

Cross-Border Assets Holdings, Equity Securities, and Debt Securities between Gulf Cooperation Council (GCC) and Organization for Economic Co-Operation and Development (OECD)

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Abstract

This paper investigates the trends of asset holdings across borders to GCC financial markets through panel data and compares the findings with those acquired for the OECD countries. A gravity panel data model was set on bilateral gross cross-border investment flows between GCC countries and host OECD countries between 2002 and 2019. Three dependent variables were used; aggregate equity securities and debt securities, equity securities, and debt securities. Data were obtained from the International Monetary Fund's (IMF) coordinated Portfolio Investment Survey (CIPS) and converted into real terms using the GDP deflator. The World Bank (2014) World Development Indicators Database (WDI) provided data for GDP deflators. The results indicate that the source economies' bilateral trade, GDP per capita, and population are always positive and significant determinants of cross-border linkages. Geographical proximity (Distance) is found to exert a significant positive influence on assets so that investors may seek to diversify their portfolios and prefer to invest outside their region.

Keywords: portfolio assets, equity assets, debt assets, distance, GCC Countries, OECD Countries, gravity model

1. Introduction

1.1 Introduce the Problem

The investigation of international financial linkages is an important matter in international macroeconomic research. The level and attributes of international financial integration, at the theoretical level, impact macroeconomic consequences and the cross-border risk distribution. Similarly, the ability of policy officials to scan the prospect for dynamic macro-financial risks and calibrate policy interventions relies on an appropriate understanding of international financial transmission platforms (Galstyan et al., 2016).

1.2 Explore the Importance of the Problem

There has been minimal emphasis given to capital markets implementation despite the significant rise in the optimum size of financial assets traded across borders (Khayat, 2020). Particularly, concerns associated with international asset flows and the effect of financial and economic amalgamation on the trends of international asset allocation remain a concern. A rigorous mechanism of empirical evidence is essential for designing beneficial models and making effective policy decisions along both dimensions. This paper contributes to the current literature by addressing the link between cross-border asset holdings, equity securities, and debt securities in GCC countries and OECD countries (Abul, Satrovic & Muslija, 2019). To the best of our knowledge, it is the first of its type to compare these findings between the countries mentioned above.

1.3 State Hypotheses and Their Correspondence to Research Design

The GCC countries enjoy a greater place in the Middle East and North Africa (MENA) concerning economic opportunities and socio-political stability. These countries have been endurance due to instant economic development in oil and non-oil sectors (Aggarwal et al., 2012). By applying proactive roles, governments of these countries have proceeded from record oil prices to stimulating the non-oil sectors of their countries via immense investments in housing, services, education, and infrastructure (Alam & Ahmed, 2018). Therefore, it is critically important to develop a growth engine competent to make their countries consequently less dependent on oil outcomes.

The rest of the paper is organised as follows: Section 2 reviews the previous literature. Section 3 presents and

discusses the empirical approach and the variables. Section 4 presents the sample and descriptive statistics and discusses the empirical results and robustness checks. Section 5 summarises the paper and presents the conclusion.

In this regard, this paper is a natural complement to the current literature. This paper argues that economic necessities can all likely demonstrate international portfolio inflows to GCC countries in the presence of host countries, the financial openness of the host country, economic connections between host and source countries, countries' characteristics, and the extent of real income of source countries. In particular, economic connections are exceptionally essential when undertaking distance, trade volume, transferring money across borders for setting financial transactions, and the comparative easiness of securing loans. It is of significant interest to raise whether the general trends of cross-border asset holdings can be explained by economic linkages between equity and debt securities in the GCC countries. This paper investigates the trends of asset holdings across borders to GCC financial markets through panel data and compares the findings with those acquired for the OECD countries. In line with previous contributions to the literature, the findings indicate that bilateral factors such as debt and equity securities play an important role in asset holdings in the GCC region. Surprisingly, a strong portfolio GCC bias also exists since a sizable amount of the GCC investment comes from GCC members.

