

# Influence of Intellectual Capital on Foreign Portfolio Investments in Indian Pharmaceutical Industry

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## **Abstract**

International capital flow is considered to be one of the prominent determinants of International business operation. Knowledge economy is characterized by a new genre of industries, which use knowledge as a prominent resource. The intellectual assets may influence international business operations in knowledge-based industries. Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) are the prominent avenues of international investments. While decision regarding Foreign Direct Investment is influenced by macro-economic factors like ownership, location and internationalization, Foreign Portfolio Investments decision is influenced by industry specific and firm specific factors, primarily the expected returns on investment and risk diversification. But the investments in knowledge-based industries may be driven by the quality and worth of intellectual capital. There are many studies to prove this postulate from the perspective of foreign direct investment. But, studies are not abundant from the perspective of Foreign Portfolio Investments. Therefore the present study is undertaken to analyze the relationship between 'intellectual capital' and 'international finance capital' from the foreign portfolio Investments perspective. As the pharmaceutical industry of India is a successful model for thriving on its intellectual capital, the study proposes to test the above postulate in this industry.

## **Keywords:**

Intellectual Capital; Foreign Portfolio Investments; Indian Pharmaceutical Industry

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## **Introduction**

International business is understood as commercial activity, which transcends borders. In the era of globalization, the distinction between domestic business and international business has become insignificant. International investments are the key drivers of International Business operations. Foreign Direct Investments (FDI) and Foreign Portfolio Investments (FPI) are the prominent forms of international investments. While Foreign Direct Investments, which result in launch of new enterprises are or re-organization of the existing

enterprises, Foreign Portfolio Investments provide short-term capital to the domestic enterprises. Further, by attracting Foreign Portfolio Investments, domestic enterprises do not subject themselves under the control of foreign investors but rather use the opportunity to finance their short-term requirements. Similarly, while Foreign Direct Investments are influenced by many macro-economic factors, Foreign Portfolio Investments are influenced by firm / industry specific advantages. Significant component of Foreign Portfolio Investments take the form of Foreign Institutional Investments (FII).

International business operations in knowledge economy may be influenced by the competitive advantage of the nation or the industry or the firm. Accordingly, the intellectual capital of the firm/industry may attract international capital investments in knowledge-based industries. Though there are many studies to support this postulate from FDI perspective, studies from FPI perspective is a rarity. Therefore we have undertaken the present study to analyze the relationship between intellectual capital of the firm / industry and Foreign Portfolio Investments in the firm / industry. Further the present study also undertakes to gauge the impact of intellectual capital on Foreign Portfolio Investments in knowledge-based industries.

### **Intellectual Capital**

There is no generally accepted definition of intellectual capital. However, many have offered views that provide a general concept. Stewart (1997) has given one of the most succinct definitions of intellectual capital as 'packaged useful knowledge'. He explains that this includes an organization's processes, technologies, patents, employees' skills, and information about customers, suppliers, and stakeholders. Various other definitions use concepts such as ability, skill, expertise, and other forms of knowledge that are useful in organizations. According to Brooking (1996), 'Intellectual Capital is the term given to the combined intangible assets which enable the company to function'. Petty and Guthrie (2000) observed 'Intellectual Capital is instrumental in the determination of enterprise value and national economic performance'.

### **Components of Intellectual Capital**

The classification of different components of intellectual capital is helpful to assess the key component that drives the intellectual capital. According to Edvinsson and Malone (1997), intellectual capital takes three basic forms: human capital, structural capital, and customer capital.

Human capital includes knowledge, skills, and abilities of employees. Human capital is an organization's combined human capability for solving business problems. Human capital is inherent in people and cannot be owned by

organizations. Human capital also encompasses how effectively an organization uses its people resources as measured by creativity and innovation.

Structural capital is everything in an organization that supports employees (human capital) in their work. Structural capital is the supportive infrastructure that enables human capital to function. Structural capital includes such traditional things as buildings, hardware, software, processes, patents, and trademarks. In addition, structural capital includes such things as the organization's image, organization, information system, and proprietary databases. Because of its diverse components, they classify structural capital further into organizational, process and innovation capital.

