How Inflation, Market Capitalization, Industrial Production and the Economic Sentiment Indicator Affect the EU-12 Stock Markets [*]

Dimitrios N. Subeniotis[1], Dimitrios L. Papadopoulos[2], Ioannis A. Tampakoudis[3], Athina Tampakoudi[4]

Abstract:

In the present study we map the relationship between the EU-12 stock market price indices and four crucial macroeconomic factors, using panel data analysis. The examined variables are market capitalization, industrial production, the economic sentiment indicator, and inflation, while the twelve countries are those which have adopted the euro. The empirical results reveal a strong effect of the first three factors, while inflation has a negative but not statistically significant coefficient. Further, the variables that affect the stock markets positively are market capitalization and the economic sentiment indicator. Finally, an applied statistical model confirms the significant convergence of the EU-12 stock markets in the long run, indicating a low geographic diversification across European markets.

Key Words: *Stock Markets, Panel Data, Macroeconomic Fundamentals.*

---

[1] *Associate Professor of Business Strategy and Finance, Department of Business Administration, University of Macedonia 156 Egnatias Street, 54006 Thessaloniki, Greece, Tel: +30 2310 891298, Fax: +30 2310 891544, Email: subedim@uom.gr*
[2] *Professor of Entrepreneurial Economics, Department of Accounting and Finance, University of Macedonia, Tel: +30 2310 891673, Fax: +30 2310 891648, Email: dimpap@uom.gr*
[3] *Department of Business Administration, University of Macedonia, Tel: +30 2310 891580, Fax: +30 2310 891544, Email: tampakoudis@uom.gr*
[4] *Department of Economics, University of Macedonia, Tel: +30 2310 697399, Fax: +30 2310 891648, Email: tampakoudi@uom.gr*

1. Introductory observations and study objectives

Stock market price movements, like mutual funds, investment firms, and hedge funds, constitute a particularly popular research field among academics and individual and institutional investors. Despite the fact that certain variables affect stock markets similarly, the degree of this dependence is not determined in a rigorous manner. Indeed, stock markets are included in a globalized environment, which means that they move in a similar mode; however, the country-specific, geographic, economic, political, and social factors also have their particular effect on markets. The importance of capital markets is confirmed by the extensive volume of trades taking place globally, while the number and type of private and institutional investors has considerably increased. Consequently, the international literature consists of a serious amount of research papers that use different statistical approaches to identify the relationship between stock markets and their defining factors.

The present study focuses specifically on Europe, and its main objective is to determine the effects of inflation (INF), market capitalization (MC), industrial production (IP), and the economic sentiment indicator (ESI) on stock market indices, using a panel of 12 European countries[5] during the period 2000–2005. The criterion for selection of the countries is a shared currency, which in turn indicates similar macroeconomic policies and characteristics. Additionally, the overarching role of the four variables previously discussed is confirmed theoretically and empirically, since numerous empirical studies have established a link between these macroeconomic factors and stock markets (Flannery and Protopapadakis, 2002, Thalassinos, 2006). Many studies, using various econometric methods, confirm that stock returns are negatively related to the general level of prices (Geske and Roll, 1983; Pearce and Roley, 1983; Fama, 1981; Bodie, 1976). On the other hand, a questionable relationship between stock market prices and the national industrial production index is identified, which represents general industrial growth. Last but not least, empirical examination of stock market behavior has exposed a strong link between stock market prices and both market capitalization and the economic sentiment indicator (Estrella and Mishkin, 1997; Harvey, 1988). Taking into account the significance of these four factors for market prices, we establish that a considerable amount of market variation can be explained by applying a statistical model that simultaneously examines the above factors. Therefore, the relationship between the European stock markets and the selected fundamentals is investigated through a panel data analysis.

The rest of the paper is organized as follows: in the second section we present previous empirical research into the impact of the particular variables on the EU-12 stock market indices. The data and the structure of the applied model are

---

[5] The countries being considered are the following: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain

described in the third section, while the regressions and the estimation of the model together with an interpretation of the results are presented in the fourth section. The final section of the paper gives the conclusions of our study and provides suggestions for further research.