This paper aims to shed light on the determinants of portfolio investments in Gulf Cooperation Council (GCC) countries by investigating the role played by market forces, population, trade openness, market capitalisation, and distance. Also, researchers have not treated cross-border portfolio investment between GCC and OECD countries in much detail. For this reason, panel data was applied for the determinants of cross-border portfolio investment using a Gravity model between 2002 and 2019. The main results illustrate that the bilateral trade, GDP per capita, and Population of the source economies had a positive and significant effect on determinants of cross-border linkages. The findings revealed that the banking sector dominates the region, exhibiting several common structural factors across countries. These have encouraged GCC and OECD banks' resilience to the financial crisis. Firstly, direct cross-border spillovers were mitigated through the dominant performance of domestic banks within GCC and OECD banks. Secondly, balance sheets restrict losses from exposures to structured products and derivatives to a few isolated cases based on the high share of the conventional banking book. Thirdly, high profits and capital buffers buttress the banking sectors in the GCC countries in the run-up to the 2008-09 international financial crisis and global recession.

2. Literature Review

Countries have enjoyed massive current and fiscal account surpluses despite fiscal expansion and increasing import development. Oil prices, before the mortgage crises in the United States, had shoot levels in the past two decades, whereas interest rates had equivocated in some cases between 3 and 4% (Alam, & Ahmed, 2018). The COVID-19 pandemic and oil price in 2020 had a huge financial impact on the Gulf Cooperation Council region. In response to the pandemic, policy-makers took swift and comprehensive action to support individuals, businesses, and the economy while minimising its long-term effects. The profitability and asset quality suffered, but the banking systems' capitalisation remained strong. (Al-Hassan et al., 2022) At least from the perspective of the overly risk-averse investors, the Gulf Cooperation Council (GCC) markets become spectacular as their governments are major shareholders, possess control in the firms, and attract additional confidence because governments are less likely to be bankrupt. A model of economic success and political stability was introduced to cater for the distinctions in immigration and ownership laws of some of these economies (Al-Hadi et al., 2017). GCC governments have shown a strong indication to investors that their investments are comparatively protected in their respective countries for similar returns compared to the stereotypes often held by Organization for Economic Co-operation and Development (OECD) countries (Al-Mawali, 2015).

The investment strategy of the sovereign wealth funds (SWFs) of the Gulf Cooperation Council (GCC) nations is examined in a study by Amar et al. (2022). GCC SWFs are viewed as highly politicised and somewhat opaque investors, which raises questions about potential political and security threats. The study's findings show that even if GCC SWFs are not only interested in financial gains, obtaining majority stakes is not a way for GCC governments to gain strategic interests in the targeted nation.

Companies' initial public offerings are often oversubscribed by unrealistic assumptions, reflecting investors' appetite for both owned private and newly-formed firms. On the contrary, it is irrefutable that the share prices are low for most investors because the GCC stock markets are comparatively in their infancy (Alqahtani & Mayes, 2018). In 2004, foreign portfolio holders accumulated between 150 and 170 billion US dollars in profits in the GCC countries (Bley & Chen, 2006). GCC countries also gain returns from immense capital inflows and technology transfers. Still, these countries provide different opportunities to investors to maximise their returns

in both their respective countries' real sectors and stock markets because of mega infrastructure projects, housing and road construction (Andrade & Chhaochharia, 2010). During 2004-07, equity securities accounted for 46% of OECD portfolio assets on average. Out of 38 member countries, eight OECD countries have accounted for more than 50% of their total assets, including Korea, Sweden, Australia, Iceland, United States, New Zealand, Hungary, and Canada.

The movements of the GCC and OECD countries have been affected by the global financial crisis of 2008-2009 and the cross-border portfolio capital flows corresponding to untraditional monetary easing implemented by advanced countries (Fendoglu et al., 2014). An outflow of portfolio investment was experienced in both markets in the initial phase of the crisis. On the contrary, a new wave of cross-border portfolio inflows was witnessed in both markets from investors searching for higher yields in the post-crisis period. The characteristics of the movements of cross-border portfolio assets and liabilities are explored in this paper throughout 2002-2019 by dividing this period into three periods: 2002-2007 (before the global financial crisis), 2008-2009 (during the crisis), and 2010-2019 (after the crisis). In this paper, all GCC and OECD countries were included.

Portes and Rey (2005) present empirical evidence for 14 countries and panel data examining bilateral gross cross-border equity flows between 1989 and 1996. They showed that GDP for both sources and destinations in the natural logarithmic form was positive and significant. They suggested that both GDP for sources and destination had a well-determinate coefficient. Distance in the natural logarithmic form was negative and significant. The population as a proxy for both sources and destination openness was negative and significant as expected.

