

FACTORS AFFECTING STOCK RETURNS: FIXED EFFECTS PANEL DATA APPROACH



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INTRODUCTION

- Stock Exchange Markets provide an environment for firms an opportunity of financing where the small savings are transformed into investments.
- The main purpose of this study is to determine the factors affecting stock returns of firms quoted in ISE.
- There are 2 basic methods to predict the stock returns : Technical and Fundamental Analysis.

Technical Analysis

Past Stock Return
Prices

Fundamental Analysis

Firm Financial
Ratios

Sectoral
Developments

Macroeconomic
Developments

FUNDAMENTAL ANALYSIS

Macroeconomic Factors

Inflation Rate

Industrial Production Indices

Interest Rate

Exchange Rate

Money Supply

Oil Prices ... etc.

Microeconomic Factors

Stock Performance Ratios

Firm Size

Systematic Risk

Financial Ratios

- Profitability
- Efficiency Ratios
- Liquidity Ratios
- Leverage Ratios

LITERATURE REVIEW

Macroeconomic Studies – Inflation Rate

Year	Country	Paper	Variable	Relationship
1953-1971	US	Fama & Schwert (1977)	inflation	-
1/1953-11/1983	US	Chen, Roll & Ross (1986)	inflation	-
I/1980-IV/2003	Jordan	Al-Sharkas (2004)	inflation	-
	UK	Firth (1979)	inflation	+
1/1986-7/1997	Brezil	Adrangi & Chatrath (2002)	inflation	-
1999-2002	ISE	Akkum & Vuran (2003)	inflation	1/20 (-)
1/2000-4/2007	ISE	Mutan & Çanakçı (2007)	inflation	-
1/1986-6/1996	ISE	Kargı & Terzi (1999)	inflation	+
1/1990-12/2003	ISE	Yılmaz, Güngör & Kaya (2007)	inflation	+

Macroeconomic Studies – Industrial Production Indice/GDP

Year	Country	Paper	Variable	Relationship
1/1953-11/1983	US	Chen, Roll & Ross (1986)	IPI	+
I/1980-IV/2003	Jordan	Al-Sharkas (2004)	IPI	+
I/1988-IV/2006	ISE	Karagöz & Armutlu (2007)	GDP	+

Macroeconomic Studies – Interest Rate

Year	Country	Paper	Variable	Relationship
1/1988-1/1995	Singapore	Maysami & Koh (2000)	Short-T IR Long-Term IR	+ -
1/1986-12/1998	ISE	Durukan (1999)	Interest Rate	-
I/1980-IV/2003	Jordan	Al-Sharkas (2004)	Interest Rate	+
1/1989-6/1999	Greece	Papapetrou (2001)	Interest Rate	-
1999-2002	ISE	Akkum & Vuran (2003)	Interest Rate	+

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Macroeconomic Studies – Exchange Rate

Year	Country	Paper	Variable	Relationship
1/1980-12/1998	Hong K., Malezia, Sing, Thailand & Philipins	Phylaktis & Ravazzolo (2005)	ER	+
1/1980-12/1992	Korea	Kwon & Shin (1999)	ER	-
2002-2007	ISE	Dizdarlar & Derindere (2008)	ER	-
	ISE	Albeni & Demir (2005)	ER	-
1999-2002	ISE	Akkum & Vuran (2003)	ER	-
1/1990-12/2003	ISE	Yılmaz, Güngör & Kaya (2007)	ER	+

Macroeconomic Studies – Money Supply

Year	Country	Paper	Variable	Relationship
3/1960-4/1994	G7, Holland	Lastrapes (1998)	MS	+
I/1980-IV/2003	Jordon	Al-Sharkas (2004)	MS	+
1/1980-12/1992	Korea	Kwon & Shin (1999)	MS	-
1/1986-12/2003	ISE	Kasman (2004)	MS	+

Macroeconomic Studies – Oil Prices

Year	Country	Paper	Variable	Relationship
1/1996-12/2007	G7, Australia	Cong et.all (2008)	OP	-
1/1989-6/1999	Greece	Papapetrou (2001)	OP	-
1/1986-12/2003	ISE	Kasman (2004)	OP	none

Microeconomic Studies – Earnings-Price Ratios

Year	Country	Paper	Variable	Relationship
9/1956-8/1971	US	Basu (1977)	P/E	-
6/1988-12/1996	Sing., Malaysia	Lau, Lee & McInish (2002)	E/P	+
7/1984-6/1997	Hong Kong	Lam (2002)	E/P	+
I/1986-IV/1992	ISE	Aydoğan & Güney (1997)	P/E	-
	ISE	Ege & Bayrakdaroğlu (2007)	P/E	-
7/1992-6/2005	ISE	Canbaş, Kandır & Erişmiş (2007)	E/P	-

