

Does Fundamental Analysis Matter For Foreign Investors? An Empirical Analysis of Foreign Investment in the Istanbul Stock Exchange

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Abstract. The purpose of this paper is to analyze how the buy and sell decisions of foreign investors are related to the financial indicators of the selected firms on the Istanbul Stock Exchange. Based on monthly data from January 2000 to April 2006, empirical analysis proves that foreign investment decisions are made on the basis of fundamental analysis with solvency emerging as the most important factor for foreigner investors.

JEL Classification Codes: G10.

Keywords: Foreign Stock Investment, Short-Term Foreign Investment, Behavior of Foreign Investors, Behavior of Institutional Investors, Foreign Cash Flow, Fundamental Analysis and Portfolio Choice, Motives Behind the Foreign Stock Investments

1. Introduction

The Istanbul Stock Exchange (ISE) has an outstanding record in achieving the highest settlement rate of any emerging market in the world. The impressive performance of the Turkish stock market over the last decade has attracted a large and growing percentage of foreign investors, who account for more than half of free float equity ownership in Turkey. The total foreign share in publicly traded stocks of ISE firms was 51% in 2003, 61% in 2004 and had reached 67% by 2005. It displayed a consistent rise during 2006 and

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had reached 55 billion USD as of April 2006, equating to a foreign share of some 70%.

The aim of this study is to analyze the behavior of foreign investors in the Istanbul Stock Exchange from one particular perspective. Specifically, the study attempts to find empirical answers to fundamental issues concerning the magnitude of transaction volumes, the patterns that they follow, how investment decisions are made and how portfolios are constructed. In doing so, this study will pay particular attention to the role of fundamental analysis in the behavior of foreign investors. Given that almost all foreign investors in the Turkish stock market are institutional investors, the results of this study will also contribute to literature concerned with the behavior of institutional investors. Moreover, by focusing on the Turkish market, this paper provides a new contribution to discussions regarding short-term foreign capital movements in emerging markets as a whole.

To date, literature on investor behavior has mainly focused on well-developed stock markets. There have been very few empirical studies of foreign investor behavior in emerging markets. In a study of the Czech market, Anderson *et al.* (2001) show that foreign investors seek safe, profitable firms in which they can exert unchallenged influence on corporate governance. Examining empirical studies concerning the rationale behind stock prices and investment decisions in the Turkish securities market, Akgören (2005) finds that volatility plays an important role for investors in their investment decisions. Unexpected events continually influence stock prices. The results of Şamiloğlu's study (2005) indicate that there is a weak relationship between share earnings and operating incomes, changes in operating incomes, operating cash flows, changes in operating cash flows, annual growth and change in the annual growth of companies. On the other hand, the results of this research indicated a meaningful relationship between share prices, earnings per share and nominal values of shares. Kalaycı *et al.* (2005) analyze the relationship between stock returns and financial ratios using a sample of manufacturing industries. They find that stock returns are explained by profitability, stock market performance, and productivity ratios.

This paper is organized as follows: Section 2 presents a preliminary analysis of foreign holdings and trading volume indicators. Section 3 analyses whether foreigners make rational choices based on fundamental analysis. The conclusion and implications are presented in section 4.

2. A Preliminary Analysis of Foreign Stock Volume and Holdings

The data used in this study includes the amount of each stock, in nominal terms (number of shares), in national currency (TL) and in US dollars, bought and sold by foreign investors within a given month. The data covers the period from January 2000 to April 2006 and is collected from a number of sources including the Istanbul Stock Exchange (ISE), Bender Securities, the ISE Settlement and Custody Bank, the Central Registry Agency and the State Planning Organization.

It is important to note that flows coming in from abroad do not necessarily signify that foreign investors are responsible. For a transaction to be eligible the cash may cross the border in either direction. The transaction of a foreigner in Turkey is not eligible since no money flows in or out of the country. Similarly, the transaction of a Turkish citizen executed abroad is eligible if the money is coming from abroad.

When the data is analyzed on a stock basis, it is also possible to see the amount of ownership represented by foreign investment in nominal terms. If there is a net positive nominal flow for a given stock in a given period of time, all else being equal, it can be concluded that foreign ownership in that stock has increased. The nominal data is useless in aggregate terms since there is a scale problem. Thus, in nominal terms the stocks are incomparable.

One common belief about foreign investment is that foreigners generally invest for the longer term. There is no easy way to measure terms of investment but there are some indicators useful for understanding general behavior. One such indicator is the percentage contribution of foreign transactions to total market volume. The average ratio of total foreign volume to total market volume is 11.59% throughout the period of 2000 and 2006. Comparing the average of 8.83% revealed by previous research based on 1997 to 1999 data (Saraç *et al.* 1999) one can argue that foreign involvement in the post-crisis period is significantly higher.

The historical trend in the percentage of foreign volume is illustrated in Chart 1.

