

FOREIGN INVESTMENT AND ENVIRONMENTAL, SOCIAL AND GOVERNANCE PRACTICES IN INDIA

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Abstract: The role of Environmental, Social and Governance (ESG) Practices in protecting the interests of investors has been recognised more than ever before, especially after the world wide corporate financial failures like World com, Enron, Tyco, Parmalat and Satyam Computers. Good ESG practices are necessary for the integrity of corporations, financial institutions, and markets; and contribute to the growth and stability of the economy. During the last 10 to 12 years, India has made significant reforms in the area of ESG practices. Therefore, it is very important to see, what has been the impact of stringent ESG practices followed by Indian Corporates on the inflow of foreign capital in India. The present paper attempts to gauge this relationship between ESG INDEX and the foreign investment in Indian industry. The data source is ESG India Index by National Stock Exchange of India for the years 2005 to 2013. The dependent variable is Foreign Institutional Investment (FII) in Indian companies. The data includes both, investment in debt portfolios and equity portfolios. The explanatory variables are: ESG Index(ESG_INDEX), Nifty 50 (NIFTY_50), P/E Ratio (P_E), Price to Book Value Ratio (P_B), Yield(YIELD), Index of Industrial Production (IIP), and Real Effective Exchange Rate(REER), Interest Ratio(INTREST_RATIO) and Stock Market Capitalization(SMCAP) of top50 companies by market capitalization at the National Stock Exchange. The stepwise regression analysis shows positive significant relationship between DEToI and ESG and D (P_B) and ETYoI with ESG and P_E and DREER. Thus, the study shows that the ESG, DP_B or P_E ratio and DREER have determined the inflow of foreign capital in India during the period under consideration.

Key Words: Foreign Institutional Investment, India, Corporate Governance, Portfolio, Returns, Risk.

Introduction: These days it is obligatory for all companies listed on the main stock exchanges in the world to make the disclosure of financial information. This information generally provides a good overview of the financial performance of the companies. However, a company's sustainability depends on the operational and financial stability and this information is not sufficient to make a decision about the company's sustainability. Even the companies making good returns and having low level of debt may be subject to risks from factors like environment, social and governance.(ESG criteria). For example, companies which do not incorporate human rights in their corporate culture, can have less productivity and more chances of strikes, which can bring additional risks to investors. Likewise, a company may have problems, if it does not follow strict environmental and governance practices.

Due to rising concern among investors, about the ESG issues, many companies have started giving information about their ESG related indicators in the form of additions to their annual reports, social reports, special sections on websites and press releases, etc. It is easy for investors to evaluate companies' risks through this information and find ways to mitigate them. In this paper, an attempt has been made to see the relationship between the inflow of foreign investment and the ESG INDEX.

ESG INDIA INDEX was launched by Standard and Poors in 2005 to measure companies' environmental, social and governance responsibility. This index

comprises of 50 companies whose business strategies and performance demonstrate a high level of commitment to meeting environmental, social and governance standards. These 50 companies are drawn from top 500 companies by market capitalization, listed on the National Stock Exchange, which are subjected to a screening process and yield a score based on company's ESG disclosure related practices in the public domain. This INDEX promises investors that the portfolio of these 50 companies are consciously balancing the interest of all stakeholders, and thereby, create a platform for strong long term performance.

All Investors, domestic or foreign, primarily take into account two factors to make their investment decisions- the rate of return on investment and the risk associated with the investment. Over the last few years, the attractiveness of developing countries as a destination for foreign investment has increased, mainly because of the possibility of making good returns and secondly, because of the decreasing attractiveness of developed countries as a destination for foreign investment. The possibility of making good returns, by itself, can not attract large amount of foreign investment. The associated risk is equally important in the investment decisions. Good environmental, social and governance practices reduce this risk by transparency, accountability and enforceability of ESG standards.

The foreign investment helps the countries and the companies to enhance their liquidity and reduce the

cost of capital and compete with other countries and companies strongly, though the foreign portfolio flows are considered to be fickle, not associating much with economic fundamentals. During the recent past, ESG practices have become the subject of interest to the foreign direct investors and portfolio investors. Even the host countries seeking access to the foreign capital find it important to maintain their companies' ESG standards.

