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The Impact of Macroeconomic Indicators on Stock Prices in Nigeria

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Abstract

This study set out to investigate the impact of macroeconomic indicators on stock prices in Nigeria. Since none of the previous writers in this area looked at the study at the individual firm's level, the research work is therefore unique as it uses a different methodology to consider it at the micro level.

Secondary data on stock prices of selected firms and six macroeconomic variables between 1985:1 and 2009:4 were used for the analysis. The macroeconomic indicators used in the research work are: money supply (BRDM), interest rate (INTR), exchange rate (ECHR), inflation rate (INF), oil price (OIL) and gross domestic product (GDP).The pooled or panel model was used to examine the impact of macroeconomic variables on stock prices of the selected firms in Nigeria. This model was considered appropriate for its ability to combine both time series and cross-sectional data. The empirical findings of the study revealed that macro economic variables have varying significant impact on stock prices of individual firms in Nigeria. Apart from inflation rate and money supply, all the other macroeconomic variables have significant impacts on stock prices in Nigeria

The study therefore concluded with empirical evidences that trends in macroeconomic variables can be used to predict movement of stock prices to a great extent in Nigeria.

Keywords: Macroeconomic Indicators, Stock Market, Pooled or Panel Model,

1. Introduction

The question of whether or not stock prices can be predicted by macroeconomic indicators in an economy is of serious concern both to the academics as well as the practitioners all over the world. This line of thought is what researchers in the field of finance refer to as the macroeconomic approach. It is a method of using factor analysis technique to determine the factors affecting asset returns. Many scholars have used macroeconomic factors to explain stock return and found that changes in some macroeconomic variables are associated with risk premium. They interpreted the observations to be a reflection of the finding of Fama (1977) that changes in the rate of inflation are fully reflected in interest rates (Emenuga, 1994). The focus of the macroeconomic approach is to examine how sensitive are stock prices to changes in macroeconomic variables. This approach maintains that the performance of stock is influenced by changes in money supply, interest rate, inflation rate, exchange rate, international crude oil prices, external debt, external reserve etc. The approach, believing on the economic logic that everything does depend on everything else,

stresses the interrelations between sectors as central to the understanding of the persistence and co-movement of macroeconomic time series.

In Nigerian, the few empirical evidences produce mixed results. Maku and Atanda (2009) posit that the Nigerian Stock Exchange (NSE) all share index is more responsive to changes in macroeconomic variables herein referred to as external shock. Asaolu and Ogunmakinwa (2010) maintain that a weak relationship exists between Average Share Price (ASP) and macroeconomic variables in Nigeria. The results of Olowe (2007) show that a cointegrating relationship exists between macroeconomic variables and Nigerian stock exchange index. It is interesting to note that all previous works in Nigeria used the macro approach in their findings. In view of this, the question still remains. To what extent and in what ways can movement in stock prices be determined by changes in macroeconomic variables in Nigeria? Do macroeconomic indicators exert shock on stock prices? It is in an attempt to answer these research questions that the study aims at using a new methodology; the micro approach, to examine the relationship between stock prices and macroeconomic variables employing panel data from 1985 to 2009 which capture the adjustment, post adjustment and reform periods in Nigeria.

2. Literature Review

Several attempts have been made to identify or study the factors that affect stock prices. Some researchers have also tried to determine the correlation between selected factors (internal and external, market and non-market factors, economic and non-economic factors) and stock prices. The outcomes of the studies vary depending on the scope of the study, the assets and factors examined. The Capital Asset Pricing Model (CAPM) assumes that asset price depends only on market factor. Hence, it is tagged a one factor model. On the other hand the Arbitrage Pricing Technique/Model (APT) which could be taken as a protest of CAPM believes that the asset price is influenced by both the market and non-market factors such as foreign exchange, inflation and unemployment rates. However, one of the defects of APT in spite of its advancement of asset pricing model is that the factors to be included in asset pricing are unspecified.

Al–Tamimi (2007) identified a number of company internal factors and external factors as influencers of asset prices. He developed a simple regression model to measure the coefficients of correlation between the dependent and independent variables as follows: SP = *f* (EPS, DPS, OL, GDP, CPI, INT, MS); where, SP: Stock price; EPS: Earnings per share; DPS: Dividend per share; OL: Oil price; GDP: Gross domestic product; CPI: Consumer price index; INT: Interest rate and MS: Money supply. He discovered that the firm's internal factors exercise the most significant impact on stock prices.

On the contrary, the prior findings of Chen (1991) in a study covering the USA suggest that future market stock return could be forecasted by interpreting some macroeconomic variables such as default spread, term spread, one month t-bill rate, industrial production growth rate, and the dividend–price ratio. Mukherjee and Naka (1995) used vector error correction approach to model the relationship between Japanese stock return and macroeconomic variables. Cointegration relation was detected among stock prices and the six macroeconomic variables, namely exchange rate, inflation rate, money supply, real economic activity, long-term government bond rate and call money rate.

The study by Flannery and Protopapadakis (2002) reevaluate the effect of some macroeconomic series on US stock. Among these series, six macro variables, namely:

balance of trade, housing starts, employment, consumer price index, M1 and producer price index seem to affect stock returns. On the other hand, two popular measures of aggregate economic activity (real GNP and industrial production) do not appear to be related with stock returns.

Some brilliant attempts have also been made by Nigerian researchers to investigate the relationship between macroeconomic variables and stock prices. Akinnifesi (1987) used a disaggregated analysis to investigate the relationship between exchange rate and stock prices fluctuation. He found that a depreciating Naira exchange rate increases stock prices. Soyode (1993) made an attempt to test the association between stock prices and macroeconomic variables as exchange rate, inflation and interest rate. He found that the macro economic variables that cointegrated with stock prices are consequently related to stock returns.