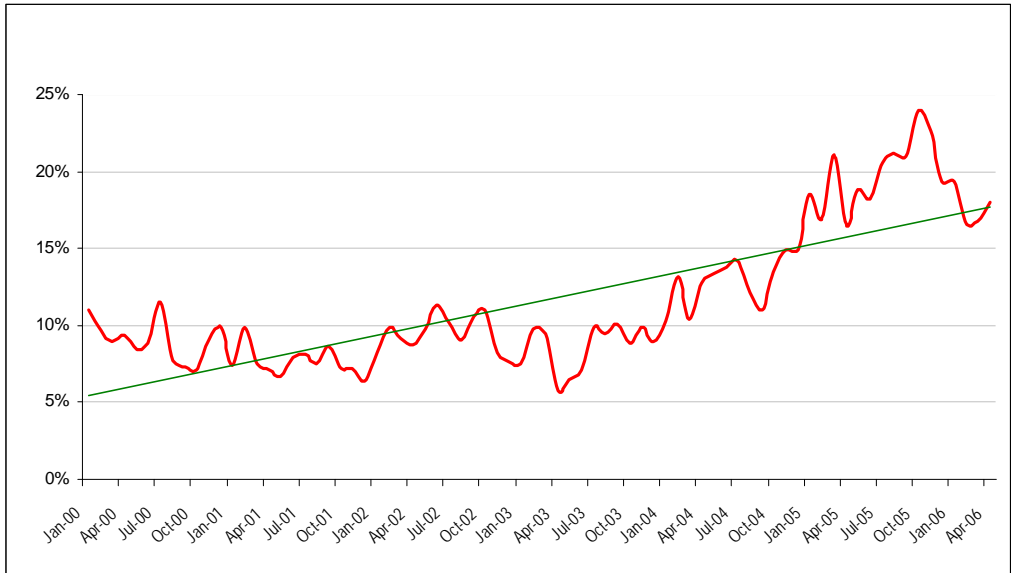


Chart 1: Historical percentage of foreign volumes and trend line

The observable trend in the above chart indicates that foreigners are increasing their contribution to market turnover. This is common behavior when the investment horizon shortens. That is, they buy what they have earlier sold short or take profits as soon as the opportunity appears. When this behavior is employed by most of the investors in a market, it tends to destabilize a market's trend, which results in increased volatility. The most significant problem with investing short term is that shorter-term investments break the economic linkage between the performance of the stock market and the general mood of the domestic economy. The more short term the investors' horizons are, the more so-called "speculative" trading is likely to take place. Such trading behavior is fed, both at the firm and market level, by rumors rather than by facts derived through fundamental analysis. It subsequently causes an inexplicable relationship between the real economy and the market indices. The extent to which foreigners make their investment decisions based on fundamental analysis at the level of the firm is analyzed in the following section.

If the trend visible in Chart 1 is statistically significant then it may indicate that foreigners are acting as shorter-term investors. For a more robust conclusion, however, the trend in total foreign holdings over total market capitalization must be analyzed. If the latter also shows a significant

increase then it may well indicate that foreigners want to increase their share in the markets. In this case, an increase in volume may not necessarily mean that investors are simply speculative traders chasing short-term profits.

$$VOLUME_t = \beta_0 + \beta_1 DATE + \varepsilon_t \quad (1)$$

The significance of the trend line for foreign trade volume is shown in Table 1.

Dependent: VOLUME	F	Signf.	
	24**	0,000	
Coefficients	Beta	t	Significance
Constant	-5,383**	-4,819	0,000
DATE	0,00042**	4,899	0,000

Table 1
ANOVA&Regression for The Foreigners' Holding Trend

The F-statistic is highly significant, implying that there really is a positive trend between time and the percentage of foreign volume. The significant positive regression coefficient, though not too high, seems to support the hypothesis that foreigners are short-term investors.

Another variable used to observe the effects of foreign capital flows is the share of foreign holdings in the stock market. This analysis is based on the data from January 2000 to April 2006. The data summarizes the market value of all the stocks under foreign ownership. The set is a series of aggregate dollar values.

As can be seen from Chart 2, the trend in foreign holdings between 2000 and 2006 consists of two main phases: January 2000 to December 2002 where the foreign holdings within total market capitalization (MCAP) remain stable, and January 2003 to April 2006 where foreign holdings rise continuously. Total foreign holdings of ISE stocks at the beginning of 2000 are almost 15 mn USD and decreases to some 3000 mn by the end of 2001. The decrease in the amount up to the end of 2002 can be explained by a

parallel decrease in total MCAP. There is a constant rise especially after April 2003 from some 10% to over 27% by the end of the research period.