2. Literature review

The significance of inflation, market capitalization, industrial production, and the economic sentiment indicator for stock market indices has been examined extensively in the international literature. Numerous researchers consider any of these factors to be a reliable indicator of future stock market movements. However, the methodological approaches among the empirical studies are not similar, since different statistical models are applied to capture the significance of each variable in the determination of stock prices. The major findings regarding the correlation between these variables and the stock market are presented here.

Quite a few empirical studies provide evidence that inflation has a negative short-run effect on stock returns, while other studies report a positive long-run Fisher effect on stock returns. More specifically, the time path of the market reaction to a shock in the level of goods and services prices exhibits an initial negative response, which turns positive over a longer time period. In addition, there is empirical evidence that stock prices have a long memory with respect to inflation shocks, such that stocks could be expected to be a good inflation hedge over a long holding period. Jaffe and Mandelker (1976) report a negative relationship between annual stock returns and concurrent rates of inflation over short sample periods, but a positive relationship over the much longer period from 1875 to 1970. Boudoukh and Richardson (1993), who examine stock returns and inflation using one-year and five-year periods during 1802–1990 in the US and UK, also find inflation to have a positive long-run effect. However, a study by Bodie (1976), based on data for the period 1953–1972, demonstrates a negative link between the two factors although over the short-run. Anari and Kolari (2001) examine monthly time series of stock price indices and goods price indices for six industrialized countries from 1953 to 1998, and estimate the long-run Fisher effect. The model applied in their study is the following:

$$ S_t^e - S_{t-1} = (1-T)^{-1} R_t^e + (1-T)^{-1} \pi_t^e \qquad (1) $$

where:

- $S_t^e - S_{t-1}$ is the stock return for the period t,
- R_t^e is the expected real rate of interest,
- π_t^e is the expected rate of inflation, and
- T is the marginal tax rate on investment income.

Their estimates of the long-run Fisher elasticities of stock prices in relation to the inflation rate range from 1.04 to 1.65 across the six countries. Consistent with previous studies of short-run inflation effect on stock returns, they find an initial negative response of stock prices to an inflation shock across all six countries. However, beyond the initial negative transitory period, the long-run relationship between stock prices and goods prices is positive and permanent in all cases. Thus, their results bring together the previous empirical evidence on short-run and long-run stock returns and inflation.

The role of industrial production, as a variable in the determination of stock market prices remains an open question, since the results of a number of empirical studies do not definitively determine a significant and reliable statistical relationship between them (Gultekin, 1983; Fama, 1981; Homa and Jaffee, 1971). However, Chen *et al.* (1986) identify industrial production as a vital risk factor for the determination of stock returns, while Cutler *et al.* (1989) find that stock returns correlate significantly and positively with industrial production growth over the period 1926–1986. Besides, Errunza and Hogan (1998), estimating VAR models for European stock returns from 1959 to 1993, conclude that the volatility of industrial production has a negative impact on the stock market, which is dramatically important in countries like Germany and France. Finally, a study by Sadorsky (1999) reveals that industrial production responds positively to shocks in stock returns.

Results of previous studies indicate that the development of a liquid and highly capitalized equity market accelerates growth. Garcia and Liu (1999) contribute significantly to the literature by using panel techniques with annual data to explore the determinants of stock market development, particularly market capitalization. They examine the association between financial intermediary development and stock market development, using a sample of fifteen industrial and developing countries from 1980 to 1995. They conclude that stock market liquidity is an important predictor of market capitalization, while macroeconomic stability, on the contrary, remains an independent factor with no significant effects. Naceur *et al.* (2007) measure stock market liquidity using the ratio between total value traded and market capitalization, and find that liquidity has a positive impact on the stock market, since larger amounts of savings are channelled through the stock markets. Their estimation of both fixed and random effect specifications was carried out using an econometric methodology. First, the *F*-test validated the presence of unequal individual effects, confirming heterogeneity across countries. Similarly, the Hausman test confirmed the null hypothesis according to which the estimates issued from each type of model are equivalent. Indeed, it is difficult to make a real distinction between fixed and random effects models in such a situation, due to the technical and conceptual specificities.

