Factors Affecting Stock Returns of Firms Quoted in ISE Market: A Dynamic Panel Data Approach

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Abstract

Several studies, explaining the factors affecting stock returns, have been published both in developed and developing countries. In many of these papers, either cross-sectional or time series methods have been applied. In this study, Dynamic Panel Data Analysis Methods have been conducted to explain the factors affecting stock returns of 64 manufacturing firms that are continuously quoted in ISE during the period of 2003-2007. The results indicate that stock performance, financial structure, activity and profitability ratios can be used to explain the stock returns as well as the oil prices, economic growth, exchange rate, interest rate, and money supply.

Keywords: Dynamic Panel Data Analysis, Stock Returns, Stock Performance Ratios, Financial Ratios

JEL: C23, L25

1. Introduction

Security market is an economic institute within where sale and purchase transactions of securities between subjects of economy on the base of demand and supply take place. It is a system of interconnection between all participants that provides effective conditions to buy and sell securities, to attract new capital by means of new security issuance, to transfer real assets into financial assets, to invest money for short or long term periods with the aim of deriving profit. Therefore, a stock exchange market has multiple roles in an economy. It provides companies with the facility to raise capital for expansion through selling shares, raising capital for businesses, mobilizing savings for investment, facilitating company growth, creating investment opportunities for small investors and etc. The determination of the factors that situmulate the investments in the stock exchange markets has been well researched in the literature both theoretically and empirically.

The main aim of this study is to investigate the factors affecting stock returns that motivate investors in Istanbul Stock Exchange (ISE). In the literature from time series or cross sectional analysis interest rate, exchange rate, inflation rate, money supply and firm beta, firm size, book-to-market equity (BE/ME) ratio, equity-to-price (E/P) ratio, debt management ratios, activity and profitability ratios are found to significantly explain the stock returns. In this study, it is aimed to capture the effects of both macro and microeconomic indicators with dynamic panel data approach that enables us to include previous period stock returns beyond macro and microeconomic indicators.

This paper is structured as follows: Section 2 gives a detailed survey of literature. Methodology is briefly explained in Section 3. Data and variable description and the introduction of the model are documented in Section 4. Section 5 presents the emprical results and discusses the results in the context of Turkish situation. In section 6, future work is suggested.

2. Literature Review

The existing literature contains detailed analyses applied to test the relationship between macroeconomic and/or microeconomic variables with stock returns. It is often observed that stock prices tend to fluctuate with economic news, and this observation is supported by emprical evidence indicating that macroeconomic variables have explanatory power on stock returns.

Fama & Schwert (Fama and Schwert, 1977) examine the effect of inflation on stock returns in New York Stock Exchange between the years of 1953-1971 and find evidence that stock returns are negatively affected by both expected and unexpected inflation in the U.S. and Fama (Fama, 1981) offers an explanation for negative relationship between stock returns and inflation through a hypothesized chain of macroeconomic linkages. A reduction in economic activity negatively affects the future corporate profits and stock prices. The resulting negative relationship between stock returns and inflation is referred to as “Proxy effect”.

Chen, Roll, & Ross (Chen, Roll, and Ross, 1986) test a set of economic variables such as industrial production rate, inflation rate, risk premium, real consumption per capita rate and oil prices whether they have a systematic influence on stock market returns or not and examine their influence on asset pricing for the period of 1953-1983. They contribute that there exists a negative relationship between stock returns and inflation rate but a positive relationship between industrial production rate and stock returns.

Kwon & Shin (Kwon and Shin, 1999) investigate whether current economic activities in Korea can explain stock market returns using a cointegration test and a Granger causality test from a vector error correction model. The cointegration test and the vector error correction model illustrate that stock price indices are cointegrated with production index, exchange rate, trade balance, and money supply which provides a direct long-run equilibrium relation with each stock price index for the period of January 1980-December 1992.

Maysami & Koh (Maysami and Koh, 2000) examine the long-term equilibrium relationships between the Singapore stock index and selected macroeconomic variables, as well as seasonally adjusted month-end stock indices of Singapore, Japan, and the United States for the period of January 1988 - January 1995. Upon applying appropriate vector error correction models, they detect that changes in two measures of real economic activities, industrial production and trade, are not integrated of the same order as changes in Singapore’s stock market indices. However, changes in Singapore’s stock market indices do form a cointegrating relationship with changes in price levels, money supply, short and long term interest rates, and exchange rates.

