



The Impact of Stock Market Performance on Foreign Portfolio Investment in China

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ABSTRACT

The research is aimed at investigating the impact of stock market performance and inflation on foreign portfolio investment (FPI) in China. For this purpose, time series quarterly data from 2007Q1 to 2015Q4 is used. On the basis of stationarity results, auto regressive distributed lag model is used to examine the impact of the stock market prices and inflation on FPI. The results show that there is significant positive impact of stock market performance on the FPI, whereas inflation is found to be negatively associated with the FPI. The study also reveals that some historical events like Asian financial crisis of 2008, and the Shanghai Composite Stock Index crash of 2015, significantly affected the FPI in China. The investors should consider these two factors while investing in foreign financial markets.

Keywords: Stock Market Performance, Inflation, Foreign Portfolio Investment, China

JEL Classifications: F21, G11, O16, P45

1. INTRODUCTION

Stock market is a place for trade of securities and company shares, where the trade is operated through either stock exchange or through counter market. Stock market is also known as the equity market, as the equities of the firms listed are purchased and sold in the stock market. Investors and organizations commonly profited each other, by accessing the capital and a cut possession in the organization. The part of stock exchange is imperative for financial advancement and development. Business exercises in the nation are supported by stock exchange through offering shares and raising capital for the organization. Reserve funds of the general population, if are apportioned to put resources into stock exchange, rather than keeping it sit without moving some place, it will advance profitability and trust in the economy. Not just vast investors can partake and take proprietorship in the organization yet little investors likewise get a change and take an interest by purchasing shares up to their purchasing power.

In the course of recent decades, capital market liberalizations have prompted a sensational growth in global flow of foreign direct

investment (FDI) and portfolio equity. As indicated by the 2015 World Investment Report, the world FDI went up from \$154 billion in 1991 to \$1.23 trillion in 2014, and correspondingly, foreign portfolio value inflows expanded from \$106 billion to \$744 billion. Earlier research demonstrates that these two types of foreign ventures create distinctive ramifications about the security and effectiveness of worldwide capital markets and of host nations.

There is much theory and experimental confirmation to backing that budgetary liberalizations produce noteworthy financial advantages. For instance, they empower investors worldwide to share chances better by lessening the expense of capital (Bekaert and Harvey, 2000; Henry, 2000a; 2000b; Chari and Henry, 2004), upgrade firm valuation (Ferreira and Matos, 2008; Chan et al., 2009) and financial development (Bekaert et al., 2005; Gupta and Yuan, 2009), and advance better administration (Aggarwal et al., 2011). Exceptionally compelling to this study is the current work on how showcase liberalizations influence stock liquidity.

In particular, Tesar and Werner (1995) and Vagias and van Dijk (2010) find that expansions in foreign property assessed from

amassed capital streams enhance neighborhood stock business sector liquidity, and Wei (2010) achieves the same conclusion utilizing possessions information of foreign institutional investors. While their outcomes are reliable with the hypothetical contention that globalization of shareholder bases could improve liquidity (Merton, 1987; Amihud and Mendelson, 2008), our present study means to demonstrate whether foreign speculator heterogeneity matters in stock liquidity and whether there is a liquidity-control tradeoff in the foreign responsibility for firm.

In their theoretical model, Goldstein and Razin (2006) demonstrate that there is a tradeoff between foreign direct speculations (FDI) and foreign portfolio ventures (FPI), or between administration productivity and liquidity. Both exchange offs are driven by asymmetric information. FDI investors take both possession and control positions in local firms and in this way have admittance to private data of the organizations that empowers them to screen the administration effectively. Notwithstanding, their conscious of inside data accompanies a liquidity cost connected with the value effect of their exchange, recommending that foreign direct ventures diminish stock liquidity. FPI investors, then again, pick up possession without control of neighborhood firms furthermore broadens firms' shareholder bases, henceforth enhancing liquidity through exchanging movement.