Amadi, Oneyema and Odubo (2000) employed multiple regression to estimate the functional relationship between money supply, inflation, interest rate, exchange rate and stock prices. Their study revealed that the relationship between stock prices and the macroeconomic variables are consistent with theoretical postulation and empirical findings in some countries. Though, they found that the relationship between stock prices and inflation does not agree with some other works done outside Nigeria.

Nwokoma (2002), attempts to establish a long-run relationship between the stock market and some of macroeconomic indicators. His result shows that only industrial production and level of interest rates, as represented by the 3-month commercial bank deposit rate have a long-run relationship with the stock market. He also found that the Nigeria market responds more to its past prices than changes in the macroeconomic variables in the short run.

Ologunde, Elumilade and Asaolu (2006), examined the relationships between stock market capitalization rate and interest rate. They found that prevailing interest rate exerts positive influence on stock market capitalization. They also found that government development stock rate exerts negative influence on stock market capitalization rate and prevailing interest rate exerts negative influence on government development stock rate. Their findings seem to take interest rate as the lending rate. If deposit rate increases, theoretically, investors will switch their capital from share market to banks. This will exert a negative impact on stock prices. Therefore this work used the deposit rate to express interest rates in Nigeria. Earlier studies have revealed that the impact of oil prices depends on whether a country is an oil exporting or oil importing. Crude oil accounts for over 60% of GDP in Nigeria and findings from the six oil producing countries of the Golf Cooperative Council (GCC) show that there is a link between oil price and stock returns. Again, Nigeria exports crude oil and at the same time the country is a major importer of oil. In view of the above, oil price is a major variable in the model for this work. With the exemption of Olowe (2007), this variable was omitted in many of the related works in Nigeria.

From the positions of the several authors in this line of thought, there is no doubt that the impact of macroeconomic variables on stock performance both in the short-run and in the long-run produce mixed results. Hence the needs to further explore this in Nigeria not only by including more variable such as oil price, but also using a new approach in methodology. It is on this note that this work uses the panel model which enables us to examine the impact of the selected macroeconomic variables on individual stock. This micro approach makes this research work a unique one in this line of thought.

3.1 Methodology

Here, reference is made to theory and existing empirical works (e.g Olowe, 2007; Maku and Atanda, 2009; Asaolu and Ogunmakinwa, 2010; Ali, Rehman, Yilmaz, Khan and Afzal, 2010) as a motivation in selecting a number of macroeconomic variables that are expected to be strongly related to stock prices in Nigeria. Six macroeconomic indicators that were hypothesized to exert shocks on share returns are: M2 or broad money supply (BRDM), interest rate (INTR), exchange rate (ECHR), inflation rate (INF), international price of crude oil (OIL) and Gross Domestic Product (GDP). The individual stock price (STK) was used to measure stock performance at the micro level i.e. the firm's level. The individual firm's stock prices (STK) are used in this work as barometers for monitoring upswings and downswings in the capital market.

3.2 Data Description

Quarterly data from selected firms' stock prices, inflation rate, exchange rate, broad money supply, interest rate, oil prices and GDP in Nigeria were analyzed and used throughout the process. The study covers a period of twenty six years (1985 - 2009), representing adjustment, post-adjustment and reform eras in Nigeria. The study is limited to the realm of the Nigerian capital market. The pooled data sets were sourced from various issues of the Central Bank of Nigeria Statistical Bulletin, Annual Abstract of Statistic of National Bureau of Statistic (NBS) and the NSE Daily Equities Report. The variables were transformed into natural logs to reduce multi-collinearity and assume linearity. As at 1985, there were ninety three (93) equity stocks in the Nigerian stock market. However, the work uses thirty six equities that were consistent and active throughout the period in the market.

3.3 Model Specification

To capture the precise effect of macroeconomic variables (MEV) on STK, reference is made to the theoretical and empirical literature. The explicit form of the panel model that can be estimated at the individual firm's level using a pool object is hereby specified as:

$$\gamma_{it} = \alpha_{it} + \chi_{it}'\beta_i + \theta_{it} \qquad \ldots(1)$$

Where γ_{it} is the dependent variable (STK) and χ_{it} and β_i are k- vectors of non-constant regressors (MEV) and parameters for $_i$ = 1, 2…., 12 cross sectional units. Each cross-section unit is observed for dated periods t= 1,2…, 100. α_{it} is the **common effect** of the intercept which is assumed to be identical for all the pool members. In order to determine the presence of cross-section heteroskedasticity and contemporaneous correlation, the residual covariance matrix for the equation is computed as:

$$\Omega = E(\epsilon\epsilon') = E \begin{pmatrix} \epsilon_1\epsilon_1' & \epsilon_2\epsilon_1 \ldots & \epsilon_N\epsilon_1' \\ \epsilon_2\epsilon_1' & \epsilon_2\epsilon_2 & \vdots \\ \epsilon_N\epsilon_1' \ldots & \cdot & \epsilon_N\epsilon_N' \end{pmatrix} \qquad \ldots\ldots (2)$$

The basic specification treats the pool specification as a system of equation and estimates the model using the Generalized Least Square (GLS) instead of the usual Ordinary Least Square (OLS). This specification is appropriate when the residual are

contemporaneously uncorrelated and the time-period and cross section homoskedastic :

$$\Omega = \sigma^2 I_N \otimes I_T \text{..... (3)}$$

The coefficients and their covariance are estimated using the GLS techniques applied to the stacked model.