Adrangi *et al.* (Adrangi, Chatrath, and Sanvicente 2002) document a negative relationship between stock returns and inflation rates for Brazil by employing Johansen and Juselius cointegration tests. Their study verifies that stock prices and general price levels also show a strong long-run equilibrium with real economic activity and each other. These findings support Fama’s Proxy hypothesis in the long-run.

Al-Sharkas (Al-Sharkas, 2004) analyzes long run relationship between real economic activity, money supply, inflation, interest rate and Amman Stock Exchange Index using vector error correction model from March 1980 to December 2003. Emprical evidence shows that there exists a cointegrating vector among the variables. The level of real economic activity affects stock prices positively while money

supply, industrial production, interest rates have a positive effect on ASE, and consumer price index is the negative determinant of Jordanian stock prices.

Türsoy *et al.* (Türsoy, Gürsoy, and Rjoub, 2008) empirically test the Arbitrage Pricing Theory in Istanbul Stock Exchange (ISE) for the period of February 2001-September 2005 on a monthly base. In their analysis they use 13 macroeconomic variables representing the basic indicator of an economy namely money supply, industrial production, crude oil price, consumer price index, import, export, gold price, exchange rate, interest rate, gross domestic product, foreign reserve, unemployment rate and market pressure index on 11 industry portfolios of Istanbul Stock Exchange to observe the effects of these variables on stock returns. They apply ordinary least square (OLS) technique and find that all of the variables are significant in explaining stock returns while there are quite small differences among market portfolios. There are fewer researches investigating the effects of oil-price changes on stock returns. Jones & Kaul's study (Jones, and Kaul 1996) shows that international stock prices (United States, Canada, Japan, and the United Kingdom) do react to oil price shocks. Papapetrou (Papapetrou, 2001) shows that an oil price shocks have a negative impact on stock prices, since they negatively affect industrial production as well as employment growth. Nandha & Faff (Nandha and Faff. 2008) argue that oil shocks can have adverse effects on firm's output as well as firm's profitability, especially for those firms where oil is used as an input, but they fail to emprically reveal such a direct impact for certain industries. Furthermore, O'Neil *et al.* (O'Neil, JPenm, and Terrell 2008), Cong *et al.* (Cong, Wei, Jiao and Fan, 2008) and Park & Ratti (Park and Ratti, 2008.) report that oil price shocks have a statistically significant negative effect on stock prices for an extended sample of 13 developed markets.Whereas Kasman (Kasman, 1997) finds no evidence of oil price volatility effect on stock returns. There are many studies done to test the effect of exchange rates on stock returns. Phylaktis & Ravazzolo (Phylaktis and Ravazzolo, 2005), Yılmaz *et al.* (Yılmaz, Güngör and Kaya, 1997) find that exchange rate has a positive effect on stock returns whereas Kwon & Shin(Kwon and Shin 1999), Dizdarlar & Derindere (Yılmaz, Güngör and Kaya 1997), Albeni & Demir (Albeni, and Demir 2005), Akkum & Vuran (Akkum and Vuran 2003) find a negative relationship in different markets.

Kargı & Terzi (Kargı and Terzi, 1999), Mutan & Çanakçı (Mutan and Çanakçı, 2007), Yılmaz *et al.* (Yılmaz, Güngör, and Kaya 1997) investigate the effect of inflation rate on stock returns in ISE and they find that inflation rate negatively associate with stock returns.

There is also a substantial literature that examines the explanatory power of financial ratios of firms on stock returns. This literature goes back to Fama & MacBeth (Fama and MacBeth 1973) where the researchers find that there is a positive simple relationship between average stock returns and beta which is a measure of risk in the pre-1969 period. Basu (Basu, 1977) finds that stocks with high (low) P/E ratios generate lower (higher) stock returns.

Rosenberg *et al.* (Rosenberg, Reid and Lanstein 1985) find that average stock returns are positively related to the ratio of a firm's book value of common equity to its market value in the US market. Bhandari [Bhandari, 1988] finds that the expected common stock returns are positively related to the ratio of debt to equity, controlling the beta and firm size. This relationship is found not to be sensitive to variations in the market proxy, estimation technique, etc. The evidence suggests that the "premium" associated with the debt/equity ratio is not likely to be just some kind of risk premium. Fama & French (Fama and French 1992) document that firm size, BE/ME capture much of the cross-sectional variation in average stock returns.