China turned into the world's biggest investor in 2010 and will remain so for a long time. In 2014, China made \$4.9 trillion of aggregate settled resource speculation, contrasted and \$3.4 trillion in the US and \$1.1 trillion in Japan. China has additionally been the best giver to worldwide growth since 2007, contributing \$0.9 trillion to the expansion in worldwide gross domestic product (GDP) in 2014, contrasted and \$0.6 trillion from the US and \$0.3 trillion from the UK. Balanced for acquiring power, China's venture and commitment to growth are twice as vast. The productivity of China's monetary framework in assigning capital crosswise over speculation opportunities will be an imperative determinant of worldwide financial growth in the coming decades. This paper presents prove that China's stock business sector has a pivotal part to play. Despite the fact that it has turned into the second biggest on the planet, with a business sector capitalization of \$6 trillion toward the end of 2014, China's stock business sector is still a sideshow in a budgetary framework ruled by a monstrous state-controlled keeping money part. Following a rough first decade from 1990 to 2000, China's stock business sector earned notoriety for being a gambling club controlled by examiners and insiders. In the years after the money related emergency, China's stock business sector recuperation slacked those of other extensive economies, as its quickly growing shadow keeping money segment, issuing new high yielding however verifiably ensured riches administration items to fund both business sector driven and midway arranged venture, pulled in monetary capital and raised required value returns. Just as of late has the business sector discovered up, procuring a 60% return in 2014, in expectation of store protection and different changes that will decrease the understood appropriation to the interconnected saving money and shadow managing an account part and fortify financial growth.

Emerging market economies summon progressively more noteworthy weight in foreign portfolios investment, making foreign investors more vulnerable to the dangers connected with politically or monetarily delicate administrations. Political clashes are regular in numerous ranges of the world, including huge parts of Africa, Asia, and the Middle East. Appropriately, a developing writing has inspected the monetary impact of war, terror, and all the more by and large, political insecurity, giving knowledge into the effect of political clashes on the economy and money related markets. However, past studies tend to concentrate on the total impact and don't recognize the parts played by foreign and local investors. A host nation's political danger may have distinctive ramifications for foreign investors than for local investors, driving them to react in an unexpected way. Along these lines, the part foreign investors' play in the neighborhood value market consequent to political clashes can be altogether different from what is suggested by the impacts collected over all investor sorts. The writing on worldwide capital streams proposes that foreign and residential investors can be inspired by various components (e.g., Forbes and Warnock, 2012; Rothenberg and Warnock, 2011). A decay into foreign and household investors not just gives knowledge into foreign portfolio venture choices additionally has arrangement suggestions in that an alternate strategy reaction might be required relying upon whether a watched example is driven by foreigners or local investors. Our study endeavors to fill this hole in the writing by examining the conduct of foreign (i.e., non-South Korean) investors independently from that of household (i.e., South Korean) investors encompassing occasions that heighten geopolitical danger on the Korean promontory.

Growth of capital streams to emerging world since the end of the twentieth century fortified a hot civil argument among the researchers. By and large, this movement is ascribed to change in various monetary, principal and nation particular conditions round the globe. Our enthusiasm here focuses upon the investigation of various elements which are mindful in driving fleeting capital streams to China and India, centering of FPI inflows of both nations. Foreign capital streams assume an imperative part in the economy. These streams connect the investment hole and satisfy the capital needs of a nation at the local and worldwide level. In the present period of globalization and money related liberalization, foreign investors from different nations of the world will put resources into whatever remains of the world. As of late, FPI is turning into a typical type of investment in numerous nations of the world. Portfolio investors, when contrasted with FDI investors, contribute for a transient period and their motivation is to hypothesize the market blast.

Investment in foreign nations is a wellspring of procuring and in addition accommodating to differentiate the portfolio danger of the investors. Since a decade ago, pattern to put resources into a foreign nation is empowering among foreign investors as said by Daly and Xuan (2013) in their exploration that, still a large portion of the investors like to put resources into their household market. This marvel is known as investor home-predisposition. Along these lines, to pull in a great looking measure of investment, the host nation needs to give an alluring bundle to the investors.

Less confinements on capital streams, an alluring open door for investment and with the impressive growth rate of the economy, the emerging markets are the best place to contribute from the most recent two decades. Investors around the world are intrigued to put resources into budgetary markets of China and India on account of their financial growth rates. Foreign capital inflows began in India in 1991, while China got its first FPI in 1997. Since the most recent decade, both nations experienced higher growth in FPI. China's FPI growth is essentially higher than India by and large, yet both nations are developing with an expanding pattern. Worldwide budgetary emergencies backed off numerous economies of the world and FPI in China and India had a critical ruin in 2008. This work is expected to investigate the determinants of FPI in China and contrast the outcomes and determinants of FPI in India investigated by Garg and Dua (2014).

