FDI by 1% leads to a increase[5] in real GDP by 0.326% in GCC countries this confirms a widely documented result in the literature (De Mello, 1997 and Zhang, 1999).

Furthermore, the results reveal a negative and significant effect of the interaction variable on RGDP growth. This finding indicates that the interaction role of both financial development as and foreign direct investment deteriorates economic growth in GCC countries. However, the trade openness has a positive and significant effect on RGDP at the 5% significance level; an increase in the trade openness by 1% is followed by an increase in real GDP by 0.254%.

In the short-run, Table 9 reveals a negative and significant relationship between the LFDI and RGDP, as contrast with long-run results, indicating that the increase of LFDI (-2) by 1% decreases real GDP by -0.030%. Both, FD and LTO variables are not significant in the short-run. However, we have observed a positive and significant relationship between the interaction variable and RGDP, signifying an increase of INT by 1% is associated with the increase of RGDP by 0.0001%.

Furthermore, the coefficient of the error correction term (ECT) is statistically significant at the 5% level, is less than one, and is negative, which, according to Pesaran et al., (1999), validates the long-run equilibrium of our model. The ECT coefficient of -0.069 indicates that RGDP is anticipated to converge to its equilibrium level over time at an annual adjustment rate of 7%. Thus, it is projected that attaining the new state of equilibrium will need around 14 years.

Table 10. Panel ARDL Estimation Results

Variables	Coefficients	Std. Error	t-Statistic	P-values
Long-run dynamics				
FD	-0.0042**	0.0021	-2.0319	0.0434
INT	-0.0005***	0.0002	-2.7135	0.0072
LFDI	0.3260***	0.0510	6.3932	0.0000
LTO	0.2535**	0.1161	2.1831	0.0301
Short-run dynamics				
ECT_{it-1}	-0.0689**	0.0278	-2.4774	0.0140
Δ (FD)	-0.0005	0.0009	-0.5294	0.5971
Δ (FD(-1))	0.0005	0.0007	0.7405	0.4598
Δ (FD(-2))	0.0005*	0.0003	1.6865	0.0932
Δ(INT)	0.0001***	0.0000	3.0408	0.0027
Δ (INT(-1))	0.0001***	0.0000	3.4281	0.0007
Δ (INT(-2))	0.0001*	0.0000	1.8061	0.0723
Δ (LFDI)	-0.0208	0.0513	-0.4047	0.6861
Δ (LFDI(-1))	-0.0231	0.0496	-0.4649	0.6425
Δ (LFDI(-2))	-0.0299**	0.0150	-2.0023	0.0465
Δ (LTO)	-0.0081	0.0301	-0.2684	0.7886
Δ (LTO(-1))	0.1063*	0.0636	1.6707	0.0963
Δ (LTO(-2))	0.0446	0.0302	1.4795	0.1405
Constant	0.1363**	0.0499	2.7336	0.0068

Note: ***, ** and *denote the rejection of the null hypothesis at the 1%, 5% and 10% significance level, respectively.

Source: Compiled by the authors

The direction of causation assists policymakers to initiate relevant economic policies for long-term sustainable economic growth and development. To achieve this, we utilize the Dumitrescu and Hurlin (2012) heterogeneous Granger causality technique, which predicts both short-run and long-run causality. The D.H. establishes short-run causality among the series, while long-run causation is assessed through the statistical significance of the error correction term ECT(-1) derived from the residual of Eq.3. The D.H. is based on the following linear heterogeneous model:

$$Y_{it} = \alpha_i + \sum_{j=1}^{j} y_i^j Y_{i,t-j} + \sum_{j=1}^{j} B_i^j X_{i,t-j} + \varepsilon_{it} \quad (11)$$

The subscripts i denote the individual cross-sectional unit, while t represents the time period, α_i represents individual effects that are assumed to be fixed over time, j denotes the optimal lag interval applicable to all cross-sections, y_i^j represents the autoregressive coefficients, and B_i^j signifies the regression parameter that may differ across groups, ε_{it} it is the vector of error terms, while x and y indicate the series for which causality will be evaluated. The objective of this test is to determine whether X causes Y.