Microeconomic Studies – Book-to-Market Ratio

Year	Country	Paper	Variable	Relationship
1973-1984	US	Rosenberg, Reid & Lanstein (1985)	BE/ME	+
1990-2002	ISE	Yıldırım (1997)	BE/ME	+

Microeconomic Studies – Firm Size (Market Equity)

Year	Country	Paper	Variable	Relationship
	HongK, Korea, Malas, Tayv, Thailand	Chui & Wei (1998)	logME	-
1992-2005	ISE	Erişmiş (2007)	logME	-
1/1992-12/1998	ISE	Akdeniz et.all. (2000)	logME	-

SUMMARY OF THE LITERATURE

Macroeconomic Studies		
Inflation	+	-
IPI-GDP	+	
Interest Rate	+	-
Exchange Rate	+	-
Money Supply	+	-
Oil Prices	-	

Microeconomic Studies		
E/P	+	-
BE/ME	+	
Firm Size		-
Beta (systematic risk)	+	
Financial Ratios	+	-

WHY PANEL DATA?

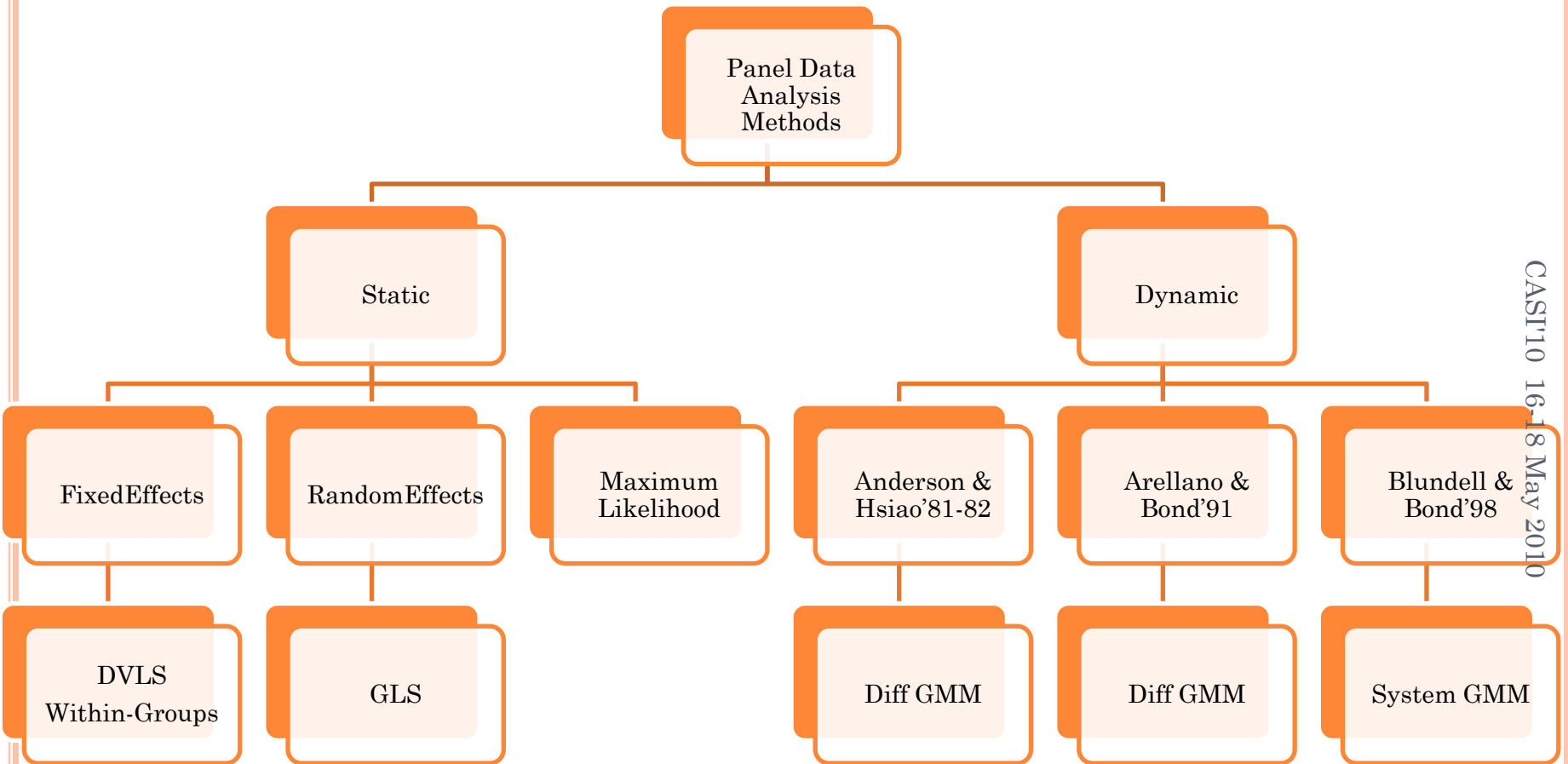
- Both macro and micro economic factors can be analysed and there are many advantages of panel data analysis (Baltagi (2005) pp.5-7):