Chan *et al.* (Chan, Hamao and Lakonishok, 1991) relate cross-sectional differences in returns on Japanese stocks with the underlying behaviour of four variables: earnings yield, size, book to market ratio, and cash flow yield. The sample includes both manufacturing and nonmanufacturing firms, quoted in Tokyo Stock Exchange from 1971 to 1988. Their findings reveal a significant relationship between these variables and expected stock returns in the Japanese market. Of the four variables considered, the BE/ME ratio and cash flow yield have the most significant positive impact on expected returns.

Lau *et al.* (Chan, Hamao, and Lakonishok, 1991) examine the relationship between stock returns and beta, size, earnings-to-price ratio, cash flow-to-price ratio, book-to-market equity ratio, and sales growth using data from Singapore and Malaysia for the period of 1988–1996. They find a conditional relationship between beta and stock returns and a negative relationship between stock returns and size for both countries. For Singapore, they also document a negative relationship between returns and sales growth. For Malaysia, they find a positive relationship between returns and the E/P ratio.

Canbaş *et al.* (Canbaş, Kandır, and Erişmiş 2007) investigate the effects of firm size, book-to-market ratio, book leverage, market leverage and earnings-to-price ratio on stock returns of all nonfinancial ISE firms from July 1992 to June 2005. Analysis is conducted by examining the returns of portfolios with different characteristics. Stocks of small ISE firms appear to have earned higher monthly returns than the stocks of large firms. Similarly, firms with high BE/ME ratios produce higher returns than those with low BE/ME ratios. Furthermore, stocks of high-leverage firms have higher returns than the stocks of low-leverage firms. By contrast with the existing literature, portfolios with the lowest E/P ratios seem to have earned the highest rates of returns.

Aydoğan & Güney (Aydoğan and Güney, 1997) and Ege & Bayrakdaroğlu [Ege and Bayrakdaroğlu, 2007] also investigate the effect of P/E ratios in the Turkish market. They find evidence of a negative relationship between stock returns and P/E ratios.

Yıldırım (Yıldırım, 1997) finds in his study that the BE/ME ratio is a significant factor in explaining stock returns in ISE. All of these findings are summarized in Table 1.

Table 1: Literature review of variables found to be significantly affecting the stock returns

Variables	**Previous studies which employ indicated variables**
Inflation	Fama & Schwert, 1977; Firth, 1979; Chen, Roll & Ross,1986; Cohn & Lessard ,1980; Fama ,1981; Gultekin ,1983; Kaul ,1986; Al-Sharkas,2004; Adrangi *et al.*,2002; Akkum & Vuran, 2003; Albeni & Demir ,2005; Mutan & Çanakçı ,2007; Kargı & Terzi ,1999;Yılmaz *et al.* 1997;
Interest Rate	Al-Sharkas, 2004; Akkum & Vuran,2003; Maysami & Koh, 2000; Durukan,1999; Papapetrou , 2001; Türsoy *et al.* 2008;
Exchange rate	Akçoraoğlu & Yurdakul, 2002; Akkum & Vuran, 2003; Yılmaz *et al.*, 1997; Maysami & Koh, 2000; Phylaktis & Ravazzolo, 2005; Kwon & Shin,1999; Dizdarlar & Derindere, 2008 Albeni & Demir, 2005; Türsoy *et al.*,2008; Özçiçek, 2006;
Oil price	Jones & Kaul, 1996; Papapetrou, 2001; Nandha & Faff,2008; O'Neill *et al.*,2008; Park & Ratti, 2008 Cong *et al.*, 2008; Kasman,1997; Türsoy *et al.*,2008; Apergis & Miller,2009.
Money Supply	Al-Sharkas, 2004; Maysami & Koh, 2000; Lastrapes, 1998; Kwon & Shin, 1999; Kasman, 1997; Türsoy *et al.*2008.
GDP	Karagöz & Armutlu, 2007; Türsoy *et al.*, 2008.
Production Indice	Chen, Roll & Ross, 1986; Al-Sharkas,2004; Kwon & Shin,1999.
P / E	Basu, 1977; Aydoğan & Güney, 1997; Ege & Bayrakdaroğlu, 2007; Yalçıner *et.al*., 2005.
E / P	Lau *et al.*, 2002; Canbaş *et al.*, 2007; Bildik & Gülay, 2007.
BE / ME	Rosenberg *et al.*, Yıldırım, 1997; Chan *et al.*, 1991; Stattman, 1980; Strong Xu, 1997.
ME / BE	Yalçıner *et.al.* Ege & Bayrakdaroğlu,2007; Kalaycı & Karataş, 2005.
Dividend Yield	Blume, Fama & French, 1988; Aydoğan & Güney, 1991; Kothari & Shanken, Morgan & Thomas, 1998.
Firm Size	Banz, Chui & Wei, 1998; Canbaş *et al.*, Akdeniz *et.al.*2000.
Financial Leverage	Fama & French, 1992; Lam, Canbaş *et al.*, 2007; Kalaycı & Karataş, 2005.
Profitability Ratios	Strong, 1993; Tsay & Goo, 2006; Yıldırım, 1997; Kalaycı & Karataş, 2005
Liquidity Ratios	Kalaycı & Karataş, 2005; Ege & Bayrakdaroğlu, 2007