Availability of foreign capital depends on many factors which are specific to the companies and also related to the economic development of the country. ESG standards can impact the companies' financial performance and strategic positioning. On the other hand, the chronic or multiple ESG problems could signal management issues. As such, a typical foreign investor looks forward to maximize financial returns subject to specific risk tolerances. He does not have in mind a specific social agenda. However, this orientation is changing and investors are increasingly realizing that ESG factors can be a business risk for companies operations in the short as well as medium to long run. Therefore, companies have to maintain positive and constructive relations with important non-financial stakeholders like employees, customers, communities and the government to maximize sustainable competitive advantage and minimize operational risks.

One can objectively measure certain factors which can be taken as evidence to measure companies' ESG performance. The ESG INDIA Index takes into account 127 corporate governance indicators to identify mainly shareholders rights, audit process, financial and operational indicators, board and management profile, ownership structure and business ethics. It considers 70 environmental and social indicators to identify environment, employees, community and customers related standards. The composite ESG score incorporates 50% Governance (G) score and 50% Environment and Social (ES) score. The companies are ranked in descending order of ESG scores and 50 highest scoring companies are selected each year, provided they have traded a minimum of Rs. 20 billion in the last 12 months. The weight of the company in the index is a product of its float adjusted market capitalization and its score adjusted weight factor score.

Literature Review: Many researchers have proved that the economic growth of a country is the main factor that attracts foreign investment in India. It is only after the Asian Financial Crisis that the importance of corporate governance as a factor important to attract foreign investment has been considered because corporate governance failure has been the main cause of Asian Financial Crisis. Stringent ESG practices have been followed in almost

all the countries around the globe. In India also Amendments have been brought in clause 49 of the Companies act 2013. The companies have to constantly demonstrate their intent and conduct for the better to remain relevant.

Sinha (2012) shows that of 279 firms in the sample, category 3 firms, which scored 55 or more in corporate governance, had more stable gross profit margin. Their return on capital employed was also higher and debt equity ratio lower. He also showed that CG score and firms' value are positively related. Category 3 firms also command higher market valuation.

Goyal et.al.(2014), show that ESG stock portfolio is highly correlated to blue chip and market portfolios in Indian stock market. They show that ESG stock portfolio generated higher return than the blue chip and market portfolio. Using sharpe ratio and Treynor and Jensen ratio, they show that ESG stock portfolio is most aggressive portfolio as it has higher systematic risk than the other two portfolios.

Bhandari et, al. (2013) prove that the investor community is not interested in investing in companies with high asset base but in those which are able to churn the assets efficiently. Companies performing corporate social responsibility activities have been repaid off with the augmentation in their performance measures. The event study methodology reveals that the investors' community had appreciated the adoption of clause 49 and that's why there were abnormal returns on announcement.

Banergee et.al- In their paper they prove that the corporate governance is a risk that neither the investors nor the government or regulations can ignore. The hypothesis that firms with better corporate governance practices receive better market valuations. They use corporate governance from ESG India index as proxy for firm level governance quality return on net worth, return on capital, profitability ratio and interest coverage ratio and Tobin's Q as measure of firm level performance. They also use regression analysis to test the nature of relationship between governance score and market value as measured by Tobin's Q. The results show a positive and significant relationship between the corporate governance score and firm level performance. Better governed firms not only command a higher market valuation but are also less leveraged and have higher interest coverage ratio. They also provide a higher return on net worth and capital employed, and their profit margins are relatively more stable. Finally, their price earnings ratio and yield are also higher in comparison to the firms whose corporate governance score is lower.

Gorden et.al(2003) This paper analyzes the determinants of FII Equity flows into India by taking domestic, regional and global factors in the model.

The regression results show that a combination of global, regional and domestic macroeconomic factors are important in determining FII flows to India. The principal global factor to be significant is the London interbank offered rate (LIBOR), which is negatively associated with FII flows in the regressions. The domestic variables of significance include the return on domestic stocks, rating downgrades and exchange rate depreciation. Among the regional variables, the paper includes the return on the Morgan Stanley Capital International (MSCI) index and a dummy for currency crisis in major emerging markets and industrial production growth in emerging markets. The results show that the emerging market stocks positively influence the FII flows to India.