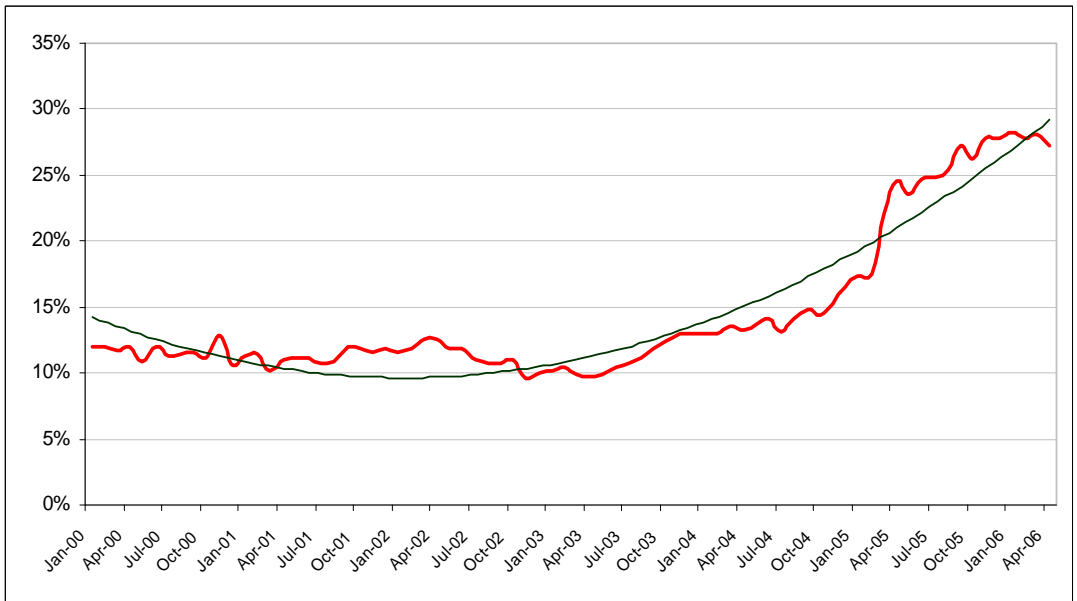


Chart 2: Foreign holdings to total MCAP and Foreign Holdings

The findings of ANOVA and regression analysis (see Table 2) reveal that the positive relationship between time and foreign holdings over total market capitalization is statistically significant. In other words, the increasing trend of foreign holdings in the market is significant. This also implies that foreigners increase their share in the market in line with trading volumes, which leads one to conclude that foreigners have become longer-term investors especially after 2002. This turning point may well be explained by the greater political and economic stability in evidence following the election of the new government.

$$FOREIGN\ HOLDING/TOTAL\ MCAP_t = \beta_0 + \beta_1 DATE + \varepsilon_t \quad (2)$$

Dependent:		F	Signf.
FORGN. HLD./TOT.MCAP		102,313**	0,000
Coefficients	Beta	t	Significance
Constant	0,0696**	7,980	0,000
DATE	0,00199**	10,115	0,000

Table 2
 ANOVA & Regression for Foreigners' Holding Trend

Market dynamics aside, the consistent increase in all of these indicators especially after July 2004 may be explained by the progress in Turkey's application to become a full member of the EU.

3. Do Foreigners Make A Rational Choices Based On Fundamental Analysis?

To understand the behavior of foreign investors in the ISE, one should start by reflecting upon the behavior of a single rational investor. Starting from this position, one can easily define different points where one can check whether a foreign investor follows the same approach as any rational investor or takes some alternative perspective.

This research proposes that a foreign investor will make a rational choice of a portfolio among different assets by evaluating each firm on its fundamentals such as generally accepted financial indicators appropriate to the sector of concern, the growth opportunities of the sector and the firm, macroeconomic indicators and other variables that have a direct influence on the operational and financial existence of a firm. This study takes manufacturing firms into consideration for the empirical analysis. The fact that manufacturing firms in the ISE constitute the largest portion (some 60%) of transaction volume leads one to accept that this sector is a fair representative of the market as a whole.

Data and Methodology

The data set includes 153 manufacturing firms quoted on the ISE. Information relating to foreign volume in respect to the manufacturing industry is as follows for Jan 2000 to April 2006:

ISE SECTOR	FOREIGN VOLUME %	FOREIGN VOLUME (Mn USD)	TOTAL VOLUME (Mn USD)
Manufacturing Total	6.95%	76.721	1.104.199

Table 3

Quarterly income statements and balance sheets for these companies are taken from the ISE. Generally accepted financial ratios are used in the analysis to test different hypotheses relating to the degree of rational behavior among investors. These ratios are computed one by one, by defining the formulas in Excel. Table 4 presents the list of financial ratios considered.

As usage of too many ratios causes difficulties in interpretation because of interdependencies, parameters which have very low correlation with each other are good candidates to be used for analysis. They have individual effects on the result and multicollinearity is not a drawback of the analysis.