The **fixed effect** estimators allow the intercept α_i to differ across cross- section units by estimating different constants for each cross section. The fixed effect is computed by subtracting the "within" mean from each variable and estimating GLS using the transformed data:

$$\gamma i - \bar{y}_i = (\bar{x} - \bar{x})' \beta + (\epsilon_i - \bar{\epsilon}_i) \text{ .....(4)}$$

Where: $\bar{y}_i = \sum_t \gamma_i / T$; $\bar{x} = \sum_t x_i t / T$ and $\bar{\epsilon} i = \sum_t x it / T$

The coefficient covariance matrix estimates are given by the usual OLS covariance formula applied to the mean different model:

$$\text{Var}(b_{FE}) = \sigma^2_W = (\bar{x}' \bar{x})^{-1} \text{ ..... (5)}$$

Where: $\bar{x}$ represents the mean different X, and

$$\sigma^2 W = \frac{e_{FE}' e_{FE}}{NT - N - K} = \frac{\sum_{it} (\gamma_{it} - x_{it}' \bar{b}_{FE})^2}{NT - N - K} \text{ ..... (6)}$$

Where: $e_{FE}' e_{FE}$ is the SSR from the fixed effects model.

Lastly in this section, the weighted statistics are derived from equation 6. Cross-section weighted regression is appropriate to take care of residuals that are cross-section heteroskedastic and contemporaneously correlated. This is derived as follows:

$$\Omega = E(\epsilon\epsilon') = E \begin{pmatrix} \sigma^2_1 IT_1 \text{ .... } 0 \text{..... ... } 0 \\ 0 \quad \sigma^2_2 IT_2 \text{ ..... } 0 \\ 0 \text{ ..... } 0 \text{ ..... } \sigma^2_3 IT_3 \end{pmatrix} \text{ ..... (7)}$$

4. Results and Findings

The overall objective of this study is to examine the impact of macroeconomic variables on stock prices of selected quoted companies in Nigeria. i.e. the impact examination at the micro level. This is sufficiently satisfied in the model. There are thirty six (36) cross-sectional observations and for each company, there are one hundred and four (104) time series observations on stock prices and macroeconomic variables. Since each cross-sectional unit has the same number of time series observation, we then have a balanced panel. The pooled regression techniques are used here to take heterogeneity of the individual firm into account. This is believed to enrich empirical analysis in a way that may not be possible if only cross-section or

time series data are used. Unfortunately, the usual OLS method does not allow for the strategy and variability of the dependent variables (STK) because it only assigns equal weight or importance to each observation. However, the Generalized Least Square (GLS) takes such information into account explicitly and is therefore capable of producing estimators that are reliable. It is envisaged here that the residual covariance matrix will show a heavy presence of heteroskedasticity. This led to the choice of instituting individual firm's weights and convergence after one (1) iteration as contained in the following tables.

Table 1: GLS Results (Common Coefficient Method)
Dependent Variable: STK?

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.52653	3.094665	-6.309742	0.0000
BRDM?	0.043373	0.583305	0.074358	0.9407
INTR? **	-0.310920	0.073740	-4.216455	0.0000
ECHR? **	-0.027050	0.008216	-3.292300	0.0010
INF?	0.002880	0.010837	0.265757	0.7904
OIL? **	0.190954	0.011227	17.00821	0.0000
GDP? **	2.004507	0.517832	3.870961	0.0001
Weighted Statistics				
R-squared	0.409607	Mean dependent var		18.25929
Adjusted R-squared	0.408612	S.D. dependent var		30.20697
S.E. of regression	23.22970	Sum squared resid		1919424.
Log likelihood	-13887.90	F-statistic		411.3009
Durbin-Watson stat	2.155811	Prob(F-statistic)		0.000000

Note: ** significant at 5%
Source: Author's Computation

The results presented in the above table show the common coefficients for all cross sectional observations. Four (4) of the variables, namely: interest rate (INTR), exchange rate (ECHR), oil price (OIL) and Gross Domestic Product (GDP) are found to be statistically significant at 5% significant level. GDP and OIL exert a positive impact on stock prices (STK). Interest rate and exchange rate exert a negative impact on stock prices in Nigeria. The other two macroeconomic variables in the model; broad money (BRDM) and inflation rate (INF) are not statistically significant in this study. The adjusted R^2 of 0.4086 shows that about 40.86% of the behaviour of stock prices in the Nigerian Stock Exchange (NSE) is explained by the selected macroeconomic variables. The F- statistics of 411.3 shows that the model is statistically significant at 5% significant level.

Since the major objective of this research work is to examine the impact of macroeconomic variables on stock prices of individual firms (i.e a micro approach), it becomes expedient to consider the cross section specific coefficient method. The results from this approach are as presented in the following table.

Table 2: GLS Results (cross section specific coefficient method)
Dependent Variable: STK?

Variable	Number of stocks on which	Percentage of total sample

	the variable has significant impact	
BRDM?	15	41.7
INTR?	25	69.4
ECHR?	29	80.6
INF?	6	16.7
OIL?	31	86.1
GDP?	15	41.7

Weighted Statistics

R-squared	0.775596	Mean dependent var	17.94272
Adjusted R-squared	0.761114	S.D. dependent var	21.69102
S.E. of regression	10.60168	Sum squared resid	376188.5
Log likelihood	-9780.794	F-statistic	53.55599
Durbin-Watson stat	0.804683	Prob(F-statistic)	0.000000

Source: Author's Computation

Interestingly, this approach improves the adjusted R^2 from 40.86% to 76. 11 % showing that about 76.11% of the behaviour of stock prices in the Nigerian Stock Exchange is explained by the selected macroeconomic variables. The impact of broad money is statistically significant on fifteen out of the thirty six selected stocks, interest rate is statistically significant on twenty five stocks, exchange rate has significant impact on twenty nine, inflation rate has significant impact on only six, oil price has significant impact on thirty one while GDP has significant impact on only fifteen of the selected stocks. The results show that interest rate, exchange rate and oil prices have a strong influence on stock prices in Nigeria. The influence of money supply, inflation rate and GDP is weak.