Aggarwal et.al. (2008). This paper examines the investment allocation choices of US mutual funds in emerging market equities after the market crises of the 1990's. An analysis is made of country and firm level disclosure and institutional policies that influence mutual funds's allocation choices relative to major stock market indices. The paper takes US mutual funds holdings of 2002 as dependent variable. The sample consists of funds which are primarily equity funds with more than 90% of investments in equities. It consists of 74 diversified emerging funds, 25 Asia Japan Funds and 15 Latin American Funds. The Percentage Relative Spread method is used that measures the over and under investment of funds by calculating the difference between the firms' allocated weight and the MSCI Index Weight for each country. The macroeconomic control variables include log GDP per capita, market capitalization as a percentage of GDP, market returns and market turnover. A dummy is used to capture exchange rate float. To investigate the impact of country level investor protection policies, the paper uses three measures of corporate governance: legality, shareholders rights and accounting quality. The regression analyses shows that the shareholder rights and accounting quality are positively and significantly related to foreign investment after controlling for other country level attributes. The interaction of shareholders rights and accounting quality is negative and significant indicating that high quality accounting and disclosure practices matter more in countries with weak shareholder protection. The interaction of legality and accounting quality is positive and significant. In the firm -level analysis, the variables included are firm size, measured by natural log of total assets, the stock return for 12 month period, dividend yield leverage, defined by total debt/ total capital and performance, measured alternatively as return on equity and price to book ratio and Analysts reported by I/B/E/S. It also includes ADR listing as proxy for disclosure quality and firm level accounting quality. The regression

analysis shows that firm size and analysts are the strongest determinants of US funds' investment decisions. In the second equation, the results show that ADR and firm accounting quality also are positive and significant after controlling for other firm level characteristics and country fixed effects.

Brahambhatt and Srivastava - This paper studies the compliance of banking sector in India with respect to corporate governance guidelines followed by private and public sector banks. A survey of investors and financial advisors was done. Corporate governance card was prepared on the basis of seventeen parameters including board committee, disclosure and transparency, compliance of corporate governance and auditors certificate and disclosure of stakeholders interests. Score card and Microsoft Excel have been used to analyze and interpret data. Descriptive statistics and comparative score card have been employed for data analysis, findings and analysis. The study shows that the major mandatory clauses have been met with but non mandatory parameters are not integrated into the corporate system or not disclosed. The score card shows different levels of adherence to the corporate governance norms by banks and therefore they rank on differently average score. Study includes only banks listed on stock exchanges in India and does not include MNC banks and banks not listed on the Indian Stock Exchanges.

Pant and Patnayak (2010)- This paper analyses the impact of corporate governance mechanisms like ownership type and concentration group affiliation capital structure and product market competition and productivity. Using the panel data of more than 1833 firms for the period 2000-01 to 2003-04 the study finds that ownership has a positive impact on productivity. It concludes that the higher amount of insider stake in Indian firms enhances firm's efficiency and productivity which is beneficial for the whole economy. The paper also evidences that countries with weak legal enforcement can have better firms performance with moderate concentrated ownership. However it finds out firms with higher amount of insider stake are more productive only when competition in firm's product market is intense. A negative correlation exists between debt intensity and productivity. The study shows domestic financial institutions do not play a significant role in improving firm productivity. On the other hand corporate shareholding and foreign institutional investors' shareholding results in higher firm productivity.

Ukessays. Com- This study attempts to construct corporate governance score and establish relationship between corporate governance score and firm performance and also between institutional holdings

and corporate governance and institutional holdings and firm performance.

The data source is proven database for the period 2004-2008. Simple linear regression analysis has been used to investigate the relationship between different variables. The corporate governance score has been developed on the basis of key characteristics of standard and poor's transparency and disclosure benchmarks which are evaluated by from the annual reports of sample companies for ninety eight attributes divided into three categories. One ownership structure and investor rights (28 attributes) two financial transparency and information disclosures (35 attributes) three, board and management structure and process (35 attributes).

The major findings of the study on the relationship between institutional holdings and corporate governance score show that there exists positive and significant two way relationship between the two. Section-wise analysis shows positive relation between FIIS and corporate governance score but weak relationship between mutual funds and CG score but positive strong two way relation between banks FIIs and Corporate governance score.

Phani, Reddy, Ramachandran & Bhattacharya-The paper attempts to examine the role of insider ownership on the performance of the firm in the Indian context. The data pertains to all manufacturing companies listed and traded on the BSE for the period 1989-2000. A multiple linear regression model has been used to examine validity of the various hypotheses on the basis of equation:

$$\text{Performance} = a + b \text{ size} + c \text{ insider} + d \text{ age} + 4$$

The results show that insider ownership in the Indian context has no influence on the performance of the firm in a majority of industries irrespective of the period of the study.