Organizational capital includes the organization philosophy and systems for leveraging the organization's capability. Process capital includes the techniques, procedures, and programs that implement and enhance the delivery of goods and services. Innovation capital includes intellectual properties and intangible assets. Intellectual properties are protected commercial rights such as patents, copyrights and trademarks. Intangible assets are all of the other talents and theory by which an organization is run.

Customer capital is the strength and loyalty of customer relations. Customer satisfaction, repeat business, financial well-being and price sensitivity may be used as indicators of customer capital. The notion that customer capital is separate from human and structural capital indicates its central importance to an organization's worth. The relationship with customers is distinct from other relationship either within or outside an organization.

Brooking (1996) suggests that intellectual capital is comprised of four types of assets: (i) market assets, (ii) intellectual property assets, (iii) human-centered assets and (iv) infrastructure assets. Market assets consist of such things as brands, customers, distribution channels, and business collaborations. Intellectual property assets include patents, copyrights, and trade secrets. Human-centered assets include education and work-related knowledge and competencies. Infrastructure assets include management processes, information technology systems, networking, and financial systems.

### **Objectives of the study**

The main objectives of this study are to:

- Analyze the international business operations of the Indian pharmaceutical industry;
- Highlight the role of intellectual capital in the Foreign Institutional Investment inflows of the Indian pharmaceutical industry;

- Establish a conjecture that intellectual capital influences significantly the international portfolio capital investments of knowledge based industries.

### **Pharmaceutical Industry as Knowledge-Based Industry**

Worldwide, Pharmaceuticals is one of the most intense 'Knowledge Driven' industries, which is continually in a state of dynamic transition. The process of invention of a drug is elaborate, requiring on an average 8-10 years, at a cost of US\$ 300 million, for a new drug to reach the market. The huge investment made in 'learning', 'knowledge generation' and its transformation to 'value added knowledge' necessitates protection of these investments, which take the form of assets, like patents, trademarks, designs and copyrights. Globally, these tools of Intellectual Property Rights (IPRs) are key components of strategy formulation and implementation by Pharmaceutical Corporations. As protected Intellectual Capital preserve exclusive markets, maintain profit margins, provide market access and give freedom to operate. Intellectual Capital has now become an effective platform for benchmarking of innovative capabilities of corporations, business entrepreneurs and researchers. This is extensively being used in the world of mergers, acquisitions, strategic alliances, and collaborations, licensing arrangements and venture capital funding in pharmaceutical and allied industries.

### **An overview of the Indian Pharmaceutical industry**

The Indian pharmaceutical industry was mostly dependent on imports until the early 1970s. During the early 1970s, the government put into place a series of policies aimed at breaking away India's dependence on the Multinational Corporations for the production of bulk drugs and formulations and moving the country towards self-sufficiency in medicines. The introduction of the Patent act 1970 was perhaps the single most significant policy initiative taken by the government that laid the foundation of the modern pharmaceutical industry. This Act did not allow product patents on medicines, agricultural products and atomic energy. For these only process patents could be registered. This Act enabled Indian companies to develop skills in reverse engineering and to produce alternate processes for drugs. Exempt from paying for licenses and royalties, Indian companies could now access the newest molecules from all over the world and reformulate them for sale in the domestic market. As a result, after 1970, many new drug firms were set up. These companies developed R&D base, which was later, leveraged by them to move up the R&D value chain. By the mid 1980s, India had emerged as a major pharmaceutical producer and the indigenous sector had captured a substantial proportion of the market. The pharmaceutical industry in India is highly fragmented both in terms of number of manufacturers, with over 23,000

licensed units and a range of over 100,000 drugs. The pharmaceutical industry can be broadly divided into organized and unorganized sectors. There are around 300 manufacturing and formulation units in the organized sector and it accounts for 70 percent of the total sales of the industry. Around 100 players in the organized sector, account for about 90 percent of the total turnover of the industry. The market is concentrated at the top with the top 30 players controlling about 70 percent of the market share. Moreover, the growth rate of the top 30 players is around 18 percent per annum as compared with the industry growth rate of about 15 percent. Currently, the Indian pharmaceutical industry is one of the world's largest and most developed, ranking fourth in terms of volume, with 8 % of global production, and thirteenth in terms of value, accounting for 2 % of the global market share. Most of the domestic pharmaceutical drug requirements are met by the domestic industry. Apart from being self-sufficient, the industry is emerging as one of the major contributors to Indian exports.

