

The Effect of Macro-economic Variables on Real Estate Development in Kenya

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Abstract

Purpose – The development of real estate sector in any context is highly affected by several economic factors. This study sought to establish the effects of macroeconomic factors on real estate sector development in Kenya. Independent variables studied are balance of payment, government expenditure, external government debt, foreign direct investments, taxation, interest rate, inflation rates, unemployment, capital market development and exchange rates.

Methodology – Development of the real estate sector was measured by quarterly Hass Consult Property index. Secondary data was collected for a period of 10 years (January 2008 to December 2017) on a quarterly basis. The study employed a descriptive cross-sectional research design and a multiple linear regression model was used to analyze the relationship between the variables.

Findings - The results of the study produced R-square value of 0.840 which means that about 84 percent of the changes in growth of the real estate sector in Kenya can be explained by the ten selected independent variables while 16 percent in the variation was associated with other factors not covered in this research. The study also found that the independent variables had a strong correlation with growth of the real estate sector. The results further revealed that individually only balance of payment and unemployment rate are statistically significant determinants of real estate development in Kenya.

Implications - Adequate measures should be put into place to improve and develop the real estate sector in Kenya by reducing both the prevailing unemployment rate levels and current account deficit.

Value – The study will be used as a guide in formulating policies by the government and any other institution involved in policy formulation for the real estate sector.

Key Words: *macro-economic variables, Real Estate Development in Kenya*

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Introduction

Real estate investment plays a fundamental role by providing shelter to households, employment, and enhancement of income distribution as well as means of alleviating poverty (Masika, 2010). The real estate sector is made up of three major segments namely agency, investment and operations (Kimmono 2010). Real estate market involves construction of permanent fixed assets and involvement of capital and labor with aim of earning favorable returns on the capital (Muli, 2013). Real estate investing entails purchase, ownership, management, renting of land or sale of real estate for profit whereas real estate operations involves developing, renting, leasing, managing commercial and residential properties, consultation services, real estate appraisal services, brokerage and agency services (New York Times 2016).

Several benefits accrue from development in the real estate sector; property tax on the new constructions which contribute positively to the economy in terms of funding for infrastructure developments, employment in the real estate sector thereby contributing to a reduction in unemployment and economic growth as income earned is spent locally (Economic Impact of Commercial Real Estate, 2014). Both theory and empirical literatures hold that the thriving of a nation is directly associated with certain macroeconomic factors such as economic growth, unemployment, balance of payments, inflation, remittances, exchange rate, money supply and interest rate. The financial performance of any sector is influenced by variations in economic fundamentals which in turn affect future prospects in the industry. According to Gazi, Uddin and Mahmudul (2010), a rising index or consistent growth in financial performance is an indicator of a growing sector whereas fluctuations in financial performance indicate economic instability in a country.

McKinnon (1973) theory argues that macro-economic variables for instance real interest rates, exchange rates and inflation should be monitored as they influence the diverse economic fundamentals and hence economic status. McKinnon posits that holding interest rates below market equilibrium leads to an increase in investment demand but the

real investment may remain unaffected. However, according to market efficiency theory the prices of all variables should not be influenced by other factors apart from demand and supply (Fama, 2000). According to Fama, a market is efficient market if stock prices indicate all the information regarding the market.

Investment is a critical component of GDP because it increases productive capacity as well as create employment. A rise in real estate investment creates a positive wealth effect. People can re-mortgage against their property and this increases the value of real estate hence increasing consumer spending. Real estate contributes to the GDP of an economy through the money that is spent on housing services as well as residential investments (Kipkirui, 2015). According to Nzalu (2012), there is a direct relationship between GDP and real estate investment. The government can employ different policies to influence a section or the whole economy at large in a certain way. Subsidies and tariffs can be employed where the government taxes the general public and the money is directed towards real estate sector with a view of making it more profitable. In addition, creating conducive legal environment e.g. protection of intellectual property rights as well as improvement of general infrastructure will have a positive impact on real estate sector (Wisniewski, 2012).