Similarly, Hellmanzik and Schmitz (2017) have used another proxy for openness, that is, the ratio of total trade to GDP and found that insignificant and negatively signed for the destination country, whereas, in the source country, it was positive and significant (Hellmanzik & Schmitz, 2017). Aggarwal et al. (2012) used panel data for estimating the IMF's CPIS survey of foreign debt and equity portfolios across 174 originating and 50 host countries from 2001 to 2007 and used OLS estimation. They found that distance was negative and strongly significant.

Hattari and Rajan (2011) have produced a gravity model over the period 2000–2007 for 48 sources and 57 destination countries using OLS estimation. Their estimation showed that the population for both source and destination countries were insignificant, and the GDP per capita variable for the source country was negative and significant on capital flows. Coeurdacier and Martin (2009) have analysed the determinants of bilateral equity and debt holdings on cross-country data on a Swedish data set using panel data for 27 source countries and 61 host economies. They found that GDP was positive and significant as a proxy for host countries' market size for host countries, trade between countries, and market capitalisation over GDP for host countries.

Chintrakarn (2007) re-examined the determinants of cross-border equity flows using a gravity model for 14 source and host countries between 1989 and 1996. The results found that lagged asset flows positively and significantly correlated with present asset flows. Aviat and Coeurdacier (2007) used a simultaneous gravity model to complement bilateral asset holdings and trade in goods. Daude (2008) used a novel database of bilateral capital stocks for all types of investment, including FDI, equity securities, and debt securities for a broad set of 77 countries. The study pointed out that distance was negative and significant.

Muzur et al. (2015) used seven cross-sections of data for 2000-2006 to fit several gravity models for bilateral FPI holdings. They found that GDP for home and host countries and trade had a positive and significant effect, while distance had a negative and significant effect. Portes et al. (2001) used a gravity model for equity assets. They outlined that both home and host market capitalisation has a positive and significant result, but the distance has negative and significant effects. Lee (2008) produces empirical analysis based on the gravity model of bilateral international asset holdings for the determinants of financial integration in East Asia.

Balli et al. (2011) investigate the determinants of cross-border portfolio investment, focusing on the difference between the GCC economies' total foreign investment holdings, bond holdings, and debt holdings, with 35 sources as host countries between 2001 and 2006. Andrade and Chhaochharia (2010) examined how residents of the United States allocated their stock portfolios internationally. They found that a large US FDI position in a host country was associated with a relatively large stock portfolio investment position in that country from 2001–2006. Furthermore, GDP and GDP per capita showed a negative and insignificant effect. Vermeulen (2013) examined a gravity model for international equity investors' foreign portfolios before and during the financial crisis for 22 home and 42 destination countries between 2001 and 2009.

3. Method

3.1 Bilateral Linkage Model

The model proposed by Obstfeld and Rogoff (2000) was used as the principal framework where trading costs play an important role in explaining empirical macroeconomic outcomes. This framework is adequate and beneficial to addressing home bias puzzles, as witnessed in French and Poterba (1991). The Obstfeld and Rogoff (2000) model has been extended by Lane and Milesi-Ferretti (2008) to N countries to show that current trading costs in the individual preferences and goods market influence bilateral equity positions in both developing and industrial countries.

According to the N-country model of Lane and Milesi-Ferretti (2008), the share of the home country of equity possessed by the foreign country is a reducing function of the trading costs between the foreign and home country and an elevating function of the real-time significance of the product that is being traded. This paper applies the same framework to emphasise the portfolio inflows of OECD countries to GCC countries. From a theoretical perspective, there are N countries globally, and each country is blessed with a stock of unpreserved and random goods. Across borders, the output is unequally produced, and there is an entire series of Arrow-Debreu (AD) securities in the capital markets. It is assumed that individuals possess a cross-border portfolio at a t time as they endeavour to maximise their anticipated utilities. There are iceberg shipping costs η only a fraction of a unit of food shipped from country h to country j reaches the destination. In particular, η_{hj} is greater as compared to zero, whereas preferring that there are no shipping costs for good i throughout the foreign country $\eta_{jj} = 0$, or throughout the home country, $\eta_{hh} = 0$. Free traded Arrow-Debreu securities were used in this model where the marginal utility per dollar for good across countries must be the same for the last units consumed. On the other hand, the ratio of marginal utility must be equal to the relative price of goods across borders derived from the consumption of the good.