Activity Ratios	Kalaycı & Karataş, 2005; Ege & Bayrakdaroğlu, 2007

3. **Methodology**

In this study dynamic panel data analysis is applied in order to determine the factors affecting stock returns of the firms quoted in Istanbul Stock Exchange Market, since it is believed that the current stock returns are affected from the previous stock returns beyond other explanatory variables. The general dynamic panel data model could be expressed as follows:

$$y_{it} = \gamma y_{i,t-1} + \boldsymbol{\rho}'\mathbf{z}_i + \boldsymbol{\delta}'\mathbf{r}_t + \boldsymbol{B}'\boldsymbol{x}_{it} + v_{it} \qquad \textbf{(1)}$$

for $i = 1,\ldots,N$ denoting firms and $t = 1,\ldots,T$ denoting years, where y_{it} and $y_{i,t-1}$ are the stock eturns of the i th firm for time t and $t-1$, respectively, $\boldsymbol{z}_i$ are the time-invariant firm specific bservable variables, $\boldsymbol{r}_t$ are the firm-invariant time specific observable variables, $\boldsymbol{x}_{it}$ are the time and firm variant financial variables, v_{it} are the unobservable factors that affect the i th firm stock returns time t. It is assumed that the composite error term v_{it} follows a one-way error structure $v_{it} = \mu_i + u_{it}$ that has two components, μ_i specific to firms that doesn't change over time and u_{it} that changes both over time and for firms.

The estimation of the model given in (Fama and Schwert, 1977) with Ordinary Least Squares (OLS) would be biased and inconsistent since the lagged dependent variable appears in the model as an explanatory variable that is correlated with the error term v_{it} (Bond, 2002, p. 4). Furthermore, both the fixed effects and random effects models result in biased estimates due to the correlation between $\left(y_{it} - \overline{y}_{i,-1}\right)$ and $\left(v_{it} - \overline{v}_i\right)$. This relationship occurs as a result of the correlation between $y_{i,t-1}$ and $\overline{v}_i$ that contains $v_{i,t-1}$ (Baltagi, 2001, p. 130 ; Bond, 2002, p. 5). Therefore it is not possible to obtain consistent estimates with dummy variable least squares or covariance panel data methods (Brüderl, 2005, p. 19).

Since a dynamic panel data cannot be efficiently estimated with either OLS or fixed and random effects, many alternative methods have been developed in order to obtain consistent estimators. For example, Maximum Likelihood (ML) and Covariance Estimators can be consistent and efficient with appropriate transformations on the initial values when T is fixed and N tends to infinity. However, a mistake made in the assumptions of the determination of the initial values may cause the estimates to be biased or even inconsistent (Anderson & Hsiao, 1981, p. 605; Hsiao, 2003). Furthermore, one may not be able to have enough information on the choice of initial values (Anderson & Hsiao, 1981, p. 605). As a result many other estimators which require less or even don't require any restrictions on the initial conditions have been developed. These methods mainly focus on finding consistent estimators by the help of the inclusion of instruments that are correlated with the lagged dependent variable and that are not correlated with the error term. The firstly developed method in this area is Anderson & Hsiao's (A&H) Instrumental Variables (IV) estimator in 1981. A&H estimator is based on taking the first difference of the model to eliminate the unobserved individual effects and then using $y_{i,t-2}$ or $\Delta y_{i,t-2} = y_{i,t-2} - y_{i,t-3}$ as an instrument for $\Delta y_{i,t-1}$ in order to obtain consistent estimates since these instruments will be highly correlated with $\Delta y_{i,t-1}$ and will not be correlated with Δu_{it} (Anderson & Hsiao, 1982, p. 58-59 ; Hsiao; 2003,p. 85 ; Bond, 2002, p. 7 ; Judson & Owen, 1999, p. 9-11 ; Wooldridge,2002, p. 304 ; Mátyás & Sevestre, 1996, p.127-130).