### **The International Business orientation of the Indian Pharmaceutical Industry**

India exports full basket of pharmaceutical products comprising intermediates, APIs, Finished Dosage Combinations (FDCs), biopharmaceuticals, vaccines, clinical services, etc., to various parts of the world. The country has achieved the distinction of providing healthcare at very low cost while maintaining profitability. The export performance of Indian pharmaceutical industry has been commendable, the trade balance being positive throughout the years. India's exports of drugs, pharmaceutical and fine chemicals grew by 27% for the year 2012. Ministry of Commerce has proposed an ambitious strategy plan to double pharmaceutical exports from USD 10.4 billion in 2009-10 to USD 25 billion by 2013-14. The pharmaceutical sector has been attracting sizable FDI, since the last two decades. During 2001-10, this industry has attracted of 1.83% total FDI. Though this figure seems to be negligible when compared with overall FDI, the large-scale takeovers of the domestic pharmaceutical companies by the foreign enterprises during the last five years, as evidenced from sharp increase in control of industry by the foreign enterprises from 10% to 15%, has caused jitters among the stakeholders, prompting the Government of India to think about curbing the FDI limits.

Notwithstanding the above, Indian pharmaceutical industry continues to attract a steady stream of FII during the same period. Such investments are probably an outcome of the intellectual capability of the industry to look beyond exports, into further horizons of international business. The areas of Contract Manufacturing, Clinical Trials, and Patent Challenges emerge as the new evolving forms of

international business. The global market for contract manufacturing of prescription drugs is estimated to increase from a value of \$26.2 billion to \$43.9 billion. India and China could potentially account for 35 percent to 40 percent of the outsourced market share for active pharmaceutical ingredients, finished dosage formulations and intermediates. Costs of clinical trials in India are around one-tenth of their levels in the U.S. and it is estimated that it could be worth US\$300 million to India according to 2010 estimates. The world market for natural products is estimated at US\$62 billion and is exhibiting double-digit growth rate. Since there has been a great deal of interest in alternate remedies, the opportunities in biopharmaceuticals will be the major attraction in the next decade.

### **Foreign Institutional Investment in Indian Pharmaceutical Industry**

As of December, 2013, US dollar 61.81 billion was invested in Indian stock market. Pharmaceuticals industry has attracted 5.83 percent of total foreign investment in equity, during 2000 - 2013. Pharmaceuticals continue to be the third preferred manufacturing industry, after telecommunications and computer software and hardware. The foreign investment policy allows a company in a sector where 49 percent Foreign Direct Investment (FDI) is allowed through approval route to obtain permission for another 49 percent through Foreign Institutional Investment (FII) route, thus effectively 98 percent foreign control was permitted. In this backdrop, this sector witnessed a spate of acquisitions and takeovers, from November 2011 to July 2013. In this sector alone, 74 proposals were approved by Foreign Investment Promotion Board (FIPB). This pace of brown field foreign investments, in the Indian pharmaceutical industry, caused alarm about the affordability of healthcare. In order to address this concern, the Department of Industrial Policy and Promotion (DIPP), has suggested for taking permission from the FIPB for foreign institutional investment beyond 24 percent in the listed pharmaceutical companies. These developments have kindled a research interest to explore the determinants of foreign institutional investment in Indian pharmaceutical industry.

### **The Intellectual Capital of Indian Pharmaceutical Industry**

The success story of Indian pharmaceutical industry is an exhibit of the significance of its Intellectual Capital (Stewart, 1997). Undisputedly the different international business orientations of Indian pharmaceutical industry, ranging from Exports to Patent Challenges, lies in its intellectual capital. The sophisticated chemistry capabilities, lateral thinking abilities in developing non-infringing processes, disciplined approach to adhere to any stringent guidelines, dedication for manufacturing excellence, etc., make India as a most favorite destination to

source or outsource various components of value chain. Thus the Intellectual Capital of Indian pharmaceutical industry is manifest in its significant advantage of low cost of innovation, low capital requirements and lower costs in running facilities, well established manufacturing processes, R&D infrastructure. With the Government of India recognizing Pharmaceutical sector as an intellectual industry, the area of Intellectual Capital is gaining importance and will play a key role in the success of the Indian pharmaceutical industry. Further, the Intellectual Capital of the industry continues to attract Foreign Direct Investments and Foreign Portfolio Investments.