The present study aims at investigating the impact of stock market performance on the FPI in case of China. The study will also investigate whether there is any causality between these two variables and of what direction.

After an introduction and background, next section will in detail discuss the review of literature, Section 3 will explain data and methodology, and the empirical procedures. Section 4 provides the results and discussions. Finally, Section 5 consists of concluding remarks and suggestions for policy makers.

2. LITERATURE REVIEW

The all accessible statistics all available information associated to domestic and worldwide markets engrosses by the stock market (Gazioglu, 2008; Twerefou and Nimo, 2005) argued that prices are evidence compelled and are centered on supply and demand of securities in the capital markets, which is basically cognizant by the macroeconomic indicators performance conversely, the price changes defines the return on securities, which further conclude the market return. Typically the choice to invest abroad is a two-step progression for financiers. Primarily investors have to make a decision that in which country they will going to invest. And as the next step they have to decide that to invest which firms they can select. According to Aggarwal et al. (2005) verdicts of erstwhile researches that at the firm level confession is an imperative determinant of firm choice for influential investors. The major attraction of foreign investment have been recognized by the favorable business background and sturdy legal system, regardless of how vivacious a capital market can be and as a contrast the weak legal system and not favorable business environment would not be able to entice FPI (Michael and Thankgod, 2014). FPI shifted from advanced to mounting states before the financial calamity of 2008. With market capitalization and degree of ingenuousness in Nigeria, FPI flows have robust affirmative and a long term association. The adjacent countries also have affirmative or deleterious impact on capital flows to a particular host country. Another important consideration among the investors is the safety of funds. The level of political risk in the country where the investors going to invest interrelated with the level of the anticipated rate of return from any portfolio. Investors always desire to shift their funds from politically less steady to more established countries. According

to Chukwuemeka et al. (2012), Smimou (2014) cultural features of instigating and terminus countries are also important elements of FPI flows. The essential in the decision making progression of apportionment of reserves in a country has to be played by the Impartiality market individualities of host countries. On the other side foreign portfolio equity investors while investing abroad, keep in view abundant elements like, market liquidity, size and trading cost. Foreign portfolio investors always prefer to invest more in larger and more efficient markets along with the low cost of trading. Portfolio inflows are damagingly associated with squat eminence of associations. The distance between cultures is also has to keep in view along with the common language and religion among the countries while trading with each other have a constructive influence on the FPI prosperities of both debt and equity. These effects are greater for the cross-border equity than debt. For researchers and policy makers, aspects are important that impact the debt or equity flows at international level, among these factors investor protection is one. In the countries where better stockholder fortification measures are experienced, investors always tend to invest in those countries. As per the study by De Santis and Luhrmann (2009), Poshakwale and Thapa (2011), Aggarwal et al. (2012), Thapa and Poshakwale (2012). The investor protection principles are significant to attract FPI in the country specifically in example of foreign investment. According to the study by Garg and Dua (2014), to developing countries the portfolio equity flows are amplified during the 5 year period from fourteen billion dollars to 67 billion dollars. Later in 2010 this amount reached to 128 billion dollars. The protuberant beneficiaries are China, India, Russia, Brazil and South Africa. The 70% of aggregate portfolio investment capitalized in developing countries receive by China, India and Brazil. For the last three decades a tremendous progress had been made by china. Currently after US, China is the second largest world.

According to a study Bekaert and Harvey (1998) in attracting FPI, performance of stock market is one of the crucial factor. The Increasing returns of stock market attract overseas investors and eventually which boost their confidence in order to further invest in stock market. An examination performed by Singh and Weisse (1998) that due to the emerging countries with shudders concerning in it, the stock and foreign exchange markets go unsteady with detrimental connotation. The Asian developing countries with economies of dynamical nature and the economic systems come under the domination of stock market. So for financial liberalization besides further markets propagations that is hurting the financial authority over industry stroking emphasis on financial market strategies over the process of industry fabrication, the evolving countries make the dimension of capital flows and confine from assessment strategy and spare prerequisite further more banking systems needs to be enriched relatively than aiming on the promotion of stock market because banks alleviate the development for long term activities and for better development, governments should control the corporate for evolving manufacturing groups and globalization encumbrance for emerging to develop real economy. According to another study Eagly et al. (2010) in which they premeditated foreign investment inflows by an influence of risk factor for stockholders and behavior of stock market in United States. In order to study the effects of

corporate bonds, corporate stocks vector autoregression (VAR) model was taken to net inflow as in contradiction of the risk and returns were taken from the test among variables that how stock inflows to the US is prejudiced by the stock market and that inflows of stock to the US which is completing the risk repugnance. Bonds and stocks were the major part of the investments, other related factors were not part of the test.