By using multivariate factor analysis, financial ratios are compacted into a smaller group of factors. Dealing with a smaller number of factors, and especially orthogonal ones, eases the analysis. Prior to this, a preliminary examination of the data is a must. In this analysis, therefore, a visual check was performed first and obvious outliers were eliminated. Case by case the data was observed. Cases with abnormal measures were canceled out because they were not representative. Outlying data was subjected to additional analysis as it was believed that it may contain useful information.

Appendix I shows the descriptive statistics for the manufacturing sample.

Variable	Description	Abbreviation
Current Ratio	Current Assets / Current Liabilities	CURRATIO
Quick Ratio	(Current Assets - Inventory) / Current Liabilities	QUICKRAT
Working Capital	Current Assets - Current Liabilities	WORKCAP
Inventory Turnover	Net Sales / Average Inventory	INVTURN
Account Receivable Turnover	Net Sales / Average Account Receivable	ACCRECTO
Debt Ratio	Debt / Total Assets	DEBTRAT
Equity Ratio	Equity / Total Assets	EQUITYRAT
Total Interest Coverage Ratio	Operating Profit / Financial Expenses	TIERAT
Return on Equity	Net Income / Average Equity	ROE
Return on Assets	Net Income / Average Assets	ROA
Operating Expenses/Net Sales	Operating Expenses/Net Sales	OPEXNSAL
Book to Market Value of Equity	Equity / MCAP	BTMVE
Price Earnings Ratio	MCAP / Net Income	PE
Fixed Assets Turnover	Net Sales / Fixed Assets	FATO
Total Assets Turnover	Net Sales / Total Assets	TATO
Fixed Assets to Total Assets Ratio	Fixed Assets / Total Assets	FATA
Profit Margin	Net Income / Net Sales	PROFMAR
Long Term Debt to Market Value of Equity	Long Term Liabilites / MCAP	LTDIMVE
Book to Market Value of Assets	Total Assets / (MCAP + Total Debt)	BVAMVA
Sales Growth	$(\text{Net Sales}_t / \text{Net Sales}_{t-1}) - 1$	SALESGR
Asset Growth	$(\text{Total Assets}_t / \text{Total Assets}_{t-1}) - 1$	ASSETGR
Equity Growth	$(\text{Equity}_t / \text{Equity}_{t-1}) - 1$	EQUITYGR
Net Income Growth	$(\text{Net Income}_t / \text{Net Income}_{t-1}) - 1$	NIGR
Operating Income Growth	$(\text{Operating Income}_t / \text{Operating Income}_{t-1}) - 1$	OPINGR

Table 4: List of variables used

The manufacturing sector consists of 153 firms, which belong to sixteen sub-sectors. The distribution of firms in the manufacturing sector is as follows:

- Textiles – 29 companies
- Petroleum and derivatives – 9 companies
- Paper products – 7 companies
- Paint – 5 companies
- Metals – 7 companies
- Machines and tools – 3 companies
- Glass – 3 companies
- Food – 16 companies
- Fertilizers – 4 companies
- Energy – 3 companies
- Consumer products and durables – 17 companies
- Construction – 10 companies
- Ceramic – 5 companies
- Cement – 16 companies
- Beverages – 5 companies
- Automotive – 14 companies

The objective here is to find the underlying factors of different financial ratios. R type factor analysis is employed for this purpose. It examines a set of variables to identify dimensions that are latent (such as profitability, liquidity and solvency, in this case). A simple overview of the correlation matrix (see Table 5) for variables shows that there is sufficient correlation among some of the ratios and that these ratios are most likely to load on to the same factor because of the commonality they possess.

The first step is to assess overall significance of the correlation matrix with the Bartlett's test of sphericity. In our case the correlations, when taken overall, are significant at the .001 level. The other overall test is the KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy which is 0.788 and falls within the acceptable range (>0.50). However, examination of the values for each variable identifies eight variables that have values under 0.50. Therefore these variables are omitted to obtain a set of variables that exceed the minimum acceptable MSA levels.