Marisetty & Vedpuriswar: This paper shows that share mispricing is an effective measure of corporate governance. The governance is defined as a mechanism which involves effective allocation of resources to maximize social welfare. The hypotheses are built on the premise that market reactions provide the best measure of governance and stock mispricing is the core information that reflects corporate governance.

The study finds out that good governance companies are less mispriced compared to bad governance companies. However good governance companies are more mispriced during event announcements compared to bad governance companies. For identifying good and bad governance companies, the paper uses standard and poor's corporate governance rating of Indian companies. The proven database has been used for firm specific information and for the event dates the period of the study is 1996 to 2003. For the period under study 31(13) events for the sale of

assets 24 (26) events for preferential allotments 13(11) events for dividend announcements and 14 (11) events for merger announcements for bad (good) governance companies. Daily price data has been used to calculate returns for each event for a period of 90 days before and 30 days after the event co variances of the returns, Methodology has been used to measure the information content of different time periods. The results show that volatility in the private information during the sale of assets period is higher for good governance companies than in the bad governance companies. The paper concludes that while ranking companies on the basis of corporate governance different weights should be given to different variables based on the sensitivity of the variable which is determined by the market reactions.

Data Analysis: The Foreign Institutional Investors invest in most profitable and less risky portfolios. To verify this, this paper considers variables which are proxies for returns and risk in the analysis. The data sources are the Reserve Bank of India and National Stock Exchange. The period of the study is January 2005 to May 2013. The variables considered for the analysis are the following

FII_DEBT- FII investment in India in Debt instruments in Nifty 50 companies.

FII_EQUITY- FII investment in India in Equity instruments Nifty 50 companies.

ESG_INDEX- ESG India Index by National Stock Exchange of India.

INTEREST_RATIO- Ratio of interest in US treasury bills to interest in Indian Government Bonds.

NIFTY_50- Index of top 50 companies my market capitalization at the National Stock exchange.

P_E- P/E ratio of top 50 companies my market capitalization at the National Stock exchange.

P_B- P/B ratio of top 50 companies my market capitalization at the National Stock exchange. REER- Real Effective exchange Rate of Indian Rupee (Thirty Six Countries Bilateral Weights)

IIP- Index of Industrial Production

YIELD- Dividend Yield of top 50 companies my market capitalization at the National Stock exchange.

SMCAP- Stock Market Capitalization of top 50 companies my market capitalization at the National Stock exchange.

The unit root test was performed on all the variables. (TABLES-1-11) The FII_DEBT, FII_EQUITY, P_E and YIELD series were found to be stationery. However, unit root existed in all other variables. The first difference series was put to unit root test and the series were found to be stationery except SMCAP for which second difference series was tested and found to be stationery.

The correlation and variance test was performed on all the variables. (TABLE 12 and 13). The variables which were found to be highly correlated with FII-

EQUITY are D(ESG_INDEX), D(NIFTY_50), D(REER)and(SMCAPI) and the variables which were found to be highly correlated to FII-DEBT are D(ESG-INDEX), D(IIP), D(REER) and D(SMCAPI).

The regression analysis was performed taking the explanatory variables which are the proxies for return and risk for the FII portfolios. The method used is Stepwise Regression. The two equations taking FII_DEBT and FII_EQUITY as dependent variables are as follows.

$$FII_DEBT(t)=a+bD(ESG-INDEX)(t-1)+cD(INTERES_TRATIO)(t-1)+dD(P_E)(t-1)+eD(REER)(t-1)+fYIELD(t-1)+gD(P_B)(t-1)+hD(SMCAPI)(t-1)+iD(NIFTY_50)(t-1).....(1)$$

$$FII_EQUITY(t)=a+bD(ESG-INDEX)(t-1)+cD(INTERES_TRATIO)(t-1)+dD(P_E)(t-1)+eD(REER)(t-1)+fYIELD(t-1)+gD(P_B)(t-1)+hD(SMCAPI)(t-1)+iD(NIFTY_50)(t-1).....(2)$$

The regression results (Table-14-15) show that ESG_INDEX, and DP_B are significant factors which have influenced the FII_DEBT inflow during the period under study. With regard to FII_EQUITY flows also ESG_INDEX is a significant factor explaining the variations. P_E and DREER also are significant in explaining the variations. The DINTEREST_RATIO also has taken the expected negative sign though it is not significant explanatory variable.