The relationship between Stock Price (STK) and Interest Rate (INTR) is negative for most of the selected firms. This is consistent with theory since the study uses the deposit rate as interest rate. The findings also confirm the work of Jefferis and Okeahalam (2000) on South Africa, Botswana and Zimbabwe. Nigeria exchange rate (ECHR) has a negative relationship with the stock prices of majority of the sampled firms. A negative relationship between a depreciating exchange rate and stock prices is consistent with theory.

The international price of crude oil is positively related to majority of the stock prices. This implies that movement of oil price affects share price movement in Nigeria. My finding is consistent with several studies which have explored the oil price-stock price casual link. Among them are Hamilton (1983), Burbridge and Harrison (1984), Gisser and Goodwin (1986), Mork (1989), Loungani (1986), Hooker (1996) and Hamilton (2000).

5. Summary and Conclusion

The focal point of this study is to examine the impact of macroeconomic variables on stock prices in Nigeria. The study employed basically secondary data between 1985:1 and 2009:4. The research work takes a new dimension by not only looking at the effect of macroeconomic variables on stock prices at macro level as previous writers have done, but making concerted effort to consider the effect at the individual firm's level (the micro effect). Of the six macroeconomic variables that were carefully selected based on theories as well as the peculiar economic characteristic of the nation, interest rate, exchange rate, and international oil price exert strong significant influence on stock prices while money supply, inflation rate and GDP exert weak influence on stock prices in Nigeria. No doubt that stock market is a very risky channel of investment. Hence, investors always try to predict the trends of stock market to spot the abnormal benefits and avoid risks (Hussainey and Ngoc, 2009). By

concerning with the relationship between macroeconomic variables and stock prices in Nigeria, investors and policy makers might forecast how financial market changes if domestic macroeconomic variables fluctuate. Considering the empirical findings of this research work vis-à-vis the objectives of the exercise, it becomes obvious that Nigerian stock market is very sensitive to domestic macroeconomic factors. Hence, the following policy recommendations are hereby suggested:

Firstly, the fact that some domestic macroeconomic variables have varying significant impact on stock returns have proved useful for portfolio diversification strategies as well as achieving better risk return trade off. It suggests that Nigerian investors must focus and study the varying significance of the macroeconomic variables so as to improve their portfolio performance.

Secondly, the fact that international oil prices have a significant impact on stock returns in Nigeria suggests that the Nigerian stock market might also be very sensitive to oil price volatility. Investors in the Nigerian stock market should therefore be mindful of the trend of the global macroeconomic variables so that the risk of global economic melt down as experienced between 2007 and 2009 can be reduced to its barest minimum.

Lastly, it is also suggested that policy makers in Nigeria must be mindful of the correlation between stock market returns and macroeconomic variables such as interest rate, exchange rate and oil prices to formulate monetary policies. This will enable them to sufficiently and timely adjust Nigerian stock market to economic conditions in the country.

References

Ajayi, R. A. and Mougoue, M., (1996). On the Dynamic Relation between Stock Prices and Exchange Rates. *The Journal of Financial Research*, 19, 193-207

Akinifesi, Olu (1987): "The Role and Performance of the Capital market" in Adedotun Philips and Eddy Ndekwu (eds) *Economic Policy and Development in Nigeria NISER*, Ibadan Nigeria.

Ali I., Rehman K. U., Yilmaz A. K., Khan M. A. and Afzal H. (2010) 'Causal Relationship between Macreconomic Indicators and stock Exchange Prices in Pakistan' *African Journal of Business Management*, 4(3), 312 - 319

Amadi S.N., Onyema J.I. and T.D. Odubo (2002): *Macroeconomic Variables and Stock Prices. A Multivariate Analysis.* Africa Journal of Development Studies, 2(1), 159-164.

Asaolu T.O. and Ogunmakinwa M. S. (2011), 'An Econometric Analysis of the Impact of Macroeconomic Variables on Stock Market Movement in Nigeria' *Asian Journal of Business Management*, 3(1), 72 – 78.

Brurbridge, J., & Harrison A. (1984), Testing for the effects of oil-price rises using vector autoregression. *Int Econom Rev*, 25, 459-84.

Chen N.F., Roll R. and S.A. Ross (1986): *Economic Forces and the Stock Market.* Journal of Business, 59(3), 383-403.

Emenuga C.A. (1994); *Systematic Factors and Returns on Equities in the Nigerian Securities Market.* Unpublished Ph.D Thesis, University of Ibadan, Ibadan.

Fama E. (1977): Asset Returns and Inflation, *Journal of Monetary Economics*, 38, 327-348.

Flannery M.I. and A.A. Protopapadakis (2002): Macroeconomic Factors do Increase Aggregate Stock Returns. *Review of Financial Studies*, 15, 751-789.

Gisser, M. and Goodwin T. H. (1986), Crude oil and the macroeconomy: tests of some popular notions. *Journal of Money Credit Bank*, 18, 95-103.

Hamilton, J. D. (1983), Oil and the macroeconomy since World War II. *Journal of Political Economy*, 92, 28-48.

Hamilton, J.D. (2000). What is an Oil Shock?, NBER Working Paper 7755.

Hooker, M. A. (1996), What happened to the oil price-macroeconomy Relationship? *Journal of Monetary Economics*, 38, 195-213.

Hussainey and Ngoc (2009), 'Impact of Macroeconomic Variables on Vietnamese Stock Exchange' *Journal of Risk Finance,* 4, 18-46

Jefferis, K. R. and Okeahalam, C. C. (2000). The Impact of Economic Fundamentals on Stock Markets in Southern Africa. *Development Southern Africa*, 17(1), 23-51.

Loungani P. (1986), Oil Price Shock and Dispersion Hypothesis. *Rev Econ Stat*, 68(3), 536-539.