### **Factors contributing to International Portfolio Capital inflows – A Review of past studies**

The basic premise of the theory of foreign portfolio investment is that such investments are based on a two-step decision - the choice of the country cum currency and the choice of the firm in which the portfolio investment is made. Guided by considerations of earning higher expected profits and lowering the risks, the FIIs go in for international portfolio diversification. In taking the first step of their decision process, country risks and the currency risks are taken into account. Having done that, the FIIs have to choose the firms in which to invest. This is the second step of the decision making process. So, at macro level, foreign portfolio investments are mainly driven by the returns on investments, as reflected in the capital markets and diversification of risks. At the micro level, the international investments in capital market place a value to the efficient allocation of the financial resources to the Physical Capital and Intellectual Capital of a firm. Higher returns on investments in a firm's / industries financial stock reflect on the allocation of the financial resources to gain or secure the competitive advantage that a firm / industry possesses. The competitive advantage of a firm may be derived from its Technological capabilities, Marketing capabilities, Advertising capabilities, Human Capabilities & its Tangible assets. Further, the reported Profit is explicit information that would attract investments in stock markets. These capabilities are collectively called as 'firm-specific factors' and are likely to have a pervasive influence on inward foreign investments. Garg & Dua (2014) have analyzed the principal determinants of FII and ADR/GDR flows into India. They found that performance of the stock market, exchange rate and domestic output growth are major determinants. Further merging market equity performance, interest rate differential and volatility in exchange rates are found the important determinants of foreign portfolio investments. Kaur & Dhillon (2010) have examined the causes for foreign institutional investment in India. They found that stock market returns have positive and significant impact on FII. The market capitalization and market turnover have positive and significant influence on FII. Thus

the study concludes that the risk and return characteristics are relevant for short run investments. Pandit & Siddharthan (2007) have analyzed the firm specific factors that determine FII in India. They state that foreign portfolio investment decision is guided by two steps, first analyzing the country and its currency risks and second the firm in which the investment is to be made. The study found that the technological change, advertisement expenses and international exposure to be the important factors in choice of firms. They found that technological capabilities of a firm to be a significant determinant of foreign portfolio investment.

From the above studies, it is found that variables like technological capabilities, brand building, international orientation and profitability are the major factors that influence foreign portfolio investments in Indian firms. Since this study is mainly focused on intellectual capital, the following factors are assumed to be the major determinants of foreign portfolio investments.

### **Technological capabilities**

Pharmaceutical industry is one of the most research-intensive industries. As a classic science-based industry, pharmaceuticals depend heavily on high-level manpower and substantial R&D for new products and growth. R&D generates not only innovations but also allows firms to better assimilate external technological knowledge. Indian firms are not innovators but they need to perform R&D to absorb foreign technologies. The need to perform R&D for assimilating foreign technologies in this sector is clear from the fact that the pharmaceutical industry in India also is the most research-intensive industry having the highest R&D-sales ratio.

### **Human capabilities**

As mentioned earlier, Human capital or the skilled manpower has been one of the attractive features of Indian pharmaceutical industry. Large pool of scientists, with lateral thinking abilities, and the expertise developed during the last three decades in deciphering the process of drug making, has given a distinct advantage to the industry. The emerging opportunities in the area of Research Collaborations, Contract Manufacturing and Clinical Trials indicate the quality of the human capital of the industry.

### **Marketing capabilities and Advertising capabilities**

The promotional practice of pharmaceutical companies is another important factor affecting this industry. When a pharmaceutical company develops a new drug it gives the drug two names. The first one is its generic name, which represents the chemical structure or chemical form of the drug. The generic name of the drug never changes. The second name given to the drug is its brand name. The use of

brand name confers a considerable scope of product differentiation between a brand name and its generics. Brand-generic differentiation encourages firms to spend heavily on brand promotion. Generic companies also spend some funds on marketing but such expenses for originator (branded) products are much higher than for generic products. Product differentiation is not always between a brand and its generics only, but it is between different brands of the same product also. At any time there may be different brands of the same product in the market. Companies may vary an existing molecule through molecular restructuring and introduce their own brands of the similar product. However the different brands attract promotional campaign by the firms. The industry is thus characterized by product differentiation at two different levels: brand-brand differentiation and brand-generic differentiation.