3.2 Sample Description and Data

The study uses panel data from GCC countries investing and OECD countries from 2002 to 2019. The dependent variables are the aggregate equity securities and debt securities between source countries i and host country j, equity securities, and debt securities (Aggarwal et al., 2012; Coeurdacier & Martin, 2009). Data were obtained from the International Monetary Fund's (IMF) coordinated Portfolio Investment Survey (CIPS) and converted into real terms using the GDP deflator. The World Bank (2014) World Development Indicators Database (WDI) provided data for GDP deflators.

The gravity model regressed three dependent variables: total cross-border assets holdings, equity securities, and debt securities on a set of standard explanatory variables. These variables denoted relative market size and wealth, Population, market capitalisation and trade openness. Details on the selection of data sources and parameters for each of the variables in the model are described in the following subsections. The literature guided the choice of variables and proxies. Table 1 shows variables, definitions, and data sources.

Table 1. Variables, Definitions, and Data Sources

Variables	Definitions
TotalFPIij	bilateral cross-border assets holdings (equity securities and debt securities in the short term and long term) between source country i and host country j
Ln TotalFPIij	Bilateral cross-border assets holdings (equity securities and debt securities in the short term and long term) between source country i and host country j, in natural logarithm form.
EquityFPIij	bilateral cross-border assets equity holdings between source country i and host country j
Ln EquityFPIij	Bilateral cross-border assets equity holdings between source country i and host country j, in natural logarithm form.
DebtFPIij	bilateral cross-border assets debt holdings between source country i and host country j
Ln DebtFPIij	Bilateral cross-border assets debt holdings between source country i and host country j, in natural logarithm form.
GDPpci	Real GDP per capita (constant 2005US) in sources country i
Ln GDPpci	Real GDP per capita (constant 2005US) in sources country i, in natural logarithm form
GDPpcj	Real GDP per capita (constant 2005US) in host country j

Ln GDPpcj	Real GDP per capita (constant 2005US) in host country j, in natural logarithm form
Popi	Population in source country i
Ln Popi	Population in source country i, in natural logarithm form
Popj	Population in host country j
Ln Popj	Population in host country j, in natural logarithm form
Marketi	Market capitalisation of listed companies in source country i (% of GDP)
Ln Marketi	Market capitalisation of listed companies in source country i (% of GDP), in natural logarithm form
Tradeij	The total ratio of bilateral trade (exports + imports) between source and destination countries relative to the destination country's GDP
DISTij	The geographical distances (miles) between source and host countries.
Ln DISTij	In natural logarithm form, the geographical distances (miles) between source and host countries.

Sources: Data for international portfolio investment (2001-2012) are obtained from the International Monetary Fund's (IMF) coordinated Portfolio Investment Survey (CIPS).

Data for GDP pc, population, and Market capitalisation (2001-2012) from World Development Indicator (December 2014). Bilateral trade (2001-2012), bilateral exports and imports from the International Monetary Fund, Direction of Trade Statistics, and GDP destination country's data are taken from the World Development Indicators Database (World Bank, 2014). Distance, Contiguous, and common an official language (2001-2012) from Centre d' Etudes Prospective et d' Information's Internationals (CEPII)'s.

3.2.1 Gross Domestic Product Per Capita Constant

The variable GDP per capita denoted relative wealth and market size of the home and host countries in natural logarithm form (Vermeulen, 2013) and was expected to have had a positive effect on portfolio investment. This suggested that richer economies were major homes and recipients of portfolio investment. It was obtained from the World Bank (2014) and the WDI database.

3.2.2 Population

Population variables in natural logarithm form indicate that larger economies are mainly sources and recipients of portfolio investment (Portes & Rey, 2000) and was expected to be positively related to Cross-Border portfolio investment. It was also obtained from the World Bank (2014) WDI database.

3.2.3 Market Capitalisation of Listed Companies (% of GDP)

Following Hattari and Rajan (2011) and Coeurdacier and Martin (2009), market capitalisation was used in a natural logarithm form. It was suggested that richer countries and those with a more developed financial market might have higher incentives to invest in assets of other countries. The variable was expected to positively impact investment, and it came from the World Bank (2014) and World Development Indicators Database (WDI).