Zhou (1996) contradicted the perceived notion that there exist an association between interest rate, exchange rate, economic growth, inflation and development. His study tried to demonstrate that there are other fundamental factors affecting development most importantly the efficiency of the market that result in the market self-regulating due to availability of all fundamental market information and hence no one has the upper hand or the ability to beat the market. The hypothesis that development move one-for-one with ex ante economic variables is rejected.

According to Gazi, Uddin and Mahmudul (2010), a rising index or consistent growth in a sector is an indicator of a growing economy whereas fluctuations in growth indicate economic instability in a country. As demand for housing increases, there is an increase in housing prices as well as increased investment in real estate as firms attempt to capture

the increased demand (Knight Frank Economic Report, 2011). It can therefore be said that due to the positive relationship between housing demand, real estate prices and investment, the parameters present a suitable measure of the development of the real estate sector.

Karlson and Nordstrom (2007) associated macroeconomic factors to real estate financial performance; Venkstech (2013) associated macroeconomic factors to performance of the real estate sector in his survey of the real estate bubble in Singapore while Manni and Chane Teng (2008) established a significant relationship between macroeconomic factors and French real estate investment trust performance. Baum and Crosby (2012) did a study and established that interest rates, economic growth and speed of real estate sales as well as ease of accessing finance were the major factors affecting real estate investment. Rodenholm & Bernardi (2007) studied the macroeconomic effects on securitized real estate markets in Sweden and Switzerland and investigated the extent to which influenced real estate stock prices before and after the financial crisis outbreak.

Ouma (2015) in his study on effect of macro-economic variables on real estate prices demonstrated that high interests' rates and inflation contribute to high real estate prices while high GDP leads to low house prices. Kamau, Mboya and Mogaka (2015) showed that a positive relationship exists between GDP per capita, informal employment, inflation and mortgage growth in Kenya. Bioreri (2015) indicated that growth in exchange rate, interest rate, Diaspora remittance, inflation rate and real GDP together as opposed to individually affect the performance of the real estate sector. Muthee (2012) examined the connection between economic growth and the real estate prices in Kenya. According to the study results, it was established that there was a connection between the variables. Irandu (2017) conducted a study on the effect of selected macro-economic variables on real estate sector development in Kenya which is related to the current study.

Research Objective

This study sought to establish the effects of macro-economic variables on real estate development in Kenya.

Literature Review

Fama (1970) who is one of the promoters of EMH advanced the view that the trading value for stocks is usually its fair value and consequently, it is not possible for investors to purchase undervalued stocks or inflate prices of stocks in sale arrangements. According to EMH, there exist three forms of efficiency: Weak form efficiency results whereby prices of securities (bonds, stocks or property) reflect all historical public information. Second is the semi-strong efficiency that arises where stock prices reflect historically publicly available information such that prices change instantly to reflect release of new information. The strong form of efficiency asserts that securities' prices reflect historical, public and even private information. This theory is relevant to the current study as it recognizes the role of external factors in influencing asset prices and in effect the growth of the various sectors that make up an economy.

Harry Markowitz (1952) coined the modern portfolio theory which emphasised on how expected returns can be maximised by establishing portfolios that are weighed through risk levels. Markowitz concluded that institutions can construct a portfolio that would give the highest expected returns at a manageable risk level. The theory tries to maximize profits in a given portfolio or equally reduce the risk in a given level of expected returns by carefully selecting proportion of various investments (Fabozzi, Gupta, & Markowitz, 2002).