### **Tangible Assets**

Tangible assets represent primarily the plant, property and equipments. The better the management of tangible assets, the higher would be the sales. Therefore a firm acquires competitive advantage in terms of enhanced productive capacity, if investments in tangible assets are better.

### **Profits**

Profits are explicit information that attracts investments in stock markets. Since, the profitability of a firm /industry is key factor that an investor would look for. Therefore in this study the profitability of the firms has been included as one of the factors that would influence Foreign Institutional Investments.

Of the above-mentioned factors, R&D capabilities, Advertising & Marketing capabilities and Human capabilities correspond to intellectual capital. Therefore expenditures related to these activities are assumed as investments leading to Knowledge Assets, like Patents & Trade Marks. We have therefore analyzed these 'firm specific factors' for our present study in an attempt to understand the impact of these factors, on the attractiveness of FII in Indian Pharmaceutical industry. We thus expect the following factors to influence the FII inflow of firms:

***Foreign Institutional Investments = f (R&D capabilities, Advertising & Marketing capabilities, Human Capital, Tangible Assets, Profits).***

### **Source of Data and Period of study**

The Pharmaceutical industry can be broadly divided into organized and unorganized sectors. There are around 300 manufacturing and formulation units in the organized sector and it accounts for 70 percent of the total sales of the industry. Around 100 players in the organized sector, account for about 90 percent of the total industry turnover. The CMIE Health Care Index has been chosen for this study,

since it includes the 126 companies, which represent 90 percent turnover of the industry. We analyzed the sample for a period of 10 years from 2002 to 2013, as this period witnessed large-scale inflows of FDI and FII.

### Methodology

We constructed the following Ordinary Least Square (OLS) model, employing Pooling of Time Series and Cross-Section (PTSCS) technique to analyze the impact of the 'firm specific factors' on the attractiveness of FII of the sample pharmaceutical firms. The variables are expressed in terms of percentages in order to mitigate the econometric problem of heteroscedasticity, due to different sizes of sample companies. The variable when expressed as a percentage of sales gives us a popular ratio used in the studies related to R&D and intellectual capital, namely 'Intensity' i.e. the ratio of expenses (investments) relative to sales.

$$FIIPTPI_{it} = f(RDPS_{it}, ADMAPS_{it}, HCPS_{it}, TAPS_{it}, PPS_{it})$$

Where,

$FIIPTPI_{it}$  refers to FII as a percentage of Total Portfolio Investments in a firm  $i$  in year  $t$ ;

$RDPS_{it}$  refers to total R&D spending (investment) as a percentage of Sales of a firm  $i$  in year  $t$ ;

$ADMAPS_{it}$  refers to Advertising and Marketing expenditure (investment) as a percentage of Sales of a firm  $i$  in year  $t$ ; and

$HCPS_{it}$  refers to expenditure on Human Resources (investment) as a percentage of Sales of a firm  $i$  in year  $t$ ; and

$TAPS_{it}$  refers to value of Tangible Assets as a percentage of Sales of a firm  $i$  in year  $t$ ; and

$PPS_{it}$  refers to Profits as a percentage of Sales of a firm  $i$  in year  $t$ .

It may be observed that this study uses publicly available data, and the accounting treatment of expenditures items are assumed as investments. The study also has an implicit objective to learn whether foreign institutional investors analyze the information on items related to intellectual capital.

### Empirical evidence:

Table-I - Results of Correlation Matrix

		FIIPTI	RDPS	ADMAP	HCPS	TAPS	PPS
FIIPTPI	Pearson Correlation	1	.091(**)	.099(**)	-.018	-.026	.026
	Sig. (2-tailed)		.001	.001	.531	.364	.359
	N	1217	1217	1217	1217	1217	1215
RDPS	Pearson Correlation	.091(**)	1	.037	.003	.016	.006
	Sig. (2-tailed)	.001		.192	.913	.584	.828
	N	1217	1217	1217	1217	1217	1215
ADMAPS	Pearson Correlation	.099(**)	.037	1	-.012	-.021	-.007
	Sig. (2-tailed)	.001	.192		.681	.467	.802
	N	1217	1217	1217	1217	1217	1215
HCPS	Pearson Correlation	-.018	.003	-.012	1	.967(**)	.002
	Sig. (2-tailed)	.531	.913	.681		.000	.948
	N	1217	1217	1217	1217	1217	1215