Conclusions: The significant reforms in the field of Environment, Social and Governance practices have contributed to the FII inflows. Stringent compliance with the rules will bring in desired levels of FII inflows. The competitive prices of portfolios, the trade based exchange rate and higher interest rates are also important to attract more FII inflows.

Null Hypothesis: FII_EQUITY has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.602184	0.0000
Test critical values:		
1% level	-3.497029	
5% level	-2.890623	
10% level	-2.582353	

*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(FII EQUITY)
 Method: Least Squares
 Date: 02/25/16 Time: 19:17
 Sample (adjusted): 2 101
 Included observations: 100 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FII_EQUITY(-1)	-0.627837	0.095095	-6.602184	0.0000
C	3173.353	1005.257	3.156758	0.0021
R-squared	0.307855	Mean dependent var		-169.4370
Adjusted R-squared	0.300792	S.D. dependent var		10385.71
S.E. of regression	8684.389	Akaike info criterion		20.99624
Sum squared resid	7.39E+09	Schwarz criterion		21.04834
Log likelihood	-1047.812	Hannan-Quinn criter.		21.01733
F-statistic	43.58884	Durbin-Watson stat		2.012525
Prob(F-statistic)	0.000000			

Null Hypothesis: FI DEBT has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.957924	0.0000
Test critical values:		
1% level	-3.497029	
5% level	-2.890623	
10% level	-2.582353	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(FI DEBT)
 Method: Least Squares
 Date: 02/25/16 Time: 19:16
 Sample (adjusted): 2 101
 Included observations: 100 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FI DEBT(-1)	-0.755200	0.126755	-5.957924	0.0000
C	1101.404	581.5833	1.893803	0.0612
R-squared	0.265900	Mean dependent var		-325.8740
Adjusted R-squared	0.258410	S.D. dependent var		6153.970
S.E. of regression	5299.531	Akaike info criterion		20.00842
Sum squared resid	2.75E+09	Schwarz criterion		20.06052
Log likelihood	-998.4211	Hannan-Quinn criter.		20.02951
F-statistic	35.49686	Durbin-Watson stat		1.618346
Prob(F-statistic)	0.000000			

Null Hypothesis: D(ESG_INDEX) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.582244	0.0000
Test critical values:		
1% level	-3.497727	
5% level	-2.890926	
10% level	-2.582514	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(ESG_INDEX,2)
 Method: Least Squares
 Date: 02/25/16 Time: 19:02
 Sample (adjusted): 3 101
 Included observations: 99 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ESG_INDEX(-1))	-0.749925	0.098905	-7.582244	0.0000
C	21.52277	17.02981	1.263829	0.2093
R-squared	0.372129	Mean dependent var	1.652926	
Adjusted R-squared	0.365656	S.D. dependent var	210.2138	
S.E. of regression	167.4263	Akaike info criterion	13.09896	
Sum squared resid	2719061.	Schwarz criterion	13.15138	
Log likelihood	-646.3984	Hannan-Quinn criter.	13.12017	
F-statistic	57.49042	Durbin-Watson stat	1.898143	
Prob(F-statistic)	0.000000			

Null Hypothesis: D(INTEREST_RATIO) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-15.98313	0.0001
Test critical values:		
1% level	-3.497727	
5% level	-2.890926	
10% level	-2.582514	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INTEREST_RATIO,2)
 Method: Least Squares
 Date: 02/25/16 Time: 19:07
 Sample (adjusted): 3 101
 Included observations: 99 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTEREST_RATIO(-1))	-1.451335	0.090804	-15.98313	0.0000
C	0.041029	0.081808	0.501530	0.6171
R-squared	0.724792	Mean dependent var	-0.005295	
Adjusted R-squared	0.721955	S.D. dependent var	1.542709	
S.E. of regression	0.813471	Akaike info criterion	2.444981	
Sum squared resid	64.18824	Schwarz criterion	2.497408	
Log likelihood	-119.0266	Hannan-Quinn criter.	2.466193	
F-statistic	255.4605	Durbin-Watson stat	2.192321	
Prob(F-statistic)	0.000000			