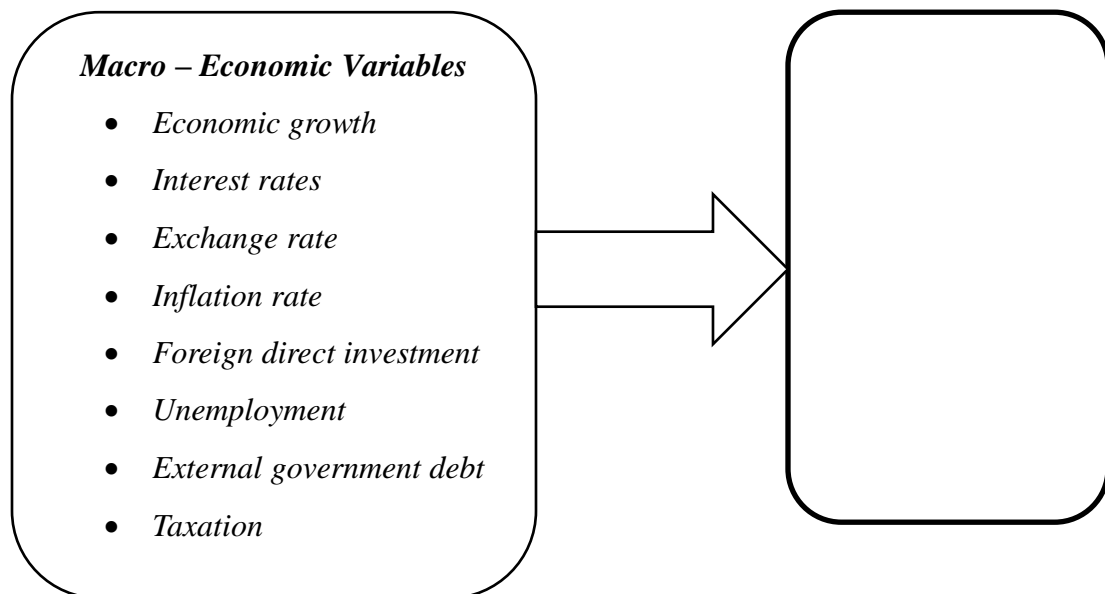
Psychologists have alleged that human beings usually exhibit emotional and cognitive biases that lead them to act in a rather irrational behavior. Behavioural finance was popularized in the 20th century, with Kahnemann and Tversky (1974) outlining behaviors and biases that hinder human beings from acting rationally. Behavioral finance holds that stock prices are affected by heuristic errors and biases, emotions, frame dependence, and social influence hence may not be the true fundamental value (Chandra, 2008). This theory is related to this study as it recognizes that human beings exhibit behaviors that can affect development of firms and sectors other than economic variables.

Mabutho (2013) undertook a study in South Africa to ascertain the association between financial and macro-economic variables on South Africa's real estate sector. Findings of the study showed that, growth in the market of real estate is affected mainly through interest rates that are short-term and inflation levels in the short run.

Juma (2014) established the impact of macro-economic variables on growth of real estate investment in Kenya. The study used secondary data on annual real estate investments growth as computed from the Hass Consult. The study established a strong positive association between growth in real estate and exchange rate fluctuations, growth in diaspora remittances, growth in money supply, inflation. The study concludes that macro-economic variables and real estate investment growth have a strong positive relationship.

Conceptual Framework

The financial performance of any sector' is influenced by variations in economic fundamentals and these fundamentals' affect future prospects. Housing prices and real estate investment are common parameters employed in measuring real estate sector development. The conceptual model developed below portrays this expected relationship between the study variables.



Methodology

A descriptive research design was employed in this study. Descriptive design was utilized as the researcher is interested in finding out the state of affairs as they exist (Khan, 2008). This research design was appropriate for the study as the researcher is familiar with the phenomenon under investigation but want to know more in terms of the nature of relationships between the study variables. In addition, a descriptive research aims at providing a valid and accurate representation of the study variables and this helps in responding to the research question (Cooper & Schindler, 2008). This refers to items with characteristics that a researcher intends to study. The study population was all residential real estate developments in Kenya as per Hass Consult Property index which covers over 320 suburbs and towns across Kenya. The study used secondary data from different sources such as Central Bank of Kenya (CBK), NSE, Hass Consult and the Kenya National Bureau of Statistics (KNBS) covering a period of 10 years from 2008 to 2017 on a quarterly basis. Data on the dependent variable, development of the real estate sector in Kenya was obtained from Hass Consult on a quarterly basis. The country's inflation rate, foreign direct inflows, unemployment rate and GDP data was collected from the KNBS, capital market development (REITs) on Nairobi Stock Exchange while data on interest rates and exchange rates was collected from the CBK.