In order to obtain more efficient and consistent estimates of the parameters, Arellano & Bond (1991) [68] developed the Generalised Method of Moments (GMM) and Arellano & Bover (1995) and Blundell & Bond (1998) developed the System Generalised Method of Moments (SGMM) estimation models where there are no initial condition restrictions (Hsiao, 2003, p. 75). These methods utilize more instrumental variables that hold some important properties (Bond, 2002, p. 7; Mátyás & Sevestre, 1996, p. 127). One of these is that the y_{i1} are uncorrelated with the subsequent disturbances u_{it} for $t = 2,3,\ldots,T$. The second one is that the instrumental variables are uncorrelated with the disturbances. The third one is that the instrumental variables are highly correlated with those variables that are used as instruments. Finally, that the disturbances u_{it} are serially uncorrelated. These assumptions should be tested beforehand in order to obtain consistent and unbiased estimates.In this paper, all of these methods will be applied and compared. Furthermore it should be noted that when the number of time periods is small, the A&H estimator may be subject to a large downward finite-sample bias. This problem may be eliminated with the inclusion of explanatory variables. These methods are applied to the stock exchange and macroeconomic data that are explained in details in the following section.

4. Data and Variables

In this study, yearly data on stocks of 64 manufacturing firms listed continuously in Istanbul Stock Exchange (ISE) in between 2003-2007 (inclusive) and the macroeconomic indicators of the Turkish economy are used to analyse the factors affecting stock returns. Financial indicators of the stock returns are obtained from ISE's database that publishes the firm consolidated balance sheets and income statements. These data were adjusted according to the inflation rate. Macroeconomic data were obtained from the statistical database of Central Bank of the Republic of Turkey[1].

The main purpose of this paper is to determine the financial and economical determinants of stock returns across firms and time, by estimating dynamic panel data models of stock returns. Individual firm stock returns are calculated using the following equation:

$$r_t = \frac{P_t \cdot \left(Rights_t + Bonus_t + 1\right) - PreREP_t \cdot Rights_t + Div_t}{P_{t-1}} \qquad (2)$$

P_t : the closing price of the stock at time t,

P_{t-1} : the closing price of the stock at time t-1,

$Rights_t$: the number of the rights issue obtained at time t,

$Bonus_t$: the number of the bonus issue obtained at time t,

$PreREP_t$: Pre-emptive right exercising price at time t,

Div_t : the dividend paid at time t.

[1] http://evds.tcmb.gov.tr/yeni/cbt-uk.html

Table 2 gives the detailed information about the variables used in this study.