3.2.4 Trade Openness

It is measured as the total ratio of bilateral trade is the sum of exports and imports between home and host countries relative to the recipients' country's GDP. Bilateral exports and imports were obtained from the IMF, Direction of Trade Statistics, and GDP destination country's data were taken from the World Development Indicators Database (World Bank, 2014). There is a positive relationship between investment and trade openness.

3.2.5 Distance

The distance was used from the capital cities of the host and source countries (Muzur et al. 2015) in natural logarithmic form. The distance was to be accounted for as a proxy for transaction costs, transportation costs, and information asymmetries. It was expected to positively impact the home bias, reflecting that the investors in developing countries preferred to invest outside their region for diversification motives (Khayat, 2019).

On the contrary, distance has also negatively affected investors' decisions to access foreign markets through trade rather than cross-border portfolio investment. This is because the larger the distance between countries, the greater the transaction costs and information asymmetry between them (Alam & Ahmed, 2018). Data for distance were obtained from Centre d' Etudes Prospective et d' Information's Internationals (CEPII)'s. It is expected to have both positive and negative impacts on cross-border portfolio investment (Khayat, 2019).

3.3 Model Specification (Gravity Model)

Traditional gravity was built. The three dependent variables are; total cross-border assets holdings, equity securities, and debt securities between source country i (GCC countries) and host country j (OECD countries) during the period (2001-2012) FPI_{ijt} in natural logarithm form. Traditional variables were included; GDP per capita in the natural logarithm form of the home country i and the host country j in year t by GDP_{pcit} and GDP_{pcjt} , respectively, the population in the natural logarithm form of the home country i and the host country j in year t by Pop_{it} and Pop_{jt} , respectively, and distance in the natural logarithm form between countries i and j by $DIST_{ij}$, a baseline gravity model as elementary variables (equation 1) is formulated as:

$$\ln FPI_{iit} = \alpha_0 + \beta_1 \ln GDP_{pcit} + \beta_2 \ln pop_{it} + \beta_3 \ln distance_{it} + \varepsilon_{iit} \quad (1)$$

Furthermore, additional variables were also used (Portes & Rey, 2005) to check the robustness of the results and to ascertain to what extent other factors may impact the composition of equities, where $Trade_{ijt}$ is the total ratio of bilateral trade (exports + imports) between sources and destination countries relative to the destination country's GDP. ε_{it} is an error term.

Pooled OLS estimations for a gravity model were applied to examine the determinants of cross-border portfolio investment following the evidence from the papers of Hattari and Rajan (2011); Aggarwal et al. (2012). These estimations are conducted to check the robustness of the result. In addition, a further set of economic and financial controls was applied to check the robustness of the results and to ascertain to what extent other factors may impact the composition of equities.

Bilateral controls possibly influence the bilateral investment levels. This paper consistently identifies the impact of information frictions for controlling all other appropriate characteristics that influence the bilateral investment volume from a specific source country by encompassing host and source country dummies and others. Secondly, the country fixed effects were explained to understand the role of factors making host countries attractive places for investment. Therefore, the model's explanatory power emerges mainly from the panel data, which is appropriate for emphasising capital stocks and the fact that the independent factors are mostly changing little overtime on information frictions and institutions.

4. Results and Discussion

4.1 Empirical Results

Summary statistics of the data are present in Table 2 and show the means for the dependent variable and all the independent variables for the entire sample. Also, Tables 3, 4, and 5 show a correlation matrix between the variables and cross-border portfolio investment. Firstly, there was a large negative correlation between the FDI market and GDP. The population was negatively correlated, although the correlation coefficient was not statistically significant. A similar finding induces debt FPI as proxied by the level of capital account liberalisation.

On the contrary, debt security and equity security holdings are positively and strongly associated with GDP per capita. In addition, countries with a large share of portfolio equity and debt stocks developed financial markets and better institutions. Furthermore, the correlations showed a significant and positive correlation only for trade and distance when considering the correlation of different asset shares with the average GDP per capita growth rate over the period 2002-2019. The main results for pooled OLS (ordinary least squares) are described in Table 6, and the robustness check is reported in Table 7.