- *“Controlling for individual heterogeneity”*
- *“More informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency”*
- *“Panel data are better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data”*
- *“Micro panel data gathered on individuals, firms and households may be more accurately measured than similar variables measured at the macro level. Biases resulting from aggregation over firms or individuals may be reduced or eliminated”*

DISADVANTAGES OF PANEL DATA

- Design and data collection problems
- Distortions of measurement errors
- Selectivity problems such as
 - Nonresponse
 - Attrition bias
- Short time series dimension
- Cross sectional dependence

PANEL DATA ANALYSIS METHODS



STATIC PANEL DATA ANALYSIS METHODS

$$y_{it} = \alpha + \mathbf{x}_{it} \mathbf{B} + v_{it}$$

$A_i + \mu_{it} + \lambda_t + u_{it}$

FIXED/RANDOM EFFECTS

$$y_{it} = \alpha + \mathbf{x}_{it}\mathbf{B} + A_i + u_{it}$$

$$E u_{it} | \mathbf{x}_{it}, A_i = 0$$

Fixed Effects

$$E u_{it} | \mathbf{x}_i, A_i = 0$$

$$E A_i | \mathbf{x}_i = E A_i = 0$$

Random Effects

Heteroskedasticity ~~Autocorrelation~~

ASSUMPTIONS

Both fixed and random effects must satisfy the assumptions of

- Homoskedasticity
- Non correlated errors
- No correlation between cross-sectional units

+

in random effects $E A_i | \mathbf{x}_i = E A_i = 0$

No correlation between unobservable effects and explanatory variables.

APPLICATION

AIM OF THE STUDY

- The main purpose of this study is to,
 - determine the factors affecting stock returns of manufacturing firms quoted in ISE by panel data analysis.

DATA

- those 64 firms quoted continuously between 2003-2007
- $N=64$ $T=5$
- Those micro and macro economic factors that have been studied in the literature are considered as explanatory factors.

SOFTWARE

- “plm” package in R is used for the panel data analysis (<http://CRAN.R-project.org/package=plm>)
- STATA is also used
- Various tests are conducted

RESULTS

	Fixed-R (1)	Fixed-R (2)
risk	0.1976 (0.0566)	0.1957 (0.0608)
size	0.2806 (0.0049)	0.2896 (0.0039)
BE/ME	0.2599 (0.0003)	0.2602 (0.0002)
E/P	0.3375 (0.0301)	0.3361 (0.0287)
euro	6.0398 (0.0000)	5.9813 (0.0000)
oilp	-0.0530 (0.0000)	-0.0521 (0.0000)
moneys	3.0425 (0.0000)	2.9774 (0.0000)
S-Equity / Fixed Assets		-0.0269 (0.0404)
Cons.	-65.778 (0.0000)	-64.698 (0.0000)
Obs.	320	320
R-sq.	0.4581	0.4624
Corr	-0.710	-0.722
F_f	1.422	1.456
F	30.07	26.67
F_f pd	0.0313	0.0234

RESULTS OBTAINED FROM THE FIXED EFFECTS

- There are individual effects: Firm reputation, management style etc.
- Macroeconomic factors :
 - Positive effect of exchange rate
 - Negative effect of oil prices
 - Positive effect of money supply

- Stock performance ratios are significant in explaining stock returns:
 - BE/ME has a positive effect
 - E/P has a positive effect
 - Firm size has a positive effect
 - Systematic risk has a positive effect

CONCLUSION

- Stock returns in ISE are affected by
 - macroeconomic factors and
 - stock performance and firm financial ratios

FURTHER RESEARCH

- The results in this research are only relevant for the firms operating in the manufacturing industry.
- The research could be extended including those firms operating in other industries by a Nested Panel Data Analysis.
- The period covered is 2003-2008. This period could be extended.

Thanks....

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