Analytical Model

The study estimated the following multiple linear regression model to examine the relationship between macroeconomic variables and real estate development in Kenya.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon \dots\dots(i)$$

Where:

Y = Real Estate Sector Development measured by percentage change on quarterly Hass Consult Property index

X_1 = Economic growth as measured by percentage change on quarterly GDP growth rate

X_2 = Interest rates as measured by percentage change on quarterly Central bank lending rate

$X_3 =$ Exchange rate as measured by percentage change on quarterly natural logarithm of KSH/USD rate

$X_4 =$ Inflation rate as measured by percentage change on quarterly Consumer Price Index

$X_5 =$ Foreign direct investment measured by percentage change in quarterly FDI inflows

$X_6 =$ Unemployment measured by percentage change on quarterly unemployment rate

$X_7 =$ External government debt measured by percentage change on quarterly natural logarithm of external debt

$X_8 =$ Taxation as measured by percentage change on quarterly natural logarithm of tax collected

$X_9 =$ Balance of payments measured by percentage change on quarterly natural logarithm of current account deficit

$X_{10} =$ REITs measured as a percentage change on quarterly turnover

$\varepsilon =$ error term

$\beta_1 \dots \beta_{10}$ = are the coefficients of the variables

$\alpha =$ y intercept of the regression equation.

Results and Discussions

Diagnostic Tests

The research assumed a 95 percent confidence interval or 5 percent significance level (both leading to identical conclusions) for the data used. These values helped to verify the truth or the falsity of the data. Thus, the closer to 100 percent the confidence interval (and thus, the closer to 0 percent the significance level), the higher the accuracy of the data used and analyzed is assumed to be. To test for normality, the null hypothesis for the test was that the secondary data was not normal. If the p-value recorded was more than 0.05, the researcher would reject it. The results of the test are as shown in table one below.

Both Kolmogorov-Smirnova and Shapiro-Wilk tests recorded o-values greater than 0.05 which implies that the research data was normally distributed. The data was therefore appropriate for use to conduct parametric tests such as Pearson’s correlation, regression analysis and analysis of variance.

Table 1: Multicollinearity Test for Tolerance and VIF

Variable	Collinearity Statistics	
	Tolerance	VIF
Balance of payments	0.392	1.463
Government expenditure	0.398	1.982
Taxation	0.388	1.422
Foreign direct investment	0.376	1.398
External debt	0.398	1.982
Interest rates	0.360	1.382
Inflation rate	0.392	1.463
Unemployment rate	0.646	1.434
Capital market development	0.388	1.422
Exchange rate	0.376	1.398

Tolerance of the variable and the VIF value were used where values more than 0.2 for Tolerance and values less than 10 for VIF meaning that Multicollinearity doesn’t exist. Multiple regressions is applicable if strong relationship among variables doesn’t exist. From the findings, all the variables had tolerance values >0.2 and VIF values <10 as shown in table 4.2 showing that Multicollinearity among the independent variables doesn’t exist. The assumption of the regression model adopted was that the error term was independent and normally distributed, with a mean zero and a constant variance. To test for the independence of the variables, Durbin-Watson statistical analysis was undertaken. This analysis was used to test for the presence of auto correlation among the residuals. Residual was the difference between the observed value and the predicted value of the variables. Table two below shows the results of Durbin-Watson analysis.

Table 2: Durbin-Watson Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.916 ^a	.840	.784	1.2574630	2.447

a. Predictors: (Constant), Exchange rate, Unemployment rate, Interest rates, Balance of payments, Taxation, Foreign direct investment, Capital market development, External debt, Inflation rate, Government expenditure

b. Dependent Variable: Real estate development

From table two above, the Durbin-Watson value was 2.447 meaning the residuals' values were uncorrelated since it falls within the acceptable range of 1.50 and 2.50. This means the size of the residual for one variable has no impact on the size of the residual for the next variable. Table three below summarizes data descriptive statistics.

