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Domestic Market Determinants of Foreign Portfolio Flows to an Emerging Market: A Study of Saudi Capital Market

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Abstract

This study examines the domestic market determinants of portfolio flows from foreign institutional investors in Saudi stock market. Monthly data relating to domestic market size, return, volatility liquidity and proportion of free float shares for the period, March 2017 to September 2023 is analysed. Granger causality shows that foreign portfolio flows cause domestic market return in Saudi Arabia and the reverse causality is absent. Multivariate time series regression analysis is employed to finds that market size as measured by market capitalization and domestic market return volatility are the covariates of foreign portfolio flows. Results of the study have important implications for the regulators of emerging markets to decide what factors to focus on in policymaking to attract foreign portfolio flows.

Keywords: Foreign Institutional Investors; Portfolio Flows; Domestic Market Return; Volatility; Liquidity; Free Float Ratio; Granger Causality Test

1. INTRODUCTION

Foreign portfolio flows to the stock market do not add to the real investment in the economy. These flows impact the economic growth through its effect on the stock market. Qualified foreign institutional investment (QFII) in the stock market decreases market return volatility by broad basing investors and improving risk sharing (Sharif, 2019), makes informativeness of stock prices better through active monitoring (Vo, 2017), restrict tunnelling of cashflows by controlling shareholders (Zhang et al., 2017), enhance reporting standards of listed firms and their governance (Lin et al., 2018), and so on. These benefits prompt regulators of markets across the globe to open up their markets for QFIs (Qualified foreign institutional investors) and constantly prompt theses flows through close monitoring and policy amendments. Knowledge of what domestic market factors attract foreign institutional portfolio flows will help the policymakers to implement appropriate policies to enhance investments by QFIs.

This study examines if market size measured by market capitalization, domestic market return, domestic market return volatility, market liquidity and proportion of free float shares impact QFII in Saudi stock market. Pairwise Granger causality test shows that QFII granger causes domestic market return and reverse causality is absent. Results confirm that QFII exerts price pressure on the small evolving Saudi stock market. A bidirectional causality is found between QFII and domestic market return volatility. QFII is found to both Granger cause return volatility and is impacted by volatility. A multivariate regression analysis shows that market size is the only variables that impacts QFII in Saudi stock market. This study contributes to the empirical literature significantly by focusing on the domestic market factors that explain the variations in portfolio flows by foreign institutional investors. Previous works on this topic generally focus on

the broad framework of what factors of developed markets push the institutional investors away from these markets and pull factors of the emerging markets that attract the foreign investors. But studies that exclusively focus on a wide range of domestic market characteristics are limited. This study contributes to the literature because of characteristics of Saudi stock market which makes it distinct and different from other emerging markets. Saudi Arabia is a small emerging stock market with a market capitalization of around 11.25 trillion Saudi riyals with just 232 listed firms as of the fourth quarter of 2023. The secondary market is opened for QFIs investment only very recently, in June 2015 while most of the emerging market were opened for foreign investment in 90s. Saudi Arabian currency is pegged fixedly to the US dollar which removes the currency risk for the foreign investors and may prove to be attractive. Previous works show that currency price fluctuations affect the attractiveness of the country (Gupta & Ahmed, 2020) as it impacts the investment performance and may involve high hedging costs. (Deng, 2020) Study of determinants of QFIs investment in Saudi stock market given its unique characteristics contributes significantly to the literature on QFI investment. (QFII)

The paper is organized in 5 sections. This section that introduces the study is followed by the section that reviews the previous works. Section 3 discusses the methodology employed. Section 4 presents the empirical results and the final section concludes the study.

2. DATA AND METHODS

This section presents the data analysed, variables studied and the model estimated to examine the market specific determinants of QFII in Saudi stock market.

2.1 Data

Monthly data relating to 79 months, March 2017 to September 2023, is analysed. QFIs are allowed to invest in Saudi stock market since June 2015. Initial flows were less than 0.20 percent of total market capitalization till September 2016. In order to increase the QFII, a major amendment is made to the rules governing QFII in September 2016 both broadening the categories of foreign institutional investors that are qualified to invest and enhancing their investment limits. As a response to this amendment, QFII started registering an increase in the subsequent months and the flows made a huge leap during early 2017. Hence, data from March 2017 till September 2023 is studied. Data is accessed from the website of Saudi stock exchange. Period of study includes the months during which Covid-19 precautionary measures were in force. In order to account for probable impact of Covid-19 on QFII, a dummy variable that is equal to 1 during months of Covid-19 precautionary measures and 0 otherwise. Previous works document the effect of Covid-19 on stock market. (See for example, Albulescu, 2021)