Demir (2009) studied performance of real investment in three countries and envisage alterations in the both fixed and financial investments with the help of through return rates. Fixed investments were affected by increasing in the rates and gaps but it not affect the financial investment. For three countries the improbability in the investment is being studied and to plaid the effectiveness rates wherever the bi-annual data is engaged and the firm level data is congregated. For the foremost proposition the firm level data classifies the countries although metamorphosis crossways countries is dignified. The results showed that mounting return rates gap among fixed assets and that of financial assets investment and the ambiguity in the macroeconomic and risk factor had the hindering factor which is momentous thriflity and statistically. The praise of financial investments linked with rising rates that further leads to implication. Factually across countries, the risk and improbability effects total assets of investments of shares. These three countries Turkey, Argentina and Mexico on the itinerary to financial liberalization from 80's. According to a study by La Porta et al. (1998), Bekaert and Harvey (2003) that FPI also interrelated with the increased liquidity in capital markets, which in actual means that because of high quantity of sponsoring the inland stakeholders are capable to access at inferior costs. As far as effects (Baghwati, 1998) on the receiving country as FPI is interim and capricious in nature and might have adverse effects on the receiving country. As bringing the real benefit to the economic growth, the enduring benefits of FPI (Kaminsky and Schmukler, 2002) more than overshadow its short-range deleterious effects. The demand for assets can be directly affected by the FPI inflows. Capital inflows to the stock market upsurge the call for stocks and increase the stock price. Due to which may be the other markets be effect by the portfolio inflows afterwards. For considering this we can say that, the stock price escalates but the expected return on stocks may decline, as capital flows into the stock market. At that time such as the real estate market and the bond market the investors may seek higher returns on other asset markets and give ascendant compression on other asset prices. According to an earlier study Tokat (2004) the purpose of entrance in the emerging markets of Foreign investors is for diversification along with to maximize returns. According to theory of financial market, sophisticated returns would recompense for the advanced risks of evolving markets over the long-run. The speedy growth of an economy reflects that political and financial system of that country is working effortlessly. Limpidity in stock market along with the good governance leads towards steadiness of economy and also able to increase in growth of GDP; organizations generally earn more profits and also able to give striking volume of surplus to these foreign investors. Consequently as the GDP growth goes higher it will further results into greater quantity of FPI inflows.

As far as foreign investors' concerns return be influenced by on the price of the stock at the start and completion of the exchange rate and on the time frame, thus roughly the sum of domestic return on security and return on foreign currency is equal to the returns (Sharpe et al., 2003). Which shows that in the stock market, the rate of return of a country's currency has an impact on the pricing of equities. Another study by Forbes and Chinn (2004) explored that when shocks to one country are transmitted to other countries than the returns in two countries could jointly move, with the linkages associated to the cross-country, may be because of the effects of worldwide shocks in both of the countries or because of the sectoral shocks effects that instantaneously distress all associated nations. The further micro features of the market researchers observed at the relationship between liquidity and return, discovery of price and liquidity and also efficiency associated to market and precariousness (e.g. Hassler, 1999; Coppejans and Domowitz, 2000). Additional emphasis is on the influence on returns have the foreign flows. According to this dispute (Stulz, 1999) foreign flows upsurge prices once they enter and lessening them when they vacate in that way creating the prices further impulsive. Henceforth, capital flows have an impact on estimations only if they are commenced for the reason that of indication that foreign investors that is not yet assimilated in prices. This leads to the introduction to the information lopsidedness which subsists among domestic and foreign financiers, the one reason for that may be the foreign investors having scarce.

Information regarding the country policies or firm principles due to which and for the reason may be of intellectual or emotional biases, process the information not in the manner as needed and this then may leads to loathing concerning global stashes (Brennan and Cao, 1997; Dahlquist and Robertsson, 2001). According to study Stulz (1999) as compared to foreign investors the domestic investors are more aware. As they well informed about the local firms they can hold more inland shares and on the other side foreign investors markdown share prices comparative to domestic investors as this depends on contrary evidence they hold. According to an argument made by Dahlquist and Robertsson (2001) that between foreign investors for outsized organizations the penchant can be observed as a substitution for firm gratitude and evidence lopsidedness.