	ADECTIO	ASSEGR	BIME	BAMA	CLRRATIO	DEBRAT	EQUINR	EQUYRA	FATA	FAO	LIDME	NGR	OPENBAL	PRNGR	FE	FROMVR	QLORAVT	ROA	RCE	SALEGR
ADECTIO	1.000	0.045	-0.104	-0.143	-0.072	0.052	0.022	-0.052	0.012	0.030	-0.079	0.009	-0.032	-0.039	0.034	-0.078	0.123	0.095	0.109	
ASSEGR	0.045	1.000	-0.046	-0.247	0.027	0.103	0.072	-0.104	-0.026	0.072	-0.060	0.068	0.152	0.136	-0.030	0.228	0.051	0.271	0.153	0.149
BIME	-0.104	-0.046	1.000	0.4919	0.014	-0.030	0.030	0.030	0.094	-0.038	0.393	-0.003	-0.144	0.033	0.011	-0.210	0.005	-0.243	-0.157	-0.036
BAMA	-0.143	-0.247	0.4919	1.000	-0.2119	0.280	-0.038	-0.280	-0.035	-0.027	0.348	-0.029	-0.079	0.031	0.021	-0.234	-0.268	-0.330	-0.193	-0.034
CLRRATIO	-0.072	0.027	0.014	-0.2119	1.000	-0.933	0.011	0.933	0.034	-0.030	-0.054	0.019	0.023	-0.021	0.005	0.392	0.897	0.216	0.134	-0.036
DEBRAT	0.052	0.103	-0.030	0.280	-0.933	1.000	-0.035	-1.000	-0.370	0.247	0.314	0.015	0.034	0.033	-0.034	-0.321	0.032	-0.338	-0.137	0.100
EQUINR	0.022	0.072	0.030	-0.038	0.011	1.000	1.000	0.035	0.035	0.026	-0.027	0.032	-0.013	-0.034	0.034	0.073	0.048	-0.003	0.032	-0.013
EQUYRA	-0.052	-0.104	0.030	-0.280	-0.035	-1.000	0.035	1.000	-0.370	-0.247	-0.314	-0.015	-0.034	-0.033	0.034	0.321	0.513	0.332	0.137	-0.100
FATA	0.012	-0.026	0.094	-0.035	0.034	-0.370	0.035	0.370	1.000	-0.369	0.140	-0.032	-0.026	-0.022	0.023	-0.027	-0.018	-0.072	-0.078	-0.054
FAO	0.030	0.072	-0.038	-0.027	-0.030	0.247	0.026	-0.247	-0.369	1.000	-0.038	0.015	0.023	0.015	-0.038	-0.032	-0.067	0.042	0.040	0.034
LIDME	-0.079	-0.060	0.393	0.348	-0.034	0.314	-0.027	-0.314	0.140	-0.038	1.000	-0.020	-0.072	-0.024	-0.021	-0.234	-0.038	-0.236	-0.152	-0.039
NGR	0.009	0.068	-0.033	-0.029	0.019	0.015	0.032	-0.015	-0.032	0.015	-0.020	1.000	-0.027	0.015	0.015	0.019	0.018	0.075	0.074	0.032
OPENBAL	0.039	0.152	-0.144	-0.079	0.028	0.034	-0.013	-0.034	-0.026	0.023	-0.027	-0.027	1.000	0.117	0.012	0.595	0.024	0.283	0.152	0.143
PRNGR	-0.032	0.136	0.033	0.031	-0.072	0.033	-0.034	-0.033	-0.022	0.015	-0.024	0.015	0.117	1.000	-0.035	0.170	-0.033	0.126	0.032	0.227
FE	-0.039	-0.030	0.011	0.021	0.005	-0.034	-0.038	0.034	-0.038	-0.012	-0.021	0.015	0.012	-0.035	1.000	-0.073	0.016	-0.015	-0.033	-0.013
FROMVR	0.034	0.228	-0.210	-0.234	0.392	-0.321	0.073	0.321	-0.027	-0.032	-0.234	0.018	0.595	0.110	-0.073	1.000	0.311	0.765	0.624	0.022
QLORAVT	-0.078	0.051	0.035	-0.268	0.897	-0.512	0.048	0.512	-0.035	-0.027	-0.038	0.018	0.032	-0.033	0.016	0.311	1.000	0.277	0.112	-0.032
ROA	0.123	0.271	-0.243	-0.330	0.216	-0.338	-0.038	0.332	-0.032	0.042	-0.236	0.075	0.283	0.126	-0.015	0.765	0.277	1.000	0.684	0.143
RCE	0.095	0.153	-0.157	-0.193	0.134	-0.137	0.032	0.137	-0.033	0.040	-0.152	0.074	0.152	0.032	-0.033	0.524	0.112	0.684	1.000	0.161
SALEGR	0.109	0.149	-0.036	-0.034	-0.034	0.100	-0.013	-0.100	-0.034	-0.034	-0.019	0.012	0.143	0.227	-0.015	0.072	-0.032	0.143	1.000	1.000
TATO	0.332	0.136	-0.279	-0.293	-0.100	0.193	-0.016	-0.193	-0.270	0.453	-0.187	0.031	0.213	0.075	-0.218	0.037	-0.053	0.232	0.189	0.197
TERRAT	-0.071	-0.015	-0.016	-0.016	0.037	-0.049	-0.003	0.049	0.026	-0.033	0.014	-0.012	-0.026	-0.030	0.003	0.016	0.013	-0.033	-0.026	-0.194

Table 5: Correlation matrix of financial ratios for the manufacturing firms

The next step is to select the number of components to be retained for further analysis (Table 6). We can use eigenvalues to assist in selecting the number of factors using the latent root criterion. According to this method, only those factors having eigenvalues greater than 1 are considered significant, therefore one can continue with 4 factors.