Finally, the studies by Chen (1991), Estrella and Hardouvelis (1991) and Harvey (1988) are earlier examples which confirm a positive relationship between the spread of long-term and short-term interest rates, which have a strong impact on

stock markets and the economic sentiment indicator. More recently, Estrella and Mishkin (1997) also found a positive correlation not only for US data, but also for Germany, France, the UK and Italy. Similar findings for Europe are reported in Moneta (2003), while Baker and Wurgler (2006) note the importance of behavioral finance due to sentiments about future financial activities, and find that the part of the economic sentiment index concerning investors is positively linked to stock markets.

3. Sample selection and research design

The methodological approach adopted in this study uses a panel of data extracted from several databases. The values of the Stock Exchange Price Index were extracted from the Federation of European Securities Exchange. The indices of market capitalization and industrial production were retrieved from the databases of EconStats and International Financial Statistics, respectively. The Eurostat database provided the inflation data, while the statistics for the economic sentiment indicator were identified from the Directorate General for Economic and Financial Affairs (DG-ECFIN) of the European Commission.

The data under examination is derived from the EU-12 countries covering the period from January 2000 to December 2005. In alphabetical order, the countries in question are Austria (AU), Belgium (BEL), Finland (FIN), France (FR), Germany (GER), Greece (GR), Ireland (IRL), Italy (IT), Luxembourg (LUX), the Netherlands (NET), Portugal (POR), and Spain (SP). The corresponding stock exchange price indices (SEPI) used were the Wiener Borse Index, BAS, OMX Helsinki (OMXH), SBF 250, CDAX, ATHEX, ISEQ, MIB, LUX, AAX, SPI, and IGBM Madrid, respectively.

The values were derived at the end of each month during the 6-year period, and consist of applied logarithms (LnSEPI) to ensure measurement compatibility with the other variables. The inflation index comprises the logarithm of goods and services price changes (LnINF) during the previous twelve months (T-12). In the same manner, we use the logarithm of the index of market capitalization (LnMC) and the logarithm of the index of industrial production (LnIP) which represents the industrial growth of each country. However, the economic sentiment indicator (ESI) is a more composite variable consisting of five sectoral confidence indicators with different weightings, namely: industrial confidence, services confidence, consumer confidence, construction confidence, and retail trade confidence. Confidence indicators are arithmetic means of seasonally adjusted balances of answers to a selection of questions that relate closely to the reference variable (e.g. industrial production for the industrial confidence indicator). Surveys are defined within the Joint Harmonised EU Programme of Business and Consumer Surveys. The economic sentiment indicator is calculated as an index with a mean value of 100 and a standard deviation of 10 over a fixed standardised sample period. Currently, mean

and variance are fixed over the period 1990–2006, while the logarithm (LnESI) for the period 2000–2005 is used.

In order to conceptualize the linkage between the stock market price indices and the other independent variables, we apply the regression model described in the next section.

$$\ln SEPI_{it} = b_{it} + a_1 * \ln INF_{it} + a_2 * \ln MC_{it} + a_3 * \ln IP_{it} + a_4 * \ln ESI_{it} + \varepsilon_{it} \quad (2)$$

Where :

- $SEPI_{it\,t}$ is the stock exchange price index,
- INF_{it} is the inflation,
- MC_{it} is the market capitalization,
- IP_{it} is the industrial production,
- ESI_{it} is the economic sentiment indicator.

Additionally, we note:

- i represents each country (i=1,2,…,12)
- t represents each month during the 6-year period (t=1,2,…,72) and
- $\varepsilon_{it} = \mu_i + u_{it}$, where μ_i are unobservable individuals-specific effects correlated with the independent variables and u_{it} are random error terms assumed to be IIDN$(0,\sigma_u^2)$.