Conversely, the foreign investors prefer to hold domestic assets as comparison to foreign assets which they have in their countries if the return associated to domestic assets striking (Dornbusch, 1988). The only reason for this is because the foreign investors more concerned about inherent risks such as political unsteadiness, devaluation and extensive oscillations in the values of currency and crisis of global buoyancy and other things (Senbet and Otchere, 2010). Global financial market instability and fluctuations in international exchange rate can affect apprehension of remunerations from capital flows which possibly will lead to hefty and disparaging smacks in capital flows (Senbet and Otchere, 2010). The researchers Pavabutr and Yan (2003) showed that reduction in risk premium and acquaintance to foreign flows is associated to each other, which lessens among stocks preferred by foreign investors and as the market develops further slackened it diminutions over time.

On the other hand (Warther, 1995) discover no indication that yields are deleteriously interrelated to earlier flows but find a positive relation among flows and succeeding returns and a undesirable relation between returns and ensuing flows. According to a study by Gazioglu (2008) in which the research explored in the case of financial crisis of turkey regarding the effects of both capital inflows and outflows on real exchange rates besides the real stock market returns afore and later catastrophe, discovers an irregular impact of returns associated to stock market and capital on exchange rate. Another study Boyer and Zheng (2009) for the relation between aggregate stock market returns and net purchases of equity from an assortment of financier clusters. They find trimestral flows to be auto-correlated for each of the altered investor groups and a substantial and constructive concomitant association between stock market returns and drifts of Mutual Funds and Foreign Investors in US. They explored that stockholders are obsessed by unanticipated flows module moderately than predictable flows, a very little proof was found by them that previous stock market returns followed by investor flows. Another investigation by Kim and Yang (2009) in which from January 1999 to September 2007 in Korea they observed the effect of capital inflows on domestic asset prices. They further explored that by directly affecting the demand for assets, capital inflows might upshot in improved, through money supply and liquescence due to which might as in return assets prices boost and by engendering financial detonations in capital getting frugalities prominent to upsurge in the prices of asset.

On the other hand in emerging markets the various features as improved economic performance, monetary development and stumpy interest rates may perhaps also affect asset prices. While in the case of Korea they explore the effect of capital inflows on domestic asset prices in which they discover the stimulus of shocks linked to capital inflow to be further striking on the stock market but inadequate in other fragments of the frugality. Another analyses made by Lagoarde-Segot and Lucey (2007) in which they studied profits linked to portfolio diversification seven MENA stock markets. In which weekly data was used by them from the period 1998 to 2006. According to their results it showed that the presence of divergence compensated in the observing area. They found that finest recital by the least variance portfolio. According to their observation they proposed that substantially authoritative and lustrous institutions both financial and economical are essential for conserving enduring portfolio yields. According to another study by Ozurumba (2012) in which the author identified the relationship between FPI and stock market return inflation rate and stock market returns and also they established the direction of causality between FPI and stock market returns in Nigeria. Linear regression methodology was applied in order to capture the impact of FPI and inflation rate on stock market returns. In order to determine the direction of causality between variables granger causality test was applied. From the results the author explored that FPI has a constructive and noteworthy impact on stock market returns while inflation rate has positive but irrelevant impact on stock market returns. Causality test showed that there is unidirectional causality running from stock market returns to FPI in the economy, which further leads stock market returns in Nigeria.

According to another speculation made by Goldstein et al. (2007) according to their predictions of their model is that countries that have a high possibility of an cumulative fluidity crisis will be the foundation of more FPI with comparison to FDI. The perception is that as the possibility of an amassed liquidity shock increases because the agents aware that they are more likely to need to sell the investment prior according to this, if FDI been hold by them than surely they will get a low price subsequently buyers are not aware either they sell for the reason that of an distinct liquidity need or because of antagonistic evidence on the efficiency of the speculation. Due to which the desirability of FDI diminutions and the ratio of FPI to FDI upsurses. There has also been competition among emerging markets to attract FPIs, which has led to a situation in which in order to sustain inflows of portfolio investments, it has become increasingly important for developing countries to ensure attractive returns for portfolio investors. Often this means offering increasing operational flexibility (Parthapratim, 2006).