Maku O. E. and Attanda A. A. (2009), 'Does Macroeconomic Indicators Exert shock on the Nigerian Capital Market? Online at *http://mpra.ub.uni-muenchen.de/17917/*

Mork K. (1989), oil and the Macroeconomy, When prices go up and down: An extension of Hamilton's results. *Journal of Political Economy*, 97(51), 740-744.

Mukherjee T.K. and A. Naka (1995): *Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market. An application of Vector Error Correction Model.* Journal of Finance Research, 18, 223-237.

Nwokoma N.I. (2002), 'Stock Market Performance and Macroeconomic Indicators Nexus in Nigeria. An empirical investigation' *Nigerian Journal of Economic and Social Studies,* 44-62.

Ologunde, A.O., Elumilade, D.O. and Asaolu, T. O. (2006). Stock Market Capitalization and Interest Rate in Nigeria: A Time Series Analysis. *International Research Journal of Finance and Economics*, 4, 154-166.

Olowe, R. A. (2007), 'The Relationship Between Stock Prices and Macroeconomic Factors in the Nigerian Stock Market' *African Review of Money, Finance and Banking, 79 - 98*

Ross S.A.(1976): 'The Arbitrage Theory of Capital Asset Pricing'. *Jounal of Economic Theory,* 13(3), 341-360.

Soyode (1993): 'Nigerian Capital Markey and Macroeconomic Variables. An empirical analysis', *Nigerian Journal of Monetary Economics,*3.

Appendix I

Dependent Variable: STK?
Method: GLS (Cross Section Weights)
Sample: 1985:1 2009:4
Included observations: 99

Number of cross-sections used: 36
Total panel (balanced) observations: 3564
One-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.52653	3.094665	-6.309742	0.0000
BRDM?	0.043373	0.583305	0.074358	0.9407
INTR? **	-0.310920	0.073740	-4.216455	0.0000
ECHR? **	-0.027050	0.008216	-3.292300	0.0010
INF?	0.002880	0.010837	0.265757	0.7904
OIL? **	0.190954	0.011227	17.00821	0.0000
GDP? **	2.004507	0.517832	3.870961	0.0001

Weighted Statistics			
R-squared	0.409607	Mean dependent var	18.25929
Adjusted R-squared	0.408612	S.D. dependent var	30.20697
S.E. of regression	23.22970	Sum squared resid	1919424.
Log likelihood	-13887.90	F-statistic	411.3009
Durbin-Watson stat	2.155811	Prob(F-statistic)	0.000000

Note: ** significant at 5%

Appendix II

Dependent Variable: STK?
Method: GLS (Cross Section Weights)
Sample: 1985:1 2009:4
Included observations: 99
Number of cross-sections used: 36
Total panel (balanced) observations: 3564
One-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.54118	0.714341	-14.75650	0.0000
_DUN--BRDM_DUN**	-3.196986	0.609859	-5.242170	0.0000
_FBN--BRDM_FBN	-2.612196	1.566111	-1.667950	0.0954
_UBA--BRDM_UBA	-1.271944	1.702812	-0.746967	0.4551
_UBN--BRDM_UBN	-0.962054	1.738369	-0.553423	0.5800
_GUIN--BRDM_GUIN	-2.065600	5.192668	-0.397792	0.6908
_NBL--BRDM_NBL	-0.536393	2.038292	-0.263158	0.7924
_JHT--BRDM_JHT	1.005076	0.738110	1.361689	0.1734
_PZ--BRDM_PZ**	-6.086093	1.373269	-4.431829	0.0000
_UAC--BRDM_UAC	0.820819	1.359226	0.603887	0.5460
_CAP--BRDM_CAP**	22.84675	4.992112	4.576571	0.0000
_NBC--BRDM_NBC**	-13.99583	3.138607	-4.459249	0.0000
_MOB--BRDM_MOB	-10.72132	9.824076	-1.091331	0.2752
_FLMILL--BRDM_FLMILL	-2.167682	2.840688	-0.763084	0.4455
_NNFMILL--BRDM_NNFMILL	-0.773784	0.893578	-0.865938	0.3866
_INCAR--BRDM_INCAR**	2.237872	0.535644	4.177910	0.0000
_BRCODE--BRDM_BRCODE	0.311814	1.169669	0.266583	0.7898
_GGUNIEA--BRDM_GGUNIEA	0.635370	0.486941	1.304818	0.1920
_NROPE--BRDM_NROPE	0.635370	0.486941	1.304818	0.1920
_NWIRE--BRDM_NWIRE	0.511656	0.391885	1.305629	0.1918
_BPAINT--BRDM_BPAINT	-0.324732	0.566766	-0.572957	0.5667
_AGLEV--BRDM_AGLEV**	1.318547	0.512059	2.574988	0.0101
_CHRAMS--BRDM_CHRAMS**	4.985781	1.017860	4.898295	0.0000
_SCOA--BRDM_SCOA	3.278041	0.691339	4.741585	0.0000
_JBERGER--BRDM_JBERGER	4.220575	3.840908	1.098848	0.2719
_COSTAIN--BRDM_COSTAIN	1.905477	1.580842	1.205356	0.2282