Table 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Std. Error
Real estate development	40	-3.8000	9.4000	1.997500	2.7072067	.361	.374	.374	.733
Balance of payments	40	-1.0000	.5578	.014487	.2371878	-1.688	.374	.374	.733
Government expenditure	40	11.3	12.8	12.097	.3648	-.269	.374	.374	.733
External debt	40	12.1	12.8	12.423	.2247	.318	.374	.374	.733
Taxation	40	11.3	12.6	12.005	.3320	-.427	.374	.374	.733
Foreign direct investment	40	17.5	210.9	49.698	36.2454	2.847	.374	.374	.733
Interest rates	40	13.6533	20.2133	15.809915	1.9545367	.715	.374	.374	.733
Inflation rate	40	1.9404	2.2705	2.122240	.0963415	-.207	.374	.374	.733
Unemployment rate	40	10.9300	12.1700	11.708000	.3486178	-.792	.374	.374	.733
REITs	40	5.8339	6.0588	5.940255	.0735071	.255	.374	.374	.733
Exchange rate	40	1.7969	2.0150	1.939390	.0553332	-.392	.374	.374	.733

Correlation Analysis

Pearson correlation was employed to analyze the level of association between development of real estate sector and the independent variables for this study (balance of payments, public expenditure, external public debt, foreign direct investments, taxation, interest rates, exchange rates, unemployment rate, capital market development and inflation) and the findings are presented in table four below.

From the study findings, there was a weak positive and statistically significant correlation ($r = .403$, $p = .010$) between balance of payments and real estate development. The study also found out that external debt, taxation, foreign direct investments, exchange rates, capital market development and inflation have a positive and significant correlation with development of real estate sector as evidenced by ($r = .748$, $p = .000$), ($r = .322$, $p = .042$), ($r = .687$, $p = .000$), ($r = .635$, $p = .000$), ($r = .766$, $p = .000$) and ($r = .699$, $p = .000$) respectively. The prevailing level of unemployment rate was found to have a negative and significant correlation with real estate development in Kenya as evidenced by ($r = -.574$, $p = .000$). Although government expenditure was found to have a positive correlation with real estate development, the relationship was not significant as shown by a p value of 0.062 which is higher than significance level of 0.05. Interest rate was also found to have a weak negative and insignificant correlation with real estate development.

Table 4: Correlation Analysis

	Real estate development	Balance of payments	Government expenditure	External debt	Taxation	Foreign direct investment	Interest rates	Inflation rate	Unemployment rate	Capital market development	Exchange rate
Real estate development	1										
Balance of payments	-.403**	1									
Government expenditure	.297	.108	1								
External debt	.748**	-.248	.420**	1							
Taxation	.322*	.110	.689**	.421**	1						
Foreign direct investment	.687**	-.049	.405**	.643**	.413**	1					
Interest rates	-.082	.059	.133	.078	.117	-.090	1				
Inflation rate	.699**	-.237	.445**	.662**	.451**	.714**	.251	1			
Unemployment rate	-.574**	.085	-.051	-.183	-.079	-.269	.183	-.127	1		
Capital market development	.766**	-.252	.439**	.680**	.450**	.733**	.112	.671**	-.262	1	
Exchange rate	.635**	-.290	.370*	.633**	.360*	.638**	.166	.627**	.014	.608**	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

c. List wise N=40

Source: Research Findings (2018)

Regression Analysis

Development of real estate sector was regressed against ten predictor variables; balance of payments, public expenditure, external public debt, foreign direct investments, taxation, interest rates, exchange rates, unemployment rate, capital market development and inflation. The regression analysis was conducted at 5% level of significance. The study obtained the model summary statistics as shown in table five below.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.916 ^a	.840	.784	1.2574630	2.447
a. Predictors: (Constant), Exchange rate, Unemployment rate, Interest rates, Balance of payments, Taxation, Foreign direct investment, Capital market development, External debt, Inflation rate, Government expenditure					
b. Dependent Variable: Real estate development					