Another quantifiable assessment was executed by Baharumshah and Thanoon (2006) in which they showed that how the growth process affected by different types of cash flows in which they collected data from the East Asian countries which also includes China. Their pragmatic investigation was based on dynamic panel data and they find; initially, that long term economic growth can be contributed by domestic savings positively. Next, they confirm that FDI is growth ornamental and that its impact is felt may be in the long run or short run. Moreover as comparison to domestic savings, FDI influence on evolution is much sophisticated. Third, short-term capital inflow has antagonistic influence on the long-term as well as short-term growth scenarios and it appears to be penetrating to long-term capital inflows. Fourth, long-term debt has positive effect on growth but its effect does slightly evaporate in the long-term. Furthermore, the detected positive contribution of FDI in the growth process of East Asian economies is a vigorous finding. From policy point of view the substantiation persuasively recommends that countries that are prosperous in attracting FDI can finance more investments and grow quicker than those that discourage FDI.

3. DATA AND METHODOLOGY

3.1. Data Description

Data on net FPI is taken from International Monetary Fund on quarterly basis. In order to make it compatible with the other variable, the growth in the net FPI is used from 2007Q1 to 2015Q4. While in order to capture the stock market performance the quarterly data of Shanghai Composite Stock Market Index is taken, again in form of growth, from 2007Q1 to 2015Q4. Descriptive statistics of the variables is given in Table 1.

Since all the variables are in growth form, the data is well in normal form, standard deviation, kurtosis and skewness are showing that the data is normally distributed.

The Figure 1 show the data of the variables of foreign portfolio invest and the stock market performance. We can see that there seems to be stock correlation between these two variables. There seems to be the relation of opposite direction in 2007Q1

upto 2007Q4, where the FPI is decreasing the stock market performance is increasing. But, from 2008Q2 onwards, there seems to systematic positive relationship between these two variables through 2015Q4.

3.2. Methodology

Since we are dealing with the time series data, there may exist the problem of non-stationarity. In order to check the unit root in the variables, we have used augmented Dickey-Fuller (ADF) test. The primary condition for employing unrestricted VAR model is to ensure the stationarity of all variables at the first difference (variables need to be I(1)). To assess the stationarity of the variables, ADF test is incorporated for identifying unit root.

Dickey-Fuller test analyses whether a unit root is present in an autoregressive model.

A simple AR(1) model is,

$$Y_t = \rho Y_{t-1} + \mu_t \tag{2.1}$$

Where, Y_t is the variable of interest, t is the time index, ρ is a coefficient, and μ_t is the error term. A unit root is present if $\rho = 1$. The model would be non-stationary in this case.

The regression model can be written as:

$$\Delta Y_t = (\rho - 1)Y_{t-1} + \mu_t = \delta Y_{t-1} + \mu_t \tag{2.2}$$

There are three main versions of the test:

1. Test for a unit root:

$$\Delta Y_t = \delta Y_{t-1} + \mu_t \tag{2.3}$$
2. Test for a unit root with drift:

$$\Delta Y_t = \alpha_0 + \delta Y_{t-1} + \mu_t \tag{2.4}$$
3. Test for a unit root with drift and deterministic time trend:

$$\Delta Y_t = \alpha_0 + \alpha_{1t} + \delta Y_{t-1} + \mu_t \tag{2.5}$$

As the result of the ADF test confirms that, FPI and the consumer price index (CPI) are stationary at level and have integration of order I(0). Whereas, the stock market performance is stationary at first difference, and has I(1) order of integration (Table 2). So we cannot use ordinary least square (OLS) as the assumption of the stationarity of all the variables is violated here. Nor we can go for Johanson cointegration, as it requires all the variables to be stationary at same order of integration. Auto regressive distributed lag (ARDL) is best suited methodology in our case, as we can analyze the variable of even different order of integration.

3.3. ARDL Model

The regressors may include lagged values of the dependent variable and current and lagged values of one or more explanatory variables. This model allows us to determine the effects of a change in a policy variable.