TAPS	Pearson Correlation	-.026	.016	-.021	.967(**)	1	.002
	Sig. (2-tailed)	.364	.584	.467	.000		.943
	N	1217	1217	1217	1217	1217	1215
PPS	Pearson Correlation	.026	.006	-.007	.002	.002	1
	Sig. (2-tailed)	.359	.828	.802	.948	.943	
	N	1215	1215	1215	1215	1215	1215

\*\* Correlation is significant at the 0.01 level (2-tailed).

As a first step, we have run a Correlation for the data, to test the existence of multi-collinearity. The results of the Correlation Matrix as given in Table I, suggest that the variables chosen for the study are independent in nature and

are free from multi-collinearity. The Correlation Matrix also indicates that there is positive relationship between FII and two important factors corresponding to Intellectual Capital, i.e., R&D and Advertising & Marketing capabilities.

**Table- II - Results of the OLS Model:  
Dependent Variable: FIIPTPI**

Independent Variable	Coefficients
RDPS	<b>3.435*</b> (3.081)
ADMAPS	<b>9.053*</b> (3.334)
HCPS	<b>0.259</b> (1.034)
TAPS	<b>-0.056</b> (-1.226)
PPS	<b>0.042</b> (0.933)
Intercept	<b>2.530*</b> (11.911)
<b>Adjusted R sq.</b>	<b>0.16</b>

\* Statistical significance at 0.05% level

The results of the OLS model specified for 'gauging the impact of the intellectual capital on the foreign portfolio investments in Indian pharmaceutical industry' specified for this study is presented in Table II. From the table it is ascertained that the investments made in Research & Development as percentage of Sales (RDPS) and

Advertising & Marketing as a percentage of Sales (ADMAPS), are significantly and positively influencing the inflow of Foreign Institutional Investments as a percentage of Total Portfolio Investments (FIIPTPI) in the sample companies, during the study period. The co-efficient of RDPS indicates that when one unit is invested in Research &

Development relative to Sales, the FII relative to total portfolio investments increases by 3.45 units. The co-efficient of ADMAPS indicates that when one unit is invested in Advertising and Marketing relative to Sales, the FII relative to total portfolio investments increases by 9 units. However, the co-efficient of the expenditure on Human Resources relative to Sales and Profits relative to Sales indicate a positive impact, but the influence is not statistically significant. On the other hand, the Tangible Assets relative to Sales influence the inflow of FII is negative and the influence is not statistically significant.

From the above results it may be seen that among the variables that significantly and positively influence the inflow of Foreign Institutional Investment are the R&D capabilities and Advertising and Marketing capabilities, which correspond to Intellectual Capital. This study is in conformity with the findings of Pandit and Siddharthan, (2007) for technological capabilities measured in terms royalty payments, but contradicts in terms of Advertisement. Notwithstanding the fact that OLS model is not statistically fit, the results strengthen our postulate that *Intellectual Capital of Indian Pharmaceutical industry significantly attracts International Portfolio Capital*.

#### **Conclusion:**

Worldwide, Pharmaceuticals is one of the most intense 'Knowledge Driven' industries, which is continually in a state of dynamic transition. The success story of Indian pharmaceutical industry is an exhibit of the significance of its intellectual capital (Stewart, 1997). The intellectual capital of Indian pharmaceutical industry is manifest in its significant advantage of low cost of innovation, low capital requirements and lower costs in running facilities, well established manufacturing processes, R&D infrastructure. The sophisticated chemistry capabilities, lateral thinking abilities in developing non-infringing processes, disciplined approach to adhere to any stringent guidelines, dedication for manufacturing excellence, etc., make India as a most favorite destination to source or outsource various components of value chain. Further, the industry has attracted significant foreign investments through Foreign Direct Investments. However, large-scale acquisition has forced the Government to look closely into their FDI policy. Our study has demonstrated that intellectual capital is a significant attraction of Foreign Portfolio investments, which provide short-term capital to the industry. If, the quality of Intellectual Capital could be further enhanced, the Foreign Portfolio Investments may stay for a comparatively longer period. Our study is a pointer to this direction.

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