R squared shows the deviations in the response variable as a result of changes in the predictor variables. From the outcome in table five above, R square value was 0.840, a discovery that 84 percent of the deviations in development of the real estate sector is caused by changes in balance of payments, public expenditure, external public debt, foreign direct investments, taxation, interest rates, exchange rates, unemployment rate, capital market development and inflation. Other variables not included in the model justify for 16 percent of the variations in real estate development in Kenya. The findings also revealed existence of a strong relationship among the selected independent variables and the development of real estate firms as shown by the correlation coefficient (R) equal to 0.902. A Durbin-Watson statistic of 2.447 indicated that the variable residuals were not serially correlated since the value was more than 1.5.

Table 6: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	239.975	10	23.997	15.177	.000 ^b
	Residual	45.855	29	1.581		
	Total	285.830	39			

a. Dependent Variable: Real estate development

b. Predictors: (Constant), Exchange rate, Unemployment rate, Interest rates, Balance of payments, Taxation, Foreign direct investment, Capital market development, External debt, Inflation rate, Government expenditure

The significance value is 0.000 which is less than $p=0.05$. This implies that the model was statistically significant in predicting how balance of payments, public expenditure, external public debt, foreign direct investments, taxation, interest rates, exchange rates, unemployment rate, capital market development and inflation affects development of the real estate sector in Kenya.

Coefficients of determination were used as indicators of the direction of the relationship between the balance of payments, public expenditure, external public debt, foreign direct investments, taxation, interest rates, exchange rates, unemployment rate, capital market development and inflation and development of the real estate sector in Kenya. The p-value under sig. column was used as an indicator of the significance of the relationship. At 95% confidence level, a p-value of less than 0.05 was interpreted as a measure of statistical significance. The results are as indicated in table 7 below.

Table 7: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	14.604	84.650		.173	.864
Balance of payments	-2.907	.952	-.255	-3.055	.005
Government expenditure	5.316	4.030	.716	1.319	.197
External debt	7.180	5.851	.596	1.227	.230
Taxation	6.352	4.490	.779	1.415	.168
1 Foreign direct investment	.018	.009	.241	1.909	.066
Interest rates	.009	.153	.006	.057	.955
Inflation rate	.360	14.384	.013	.025	.980
Unemployment rate	-3.635	.867	-.468	-4.193	.000
Capital market development	15.768	22.084	.428	.714	.481
Exchange rate	-10.688	12.900	-.218	-.829	.414

a. Dependent Variable: Real estate development

From the above results, it is evident that only balance of payments and unemployment rate were found to be significant determinants of real estate sector development in Kenya as evidenced by high t values and p values that are less than 0.05. All the other independent variables (public expenditure, external public debt, taxation, interest rates, exchange rates and inflation) were found to be insignificant determinants of development in the real estate sector in Kenya as evidenced by low t values and p > than 0.05. The following regression equation was estimated:

$$Y = 14.604 - 2.907X_1 - 3.635X_2$$

Where,

Y = Development of the real estate sector

X₁ = Balance of payments

X₂ = Unemployment rate

On the estimated regression model above, the constant = 14.604 shows that if selected dependent variables (balance of payments, public expenditure, external public debt, taxation, interest rates, exchange rates, unemployment rate and inflation) were rated zero,

the development would be 14.604. A unit increase in balance of payment deficit would result in a reduction in development of real estate sector by 2.907. A unit increase in unemployment rate, would lead to a decrease in development of the real estate sector by 3.635.

Conclusions

This study concludes that development of real estate sector in Kenya has a negative association with balance of payment deficit. The study therefore concludes that higher balance of payment deficit lead to a decline in development in the real estate sector to a significant extent. The study found that unemployment rate had a significant negative effect on development of the real estate sector in Kenya. This implies that an increase in unemployment rate will lead to a decline on the prevailing development rate of the real estate sector. The study further concludes that although government external borrowing, foreign direct investments, economic growth, capital market development, interest rates and taxation have a positive effect on real estate sector development, the effect is not significant.