Table 6 shows the findings of the benchmark model, including a distance of standard gravity variables such as variables on whether or not the two regions have a common language, colonial links, common legal origin, and whether they have a joint investment or trade agreement for facilitating cross-border investment. The findings are significant regarding the pecking order of financial implementation and the volume effects. The importance of distance is significantly essential for FDI and loans compared to portfolio debt investment and portfolio equity.

The empirical analysis was introduced with three dependents variables, and the total FPI are utilised in models 1 to 3 in table 3, and equity FPI are listed in models 4 to 6 in table 4. In contrast, the results of the debt FPI are listed in models 7 to 9 in table 5. All were estimations of OLS (ordinary least squares). To account for heteroskedasticity, we undertake the analysis using robust standard errors.

The intuition is simple for using such variables as proxies for the level of information friction. Telephone traffic is a proxy of the amount of data that flows between countries. It is believed that a larger volume of information

flows to control the size of both economies that imply less informational frictions. The principal component of all three alternative proxies was included as it may assist in reducing measurement errors associated with each factor. The findings confirm that FDI and trade are more sensitive to information frictions. On the other hand, distance is the most significant among such specifications as it shows the greatest effects on FDI and the smallest effect on portfolio debt and equity.

Table 2. Summary Statistics

Variables	Mean	Std. Dev	Min	Max
TotalFPI _{ij}	316.813	909.651	-2.633	7524.732
Ln TotalFPI _{ij}	3.961	2.369	-6.724	8.925
EquityFPI _{ij}	95.316	281.436	-25.303	2546.666
Ln EquityFPI _{ij}	2.906	2.511	-6.724	7.842
DebtFPI _{ij}	231.638	734.580	-7.322	6414.636
Ln DebtFPI _i	3.670	2.478	-4.477	8.766
GDP _{pci}	36056.3	19181.83	14232.22	74448.88
Ln GDP _{pci}	10.350	0.533	9.563	11.217
GDP _{pcj}	59277.57	26026.99	35658.14	110001.1
Ln GDP _{pcj}	10.904	0.401	10.481	11.608
Pop _i	6509853	8857762	613720	2.95e+07
Ln Pop _i	14.967	1.135	13.327	14.199
Pop _j	5.73e+07	4.67e+07	441525	1.28e+08
Ln Pop _j	16.778	2.109	12.997	18.668
Market _i	57.425	28.520	20.887	128.369
Ln Market _i	3.942	0.458	3.039	4.854
Trade _{ij}	0.001	0.002	1.54e-10	0.010
DIST _{ij}	4753.695	1681.928	2756.083	12658.23
Ln DIST _{ij}	8.423	0.278	7.921	9.446

Table 3. Correlation Coefficient Matrix (Dependent variable is Total FPI)

	TotalFPI _{ij}	GDP _{pci}	GDP _{pcj}	Pop _i	Pop _j	Market _i	Market _j	DIST _{ij}	Trade _{ij}
TotalFPI _{ij}	1								
GDP _{pci}	0.85	1							
GDP _{pcj}	0.12	-1.66	1						
Pop _i	0.87	-0.47	0.027	1					
Pop _j	-0.56	0.19	-0.823	-0.50	1				
Market _i	0.64	0.93	0.060	0.68	0.61	1			
Market _j	-0.29	-0.58	0.610	-0.74	0.32	0.71	1		
DIST _{ij}	0.02	0.25	0.054	0.70	0.87	0.67	0.02	1	
Trade _{ij}	0.48	0.17	-0.376	0.41	-0.26	-0.17	0.48	0.081	1

Table 4. Correlation Coefficient Matrix (Dependent variable is equity FPI)

	EquityFPI _{ij}	GDP _{pci}	GDP _{pcj}	Pop _i	Pop _j	Market _i	Market _j	DIST _{ij}	Trade _{ij}
EquityFPI _{ij}	1								
GDP _{pci}	-0.80	1							
GDP _{pcj}	0.08	0.30	1						
Pop _i	-0.26	0.08	-0.60	1					
Pop _j	-0.29	0.99	-0.66	-0.50	1				
Market _i	-0.19	-0.68	-0.02	-0.89	-0.17	1			
Market _j	1.00	0.71	0.51	-0.99	0.75	0.071	1		
DIST _{ij}	-0.76	3.07	-0.32	0.75	0.75	-0.158	0.112	1	
Trade _{ij}	-0.28	-1.07	0.06	-0.12	-0.96	-0.248	-0.196	-0.291	1