4. Model estimation and results

Two fundamental techniques are widely employed in panel data analysis: the fixed effects (FE) and random effects (RE) models. The choice is statistically testable using Hausman's test, which is based on vector of estimated coefficients and variance–covariance matrices obtained from different estimation methods. In the present study we employ the former, since the sample is closed (12 out of 12 countries of EU-12) and, furthermore, the individual and time effects are of equal importance.

The results conform with the application of Hausman's fixed test, which is presented in Table 1. Comparing the probability value at the significance level of 5% (0.9309 > 0.05) the null hypothesis is accepted, and consequently the fixed effects method is proposed.

Table 1. Hausman test

Random-effects GLS regression				Number of obs	=	759
Group variable (i): mark				Number of groups	=	12

R-sq: within = 0.8803   Obs per group: min =   28
       between = 0.0337   avg =   63.3
       overall = 0.0246   max =   72

Random effects u_i ~ Gaussian   Wald chi2(4)   = 5475.03
corr(u_i, X)   = 0 (assumed)   Prob > chi2   =   0.0000

lnsepi	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
lnmc	.8976607	.0149161	60.18	0.000	.8684256	.9268958
lnip	-.2132495	.0605872	-3.52	0.000	-.3319982	-.0945007
lnesi	.3409138	.0464432	7.34	0.000	.2498868	.4319408
LNINF	-.0108647	.0094073	-1.15	0.248	-.0293027	.0075732
_cons	2.109745	.6549749	3.22	0.001	.8260178	3.393472

sigma_u 1.908957
sigma_e .08967471
rho .99779814   (fraction of variance due to u_i)

. hausman fixed

                                                ---- Coefficients ----
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))	
			fixed	. Difference	S.E.
lnmc	.8984314	.8976607	.0007707	.0008376	
lnip	-.2143036	-.2132495	-.0010541	.0027814	
lnesi	.3398489	.3409138	-.0010649	.0021897	
LNINF	-.0109798	-.0108647	-.0001151	.0004285	

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

                                                    =   0.86
                                       Prob>chi2 =   0.9309

Table 2 presents the collective results of the equation estimation (2) using a) fixed effects (within) regression, b) fixed effects (within) regression excluding inflation as it lacks statistical significance, and c) fixed effects (between) regression. The results of each method are presented separately in the subsequent tables.

Table 2. Major Results

	Fixed Effect (within) *4 Variables*	Fixed Effect (within) *3 Variables*	Fixed Effect *(between)*
Constant	2,279984*** (0.355) [6.42]	2,205041*** (0.349) [6.30])	12,77733 (197.867) [0.06]
Market Capitalization	0,8984314*** (0.015) [60.14]	0,8933489*** (0.015) [61.46]	0,2990306 (0.549) [0.54]
Industrial Production	-0,2143036*** (0.061) [-3.53]	-0,1952968*** (0.059) [-3.30]	3,385893 (17989) [0.19]
Economic Sentiment Indicator	0,3398489*** (0.046) [7.31]	0,3424558*** (0.046) [7.40]	-4,871661 (29.759) [-0.16]
Inflation	-0,0109798 (0.009) [-1.17]		-0,143523 (2.4722) [-0.06]
R^2	0,8803	0,8802	0,0811
Countries	12	12	12
Period	2000:1 - 2005:12	2000:1 - 2005:12	2000:1 - 2005:12
Observations	759	763	759

NOTE: Numbers in parenthesis are standard errors, Numbers in brackets are t-statistics.***Significant at the level of 10%; **Significant at the level of 5%; *Significant at the level of 1%.

Table 3 presents the results of the fixed effect estimation method. The results show that all the independent variables, apart from inflation, are statistically significant, since their probability values are lower than the 5% significance level.