_ARBICO--BRDM_ARBICO**	6.634355	1.245798	5.325387	0.0000
_UNILEV--BRDM_UNILEV**	-4.633250	1.623125	-2.854525	0.0043
_CADBURY--BRDM_CADBURY**	-14.87859	3.337310	-4.458260	0.0000
_POLYPRD--BRDM_POLYPRD**	1.382629	0.432339	3.198019	0.0014
_STDPRES--BRDM_STDPRES**	0.956939	0.468910	2.040773	0.0414
_TOTAL--BRDM_TOTAL**	-23.60523	8.084405	-2.919847	0.0035
_AP--BRDM_AP	5.675473	10.77140	0.526902	0.5983
_PHADEC--BRDM_PHADEC**	1.294298	0.489733	2.642865	0.0083
_GLAXO--BRDM_GLAXO	1.301267	0.987334	1.317961	0.1876
_UNIPRES--BRDM_UNIPRES**	1.749406	0.538341	3.249627	0.0012
_UNTEX--BRDM_UNTEX	-0.321761	0.400403	-0.803592	0.4217
_DUN--INTR_DUN**	-0.188490	0.066850	-2.819598	0.0048
_FBN--INTR_FBN**	-0.401463	0.170433	-2.355539	0.0186
_UBA--INTR_UBA**	-0.356340	0.185273	-1.923325	0.0545
_UBN--INTR_UBN**	-0.394497	0.189133	-2.085815	0.0371
_GUIN--INTR_GUIN	-0.613800	0.564428	-1.087473	0.2769
_NBL--INTR_NBL**	-0.745878	0.221701	-3.364346	0.0008
_JHT--INTR_JHT**	-0.543544	0.080691	-6.736156	0.0000
_PZ--INTR_PZ**	-0.738747	0.149506	-4.941265	0.0000
_UAC--INTR_UAC**	-0.840518	0.147982	-5.679869	0.0000
_CAP--INTR_CAP**	-2.323357	0.542633	-4.281633	0.0000
_NBC--INTR_NBC**	-1.660511	0.341228	-4.866282	0.0000
_MOB--INTR_MOB**	-4.279175	1.067757	-4.007629	0.0001
_FLMILL--INTR_FLMILL**	-1.106157	0.308860	-3.581415	0.0003
_NNFMILL--INTR_NNFMILL**	-0.437990	0.097506	-4.491917	0.0000
_INCAR--INTR_INCAR	0.026707	0.058862	0.453725	0.6501
_BRCODE--INTR_BRCODE	-0.147532	0.127421	-1.157823	0.2470
_GGUNIEA--INTR_GGUNIEA**	0.110653	0.053632	2.063179	0.0392
_NROPE--INTR_NROPE**	0.110653	0.053632	2.063179	0.0392
_NWIRE--INTR_NWIRE	0.028622	0.043470	0.658439	0.5103
_BPAINT--INTR_BPAINT**	-0.119573	0.062209	-1.922114	0.0547
_AGLEV--INTR_AGLEV	-0.025202	0.056328	-0.447414	0.6546
_CHRAMS--INTR_CHRAMS	-0.154255	0.110966	-1.390106	0.1646
_SCOA--INTR_SCOA	-0.074478	0.075639	-0.984657	0.3249
_JBERGER--INTR_JBERGER**	-0.787197	0.417537	-1.885336	0.0595
_COSTAIN--INTR_COSTAIN	-0.216466	0.172032	-1.258287	0.2084
_ARBICO--INTR_ARBICO**	-0.314584	0.135677	-2.318616	0.0205
_UNILEV--INTR_UNILEV**	-0.589885	0.176622	-3.339816	0.0008
_CADBURY--INTR_CADBURY	-0.650327	0.362817	-1.792438	0.0732
_POLYPRD--INTR_POLYPRD	-0.001362	0.047786	-0.028492	0.9773
_STDPRES--INTR_STDPRES**	0.121680	0.051699	2.353611	0.0186
_TOTAL--INTR_TOTAL**	-3.028632	0.878690	-3.446758	0.0006
_AP--INTR_AP**	-4.328431	1.170714	-3.697259	0.0002
_PHADEC--INTR_PHADEC**	-0.171401	0.053932	-3.178126	0.0015
_GLAXO--INTR_GLAXO**	-0.353127	0.107659	-3.280049	0.0010
_UNIPRES--INTR_UNIPRES	0.038285	0.059151	0.647241	0.5175
_UNTEX--INTR_UNTEX**	0.107195	0.044377	2.415527	0.0158
_DUN--ECHR_DUN**	-0.061425	0.008311	-7.390400	0.0000
_FBN--ECHR_FBN**	0.081213	0.021312	3.810692	0.0001
_UBA--ECHR_UBA	-0.037339	0.023171	-1.611425	0.1072
_UBN--ECHR_UBN**	0.079383	0.023655	3.355863	0.0008
_GUIN--ECHR_GUIN**	0.453992	0.070646	6.426303	0.0000
_NBL--ECHR_NBL**	0.158962	0.027735	5.731566	0.0000
_JHT--ECHR_JHT**	-0.113774	0.010054	-11.31664	0.0000
_PZ--ECHR_PZ**	-0.090506	0.018689	-4.842653	0.0000
_UAC--ECHR_UAC**	-0.107618	0.018498	-5.817715	0.0000
_CAP--ECHR_CAP**	-0.249944	0.067918	-3.680113	0.0002