2.2 Variables Defined

Table 1 below gives the definition of the variables studied. This study examines the variables that are suggested by previous works and relate to domestic market characteristics. Market capitalization (See for example, Hussain et al., 2022), return (See for example, Mukherjee et al., 2022), return volatility (See for example, Hiremath et al., 2017), liquidity (Koepke, 2019) and free float ratio. (Kalyanaraman, 2011)

Table 1. Variables Studied

Variable	Definition
QFII	Investment by qualified foreign institutional investors. It is defined as Qualified foreign institutional investors' investment holding value of this month

	divided by the free float market capitalization of the previous month.
MC	Log (Free float market capitalization)
RN	Domestic market return. It is equal to the logarithmic difference of this month market index value, Tadawul All Share Index, and its value at the end of previous month.
SD	Standard deviation of daily returns on the domestic market index during the month.
LQ	Number of shares traded during the month as a percentage of free float shares.
FF	Free float shares as a percentage of issued shares during the month
Dummy	Dummy is to find out the effect of Covid19 on QFII. It takes the value 1 during months of Covid19 precautionary measures are implemented and is equal to 0 otherwise.

Table 2 presents the summary statistics and the correlation matrix. It can be noticed from the table that QFII as a percentage of the previous month market capitalization ranges from 16.85% to 0.62% with the average around 8.84% during the study period. Panel B of the table shows that the correlation between none of the study variables is high enough to cause any concern of multicollinearity. However, test of multicollinearity is also carried out and the results are presented in the results section.

Table 2. Summary Statistics and Correlation Matrix

Panel A: Summary Statistics						
	QFII	MC	RN	SD	LQ	FF
Mean	8.8400	12.1125	0.0061	0.0085	12.3761	30.1646
Median	11.5440	12.0706	0.0126	0.0070	11.1281	21.1628
Standard Deviation	5.4229	0.1773	0.0506	0.0048	5.5847	15.2872
Maximum	16.8479	12.4241	0.1009	0.0362	4.4521	51.4746
Minimum	0.6182	11.8758	-0.1592	0.0031	5.5847	12.7460
Panel B: Correlation Matrix						
QFII	1.0000					
MC	0.7907[1]	1.0000				
RN	0.0022	0.0319	1.0000			
SD	0.0399	-0.0495	-0.2350[5]	1.0000		
LQ	-0.0451	-0.2987[1]	0.2209[5]	-0.0890	1.0000	
FF	-0.8372[1]	-0.6808[1]	-0.0846	-0.1182	-0.1667	1.0000

[1] and [5] denote significance at 1% and 5% respectively

Variables are employed either at level or first difference depending on considerations of stationarity, seasonality and trend. Augmented Dickey-Fuller test results are presented in table 3 below.

Table 3. Augmented Dickey-Fuller test results

Variable	Level	First difference
QFII	-1.4864	-4.0072[1]
MC	-2.9600	-9.8112[1]
SD	-7.4790[1]	-14.3842[1]
LQ	-4.0220[1]	-9.5231[1]
FF	-1.9731	-9.5953[1]

[1]denotes significance at 1% based on MacKinnon one-sided p-values

Null hypothesis: Variable has a unit root

Exogeneous: Constant, Linear Trend

2.3 Methods

The following steps are employed to evaluate what domestic market characteristics affect QFII in Saudi stock market.

1. Initially, Granger causality test is used to check the direction of causation of domestic market return and its volatility with QFII to determine if these two variables can be employed as explanatory variables in a model that estimates the covariates of QFII.
2. A multivariate regression framework is applied to estimate the covariates of QFII.
3. To control for the effect of Covid-19 on QFII, a dummy variable that is equal to 1 during months of Covid-19 precautionary measures implementation and 0 otherwise is included in the model estimated.

2.3.1 Investigating the Direction Of Causation Of Domestic Market Return and Its Volatility to QFII

Granger causality test is applied to check the direction of causation of return and its volatility with QFII. Both theories and empirical works make varied suggestions about the direction of causation between domestic market return and QFII.

Base broadening hypothesis suggests that foreign investors help improve liquidity and risk sharing resulting in reduced market risk premium required by investors increasing the share price. This argument suggests that QFII causes return. (Angelovska, 2020) Positive feedback trading argument contends that foreign investors enter the market when the return is high and exit when the return is low showing market return as a cause for QFII. (See for example, Choudhary et al., 2022) Price pressure hypothesis argues that foreign institutional investors bring pressure on demand-supply equilibrium of low liquidity markets. Thus, QFII causes market return changes. (Richards, 2005) Some empirical studies find a bidirectional relationship between the two variables. (See for example, Mukherjee et al., 2022) Agarwal et al. (2020) find no relationship between QFII and market return.