Table 3. The Fixed Effects Method (Within) *4 - Variables*

Fixed-effects (within) regression			Number of obs	=	759
Group variable (i): mark			Number of groups	=	12
R-sq: within = 0.8803			Obs per group: min =		28
between = 0.0337			avg =		63.3
overall = 0.0246			max =		72
			F(4,743)	=	1366.57
corr(u_i, Xb) = -0.5552			Prob > F	=	0.0000

lnsepi	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
lnmc	.8984314	.0149396	60.14	0.000	.8691025	.9277603
lnip	-.2143036	.060651	-3.53	0.000	-.3333713	-.0952358
lnesi	.3398489	.0464948	7.31	0.000	.2485721	.4311257
LNINF	-.0109798	.009417	-1.17	0.244	-.029467	.0075073
_cons	2.279984	.3552052	6.42	0.000	1.582658	2.977309

sigma_u 1.7755124
sigma_e .08967471
rho .9974556 (fraction of variance due to u_i)

F test that all u_i=0:   F(11, 743) = 16726.14   Prob > F =0.0000

The market capitalization index is one of the variables that clarify stock market movements, since it has a comparably increased coefficient. The positive sign reflects a positive relationship between market capitalization and stock market indices, which is consistent with both the economic theory and the previous literature. Since market capitalization is the product of stock prices multiplied by the number of stocks, it could be argued that this index rises when stock prices grow, as the number of stocks is a constant. Still, stock prices rise when investor demand increases, which leads to the conclusion that the demand for stocks is positively correlated with the market indices.

The results for the economic sentiment indicator also establish a positive link with stock market indices. Consumer and producer optimism or pessimism about the economy is a key determinant of stock market performance. If the market participants are confident regarding their future income levels, they will be more willing to invest in the stock market. Accordingly, businesses will increase production and inventory levels, since they will anticipate higher demand for their products, which in turn influences the stock market. In the same way, relatively positive beliefs about the progress of the economy cause an increase in the stock price indices.

For the index of industrial production, the empirical results reveal a detrimental effect, since the coefficient is both negative and statistically significant. Nevertheless, this is still in line with previous literature, although the impact of industrial production on stock markets, as mentioned in section two, is ambiguous.

Finally, the coefficient of inflation is not statistically significant, and the negative sign can be explained by the short-run sample period (Jaffe and Mandelker, 1976). As inflation rises, companies increase their profits while purchasing power falls. What is more, interest rates rise, increasing the cost of funds, and as result companies reduce their investment projects. All these ramifications may have contradictory effects on stock market movements, but taking into consideration the economic theory that there should always be inflation, although this relationship shouldn't be too strong. Finally, using the method of fixed effects (within) regression, the volatility of the stock market indices is explained quite satisfactorily by the variables, since the R^2 is in the order of 88.03%, a fairly high percentage.

Subsequently, we attempt to transform the model by removing the inflation index, since it is not statistically significant. These results are presented in Table 4. In this case all independent variables are statistically significant, maintaining the negative or positive correlations previously observed. Moreover, the R^2 value is almost unchanged at 88.02%. Consequently, it could be argued that the removal of inflation does not improve the explanatory power of the model.

Table 4. The Fixed Effects Method (Within) *3 - Variables*

Fixed-effects (within) regression			Number of obs	=	763
Group variable (i): mark			Number of groups	=	12
R-sq: within = 0.8802			Obs per group: min =		28
between = 0.0333			avg =		63.6
overall = 0.0243			max =		72
			F(3,748)	=	1832.04
corr(u_i, Xb) = -0.5518			Prob > F	=	0.0000

lnsepi	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
lnmc	.8933489	.0145365	61.46	0.000	.8648118	.921886
lnip	-.1952968	.0591735	-3.30	0.001	-.3114628	-.0791309
lnesi	.3424558	.0462828	7.40	0.000	.2515962	.4333154
_cons	2.205041	.3497603	6.30	0.000	1.518413	2.89167

	sigma_u	1.7719584
	sigma_e	.08952532
rho	.99745389	(fraction of variance due to u_i)

F test that all u_i=0:   F(11, 748) = 16905.45   Prob > F=0.0000

In Table 5 we apply the "between" method, in which all independent variables are statistically insignificant (below the significance level of 5%). This phenomenon is due to the balanced sample for unbalanced data, the between variance is calculated using the mean of the panel means. In such a situation of unbalanced data, the mean may deviate from the overall mean, which in turn is calculated as a weighted mean of the panel means where the weights are given by the number of observations in the panel. The mean of the panel means is either unweighted or all weights equal one.