Table 5. Correlation Coefficient Matrix (Dependent variable is Debt FPI)

	DebtFPI _{ij}	GDPpci	GDPpcj	Popi	Popj	Marketi	Marketj	DISTij	Tradeij
DebtFPI _{ij}	1								
GDPpci	-0.76	1							
GDPpcj	-0.80	0.02	1						
Popi	0.23	-0.68	-0.81	1					
Popj	0.60	0.12	-0.28	-0.85	1				
Marketi	-0.69	0.41	0.99	0.21	0.54	1			
Marketj	0.52	0.08	-0.84	-0.39	0.51	0.071	1		
DISTij	0.71	0.37	0.76	-0.43	0.31	-0.172	0.042	1	
Tradeij	0.43	0.72	-0.81	-0.34	-0.42	-0.253	-0.187	0.091	1

Table 6. The determinants of cross-border portfolio investment (Baseline model), OLS estimations

Regressor	Total FPI (1)	Equity FPI (2)	Debt FPI (3)
Ln GDPpci	1.56*** (0.000)	0.61* (0.080)	2.11*** (0.000)
Ln GDPpcj	-3.66** (0.027)	3.52 (0.194)	-3.35** (0.025)
Ln Popi	0.63*** (0.000)	0.54*** (0.008)	0.62*** (0.000)
Ln Popj	-0.71** (0.016)	0.60 (0.219)	-0.59** (0.034)
Ln DISTij	0.14 (0.776)	2.72* (0.061)	-0.48 (0.388)
Tradeij			
Ln Marketi			
Ln Marketj			
CONSTANT	28.940 (0.287)	-83.07* (0.094)	22.69 (0.359)
Number of Observations	278	191	235
F-Test	11.18*** (0.0000)	2.11* (0.066)	14.75*** (0.0000)
R2	0.1913	0.0839	0.2276

Table 7. Robustness Check, OLS estimations, with bilateral trade, and financial sector

Regressor	Total FPI (1)	Total FPI (2)	Equity FPI (3)	Equity FPI (4)	Debt FPI (5)	Debt FPI (6)
Ln GDPpci	1.27*** (0.000)	1.41*** (0.000)	0.53 (0.162)	0.13 (0.707)	1.85*** (0.000)	2.26*** (0.000)
Ln GDPpcj	-4.27*** (0.008)	-4.28** (0.016)	3.33 (0.213)	4.35 (0.155)	-4.13*** (0.004)	-4.55*** (0.005)
Ln Popi	0.35** (0.036)	0.35** (0.020)	0.45* (0.076)	0.24 (0.396)	0.33* (0.064)	0.42** (0.023)
Ln Popj	-0.92*** (0.002)	-0.84** (0.022)	0.53 (0.258)	0.80 (0.174)	-0.83*** (0.002)	-1.01*** (0.002)
Ln DISTij	0.11 (0.820)	0.21 (0.719)	2.88* (0.089)	2.90 (0.132)	-0.53 (0.316)	-0.66 (0.240)
Tradeij	249.30*** (0.002)	171.48** (0.032)	85.94 (0.546)	22.67 (0.882)	269.75*** (0.001)	242.94*** (0.003)
Ln Marketi		-0.11 (0.711)		-0.50 (0.261)		0.41 (0.227)
Ln Marketj		0.42 (0.231)		0.51 (0.380)		-0.08 (0.823)
CONSTANT	46.12* (0.094)	41.43 (0.185)	-79.27 (0.105)	-87.86 (0.115)	42.50* (0.082)	44.16 (0.122)
Number of Observations	278	223	191	148	235	193
F-Test	12.83*** (0.0000)	12.57*** (0.0000)	1.71 (0.1207)	1.17 (0.3237)	15.61*** (0.0000)	14.84*** (0.0000)
R2	0.2196	0.2891	0.0866	0.0838	0.2573	0.3102

4.2 Results of the Determinants of Cross-Border Portfolio Investment (Baseline model)

The estimation results of equation (1) for the baseline gravity model for bilateral cross-border asset holdings are reported in Table 6. The results show that source countries' GDP per capita and population positively affected cross-border investment and were highly significant with all three dependent variables (Total FPI, equity FPI, and debt FPI). The significant positive coefficient of GDP per capita of source economies suggested that richer economies are major sources of portfolio investment. The most interesting results are the negative and significant ones on GDP per capita and population in the destination country with total FPI and debt FPI. The distance was positive and significant only with equity FPI as a dependent variable.