Earlier works show that institutional investment flows impact stock market volatility. (See for example, Derbali et al., 2020) Contradicting direction of causation between stock market volatility and QFII. Some works show that QFII increases stock market volatility (See for example, Aggarwal, et al., 2022; Naik, et al., 2022), while others argue that volatility of stocks deter QFII. (Badhani et al., 2023) In view of this conflicting evidence produced and varied suggestions provided by theories, this study examines the direction of causality of market return and its volatility with QFII.

Pairwise Granger (2001) causality test is applied and the results of the test is presented in table

4. It can be inferred from the results that QFII Granger causes domestic market return in Saudi Arabia at various lags and reverse causality is absent. A similar association is found between lagged domestic market return and QFII. Return volatility Granger causes QFII and QFII does not Granger cause return volatility. Results confirm price pressure hypothesis. Saudi stock market is relatively small and evolving market with 228 stocks listed with a market capitalization of SAR 11,410.53 billion (USD 3,042.81 billion) as of September 2023. Hence, foreign institutional investors with a holding of SAR 290.069 which constitutes around 11.28% of free float market capitalization is bound to affect the market return. In view of the results of Granger causality test, both domestic market return and its volatility are not included in the model estimated.

Table 4. Pairwise Granger Causality Test Results

Lags ⟶	F-statistic		
	2	**3**	**4**
Panel A: QFII and domestic market return			
RN does not Granger cause QFII	0.2944	1.2175	2.3734
QFII does not Granger cause RN	12.2915[1]	7.9764[1]	9.5986[1]
Lagged RN does not Granger cause QFII	2.0687	2.1551	2.2441
QFII does not Granger cause lagged RN	30.2475[1]	20.1524[1]	14.1386[1]
Panel B: QFII and domestic market return volatility			
SD does not Granger cause QFII	5.7057[1]	4.3191[1]	3.4119[1]
QFII does not Granger cause SD	3.3336[5]	2.2597	2.1122
Panel C: QFII and market size			
MC does not Granger cause QFII	38.6318[1]	26.1815[1]	18.7859[1]
QFII does not Granger cause MC	2.7972	2.2707	1.4739
Panel D: QFII and liquidity			
LQ does not Granger cause QFII	0.1112	0.1840	0.1376
QFII does not Granger cause LQ	0.0214	0.0164	0.0827
Panel E: QFII and free float ratio			
FF does not Granger cause QFII	2.2966	2.3023	3.1446[1]
QFII does not Granger cause FF	0.3526	0.3827	0.4801

[1] and [5] denote significance at 1% and 5% respectively

2.4 The Model

The following model that includes the pull factors of the domestic market is estimated.

$$QFII_t = b_0 + b_1 MC_t + b_2 LQ_t + b_3 FF_t + b_4 Dummy_t + e_t$$

$QFII_t$	Qualified foreign institutional investors' investment during month t as a percentage of market capitalization of month t-1
MC_t	Log(Market capitalization)
LQ_t	Volume traded as a percentage of free float shares during month t
FF_t	Free float shares as a percentage of issued shares during month t
$Dummy_t$	Dummy variable equal to the value 1 for months during which Covid-19 precautionary measures were implemented and 0 otherwise.

3. RESULTS

Results of the base model using monthly data from March 2017 to September 2023. Only market size variable is found to be statistically significant. One percent increase in market capitalization increases QFII by 0.17%. Domestic market liquidity, free float ratio and COVID-19 dummy variable are found to be statistically insignificant in explaining variations in QFII. Results of the base model are found to be robust to changing the sample period as shown by the subperiod model. Subperiod model is estimated with data relating to October 2018 to September 2023. Results of this study is in line with some of the earlier works that confirm that domestic market capitalization is one of the determinants of QFII. (See for example, Oke et al., 2020) In a small emerging market like Saudi Arabia, domestic market liquidity and free float ratio do not explain the variations in QFII. Covid-19 does not affect QFII. Baker et al., (2020) find no association between incidence of infectious disease and changes in stock prices. However, they find that government's restrictive measures to curb the outbreak of disease affect stock market volatility. Since both stock price and its volatility are not affected by epidemic disease outbreak, QFII is also not likely to be impacted by COVID-19.