Table 5. The Between Method *4 - Variables*

Between regression (regression on group means)				Number of obs= 759		
Group variable (i): mark				Number of groups = 12		
R-sq: within = 0.0811				Obs per group: min = 28		
Between = 0.0601				avg = 63.3		
overall = 0.0001				max = 72		
				F(4,7) = 0.11		
sd(u_i + avg(e_i.)) = 1.908995				Prob > F = 0.9743		
lnsepi	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
lnmc	.2990306	.5489395	0.54	0.603	-.9990051	1.597066
lnip	3.385893	17.98973	0.19	0.856	-39.15307	45.92485
lnesi	-4.871661	29.75091	-0.16	0.875	-75.22138	65.47806
LNINF	-.143523	2.472263	-0.06	0.955	-5.989495	5.702449
_cons	12.77733	197.8673	0.06	0.950	-455.1046	480.6592

Finally, Table 6 indicates the output after applying the Arellano-Bond dynamic panel-data regression. All variables are statistically significant at the 5% significance level, as their values are below 0.05. The coefficient of the dependent variable (LnSEPI) as independent with one lag (LnSEPI(-1) let λ_i) is the "convergence" parameter and 1- λ_i is the rate of convergence to steady state (speed of adjustment). In the examined sample the value of the parameter is 0.1887884 (less than 1), which is also statistically significant. This last observation indicates a long-term convergence tendency among the EU-12 with a noticeable speed of adjustment (approximately 81% as 1- λ_i = 0.8112116).

Table 6. The Arellano-Bond Dynamic-Panel Data Method

```
Arellano-Bond dynamic panel-data estimation
Number of obs     =        585
Group variable: mark
Number of groups    =     12
Time variable: time1
Obs per group:   min =     12
                 avg =    48.75
                 max =     58


Number of instruments =  524
Wald chi2(5) =18041.95
Prob > chi2 =0.0000

One-step results
lnsepi    Coef.     Std. Err.    z      P>   [95%Conf.  Interval]


lnsepi
L1.    .1887884  .0121051  15.60  0.000 .1650628    .2125139


Lnip   -.0923217 .0331669 -2.78  0.005 -.1573277   -.0273158
lnmc    .7705975 .0118183 65.20  0.000  .7474341    .7937609
Lnesi   .0696663 .0274055  2.54  0.011  .0159525    .12338
lninf  -.0216836 .005009  -4.33  0.000 -.0315025   -.0118647
_cons   .9702864 .0760332 12.76  0.000  .8212641   1.119309


Instruments for differenced equation
GMM-type: L(2/.).lnsepi
Standard: D.lnip D.lnmc D.lnesi D.lninf
Instruments for level equation
Standard: _cons
```

5. Conclusion and suggestions for further research

This paper has investigated the impact of four key variables on stock market price indices in 12 European countries, using panel data analysis for monthly observations covering the period 2000–2005. The variables considered are market capitalization, industrial production, inflation and the economic sentiment indicator. This study significantly contributes to the methodology of similar research questions. In particular, the statistical method adopted is the fixed effects model instead of the random effects model, due to the results of the Hausman's test.

The empirical results denote a positive link between stock market indices and both market capitalization and the economic sentiment indicator. The correlation coefficients of these two variables are found to be remarkably high and statistically significant. On the other hand, the analysis indicates that stock market movements are negatively linked to both industrial production and inflation, even though the inflation coefficient is not statistically significant. These findings concur with current economic theory as well as previous literature, which has revealed similar results. Indeed, some empirical studies have shown a negative short-run relationship between inflation and the stock market, although positive in the long run, while there is no general consensus as to the wealth effect of industrial production on the stock market. On the contrary, a positive correlation between the stock market and the other two determinants has already been demonstrated by previous empirical findings.