Null Hypothesis: D(NIFTY_50) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.417504	0.0000
Test critical values:		
1% level	-3.497727	
5% level	-2.890926	
10% level	-2.582514	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(NIFTY_50,2)
 Method: Least Squares
 Date: 02/25/16 Time: 19:09
 Sample (adjusted): 3 101
 Included observations: 99 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NIFTY_50(-1))	-0.728880	0.098265	-7.417504	0.0000
C	27.64047	31.70268	0.871865	0.3854
R-squared	0.361923	Mean dependent var		2.606982
Adjusted R-squared	0.355345	S.D. dependent var		390.6386
S.E. of regression	313.6452	Akaike info criterion		14.35440
Sum squared resid	9542213.	Schwarz criterion		14.40682
Log likelihood	-708.5427	Hannan-Quinn criter.		14.37561
F-statistic	55.01937	Durbin-Watson stat		1.905288
Prob(F-statistic)	0.000000			

Null Hypothesis: D(P B) has a unit root
 Exogenous: Constant
 Lag Length: 2 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.458502	0.0004
Test critical values:		
1% level	-3.499167	
5% level	-2.891550	
10% level	-2.582846	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(P_B,2)

Method: Least Squares

Date: 02/25/16 Time: 19:11

Sample (adjusted): 5 101

Included observations: 97 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P_B(-1))	-0.675252	0.151453	-4.458502	0.0000
D(P_B(-1),2)	0.023920	0.119693	0.199846	0.8420
D(P_B(-2),2)	-0.265210	0.099080	-2.676715	0.0088
C	-0.002944	0.025269	-0.116501	0.9075

R-squared	0.450085	Mean dependent var	0.003968
Adjusted R-squared	0.432345	S.D. dependent var	0.330059
S.E. of regression	0.248676	Akaike info criterion	0.095032
Sum squared resid	5.751101	Schwarz criterion	0.201205
Log likelihood	-0.609038	Hannan-Quinn criter.	0.137963
F-statistic	25.37230	Durbin-Watson stat	1.967812
Prob(F-statistic)	0.000000		

Null Hypothesis: P_E has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.124223	0.0280
Test critical values:		
1% level	-3.499167	
5% level	-2.891550	
10% level	-2.582846	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(P_E)

Method: Least Squares

Date: 02/25/16 Time: 19:12

Sample (adjusted): 5 101

Included observations: 97 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
P_E(-1)	-0.123668	0.039584	-3.124223	0.0024
D(P_E(-1))	0.386298	0.097624	3.956981	0.0001
D(P_E(-2))	-0.231762	0.099314	-2.333634	0.0218
D(P_E(-3))	0.290594	0.097947	2.966862	0.0038
C	2.409758	0.769144	3.133039	0.0023

R-squared	0.231635	Mean dependent var	0.040994
Adjusted R-squared	0.198227	S.D. dependent var	1.261974
S.E. of regression	1.129994	Akaike info criterion	3.132472
Sum squared resid	117.4736	Schwarz criterion	3.265189
Log likelihood	-146.9249	Hannan-Quinn criter.	3.186137
F-statistic	6.933675	Durbin-Watson stat	1.958927
Prob(F-statistic)	0.000063		

Null Hypothesis: P_E has a unit root
 Exogenous: Constant
 Lag Length: 3 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.124223	0.0280
Test critical values: 1% level	-3.499167	
5% level	-2.891550	
10% level	-2.582846	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(P_E)
 Method: Least Squares
 Date: 02/25/16 Time: 19:12
 Sample (adjusted): 5 101
 Included observations: 97 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
P_E(-1)	-0.123668	0.039584	-3.124223	0.0024
D(P_E(-1))	0.386298	0.097624	3.956981	0.0001
D(P_E(-2))	-0.231762	0.099314	-2.333634	0.0218
D(P_E(-3))	0.290594	0.097947	2.966862	0.0038
C	2.409758	0.769144	3.133039	0.0023
R-squared	0.231635	Mean dependent var		0.040994
Adjusted R-squared	0.198227	S.D. dependent var		1.261974
S.E. of regression	1.129994	Akaike info criterion		3.132472
Sum squared resid	117.4736	Schwarz criterion		3.265189
Log likelihood	-146.9249	Hannan-Quinn criter.		3.186137
F-statistic	6.933675	Durbin-Watson stat		1.958927
Prob(F-statistic)	0.000063			