Table 5. Multivariate Regression Results

Variables	Base Model	Subperiod Model
MC	17.5993 3.0681[1]	18.5214 3.4428[1]
LQ	0.0262 0.0139	0.0314 0.0169
FF	-0.0044 0.0112	-0.0009 0.0125
Dummy	-0.2905 0.2904	-0.3593 0.3578
Constant	0.1181 0.1589	0.1742 0.2504
R-squared	0.2462	0.2589
Adjusted R-squared	0.2055	0.2050
F-statistics	6.0431[1]	4.8046[1]
Durbin-Watson statistic	1.7442	0.0021

Regression is estimated by Ordinary Least Squares method with Newey-West heteroskedasticity

autocorrelation consistent standard errors and covariance. Figures in parentheses are robust standard errors.

[1],and [5] denote significance at 1% and 5% levels respectively

Base model relates to data from entire sample period, March 2017 to September 2023.

Subperiod model relates to data from the sub-sample period, October 2018 to September 2023.

Absence of the problem of multicollinearity inferred from pairwise correlations presented in Panel B of table 2 is confirmed by the variance inflation factors given in table 6. Variance inflation factors do not exceed a general rule value of 10. (Belsley et al., 1980)

Table 6. Variance Inflation Factors

	Model 1	Model 2
MC	2.0488	2.5286
LQ	1.0790	1.1155
FF	2.1959	3.1449
Dummy	1.6898	2.2768

Since lagged dependent variable is not included in the model, Durbin Watson (1951) test is carried out to check for autocorrelation in the model residuals. Table 5 presents the Durbin Watson test statistic for both the base model and the subperiod model. This statistic is compared with the upper and lower bound values taking into consideration the number of observations and variables included in the models is accessed from the table provided by Savin and White (1977). Durbin Watson test results are inconclusive as the test statistics of both the models lie between the upper and lower bounds. Hence, Breusch-Godfrey (1981) Lagrange multiplier test is done to check for autocorrelation at and up to 4 lags. This test confirms absence of autocorrelation in residuals of both models.

Table 7. Breusch-Godfrey Serial Correlation Lagrange Multiplier Test of Residuals

	Model 1	**Model 2**
F-statistic	0.5202	0.4082
	0.7212	0.8019
Obs*R-squared	2.2804	1.8612
	0.6843	0.7613

Null hypothesis: No serial correlation at up to 4 lags

p-value in parentheses

Lagrange multiplier test is applied to check for autoregressive conditional heteroskedasticity in the residuals. (Engle 1982) Test results presented in table 8 rule out the need to include ARCH terms in the estimation of the models.

Table 8. Heteroskedasticity Test: ARCH

	Model 1	Model 2
F-statistic	0.0853	0.0513
	0.7712	0.8214
Obs*R-squared	0.0882	0.0526
	0.7665	0.8186

p-value in parentheses

Table 9 that presents the results of Ramsey (1969) regression specification error test confirms the adequacy of linear model specification.

Table 9. Ramsey Regression Equation Specification Error Test

	Model 1	Model 2
F-statistic	0.2017	0.0740
	0.6551	0.7863

p-value in parentheses

4. CONCLUSION AND IMPLICATIONS

Policy makers across the globe attract foreign portfolio flows for reasons related to balance of payments problems to capital market quality. Regulations on QFII focus on the eligibility criteria defining which foreign institutional investors are qualified and the ceiling on their investments. Additionally, these regulations are periodically amended to achieve intended goals. This study is carried out in an emerging market, Saudi Arabia, which opened its market for qualified foreign institutional investors for capital market centric reasons like increasing market stability, decreasing volatility, enhance market efficiency, improve transparency and governance of listed firms, enhance professionalism of market players and so on.

This study's findings have important implications for the policy makers of emerging markets. It is found that QFIs Granger cause market return. A bidirectional causation is found between QFII and market return volatility at 2 lags. At lags higher than 2, return volatility deters QFIIs. Market size measured by free float market capitalization is found to be the only significant variable that explains the variations in QFII. These findings seem interrelated. The number of stocks listed stands at 228 as of September 2023. Average monthly traded volume stands at around 4,598 million shares and around 30% of the issued shares are available during the study period. In a market with such a restrictive opportunity set for investment, QFIs are bound to exert price pressure affecting the domestic market return and its volatility. Their investment is likely to be affected by the market capitalization as confirmed by this study. Policy makers of emerging markets with characteristics to similar to that of Saudi stock market should focus on both expanding the number of shares listed and the free float shares available for trading to attract more QFII.

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