After applying the Arellano-Bond dynamic panel-data analysis, we conclude that the twelve European countries converge to steady state with a remarkable speed of adjustment, indicating a parallel behaviour and a low diversification effect. Consequently, it could be argued that the selected variables demonstrate a similar impact on all the European capital markets, while at the same time the economies of the EU-12 countries significantly converge.

The present study could be used as a starting point for further research in the field of capital markets. Initially, the four applied variables could be evaluated against their significance in the stock market of each of the twelve European countries to enable the examination of differences among the countries in question. Furthermore, the sample of the EU-12 countries could either be widened to include the EU-28 countries or be compared against the remaining sixteen countries that have not adopted the euro. In this way, we will be able to assess the significance of common macroeconomic policy in the stock markets and the ways in which diverse levels of the same variables affect capital markets. The comparative evaluation of such samples could serve as a guide to portfolio diversification across the twenty-eight member states.

References

1. Adel, A. (2004) "The dynamic relationship between macroeconomic factors and the Jordanian stock market", *International Journal of Applied Econometrics and Quantitative Studies, Vol. 1-1.*
2. Anari, A. and Kolari, J. (2001) "Stock prices and inflation", *The Journal of Financial Research, Vol. 24, pp. 587-602.*
3. Asprem, M. (1989) "Stock prices, asset portfolios and macroeconomic variables in ten European countries", *Journal of Banking and Finance, Vol. 13, pp.589–612.*
4. Baker, M. and Wurgler, J. (2006) "Investor sentiment in the stock market", *Journal of Economic Perspectives, Vol. 21, pp. 129-151.*
5. Bilson, C., Brailsford, T. and Hooper, V. (2001) "Selecting macroeconomic variables as explanatory factors of emerging stock market returns", *Pacific-Basin Finance Journal, Vol. 9, pp.401–426.*
6. Bodie, Z. (1976) "Common stocks as a hedge against inflation", *Journal of Finance, Vol. 31, pp. 459–470.*
7. Boudoukh, J. and Richardson, M. (1993) "Stock returns and inflation: A long-horizon perspective", *American Economic Review, Vol. 83, pp. 1346–1355.*
8. Branch, B. (1974) " Common Stock Performance and Inflation: An International Comparison", *Journal of Business. Vol. 47, pp. 48-52.*
9. Campbell, G. and Vuolteenaho, T. (1990) "Inflation Illusion and stock prices", Working Paper, National Bureau of Economic Research, USA.
10. Chen, F., Roll, R. and Ross, S. (1986) "Economic forces and the stock market", *Journal of Business, Vol. 59, pp. 383–403.*
11. Claessens, S., Dasgupta, S. and Glen, J. (1993) "Return behaviour in emerging stock markets", *World Bank Economic Review, Vol. 9, pp. 131–152.*
12. Day, T. (1984) "Real stock returns and inflation", *Journal of Finance, Vol. 39, pp. 493–502.*
13. Diacogiannis, G., Tsiritakis, E. and Manolas, G. (2001) "Macroeconomic factors and stock returns in a changing economic framework", *Managerial Finance, Vol. 27, pp.23–41.*
14. Dopke, J., Hartmann, D. and Pierdzioch, C. (2006) "Forecasting stock market volatility with macroeconomic variables in real time", Discussion Paper, Deutsche Bundesbank.
15. Elhusseiny, M. and Mazhar, I. (2008) "The effects of local and global risk factors on the S&P 500 stock returns: an empirical investigation", *American Journal of Finance and Accounting, Vol. 1, pp. 87-101.*
16. Erb, C., Harvey, C. and Viskanta, T. (1996) "Political risk, economic and financial risk", *Financial Analysts Journal, Vol. 52, pp. 29–46.*
17. Errunza, V. and Hogan, K. (1998) "Macroeconomic Determinants of European Stock Market Volatility", *European Financial Management, Vol. 4, pp. 361-377.*
18. Estrella, A. and Hardouvelis, G. (1991) "The term structure as a predictor of real economic activity", *Journal of Finance, Vol. 46, pp. 555–76.*
19. Estrella, A. and Mishkin, F. (1997) "The term structure of interest rates and its role in monetary policy for the European Central Bank", *European Economic Review, Vol. 41, pp. 1375–401.*
20. Fama, E. (1970) "Efficient capital markets: a review of theory and empirical work", The Journal of Finance, Vol. 35, pp.383–432.
21. Fama, E. (1981) "Stock returns, real activity, inflation and money", American Economic Review, Vol. 71, pp.545–565.
22. Feldstein, M. (1982) "Inflation and Stock Market", Working Paper, National Bureau of Economic Research, USA.