The ARDL(1,1) model,

$$Y_t = m + \alpha_1 Y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + u_t \tag{2.6}$$

Table 1: Descriptive statistics

	CPI	FPI	SMR
Mean	3.049074	2.194763	2.844399
Median	2.633333	-0.051929	2.695880
Maximum	8.033334	32.05629	5.552301
Minimum	-1.533333	-30.44026	1.820805
SD	2.268927	10.41625	0.865098
Skewness	0.292809	0.155752	1.512271
Kurtosis	2.900308	5.854724	5.165080
Jarque-Bera	0.529331	12.36972	20.75314
P	0.767463	0.002060	0.000031
Sum	109.7667	79.01146	102.3984
Sum square deviation	180.1811	3797.436	26.19379
Observations	36	36	36

CPI: Consumer price index, FPI: Foreign portfolio investment, SMR: Stock market performance, SD: Standard deviation

Figure 1: Foreign portfolio investment and stock market performance

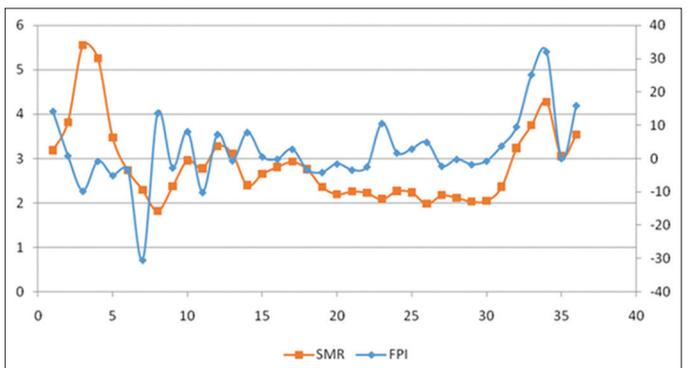
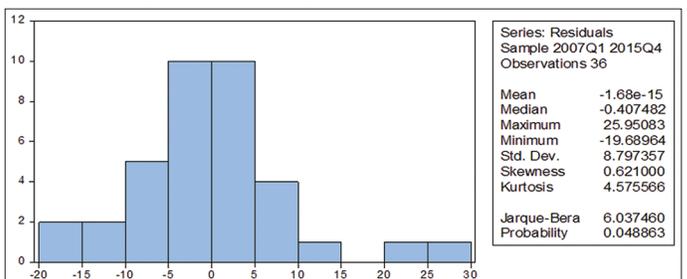


Figure 2: Normality condition of the residuals



Where, Y_t and x_t are stationary variables, and u_t is a white noise. The White-noise process: A sequence $\{u_t\}$ is a white-noise process if each value in the sequence has a mean of zero, a constant variance, and is serially uncorrelated. The sequence $\{u_t\}$ is a white-noise process if for each period t ,

$$\begin{aligned} E(u_t) &= E(u_{t-1}) = \dots = 0, \\ E(u_{2t}) &= E(u_{2t-1}) = \dots = \sigma^2, \\ E(u_t, u_{t-s}) &= E(u_{t-j}, u_{t-j-s}) = 0, \text{ for all } u. \end{aligned}$$

If the values of x_t are treated as given, as being uncorrelated with u_t , OLS would be consistent. However, if x_t is simultaneously determined with Y_t and $E(x_t u_t) = 0$, OLS would be inconsistent. As long as it can be assumed that the error term u_t is a white noise process, or more generally-is stationary and independent of x_t, x_{t-1}, \dots and Y_t, Y_{t-1}, \dots , the ARDL models can be estimated consistently by OLSs.

Table 2: ADF test

Variables	t-statistics		Critical value (5%)		P value		Order of integration
	At level	1 st difference	At level	1 st difference	At level	1 st difference	
FPI	-4.3174	-	-2.9389	-	0.0015	-	I (0)
SMR	-1.6226	-5.5266	-2.9389	-2.9411	0.4617	0.0000	I (1)
CPI	-4.6494	-	-2.9389	-	0.0006	-	I (0)

ADF: Augmented Dickey-Fuller, CPI: Consumer price index, FPI: Foreign portfolio investment, SMR: Stock market performance

We can invert the model as the lag polynomial in Y as:

$$Y_t = (1 + \alpha_1 + \alpha_2 + \dots)m + (1 + \alpha_{1L} + \alpha_{12L} + \dots)(\beta_0 x_t + \beta_1 x_{t-1} + u_t) \quad (2.7)$$

The current value of Y depends on the current and all previous values of x and u .

$$\frac{\partial Y_t}{\partial X_t} = \beta_0$$

This is referred as impact multiplier. The effect after one period is:

$$\frac{\partial Y_{t+1}}{\partial X_t} = \beta_1 + \alpha_1 \beta_0$$

The effect after two periods:

$$\frac{\partial Y_{t+2}}{\partial X_t} = \alpha_1 \beta_1 + \alpha_2 \beta_0$$

The long-run multiplier (long run effect) is $\beta_0 + \beta_1$ if $|\alpha_1| < 1$.