Null Hypothesis: D(REER) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.137108	0.0000
Test critical values: 1% level	-3.497727	
5% level	-2.890926	
10% level	-2.582514	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(REER,2)
 Method: Least Squares
 Date: 02/25/16 Time: 19:13
 Sample (adjusted): 3 101
 Included observations: 99 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REER(-1))	-0.811471	0.099725	-8.137108	0.0000
C	0.077918	0.183686	0.424192	0.6724
R-squared	0.405683	Mean dependent var		-0.003884
Adjusted R-squared	0.399556	S.D. dependent var		2.355087
S.E. of regression	1.824917	Akaike info criterion		4.060941
Sum squared resid	323.0413	Schwarz criterion		4.113368
Log likelihood	-199.0166	Hannan-Quinn criter.		4.082153
F-statistic	66.21253	Durbin-Watson stat		1.944535
Prob(F-statistic)	0.000000			

Null Hypothesis: YIELD has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.819688	0.0591
Test critical values:		
1% level	-3.497727	
5% level	-2.890926	
10% level	-2.582514	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(YIELD)
 Method: Least Squares
 Date: 02/25/16 Time: 19:14
 Sample (adjusted): 3 101
 Included observations: 99 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
YIELD(-1)	-0.094479	0.033507	-2.819688	0.0058
D(YIELD(-1))	0.280008	0.095765	2.923907	0.0043
C	0.122710	0.046388	2.645324	0.0095
R-squared	0.134349	Mean dependent var		-0.006297
Adjusted R-squared	0.116314	S.D. dependent var		0.108249
S.E. of regression	0.101759	Akaike info criterion		-1.702577
Sum squared resid	0.994077	Schwarz criterion		-1.623937
Log likelihood	87.27757	Hannan-Quinn criter.		-1.670759
F-statistic	7.449578	Durbin-Watson stat		1.941267
Prob(F-statistic)	0.000983			

Null Hypothesis: D(SMCAP) has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=12)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.30278	0.0000
Test critical values: 1% level	-3.498439	
5% level	-2.891234	
10% level	-2.582678	

*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(SMCAP,2)
 Method: Least Squares
 Date: 02/25/16 Time: 19:15
 Sample (adjusted): 4 101
 Included observations: 98 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SMCAP(-1))	-1.407830	0.136646	-10.30278	0.0000
D(SMCAP(-1),2)	0.370155	0.095335	3.882658	0.0002
C	698.9032	846.4417	0.825696	0.4110
R-squared	0.580364	Mean dependent var		5.802653
Adjusted R-squared	0.571529	S.D. dependent var		12761.43
S.E. of regression	8353.333	Akaike info criterion		20.92884
Sum squared resid	6.63E+09	Schwarz criterion		21.00797
Log likelihood	-1022.513	Hannan-Quinn criter.		20.96085
F-statistic	65.69326	Durbin-Watson stat		1.978675
Prob(F-statistic)	0.000000			

Covariance Analysis: Ordinary
 Date: 02/11/16 Time: 00:02
 Sample: 1 102
 Included observations: 102

Covariance Correlation	DOSMCP	DESG INDE...	DIIP	DINTEREST ...	DNIFTY 50	DP B	DREER	ETY01	P E	YIELD
DOSMCP	3.19E+08 1.000000									
DESG INDEX	15883669 0.877257	1002704. 1.000000								
DIIP	346678.4 0.807303	21388.47 0.888050	578.5108 1.000000							
DINTEREST_RATIO	8985.202 0.338697	728.2144 0.489430	20.45341 0.572305	2.207822 1.000000						
DNIFTY 50	16741187 0.829239	939576.6 0.829800	19904.39 0.731848	591.5276 0.352063	1278628. 1.000000					
DP B	-2094.928 -0.127181	-291.1230 -0.315121	-9.349882 -0.421335	-0.623638 -0.454922	188.3268 0.180521	0.851190 1.000000				
DREER	82287.61 0.770018	4915.287 0.820094	94.20290 0.654349	2.318657 0.260484	5129.043 0.757819	-0.428724 -0.077636	35.82597 1.000000			
ETY01	45258687 0.276351	3091675. 0.336605	47363.33 0.214687	1177.270 0.086379	3052852. 0.294338	-737.7896 -0.087183	16317.65 0.297216	84134476 1.000000		
P E	35453.10 0.636498	1777.426 0.568961	28.01081 0.373291	-0.660850 -0.142560	2786.389 0.789855	1.483631 0.515454	10.86944 0.582084	6732.005 0.235253	9.732981 1.000000	
YIELD	-3400.785 -0.614885	-166.7317 -0.537503	-2.842769 -0.381536	0.085005 0.184676	-263.9011 -0.753387	-0.147793 -0.517117	-1.003842 -0.541397	-516.4664 -0.181773	-0.902421 -0.933761	0.085963 1.000000