Table 2: Definition and Codes of Microeconomic and Macroeconomic Variables

Code	Variable	Definition/Calculation
Dependent Variable		
r	Adjusted Return of Stock	
Micro Variables		
lagr	1 year-lag of adjusted return	r_{t-1}
x1	Market Performance Ratios: Beta	Beta
x2	Market Performance Ratios: Firm Size	Logarithm of the market value of a firm
x3	Market Performance Ratios: BE/ME	Book-to-Market Equity (BE/ME)
x4	Market Performance Ratios: Dividend Yield	d_1/P_o
x5	Market Performance Ratios: Earnings to price ratio	E/P
x7_1	Liquidity Ratios: Curent Ratio	Current Assets/ Current Liabilities
x7_2	Liquidity Ratios: Asit-test Ratio	(Current Assets-Inventories)/Current Liabilities
x7_3	Liquidity Ratios: Cash Ratio	(Cash+Bank+Marketable Securities)/ Current Liabilities
x8_1	Debt Management Ratios: Leverage Ratio	Total Debt / Total Assets
x8_2	Debt Management Ratios	Equity/Total Assets
x8_3	Debt Management Ratios	Total Debt / Equity
x8_4	Debt Management Ratios	Short Term Debt / Total Assets
x8_5	Debt Management Ratios	Equity / Total Fixed Assets
x8_6	Debt Management Ratios	Total Fixed Assets / Long Term Debt
x9_1	Activity Ratios: Receivables Turnover	Receivables*360 / Annual Credit Sales
x9_2	Activity Ratios: Inventory Turnover	Cost of Goods Sold / Inventories
x9_3	Activity Ratios: Fixed Assets Turnover	Sales / Net Fixed Assets
x9_4	Activity Ratios: Total Assets Turnover	Sales / Total Assets
x9_5	Activity Ratios: Equity Turnover	Sales / Equity
x10_1	Profitability Ratios: Net Profit Margin	Net Profit / Sales
x10_2	Profitability Ratios: Return On Equity	Net Income / Equity
x10_3	Profitability Ratios: Return on Total Assets	Net Income / Total Assets
Macro Variables		
inf1	Inflation	Wholesale Price Index
inf2	Inflation	Consumer Price Index
ggnp	Growth Rate	% Change in Gross National Product
gtpi	Growth Rate	% Change in Total Production Index
gipi	Growth Rate	% Change in Industrial Production Index
euro	Exchange (Euro/TL) Rate	
logrealm1	Real Money Supply	Log(M1)
intrate	Interest Rate	Compound Interest Rate

oilp	Oil Price (US Dollar per Barrel)

5. **Emprical Results**

In this section, GMM results are interpreted and the validity of the assumptions are tested. One of the assumptions of the GMM is that all the instrumental variables are strictly exogenous. The second one is that there is no autocorrelation between the residuals of the first difference model. Exogeniety assumption of the subset of the instrumental variables is tested with Difference Sargan tests. Since the market performance ratios are calculated using stock prices, the E/P and BE/ME ratios are tested against exogeneity assumption and are found to be endogenous. The Sargan test results are given in the following table.

Table 3: Sargan Tests for Semi-Endogeniety of P/E and BE/ME

	Both E/P & BE/ME Semi-Endogenous			**E/P Semi-Endogenous**			**Diff Test**		
Models	**Sar Test$_1$**	**Sar p-val**	df$_1$	**Sar Test2**	**Sar p-değ.**	**f2**	**SarDiff**	**f1-f2**	**SarDiff p-val**
(1)	24.929	0.250	21	16.883	0.154	12	8.046	9	0.5295
(2)	23.895	0.298	21	15.007	0.241	12	8.888	9	0.4477
(3)	24.938	0.250	21	15.389	0.221	12	9.549	9	0.3882

From Table 3, it is seen that the p-values of the differences are high indicating that both E/P and BE/ME can be treated as endogenous variables. The second assumption is tested using Arellano & Bond's (1991) autocorrelation test. Here since the Δu_{it} are first differences of serially uncorrelated errors, the AR(1) statistic $E\left(\Delta u_{it}\Delta u_{i,t-1}\right)$ need not be zero, but the AR(2) statistic $E\left(\Delta u_{it}\Delta u_{i,t-2}\right)$ should be zero. In other words if the AR(2) statistic is not significant then the GMM estimation is consistent. These results are given in Table 3. The autocorrelation coefficient of the AR(1) model is significant and AR(2) model is insignificant indicating that the GMM estimation is consistent.

The findings of the models with the most significant explanatory variables are exhibited in Table 4. The results in Table 4 exhibit that;

- there exists one-way fixed unobserved effects such as management style and firm reputation,
- beta, firm size, BE/ME and E/P are found to be significant,
- among the macroeconomic variables included in the models, exchange rate (euro), interest rate (intrate) and oil price (oilp) have significant effects on stock returns,
- the lag value of stock returns also have a significant explanatory power,
- stock returns are affected by market performance ratios, profitability, activity and debt management ratios such as equity/fixed asset, fixed assets/long-term debt ratios, receivables and inventory turnover, net profit margin and return on total asset.