Variable	Eigenvalue	Pct of Var	Cum Pct
ASSETGR	4,81371	32,1	32,1
EQUITYGR	3,67532	24,5	56,6
EQUITYRA	2,0927	14	70,5
CURRATIO	1,25806	8,4	78,9
DEBTRAT	0,97842	6,5	85,5
FATA	0,78442	5,2	90,7
FATO	0,47258	3,2	93,8
NIGR	0,40364	2,7	96,5
OPINGR	0,24851	1,7	98,2
PROFMAR	0,18116	1,2	99,4
QUICKRAT	0,08884	0,6	100
ROA	0,0018	0	100
SALESGR	0,00079	0	100
TATO	0,00005	0	100
ACRECTO	0	0	100

Table 6: Eigenvalues and percentage of variation explained

In Table 7 a varimax rotated actor loading matrix is represented. This matrix is used to interpret the pattern of factor loadings for the variables in an effort to name each of the factors. To assess an orthogonal solution, varimax rotation is used. Inspection of the matrix indicates that certain variables have a high loading on a factor whereas other variables do not. In this way it is possible to determine which financial ratios are best represented by the common factors.

	Factor 1	Factor 2	Factor 3	Factor 4
ASSETGR	0,9941	-0,0139	0,0171	0,0204
EQUITYGR	0,9937	-0,0110	0,0152	0,0193
EQUITYRA	-0,0311	0,6788	-0,5783	0,1860
CURRATIO	-0,0099	0,9261	-0,0358	-0,0361
DEBTRAT	0,0311	-0,6788	0,5783	-0,1860
FATA	-0,0047	0,0008	-0,8224	0,1200
FATO	0,0058	-0,0432	0,7247	0,2051
NIGR	0,8877	0,0059	0,0432	0,0387
OPINGR	0,9940	-0,0141	0,0189	0,0234
PROFMAR	-0,0072	0,4995	-0,0373	0,5838
QUICKRAT	-0,0013	0,9094	0,0402	-0,0424
ROA	0,0410	0,4064	0,0751	0,7623
SALESGR	0,9941	-0,0150	0,0176	0,0217
TATO	0,1330	-0,1108	0,5674	0,5579
ACRECTO	0,0098	-0,2084	-0,0357	0,6537

Table 7: Varimax rotated factor loading matrix

Based on Table 7, the following table exhibits the classification of the variables according to the factors.

Factor 1	Factor 2	Factor 3	Factor 4
ASSETGR	CURRATIO	FATA	ACRECTO
EQUITYGR	DEBTRAT	FATO	PROFMAR
NIGR	EQUITYRA		ROA
OPINGR	QUICKRAT		TATO
SALESGR			

Table 8: Grouping of variables

Since all growth ratios are grouped under factor 1, it can be termed *growth*. Under factor 2, the gathered ratios relate to short term and long term solvency, therefore this factor will be termed *solvency*. Under the third factor are ratios relating to fixed assets and sales, so this factor will be termed *operational leverage*. Under factor 4, the ratios show *profitability* and *activity*, hence the factor will be named as such.

Testable Hypotheses

H1 : Foreign investors buy or sell manufacturing industry stocks based on fundamental analysis.

$$NETBUY_t = \beta_0 + \beta_1 GROWTH + \beta_2 SOLVENCY + \beta_3 OPERATINGLEVERAGE + \beta_4 PROFITABILITY \& ACTIVITY + \varepsilon_t \quad (3)$$

To test the hypothesis, the dependent variable “net foreign buy to foreign volume ratio” is regressed on the four factors. The results are given in Table 9. Despite the low explained variance (0.015), the ANOVA results show that the model is statistically significant at the 95% confidence level. Among the four factors, only the operational leverage coefficient (that concerning fixed assets) is significant at the 95% confidence level.

Results indicate that operational leverage has a significant effect on the net buy foreign volume ratio. Such a result is logical as the cash generating processes of manufacturing firms usually involve input from their fixed assets.

Dependent:		F	Significance
NETBUY		2,882*	0,022
Coefficients	Beta	t	Significance
Constant	-0,107**	-5,491	0,000
GROWTH	0,000	0,009	0,993
SOLVENCY	-0,028	-1,402	0,161
OPERLEV	0,054**	2,765	0,006
PROFITBLTY	0,025	1,282	0,200
R Square	0,015		

Table 9

ANOVA & Regression Results for The Foreigners' Net Purchases

H2: Foreign investors' allocation of volume of a given stock is dependent on the fundamentals of the company.

$$PERCENTVOL_t = \beta_0 + \beta_1 GROWTH + \beta_2 SOLVENCY + \beta_3 OPERATINGLEVERAGE + \beta_4 PROFITABILITY\&ACTIVITY + \varepsilon_t \quad (4)$$

To test this hypothesis, the foreign volume percentage of the total foreign volume of the period is calculated and then regressed on the four orthogonal factors. The results are given below in Table 10. The model is found to explain 9.5% of the total variation, and is statistically significant which means that it is globally useful to explain the relationship between the dependent and independent sets (F=21.398 significance = 0.0000).