_NBC--ECHR_NBC	0.022609	0.042702	0.529459	0.5965
_MOB--ECHR_MOB	0.250996	0.133654	1.877955	0.0605
_FLMILL--ECHR_FLMILL**	-0.076125	0.038650	-1.969621	0.0490
_NNFMILL--ECHR_NNFMILL	0.002169	0.012167	0.178235	0.8585
_INCAR--ECHR_INCAR**	-0.018917	0.007304	-2.590045	0.0096
_BRCODE--ECHR_BRCODE**	-0.039865	0.015920	-2.504029	0.0123
_GGUNIEA--ECHR_GGUNIEA**	-0.018616	0.006643	-2.802429	0.0051
_NROPE--ECHR_NROPE**	-0.018616	0.006643	-2.802429	0.0051
_NWIRE--ECHR_NWIRE**	-0.017017	0.005354	-3.178419	0.0015
_BPAINT--ECHR_BPAINT**	-0.039914	0.007726	-5.166000	0.0000
_AGLEV--ECHR_AGLEV**	-0.038053	0.006984	-5.448829	0.0000
_CHRAMS--ECHR_CHRAMS**	-0.047688	0.013856	-3.441604	0.0006
_SCOA--ECHR_SCOA**	-0.035398	0.009418	-3.758445	0.0002
_JBERGER--ECHR_JBERGER	0.022184	0.052256	0.424517	0.6712
_CSTAIN--ECHR_CSTAIN**	-0.078893	0.021512	-3.667326	0.0002
_ARBICO--ECHR_ARBICO**	-0.059401	0.016956	-3.503315	0.0005
_UNILEV--ECHR_UNILEV	-0.004988	0.022087	-0.225837	0.8213
_CADBURY--ECHR_CADBURY**	0.170033	0.045405	3.744772	0.0002
_POLYPRD--ECHR_POLYPRD**	-0.034952	0.005902	-5.921833	0.0000
_STDPRES--ECHR_STDPRES	-0.010632	0.006398	-1.661720	0.0967
_TOTAL--ECHR_TOTAL**	0.444623	0.109986	4.042530	0.0001
_AP--ECHR_AP**	-0.495326	0.146542	-3.380105	0.0007
_PHADEC--ECHR_PHADEC**	-0.036568	0.006681	-5.473737	0.0000
_GLAXO--ECHR_GLAXO**	-0.052096	0.013441	-3.875856	0.0001
_UNIPRES--ECHR_UNIPRES**	-0.018570	0.007340	-2.529885	0.0115
_UNTEX--ECHR_UNTEX**	-0.020396	0.005469	-3.729026	0.0002
_DUN--INF_DUN**	0.022721	0.011066	2.053277	0.0401
_FBN--INF_FBN	-0.017774	0.028386	-0.626142	0.5313
_UBA--INF_UBA	-0.032430	0.030863	-1.050764	0.2934
_UBN--INF_UBN	-0.029823	0.031507	-0.946536	0.3439
_GUIN--INF_GUIN	0.092009	0.094103	0.977749	0.3283
_NBL--INF_NBL**	0.085791	0.036942	2.322314	0.0203
_JHT--INF_JHT**	0.050724	0.013387	3.788946	0.0002
_PZ--INF_PZ**	0.047947	0.024892	1.926159	0.0542
_UAC--INF_UAC**	0.067679	0.024638	2.746925	0.0060
_CAP--INF_CAP	0.131381	0.090469	1.452230	0.1465
_NBC--INF_NBC	0.055769	0.056880	0.980462	0.3269
_MOB--INF_MOB	0.105903	0.178032	0.594852	0.5520
_FLMILL--INF_FLMILL	0.040303	0.051482	0.782852	0.4338
_NNFMILL--INF_NNFMILL	0.015084	0.016203	0.930924	0.3520
_INCAR--INF_INCAR	-0.011160	0.009723	-1.147835	0.2511
_BRCODE--INF_BRCODE	-0.000802	0.021204	-0.037827	0.9698
_GGUNIEA--INF_GGUNIEA	-0.015955	0.008842	-1.804544	0.0712
_NROPE--INF_NROPE	-0.015955	0.008842	-1.804544	0.0712
_NWIRE--INF_NWIRE	-0.001420	0.007123	-0.199418	0.8419
_BPAINT--INF_BPAINT	0.011585	0.010286	1.126316	0.2601
_AGLEV--INF_AGLEV	0.002494	0.009296	0.268265	0.7885
_CHRAMS--INF_CHRAMS	0.014350	0.018454	0.777629	0.4368
_SCOA--INF_SCOA	-2.97E-05	0.012541	-0.002372	0.9981
_JBERGER--INF_JBERGER	0.048241	0.069607	0.693051	0.4883
_COSTAIN--INF_COSTAIN	0.006152	0.028653	0.214719	0.8300
_ARBICO--INF_ARBICO	0.031934	0.022583	1.414063	0.1574
_UNILEV--INF_UNILEV**	0.076074	0.029419	2.585848	0.0098
_CADBURY--INF_CADBURY	0.044217	0.060481	0.731090	0.4648
_POLYPRD--INF_POLYPRD	-0.001638	0.007854	-0.208584	0.8348
_STDPRES--INF_STDPRES	-0.006603	0.008515	-0.775390	0.4382
_TOTAL--INF_TOTAL	0.156404	0.146506	1.067557	0.2858