The outcomes of the short-run and long-run heterogeneous panel non-causality tests are presented in Table 8. The analysis identified a total of six bi-directional links among LRGDP and FD, LRGDP and INT, LRGDP and LFDI, LRGDP and LTO, FD and INT, LFDI and LTO, whereas three unidirectional causalities are observed among certain variables such as, LFDI to FD, LTO to FD, and LFDI to INT. Our bi-directional relation between economic growth and financial development is in line with previous studies (King and Levine, 1993; Rousseau, et al., 2011; Hassan et al., 2011; Birru et al., (2019); Ustarz, et al., 2021; Nguyen, et al., (2022)). Another bi-directional relation between economic growth and foreign direct investment is supported by past studies (Duttaray et al., 2008; Alfaro et al., 2006; Kaur 2013; Gautam 2013; Banday et al, (2021); Mwakabungu and Kauangal, 2023). It means that FDI helps increase of knowledge transfer, domestic and regional investment and human capital., The findings of bi-directional relation between economic growth and trade openness is also consistent with previous studies (Yanikkaya, 2003; Awokuse, 2008; Rani and Kumar, 2019). It happens as trade openness supports capital accumulation, attracts foreign investments, and increases resource allocation efficiency. Our obtained results confirm bi-directional relation between foreign direct investment and trade openness which is similar to the past works (Branstetter and Foley, 2007; Zhang, 2005; Akadiri et al., (2020)). Lastly, we find long-run bidirectional causality among LRGDP. and the error correction mechanism.

Table 12. Dumitrescu and Hurlin (2012) Granger non-causality tests

Null Hypothesis	W-Stat.	Zbar-Stat.	Prob	Direction of Causality
FD does not homogeneously cause LRGDP	2.569	2.367	0.0179	LRGDP ↔ FD
LRGDP does not homogeneously cause FD	5.325	6.684	0.0000	
INT does not homogeneously cause LRGDP	3.319	3.583	0.0003	LRGDP ↔ INT
LRGDP does not homogeneously cause INT	2.318	2.001	0.0454	
LFDI does not homogeneously cause LRGDP	10.97	15.68	0.0000	LRGDP ↔ LFDI
LRGDP does not homogeneously cause LFDI	5.527	7.073	0.0000	
LTO does not homogeneously cause LRGDP	2.920	2.953	0.0031	LRGDP ↔ LTO
LRGDP does not homogeneously cause LTO	4.120	4.849	0.0000	
INT does not homogeneously cause FD	2.556	2.347	0.0189	FD↔ INT
FD does not homogeneously cause INT	3.081	3.170	0.0015	
LFDI does not homogeneously cause FD	4.334	5.132	0.0000	LFDI → FD
FD does not homogeneously cause LFDI	1.777	1.127	0.2594	

Null Hypothesis	W-Stat.	Zbar-Stat.	Prob	Direction of Causality
LTO does not homogeneously cause FD	7.772	10.51	0.0000	LTO → FD.
FD does not homogeneously cause LTO	1.968	1.426	0.1537	
LFDI does not homogeneously cause INT	2.803	2.767	0.0056	LFDI → INT
INT does not homogeneously cause LFDI	1.212	0.252	0.8009	
LTO does not homogeneously cause INT	2.204	1.821	0.0686	No Causality
INT does not homogeneously cause LTO	1.346	0.464	0.6424	
LTO does not homogeneously cause LFDI	4.898	6.079	0.0000	LFDI ↔ LTO
LFDI does not homogeneously cause LTO	4.364	5.235	0.0000	
ECT(-1) does not homogenously cause LRGDP	4.547	6.478	0.0000	ECT ↔ LGRDP
LRGDP does not homogenously cause ECT(-1)	3.214	4.214	0.0000	