Dependent:	F	Significance
PERCENTVOLUME	21,398**	0,000

Coefficients	Beta	t	Significance
Constant	0,679**	12,842	0,000
GROWTH	-0,038	-0,719	0,472
SOLVENCY	-0,154**	-2,905	0,004
OPERLEV	0,144**	2,728	0,007
PROFITBLTY	0,44**	8,318	0,000
R Square	0,100		

Table 10
ANOVA & Regression Results for Foreigners' Percent Volume

The coefficients of operational leverage, profitability & activity and solvency prove significant at the 95% confidence level. High solvency will mean a high stock of liquid assets, these not contributing to production processes (which are the core cash generator for a manufacturing firm). The profitability and activity ratios play a significant role in foreigners' allocation of the company.

H3: Foreign investors' allocation of buy volume of a given stock is dependent on the fundamentals of the company.

$$\begin{aligned} \text{PERCENTBUY}_t = & \beta_0 + \beta_1 \text{GROWTH} + \beta_2 \text{SOLVENCY} + \beta_3 \\ & \text{OPERATINGLEVERAGE} + \beta_4 \text{PROFITABILITY\&ACTIVITY} + \varepsilon_t \end{aligned} \quad (5)$$

To test this hypothesis, the foreign buy volume percentage of the total foreign buy volume of the period is regressed on the four orthogonal factors. Despite the modest R-square, the significant F indicates that the model is globally useful to explain the relationship between the dependent and independent sets.

Dependent:			F	Significance
PERCENTBUY			18,758**	0,000
Coefficients	Beta	t	Significance	
Constant	0,7**	11,756	0,000	
GROWTH	-0,040	-0,663	0,507	
SOLVENCY	-0,172**	-2,886	0,004	
OPERLEV	0,179**	3,010	0,003	
PROFITBLTY	0,451**	7,563	0,000	
R Square	0,088			

Table 11

ANOVA & Regression Results for Foreigners' Percent Buy

The coefficients show similar results to our previous test for total foreign volume. The same coefficients are significant at around the same confidence level and the signs are also the same. These results imply that there is a relationship between fundamentals and foreign buying and it is the same relationship as that between fundamentals and foreign volume.

H4: Foreign investors' allocation of sell volume of a given stock is dependent on the fundamentals of the company.

$$\begin{aligned} \text{PERCENTSELL}_t = & \beta_0 + \beta_1 \text{GROWTH} + \beta_2 \text{SOLVENCY} + \beta_3 \\ & \text{OPERATINGLEVERAGE} + \beta_4 \text{PROFITABILITY\&ACTIVITY} + \varepsilon_t \end{aligned} \quad (6)$$

To test this hypothesis, the foreign sell volume percentage of the total foreign sell volume of the period is calculated and then regressed on the four orthogonal factors. The results are given below in Table 12. A significant F

indicates the meaningful covariation of the dependent variable with the given set of independent variables.

Dependent:			F	Significance
PERSELL			22,031**	0,000
Coefficients	Beta	t	Significance	
Constant	0,659**	13,286	0,000	
GROWTH	-0,037	-0,737	0,461	
SOLVENCY	-0,136**	-2,742	0,006	
OPERLEV	0,111*	2,228	0,026	
PROFITBLTY	0,43**	8,666	0,000	
R Square	0,102			

Table 12
 ANOVA & Regression Results for Foreigners' Percent Sale

The coefficients show similar results to our previous test for solvency and profitability factors. However, operational leverage is not considered significant in selling. One possible interpretation of this could be that operational leverage is valued more when buying because it indicates assets in place available for the production process. In contrast, more variant factors such as profitability and solvency are of significance when selling, since foreign trade in the market is of a short term nature. It has been found in previous research that operational leverage for manufacturing's sub-sectors differs significantly and they are stable over time.

So far our analysis has included all of the manufacturing companies whose stock is traded on the ISE. A thorough analysis of volumes shows that, in the last three years that the sample covers, trading in only eleven companies' stocks constituted 75% of all transactions within the manufacturing sector. A look into these highly traded companies may reveal useful information and improve the findings regarding the previous hypotheses.

H5: Foreign investors trade highly-traded manufacturing stocks based on fundamental analysis.

$$\begin{aligned} \text{HIGHPERVOL}_t = & \beta_0 + \beta_1 \text{GROWTH} + \beta_2 \text{SOLVENCY} + \beta_3 \\ & \text{OPERATINGLEVERAGE} + \beta_4 \text{PROFITABILITY\&ACTIVITY} + \varepsilon_t \end{aligned} \quad (7)$$

To test this hypothesis, the foreign trade percentage of the foreign volume of the total period is again assigned to be the dependent variable. Regressing the dependent variable on the four factors provided the results given below.