Covariance Analysis: Ordinary
 Date: 02/11/16 Time: 00:02
 Sample: 1 102
 Included observations: 102

	DDSMCAP	DESG INDE...	DIIPDINTEREST ...	DNIFTY 50	DP B	DREER	ETY01	P E	YIELD
Covariance Correlation	3.19E+08								
DDSMCAP	1.000000								
DESG INDEX	15683669	1002704.							
	0.877257	1.000000							
DIIP	346678.4	21388.47	578.5108						
	0.807303	0.888050	1.000000						
DINTEREST_RATIO..	8985.202	728.2144	20.45341	2.207822					
	0.338697	0.489430	0.572305	1.000000					
DNIFTY 50	16741187	939576.6	19904.39	591.5276	1278628.				
	0.829239	0.829800	0.731848	0.352063	1.000000				
DP B	-2094.928	-291.1230	-9.349882	-0.623638	188.3288	0.851190			
	-0.127181	-0.315121	-0.421335	-0.454922	0.180521	1.000000			
DREER	82287.61	4915.287	94.20290	2.318657	-0.428724	35.82557			
	0.770018	0.820094	0.654349	0.260484	-0.077636	1.000000			
ETY01	45258887	3091675.	47363.93	1177.270	-737.7896	16317.65	84134476		
	0.276351	0.336605	0.214687	0.086379	-0.087183	0.297216	1.000000		
P E	35453.10	1777.426	28.01081	-0.660850	1.483631	10.86944	6732.005	9.732961	
	0.636498	0.568961	0.373291	-0.142560	0.515454	0.582084	0.235253	1.000000	
YIELD	-3400.785	-166.7317	-2.842769	0.085005	-0.147793	-1.003842	-516.4964	-0.902421	0.095963
	-0.614885	-0.537503	-0.381536	0.184676	-0.517117	-0.541397	-0.181773	-0.933761	1.000000

Dependent Variable: DET01
 Method: Stepwise Regression
 Date: 03/08/16 Time: 18:42
 Sample: 1 102
 Included observations: 102
 Number of always included regressors: 2
 Number of search regressors: 6
 Selection method: Stepwise forwards
 Stopping criterion: p-value forwards/backwards = 0.5/0.5
 Note: final equation sample is larger than stepwise sample (rejected regressors contain missing values)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DESG_INDEX	1.115419	0.391194	2.851317	0.0053
DP_B	-336.7888	272.2042	-1.237266	0.2189
R-squared	0.060362	Mean dependent var		1535.906
Adjusted R-squared	0.050966	S.D. dependent var		5323.831
S.E. of regression	5186.391	Akaike info criterion		19.96488
Sum squared resid	2.69E+09	Schwarz criterion		20.01635
Log likelihood	-1016.209	Hannan-Quinn criter.		19.98572
Durbin-Watson stat	1.393327			

Selection Summary

No regressors were chosen by the stepwise routine

*Note: p-values and subsequent tests do not account for stepwise selection.

Dependent Variable: ETY01
 Method: Stepwise Regression
 Date: 03/08/16 Time: 18:29
 Sample (adjusted): 1 101
 Included observations: 101 after adjustments
 Number of always included regressors: 2
 Number of search regressors: 5
 Selection method: Stepwise forwards
 Stopping criterion: p-value forwards/backwards = 0.5/0.5

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DESG_INDEX	5.735735	2.090568	2.743624	0.0073
P E	-546.8788	441.5647	-1.238502	0.2185
DDSMCAP	-0.163716	0.109992	-1.488438	0.1399
DREER	91.78846	72.72469	1.262136	0.2100
DINTEREST_RATIO	-678.1304	815.2571	-0.831799	0.4076
R-squared	0.099787	Mean dependent var		5179.318
Adjusted R-squared	0.062278	S.D. dependent var		9247.803
S.E. of regression	8955.205	Akaike info criterion		21.08610
Sum squared resid	7.70E+09	Schwarz criterion		21.21556
Log likelihood	-1059.848	Hannan-Quinn criter.		21.13850
Durbin-Watson stat	1.381270			

Selection Summary

Added DDSMCP
 Added DREER
 Added DINTEREST_RATIO

*Note: p-values and subsequent tests do not account for stepwise selection.

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