Source: Compiled by the authors

4. 6. DISCUSSIONS OF THE FINDINGS

Long-run estimates from the ARDL-PMG approach indicate a negative impact of financial development on economic growth in the GCC region. This suggests that financial development in this context hinders economic growth, a finding consistent with the findings of numerous studies across various contexts. These studies attribute this adverse impact to factors such as inefficient regulation (De Gregorio and Guidotti, 1995), transitional stage of the financial system at the time of analysis (Al-Malkawi et al., 2012), or a complex relationship between the size of the financial sector (financial development/expansion) and economic growth. Arcand et al. (2015) identified the "vanishing effect" which describes the declining positive impact of financial development over time, and stated that there is a threshold beyond which sector expansion becomes detrimental. This statment is supported by the inverted U-shaped relationship reported by Law and Singh (2014) and An and Yeh (2021), whose research suggests that while initial financial development can stimulate economic growth, exceeding an optimal threshold may lead to detrimental effects, potentially through resource misallocation and the formation of speculative bubbles.

Specifically, in GCC economies, the unique, oil-dependent structure and specific financial system characteristics are key to understanding this finding. Indeed, public revenues generated from oil exports are often used to directly finance most important public investments and development projects. The heavy reliance on oil revenues poses a risk to long-term economic sustainability, leading to economic volatility and hindering diversification efforts, which are crucial for sustainable growth (Ateba and Enwereji, 2024). The massive inflow of oil-related liquidity and the dominant role of the State fundamentally disrupt the financial system's function of mobilizing private savings and allocating resources. Under these conditions, a misallocation of resources hinders the necessary diversification of the non-oil economy, thus slowing long-term GDP growth. According to Aljarallah (2022), financial system in GCC countries often experiences a crowding-out effect, where government borrowing limits the availability of credit to the private sector. This phenomenon is detrimental to economic growth as it restricts private sector investment and innovation, which are essential for economic development. In this context, the quality of institutions plays a crucial role in transmitting financial development to economic growth (Yahyaoui and Saggaf, 2019). With a robust institutional framework, the financial system can effectively stimulate economic growth. The GCC countries, currently undertaking a major economic transition, shifting from dependence on hydrocarbons to non-oil sectors (tourism, finance, technology) through plans like Vision 2030, must take the necessary steps: continue their efforts to reduce dependence on oil revenues, mitigate current vulnerabilities in the financial system, and further strengthen institutional frameworks.

Our empirical findings also confirm a positive and significant impact of foreign direct investment on economic growth in the GCC region, a result consistent with the studies by Emako et al., (2022) and Abdi et al., (2024). FDI plays a crucial role in fostering sustained economic growth in GCC countries by facilitating diversification, knowledge transfer, and productivity enhancements. As these hydrocarbon-dependent economies transition towards knowledge-based models, FDI provides essential capital for developing non-oil sectors such as renewable energy, logistics, and advanced manufacturing—key pillars of future economic vision.

The UAE and Saudi Arabia exemplify how foreign direct investment (FDI) bolsters competitiveness via the creation of industrial clusters, including Dubai's fintech centers and NEOM's smart city initiatives. These investments introduce advanced technologies and management proficiency that enhance local capacities, simultaneously generating high-skilled employment for national workforces. The liquefied natural gas (LNG) business in Qatar exemplifies how foreign direct investment-related knowledge transfers can establish worldwide dominance in specialized industries. Apart from this, foreign Direct Investment (FDI) enhances the integration of the Gulf Cooperation Council (GCC) into global value chains, especially in the sectors of trade and logistics. Bahrain's financial sector and Oman's Duqm port show how foreign investment enhances connectivity and export capabilities. Furthermore, competition for foreign direct investment has driven regulatory reforms throughout the region, enhancing the ease of conducting business, as seen by Saudi Arabia's license simplifications and the UAE's rules permitting 100% foreign ownership. Moreover, maximizing the advantages of FDI necessitates a balance between openness and strategic interests. Excessive dependence on capital-intensive foreign direct investment without technological assimilation constrains spillover benefits, as evidenced in several GCC construction booms. Lastly, the GCC's distinctive value proposition—strategic location, sovereign wealth capital, and leadership in energy transition—enables it to harness FDI for sustainable, high-value growth beyond hydrocarbons.