23. Ferreira, E. and Martinez, M. (2008) "Economic Sentiment and Yield Spreads In Europe", European Financial Management, Vol. 14, pp. 206-221.
24. Flannery, M. and Protopapadakis, A. (2002) "Macroeconomic factors do influence aggregate stock returns", The Review of Financial Studies, Vol. 15, pp. 751-782.
25. Garcia, V. and Liu, L. (1999) "Macroeconomic determinants of stock market development", Journal of Applied Economics, Vol. 2, pp. 29-59.
26. Geske, R. and Roll, R. (1983) ''The fiscal and monetary link between stock returns and inflation'', Journal of Finance, Vol. 38, pp. 1-33.
27. Gikas, A., Hardouvelis, Malliaropulos, D. and Priestley, R. (2006) "EMU and European Stock Market Integration", Journal of Business, Vol. 79, pp. 365-392.
28. Gultekin, B. (1983) "Stock market returns and inflation: Evidence from other countries", Journal of Finance, Vol. 38, pp. 49–67.
29. Harvey, R. (1988) "The real term structure and consumption growth", Journal of Financial Economics, Vol. 22, pp. 305-333.
30. Homa, K. and Jaffee, D. (1971) "The Supply of Money and Common Stock Prices", The Journal of Finance, Vol. 26, pp. 1045-1066.
31. Jaffe, J. and Mandelker, G. (1976) "The "Fisher Effect" for risky assets: an empirical Investigation", Journal of Finance, Vol. 31, pp. 447-458.
32. Kwon, C., Shin, T. and Bacon, F. (1997) "The effect of macroeconomic variables on stock market returns in developing markets", Multinational Business Review, Vol. 5, pp.63–70.
33. Li, L. and Hu, Z. (1998) "Responses of the Stock Market to Macroeconomic Announcements across Economic States", IMF Working Paper.
34. Mandelker, G. and Tandon, K. (1985) "Common stock returns, real activity, money and inflation: Some international evidence", Journal of International Money and Finance, Vol. 4, pp. 267–286.
35. Naceur, S., Ghazouani, S. and Omran, M. (2007) "The determinants of stock market development in the Middle-Eastern and North African region", Managerial Finance, Vol. 33, pp. 477-489.
36. Pandey, I. (2001) "The Expected Stock Returns Of Malaysian Firms: A Panel Data Analysis", IIMA Working Paper.
37. Pearce, K., and Roley, V. (1983) "The reaction of stock prices to unanticipated
38. changes in money: A note", Journal of finance, Vol. 38, pp. 1323-33.
39. Sadorsky, P. (1999) "Oil price shocks and stock market activity", Energy Econ, Vol. 21, pp. 449–469.
40. Schwert, G. (1990) "Why Does Stock Market Volatility Change Over Time", Working Paper, National Bureau of Economic Research, USA.
41. Thalassinos, E.I., Thalassinos, P.E.,(2006) "Stock Markets' Integration Analysis", *European Research Studies, Vol. IX, Issue 3-4.*