The explanatory power of the regression model is 50% and the model is globally acceptable and adequate to explain the relationship. The coefficients are significant for operational leverage and solvency. Positive coefficients indicate that the higher the operational leverage, the more the operational efficiency, and this factor is related to trading by foreigners when the highly traded stocks are considered.

Dependent:			F	Significance
HIGHPERVOL			8,906**	0,000
Coefficients	Beta	t	Significance	
Constant	1,505**	4,560	0,000	
GROWTH	-0,129	-0,033	0,974	
SOLVENCY	0,980**	2,906	0,006	
OPERLEV	1,977**	5,194	0,000	
PROFITBLTY	0,133	0,330	0,743	
R Square	0,497			

Table 13
ANOVA & Regression Results for Foreigners' Volume in
Highly-Traded Stocks

H6: Foreign investors buy manufacturing stocks based on fundamental analysis.

$$\begin{aligned} \text{BUYVOL}_t = & \beta_0 + \beta_1 \text{GROWTH} + \beta_2 \text{SOLVENCY} + \beta_3 \text{OPERATINGLEVERAGE} \\ & + \beta_4 \text{PROFITABILITY\&ACTIVITY} + \varepsilon_t \end{aligned} \quad (8)$$

To test this hypothesis, the foreign buy of a stock to foreign period buy ratio is used. This ratio is regressed on the four factors. The results show that the model explains approximately 50% of the total variation. ANOVA also shows that the F statistic is 8.958 at .000 significance.

Dependent:			F	Significance
BUYVOL			8,965**	0,000
Coefficients	Beta	t	Significance	
Constant	1,590**	4,538	0,000	
GROWTH	-0,074	-0,018	0,986	
SOLVENCY	0,953*	2,660	0,012	
OPERLEV	2,165**	5,356	0,000	
PROFITBLTY	0,257	0,601	0,552	
R Square	0,499			

Table 14
 ANOVA & Regression Results for Foreigners' Purchase Volume

The coefficients show approximately the same results as the previous testing. When buying stocks, foreign investors definitely reserve a larger part of their funds for manufacturing companies with high operational leverage or, to put it another way, they invest in operational efficiency. Solvency has a strong, positive and significant coefficient, implying that foreigners buy stocks of solvent manufacturing companies.

H7: Fundamental factors discriminate between local and foreign investors in terms of total transaction volume.

The discriminant analysis reveals that profitability and solvency factors discriminate between the two sets of investors. Results show that judgment using profitability explains the differences between choices, which is in line with the previous finding that foreigners' preferences are not related to profitability. As the group means show, discriminant analysis statistically proves that foreign investors take solvency into consideration whereas the local investors take profitability into account for the top ten

firms in terms of transaction volume. Growth and operational leverage factors, on the other hand, do not discriminate between the two groups of investors.

Variables in the Analysis after Step 2					
Variable	Tolerance	F to Remove	D Squared	Between Groups	
PROFTABL	0,9067536	5,7814	0,4357978	1	2
SOLVENCY	0,9067536	9,3723	0,1927077	1	2

Variables not in the Analysis after Step 2					
Variable	Tolerance	Tolerance	F to Enter	D Squared	Between Groups
GROWTH	0,868535	0,7964514	2,9929602	1,148516	1 2
OPRLEVER	0,9753672	0,8883103	0,2223182	0,9077255	1 2

F level or tolerance or VNI insufficient for further computation

Table 15: Results of discriminant analysis

Group means				
groups	GROWTH	OPRLEVER	PROFTABL	SOLVENCY
1	-0,03141	0,27056	0,07941	-0,25461
2	-0,03974	0,09154	-0,23345	0,21416
Total	-0,03683	0,15405	-0,1242	0,05046

Group 1: Local Investors

Group 2: Foreign Investors

Table 16: Group means of local vs. foreign investors for the four orthogonal factors

4. Conclusion

The results show that foreigners trade manufacturing stocks based on fundamental analysis. Operational leverage, profitability and solvency are the factors that foreigners take into account while investing in the manufacturing stocks. Where large manufacturing stocks are of concern, operational leverage and solvency factors are still important, but profitability is not significantly taken into account. In addition, for the highly traded manufacturing stocks, profitability and solvency factors are statistically proven to discriminate between the companies that two groups of investors, local and foreigner, trade. The discriminant analysis statistically proves that foreign investors take the solvency factor into consideration whereas the local investors take profitability into account for the manufacturing stocks in terms of transaction volume. Growth and operational leverage factors, on the other hand, do not discriminate between the two groups of investors. It is shown that operational leverage is considered by both groups of investors, however growth is not a statistically significant factor in explaining the trading rationale of each group.

Although the statistical tests provide a reasonably clear conclusion, the volatile structure of the market has probably hidden many of the logical relations between the stock market, the real economy and foreign investment behavior. Another possible limitation of this study is that it considers the financial ratios derived from accounting data of firms as the only input for fundamental analysis. Further research including elements of fundamental analysis other than accounting-based ratios may provide more robust conclusions.

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