Table 4: Significant models with P/E and BE/ME semi-endogenous variables

	(1)	(2)	(3)
lagr	-0.1651	-0.1349	-0.1429
	(0.0000)	(0.0004)	(0.0002)
x1	0.2012	0.2152	0.2239
	(0.0074)	(0.0108)	(0.0083)
x2	0.4441	0.4128	0.4022
	(0.0000)	(0.0002)	(0.0006)
x3	0.2164	0.2264	0.2285
	(0.0000)	(0.0000)	(0.0000)
x5	0.7192	0.7408	0.6742
	(0.0000)	(0.0000)	(0.0000)
euro	4.8901	5.3895	5.1597
	(0.0000)	(0.0000)	(0.0000)
intrate	-0.0440	-0.0459	-0.0458
	(0.0000)	(0.0000)	(0.0000)
oilp	-0.1091	-0.1161	-0.1130
	(0.0000)	(0.0000)	(0.0000)
x8_5	-0.0500		
	(0.0002)		
x8_6		-0.0127	-0.0148
		(0.0021)	(0.0000)
x9_2	0.0230	0.0234	0.0239
	(0.0321)	(0.0223)	(0.0243)
x10_1	0.1039	0.0569	
	(0.0000)	(0.0213)	
x10_3			1.2932
			(0.0325)
AR(1)	-3.240	-3.189	-3.234
AR(1) p-val.	0.00119	0.00143	0.00122
AR(2)	-1.426	-1.215	-1.134
AR(2) p-val	0.154	0.224	0.257
Wald chi-sq	757.1	615.8	604.0
Wald p-value	0	0	0

p-values in parentheses

Thus, it is determined that the stock returns in ISE are affected by both previous years' returns and financial ratios of firms. These findings contribute that, in between 2003-2007, ISE market is a semi-efficient market and is becoming a credible market for investors.

The results support that the exchange rate has positive but oil price and interest rate have a negative effect on stock returns. The positive effect of exchange rate reveals that the firms were not exposed to exchange rate risk in the period of 2003-2007, since exchange rates in this period are not

significantly volatile. The negative effect of oil prices is not surprising since any increase in oil prices affects the production costs of firms negatively, causing stock returns to fall. The effect of interest rate variable can be explained via firm valuation framework. Since the firm value depends on the present value of future cash flows, the present value of the cash flow decreases with an increase in interest rate causing firm values and therefore common stock values to decrease. In this study it is found that an increase in interest rate causes stock returns to decrease. As a result, it can be concluded that investors prefer to invest their funds in interest bearing securities instead of real sector investments which causes stock returns to fall.

The firm size and all of the market performance ratios are found to have a positive impact on stock returns. This result can be explained by the fact that in Turkey the big sized firms are perceived to be more successful than the small-sized ones causing the stock returns of big sized firms to be higher than small sized ones. Higher E/P ratio is considered to be an indicator of a better financial performance, and therefore it is an expected result that any increase in E/P ratio appreciates stock returns. In addition, the profitability and turnover ratios affect stock returns positively. The better the profitability and turnover ratios, the higher the operational performance of the firms, resulting with a positive expectation between these ratios and stock returns. Among the debt management ratios, any increase in equity-to-fixed assets and fixed assets-to-long-term debt ratios depreciates the stock returns. The negative relationship between these ratios and stock returns can be explained by the scarce opportunity of long-term borrowing and short-term financing of fixed assets in the Turkish market where investors mostly direct their funds to stocks of firms that make dividend payment rather than those that do not make dividend payment. This causes a decrease in stock returns. Firms that finance their fixed assets with short-term instruments have high interest burden which is perceived by investors as increase in financial risk. The positive effect of any increase in receivables turnover and inventory turnover on stock returns can be explained by the ability of firms in collecting receivables and converting inventories into cash. Therefore, firms with high receivables and inventory turnover ratios are regarded as successful firms.

6. Conclusion

The empirical results of the study show that stock returns are affected by previous year's returns, financial ratios and macroeconomic variables. From the efficient market hypothesis point of view, Istanbul Stock Exchange exhibits the features of semi-efficient forms of efficient market hypothesis in between 2003- 2007 for the manufacturing firms.

The results of the study are related to manufacturing firms for the period of 2003-2007. For further research, as well as extending the period, the research sample can be broadened by adding other firms operating in different industries. Since there will be different industries, a Nested Panel Data Analysis can be applied. As a result, it can be examined if those variables explaning stock returns of manufacturing firms are also valid for other sectors.

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