4. ESTIMATION AND RESULTS

ARDL model is estimated in our case, where the basic econometric model is as:

$$Y = \beta_0 + \beta_1 \sum_{i=1}^n Y_{t-i} + \gamma_1 \sum_{i=1}^n X_{t-i} + u_t \quad (2.8)$$

The estimation results show significant and strong relationship between FPI and the stock market performance (Table 3). This shows that the stock market performance can strongly alter the course of FPI. On the other hand CPI has significant negative impact of the FPI.

D1 is the dummy variable which is incorporated to capture the fluctuation in the variable due to exogenous shocks, like Asian Financial Crisis of 2008, and the Shanghai Composite Stock Exchange crash in 2015. The dummy is used to neutralize the impact of such exogenous events globally. R^2 and adjusted R^2 shows goodness of fit. F-statistic shows that estimated model is significant, that is, all the dependent variables are jointly significant. Durbin-Watson (DW) statistics shows that residuals are not correlated. However, it is evident that lag values of the variables are also reflected in the model therefore it may not be reliable to focus on DW test only. Thus, Breusch-Godfrey serial correlation LM test is used which shows that there is no evidence of autocorrelation in residuals.

The results of the Breusch-Godfrey serial correlation LM test gave the same result as given by the DW statistics, that there is no auto-correlation in the variables (Table 4).

Table 3: Estimation results

Variable	Coefficient	Standard error	t-statistics	P
CPI	-2.244021	0.705708	-3.179817	0.0033***
SMR	4.086033	1.902574	2.147634	0.0394**
D1	-6.641678	4.585809	-1.448311	0.1573
C	-1.662903	5.455787	-0.304796	0.7625
R^2	0.286684	Mean dependent variable		2.194763
Adjusted R^2	0.219811	SD dependent variable		10.41625
SE of regression	9.200496	Sum squared residual		2708.772
Log likelihood	-128.8550	Schwarz criterion		7.556778
F-statistic	4.286968	Hannan-Quinn criterion		7.442241
P(F-statistic)	0.011875	DW statistics		2.209306

DW: Durbin-Watson, SD: Standard deviation, SE: Standard error, *** $p < 0.001$, ** $p < 0.01$

Table 4: Breusch-Godfrey serial correlation LM test

F-statistic	0.770430	P F (2,30)	0.4718
Obs*R ²	1.758701	P Chi-square (2)	0.4151

Table 5: Heteroscedasticity test: ARCH

F-statistic	3.425649	P F (1,33)	0.0732
Obs*R ²	3.291574	P Chi-square (1)	0.0696

ARCH: Autoregressive conditionally heteroskedasticity

Table 6: Chow breakpoint test: 2008Q3 2009Q3 2013Q1

Null hypothesis: No breaks at specified breakpoints			
Equation sample: 2007Q1, 2015Q4			
F-statistic	8.841430	P F (12,20)	0.0000
Log likelihood ratio	66.28754	P Chi-square (12)	0.0000
Wald statistic	106.0972	P Chi-square (12)	0.0000

Autoregressive conditionally heteroskedasticity test shows that there is no sign of heteroskedasticity. Error term of the regression is homoscedastic (Table 5). So we can say the error is identically, and independently distributed.

Table 6 is chow breakpoint test, where the breakpoint is tested for the time of 2008Q3, 2009Q3, and 2013Q1. The results confirm the break in the series, which shows that there occurred some external event that altered the course of the variables under consideration.

5. CONCLUSION AND RECOMMENDATIONS

The description of the data, lead to the examination of the stationary of the variables, and after the confirmation of the

stationary of different levels, ARDL model is used to estimate the impact of stock market performance on the FPI in China. For the purpose, the quarterly data from 2007Q1 to 2015Q4 is used. The estimation results confirmed that there is significant positive impact of stock market performance on FPI in China, while there is a negative relation found between FPI and the CPI.

As China is in the phase of transformation, foreign investment is very important for the achievement and persistence of higher growths in China. The present study shows that stock market performance has its impact on FPI, so the stock market should be regulated and the abrupt fluctuation in the stock market should be controlled.

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