In the long run, the interaction between financial development and FDI demonstrates a statistically significant negative impact on GDP in GCC countries. Consistent with earlier findings, this suggests that financial development exerts an unfavorable and significant influence on the FDI-GDP nexus within the region. This could indicate that the financial systems in some GCC nations, still undergoing development, may not yet possess the maturity required for their interaction with FDI to positively contribute to growth. However, this long-term negative effect of the financial development-FDI interaction on economic growth reverses to a positive and significant effect in the short run.

One possible reason might be of movement of Domestic Investment in GCC economy. An advanced finance sector may facilitate easier capital access for domestic enterprises. In this context, substantial inflows of foreign direct investment, particularly when accompanied by increased financial flow, may result in the movement of domestic investment in specific industries. This may happen if foreign companies possess considerable advantages or if the financial sector disproportionately supports foreign-backed initiatives, obstructing the development of domestic businesses and adversely affecting general economic growth. Besides, unequal financial flows of various economic sectors particularly to non-oil based sector might fail to robustly connect with other dominant oil-based sectors may worsen the interaction impact on overall economic growth in the long-run. Although financial growth can facilitate the absorption of FDI, an excessively stimulated financial sector resulting from substantial FDI inflows may induce imprudent risk-taking or the formation of asset bubbles. If this vast financial activity does not result in productive investments and instead incites instability, the engagement with FDI may intensify these adverse impacts, ultimately obstructing sustainable economic growth in the region.

Trade openness is found to positively and significantly affect the economic growth of the GCC region in the long run. This finding of a bi-directional relation between economic growth and trade openness is also consistent with the findings of many other studies, such as Yanikkaya (2003); Awokuse (2008); Rani and Kumar (2019) ; Hye and Lau (2015) and Banday et al., (2021). GCC's regional economic policies foster sustained economic growth by promoting diversification, enhancing productivity, and attracting investment. Traditionally oil-dependent, GCC nations benefit from global market engagement by diversifying their export base into non-oil sectors such as finance, tourism, and logistics. Integration into global value chains has enabled GCC countries like the UAE and Saudi Arabia to attract foreign direct investment, boost non-oil exports (e.g., Dubai's logistics and Saudi Arabia's petrochemicals), and increase productivity through knowledge transfer and competitive pressures that drive domestic innovation and efficiency. Reduced tariffs and trade agreements, such as the ongoing GCC-EU FTA discussions, have improved market access and facilitated capital inflows, while economic cities and free zones (e.g., Qatar Financial Zone in Doha, Abu Dhabi Global Market) have spurred innovation and industrial agglomeration. As individual nations pursue their development agendas (e.g., Saudi Vision 2030, UAE Vision 2030, Oman Vision 2040), economic openness facilitates structural transformation, strengthens economic resilience, and supports sustainable and inclusive

4. 7. ROBUSTNESS TEST: GENERALIZED METHODS OF MOMENT (GMM)

In addressing the issue of endogeneity while examining the panel data cause not only dynamic panel bias (Roodman, 2009) but also the existence of autocorrelation in the error term and the lagged dependent variable (L1.GDP). Besides, the endogeneity of additional regressors and their estimated coefficients may be biased due to their correlation with the error term. To mitigate this problem of endogeneity, we apply the one-step difference Generalised Method of Moments (GMM) estimator introduced by Arellano and Bond (1991). One of the key features of the Arellano-Bond difference GMM estimators is its ability to instrument a first-differenced endogenous repressor in the modified regression equation with its lagged values.