_AP--INF_AP	0.238206	0.195200	1.220320	0.2224
_PHADEC--INF_PHADEC	-0.005987	0.008892	-0.673355	0.5008
_GLAXO--INF_GLAXO	0.023914	0.017901	1.335913	0.1817
_UNIPRES--INF_UNIPRES	-0.012928	0.009771	-1.323043	0.1859
_UNTEX--INF_UNTEX	-0.009062	0.007277	-1.245362	0.2131
_DUN--OIL_DUN	-0.011325	0.012066	-0.938608	0.3480
_FBN--OIL_FBN**	0.214482	0.031021	6.914137	0.0000
_UBA--OIL_UBA**	0.291609	0.033730	8.645510	0.0000
_UBN--OIL_UBN**	0.135773	0.034434	3.942975	0.0001
_GUIN--OIL_GUIN**	1.018029	0.102873	9.895966	0.0000
_NBL--OIL_NBL**	0.108912	0.040377	2.697381	0.0070
_JHT--OIL_JHT**	0.083314	0.014609	5.702747	0.0000
_PZ--OIL_PZ**	0.192892	0.027199	7.091811	0.0000
_UAC--OIL_UAC**	0.461243	0.026921	17.13318	0.0000
_CAP--OIL_CAP**	0.775202	0.098900	7.838263	0.0000
_NBC--OIL_NBC**	0.213746	0.062178	3.437667	0.0006
_MOB--OIL_MOB**	1.547627	0.194630	7.951654	0.0000
_FLMILL--OIL_FLMILL**	0.698782	0.056275	12.41726	0.0000
_NNFMILL--OIL_NNFMILL**	0.177718	0.017692	10.04515	0.0000
_INCAR--OIL_INCAR**	0.064873	0.010593	6.124029	0.0000
_BRCODE--OIL_BRCODE**	0.216256	0.023164	9.335716	0.0000
_GGUNIEA--OIL_GGUNIEA**	-0.022874	0.009626	-2.376225	0.0175
_NROPE--OIL_NROPE**	-0.022874	0.009626	-2.376225	0.0175
_NWIRE--OIL_NWIRE**	-0.022082	0.007738	-2.853642	0.0043
_BPAINT--OIL_BPAINT**	0.081910	0.011211	7.306383	0.0000
_AGLEV--OIL_AGLEV**	0.061220	0.010125	6.046380	0.0000
_CHRAMS--OIL_CHRAMS**	0.168381	0.020156	8.354070	0.0000
_SCOA--OIL_SCOA**	0.065395	0.013682	4.779664	0.0000
_JBERGER--OIL_JBERGER**	0.627025	0.076092	8.240366	0.0000
_COSTAIN--OIL_COSTAIN**	0.262610	0.031313	8.386714	0.0000
_ARBICO--OIL_ARBICO**	0.145105	0.024673	5.881094	0.0000
_UNILEV--OIL_UNILEV	0.011274	0.032150	0.350674	0.7259
_CADBURY--OIL_CADBURY	0.065013	0.066114	0.983342	0.3255
_POLYPRD--OIL_POLYPRD**	0.041156	0.008542	4.818131	0.0000
_STDPRES--OIL_STDPRES	-0.000130	0.009268	-0.014053	0.9888
_TOTAL--OIL_TOTAL**	1.648683	0.160164	10.29373	0.0000
_AP--OIL_AP**	2.086665	0.213398	9.778288	0.0000
_PHADEC--OIL_PHADEC**	0.047021	0.009682	4.856624	0.0000
_GLAXO--OIL_GLAXO**	0.202213	0.019550	10.34314	0.0000
_UNIPRES--OIL_UNIPRES**	0.048774	0.010647	4.581150	0.0000
_UNTEX--OIL_UNTEX	-0.013966	0.007907	-1.766148	0.0775
_DUN--GDP_DUN**	4.704579	0.583927	8.056795	0.0000
_FBN--GDP_FBN**	3.888602	1.504084	2.585362	0.0098
_UBA--GDP_UBA	2.515643	1.635507	1.538142	0.1241
_UBN--GDP_UBN	2.368479	1.669690	1.418514	0.1561
_GUIN--GDP_GUIN	1.443456	4.989465	0.289301	0.7724
_NBL--GDP_NBL	2.272461	1.957999	1.160604	0.2459
_JHT--GDP_JHT	0.745445	0.707530	1.053587	0.2921
_PZ--GDP_PZ**	8.093300	1.318665	6.137496	0.0000
_UAC--GDP_UAC	0.638246	1.305161	0.489017	0.6249
_CAP--GDP_CAP**	-20.17666	4.796737	-4.206330	0.0000
_NBC--GDP_NBC**	16.84878	3.015527	5.587343	0.0000
_MOB--GDP_MOB	14.22937	9.439969	1.507354	0.1318
_FLMILL--GDP_FLMILL	3.436149	2.729210	1.259027	0.2081
_NNFMILL--GDP_NNFMILL**	2.062303	0.857223	2.405794	0.0162
_INCAR--GDP_INCAR**	-1.346771	0.512321	-2.628765	0.0086
_BRCODE--GDP_BRCODE	0.578599	1.122861	0.515290	0.6064

_GGUNIEA--GDP_GGUNIEA	0.346845	0.465282	0.745452	0.4561
_NROPE--GDP_NROPE	0.346845	0.465282	0.745452	0.4561
_NWIRE--GDP_NWIRE	0.565924	0.373298	1.516009	0.1296
_BPAINT--GDP_BPAINT**	1.434169	0.542358	2.644323	0.0082
_AGLEV--GDP_AGLEV	-0.331890	0.489547	-0.677953	0.4978
_CHRAMS--GDP_CHRAMS**	-4.056891	0.976823	-4.153150	0.0000
_SCOA--GDP_SCOA**	-2.225023	0.662469	-3.358681	0.0008
_JBERGER--GDP_JBERGER	-3.211429	3.690453	-0.870199	0.3843
_COSTAIN--GDP_COSTAIN	-1.005246	1.518247	-0.662109	0.5079
_ARBICO--GDP_ARBICO**	-5.482440	1.196081	-4.583670	0.0000
_UNILEV--GDP_UNILEV**	6.592735	1.558898	4.229099	0.0000
_CADBURY--GDP_CADBURY**	16.58681	3.206487	5.172891	0.0000
_POLYPRD--GDP_POLYPRD	-0.395153	0.412480	-0.957993	0.3381
_STDPRES--GDP_STDPRES	-0.074332	0.447854	-0.165975	0.8682
_TOTAL--GDP_TOTAL**	24.93183	7.768265	3.209447	0.0013
_AP--GDP_AP	-2.537786	10.35028	-0.245190	0.8063
_PHADEC--GDP_PHADEC	-0.070334	0.467979	-0.150292	0.8805
_GLAXO--GDP_GLAXO	-0.122710	0.947451	-0.129516	0.8970
_UNIPRES--GDP_UNIPRES	-0.815715	0.514924	-1.584145	0.1133
_UNTEX--GDP_UNTEX**	1.436216	0.381554	3.764124	0.0002

Weighted Statistics

R-squared	0.775596	Mean dependent var	17.94272
Adjusted R-squared	0.761114	S.D. dependent var	21.69102
S.E. of regression	10.60168	Sum squared resid	376188.5
Log likelihood	-9780.794	F-statistic	53.55599
Durbin-Watson stat	0.804683	Prob(F-statistic)	0.000000