According to Khayat (2020), "The competition for FDI among developing countries has been intensified from the new wave of globalisation. Therefore, concentrated efforts are required to attract significant FDI flows to the GCC countries at regional and national levels and enhance prospects for sustained growth and development. GCC countries must work mutually for designing and formulating appropriate policies for attracting stable investment flows."

4.3 Robustness Check

4.3.1 Results of the Determinants of Cross-Border Portfolio Investment (with Bilateral Trade)

The estimation results for the baseline gravity model and bilateral trade are reported in Table 7. The results illustrate that source countries' GDP per capita positively affected cross-border investment and had high significance with all dependent variables (Total FPI and debt FPI). In contrast, GDP per capita for host countries was negative and significant only with Total FPI and debt FPI. Population for home countries was positive and significant with all three dependent variables. Still, the population in the destination country was a negative effect and significant only with total and debt FPI. The distance was positive and significant only with equity FPI as a dependent variable. Bilateral trade has positive and significant effects with total and debt FPI as a dependent variable.

Khayat and Khayat (2020) found similar results as well. According to this study, GDP per capita is positively affected by source and destination economies, whereas the population has a negative effect on source economies. Risk premium in source economies had a positive effect, whilst market capitalisation of listed companies in source economies had a negative effect. However, the study showed no statistically significant effect of bilateral trade in a lagged form on asset holdings.

4.4 Results of the Determinants of Cross-Border Portfolio Investment (with the financial sector)

The estimation results for the baseline gravity model, bilateral trade, and financial sector are reported in Table 7. The results indicate that GDP per capita and population for source countries had a positive effect on cross-border investment and had high significance with all two dependent variables (Total FPI and debt FPI). In contrast, GDP per capita and Population for host countries were negative and significant only with Total FPI and debt FPI. Bilateral trade has positive and significant effects with total and debt FPI as a dependent variable. The distance and market capitalisation of listed companies for both home and host countries shows no significant results.

Portes and Rey (2000) applied a model for bilateral cross-border transactions in portfolio equities in 14 major markets (Europe, Asia, United States) between 1989 and 1996. Their results indicate that gross asset flows depended on market size in both source and destination countries, and distance as a proxy for information symmetric had a significant negative impact on transactions. Portes and Rey (2005) tested panel data for the determinants of cross-border equity flows between 14 major markets (Europe, Asia, United States) between 1989 and 1996. Their results reported that market capitalisation and bilateral trade significantly positively impact cross-border equity, but distance as a proxy for information asymmetries is negative and significant.

Similar results were achieved by Mina (2020). According to this study, "Broadening and upgrading their export bases can help GCC countries integrate into global value chains and make their economies more productive. Boosting intra-GCC trade and investment would raise income levels in the GCC economies. FDI can bring access to foreign markets, better management practices and technical know-how to the domestic economy, enhancing workforce skills and increasing productivity."

5. Conclusion

This paper performs a gravity model for investigating the determinants of bilateral gross cross-border investment flows from GCC countries and OECD countries, employing a panel data analysis approach from 2002-2019 using ordinary least squares (OLS) estimations. The study used three dependent variables; total cross-border assets holdings, equity, and debt securities. For Robustness Check, explanatory variables such as trade openness

and market capitalisation of listed companies were added. It was discovered that GDP per capita, Population for source, and bilateral trade are significant and correctly signed positive on estimations. This study's surprising finding is that distance positively affects bilateral gross cross-border investment because of the diversification motive.

Since one of the findings of this study is that GDP per capita, Population for source, and bilateral trade are significant and correctly signed positive on estimations. Therefore, one of the recommendations is that GCC countries try to increase bilateral trade. From a regulatory perspective, GCC countries should try to increase bilateral trade cooperation to promote it further. Furthermore, another finding is that distance positively affects bilateral gross cross-border investment because of the diversification motive. Therefore, this has some policy implications, which are as follows; if policy-makers wish to raise foreign investors' levels of activity in their domestic markets and thereby increase liquidity and the development of these markets, they should deliberate actions to improve transparency, decrease insider trading, and converse to the foreign press info relevant to the financial markets.

Competing Interest

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