Table 13 demonstrates that lagged LRGDP shows a positive effect on current LRGDP, with a coefficient of 0.903. Moreover, financial development (FD) have a negative and statistically significant impact on economic growth; precisely, a 1% increase in FD is associated with a decrease of -0.001% of LRGDP. These results align with the long-run PMG estimation of FD. Furthermore, the findings indicate that stock of foreign direct investment (LFDI) positively affects RLGDP, specifically, a 1% increase in LFDI led to a 0.060% increase in LRGDP which is consistent with the results of the PMG long-run estimation. Furthermore, tests values for second order (AR2) serial autocorrelations indicating the absence of autocorrelation in the model. The Hansen test fails to reject its null hypothesis, suggesting that legitimate instruments were utilized, hence affirming the suitability of the model specification and the general validity of the employed instruments. The findings from the one-step difference GMM analysis confirm that the coefficient estimates derived from the PMG method are robust.

Table13. Dynamic panel-data estimation, one-step system GMM

Variables	Coefficients	Std. Error	t-Statistic	P-values
LRGDP(-1)	0.903***	0.069	13.14	0.000
FD	-0.001**	0.000	-3.83	0.012
INT	0.0001	0.000	0.73	0.496
LFDI	0.060**	0.018	3.40	0.019
LTO	0.050*	0.022	2.31	0.069
Constant	0.699*	0.348	2.00	0.101
Arellano-Bond test for AR(1) in first differences: z = -2.11 Pr > z = 0.035 Arellano-Bond test for AR(2) in first differences: z = -0.81 Pr > z = 0.417 Sargan test of overid. restrictions: chi2(3) = 34.61 Prob > chi2 = 0.670 Hansen test of overid. restrictions: chi2(3) = 0.00 Prob > chi2 = 0.320				

Note: ***, ** and *denote the rejection of the null hypothesis at the 1%, 5% and 10% significance level, respectively.

Source: Compiled by the authors

5. CONCLUSIONS AND POLICY IMPLICATIONS

The present study explores to causal linkage between the long-run relationship among foreign direct investment (FDI), financial development (FD), and economic growth in GCC countries using a panel cointegration approach to over the period spanning from 1980 to 2023. The findings based on PMG-ARDL approach provides a significant long-run relationship. In the long-run, results reveal negative and significant effect of financial development on economic growth in the Gulf region. This detrimental effect is consistent with several studies that justify this result in different ways and depending on the context. In the GCC countries in particular, the oil-dependent structure and dominant public financing disrupt the private sector, causing crowding-out and hindering diversification.

Our empirical findings also confirm the positive and significant impact of FDI on economic growth in the GCC region. FDI plays a crucial role in fostering sustainable economic growth, facilitating diversification and fostering knowledge transfer and productivity improvements, which are essential for the GCC's transition to knowledge-based economies. The long-term interaction between financial development and FDI demonstrates a statistically significant negative impact on the GDP of Gulf countries. This can be attributed to the fact that the financial system may be too immature to effectively integrate FDI, or to a possible reallocation or crowding-out of domestic investments within the Gulf economy. The outcomes of the short-run and long-run heterogeneous panel non-causality tests recognized a total of six bi-directional links among LRGDP and FD, LRGDP and INT, LRGDP and LFDI, LRGDP and LTO, FD and INT, LFDI and LTO, whereas three unidirectional causalities are observed among certain variables such as, LFDI to FD, LTO to FD, and LFDI to INT, and our result also confirms a long-run bidirectional causality among LRGDP and the error correction mechanism.

The present study demonstrates a notable interactive effect between total foreign direct investment (FDI) and comprehensive financial development (FD) in promoting growth; however, we recognize that a disaggregation of these variables may uncover more intricate sectoral dynamics. A detailed analysis distinguishing between categories of FDI inflows (e.g., greenfield investments versus mergers and acquisitions) and financial development instruments (e.g., banking depth versus capital market maturity) could reveal varied impacts, as indicated by sector-specific literature (Alfaro et al., 2016). Our aggregate-level approach is intentionally selected to evaluate the fundamental macroeconomic assertion of the complementarity hypothesis (Alfaro et al., 2004) and to correspond with the strategic, macro-level goals of GCC national visions (e.g., Saudi Vision 2030), which emphasize the enhancement of investment attraction and the deepening of the financial sector as essential components for diversification. Disaggregation at this stage would undermine the integrity of our dynamic panel model by over-parameterization and distort the fundamental macro-relationship. Consequently, our findings offer the fundamental macroeconomic rationale and empirical foundation for subsequent research to expand upon, particularly by examining which financial sub-sectors are most adept at directing various types of FDI into productive non-hydrocarbon activities—a logical and crucial next step for formulating targeted policy within the complementary framework established here.

This study offers several policy implications, organized into three sequential phases, for GCC economic policymakers seeking to optimize the role of financial development in amplifying the impact of FDI on economic growth. First, continue implementing reforms that prioritize reducing systemic risk and establishing the essential conditions for efficient capital allocation by employing fiscal policy to reduce oil dependence and decouple government spending from oil price volatility, implementing the necessary financial measures to strengthen regulations, and reinforcing institutional frameworks to enhance transparency and the rule of law. Secondly, to promote the efficient allocation and diversification of capital, enabling the financial system to better direct resources towards the private economy, policymakers should in GCC countries should implement three main strategies: (i) implementing monetary and financial measures promoting credit to the private sector, deploying specific financial strategies to develop non-bank financing (actively promoting venture capital, private equity and specialized institutions to finance high-growth technologies and innovation); and the mobilizing domestic savings through economic and fiscal policy by introducing incentives and developing local capital markets (corporate equity and bond markets) to constitute a significant reservoir of long-term investment capital for the productive private sector. Finally, for financial development to act as a multiplier for economic expansion in the long term, it must be optimized for foreign direct investment (FDI) and sustainable growth. This optimization can be achieved by implementing economic and monetary policies that further reduce administrative barriers to FDI flows and guarantee full compliance with international standards, thereby facilitating access to foreign capital and technology transfer, and by prioritizing investment in human capital through funding specialized training programs in finance, risk management, and regulatory compliance to ensure the sustainable and competent management of a sophisticated financial sector by local talent.

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Notes

1. It is important to stress that most empirical studies on the causal relationship between economic growth, financial development, and FDI include some macroeconomic factors which are considered as control variables, such as inflation, government expenditures, imports, exports, gross fixed capital formation, labor, energy consumption … and so on. In this study, we are interested in the effect of trade openness and the interaction of foreign direct investment multiplied by financial development on economic growth as a macroeconomic factor.
2. The panel unit root tests of Maddala and Wu (1999), Breitung (2000), Levin et al., (2002), and Im et al., (2003) are constructed for unit root under the null hypothesis, while the test of Hadri (2000) is constructed based on stationarity under the null hypothesis. All tests indicate that there is a unit root for all variables at level, while there is no unit root for the variables at the log-first differences. Results of the unit root tests are available upon request.
3. Several studies suggest a number of potential sources that can cause FDI to exert a negative effect on the economic growth in the host country, such as the crowding-out effect (Manuel and Machado, 2005); the Balance of Payments effect (Mohammad 2011); profit repatriation (Abdin 2015); and the dual economy in the host county (Štefan and Vladimír 2007).
4. These results are consistent with the trend behavior of the trade openness displayed in Fig. 4, which shows a decrease in this variable over time.
5. Some previous empirical studies use the pooled mean group (PMG) approach developed by Pesaran et al., (1999) to estimate short- and long-run relationships simultaneously. Pesaran et al., (1999) developed the PMG approach to estimate a nonstationary dynamic panel model and indicate that the PMG estimation technique is able to eliminate the bias related to the heterogeneity among cross sections. Obviously, the obtained estimators of the long-run coefficients are consistent and asymptotically unbiased.