This study concludes that independent variables selected for this study; balance of payments, public expenditure, external public debt, foreign direct investments, taxation, interest rates, exchange rates, unemployment rate, capital market development and inflation influence development of real estate sector to a large extent as they account for 84 percent of the changes in development. The fact that the ten independent variables explain 84% of changes in development of the real estate sector imply that the variables not included in the model explain only 16% of changes in development of the real estate sector. It is therefore sufficient to conclude the variables discussed significantly affect the development as shown by the p value in anova summary.

Recommendations

This study recommends adequate measures to be put into place to ensure that the factors that influence balance of payment deficit are well addressed to bridge the gap and boost our exports. If the country can be able to bridge the balance of payment deficit, this

would lead to a rise in the development of the real estate sector and this will ultimately translate to the development of the entire economy. Policy makers should pay attention to the prevailing rates of unemployment as it can negatively affect development of the real estate sector. If measures are taken to reduce the prevailing levels of unemployment rate, this would translate to development in the real estate sector.

References

- Amato, L. & Burson, T. (2007). The Effects of Firm Size on Profit Rates in the Financial Service, *Journal of Economic and Economic Research*, 8(1), 61- 81
- Athanasoglou. P., Brissimis, S., & Delis, M, (2005). Bank-Specific, Industry-Specific and Macroeconomics Determents of Bank Profitability, *Bank of Greece*, No. 25
- Baum, K. & Crosby, P. (2012). *Retention rates, re-investment and depreciation in European office market* (2nd Ed.). London: University of Reading
- Bioreri, D. (2015). *The effect of macro-economic variables on the performance of real estate industry in Kenya*. Unpublished Research Project, 2015-2016
- Blostrom, M and Kokko, A. (1998). Multinational Corporations and Spillovers. *Journal of Economic Surveys*, 247-277
- Blanchard, O. (2009). *Macroeconomics*. 5th ed. New Jersey: Pearson Education Inc
- Chandra, R. (2008). *Investment Analysis 3/E*. New York, NY: Tata McGraw-Hill Education
- Cooper, R., & Schindler, S. (2008). *Business research methods*. New York: Mc Grawhill
- Cytonn Investment Real Estate Report (2017). *Third quarter*
- Daniel, K., Hirshleifer, D. and Subrahmanyam, A. (1997). A theory of overconfidence, self-attribution, and security market conditions of risk.' *Journal of Finance*, 19:425-442
- Gazi, S., Uddin, W. & Mahmudul, A. (2009). Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries, *International Journal of Business and Management*, 4(3), 43-51
- Fama, E. F. (2000). *Short-Term Interest Rates as Predictors of Inflation; the Debt Market*. Cheltenham: Elgar

- Fereidouni. T. A. & Masron. H. G. (2012). Effect of FDI on foreign real estate investment *18th Annual Pacific-Rim Real Estate Conference, Adelaide, Australia, 15-18, January 2012*
- He, C. & Zhu, Y. (2010). Real Estate FDI in Chinese Cities: local market conditions and regional institutions. *Eurasian Geography and Economics*, 51 (3), 360-384
- Juma, M.I. (2014). *The Effect of Macro-Economic Variables on Growth in Real Estate Investment in Kenya*. MSc Project, University of Nairobi, Kenya
- Kenyan Economic Report. (2015). *Creating an Enabling Environment for Stimulating Investment for Competitive*
- Khan, J. A. (2008). *Research Methodology*. New Delhi. APH Publishing Corporation
- Khan, W. A., & Sattar, A. (2014). Impact of Interest Rate Changes on the Profitability of four Major Commercial Banks in Pakistan. *International Journal of Accounting and Financial Reporting*, 4(1), 142-147
- Knight Frank Economic Report (2011). *Annual Report*
- Kwon, C. S., & Shin, T. S. (1999). Cointegration and causality between macroeconomic variables and stock market returns. *Global Finance Journal*, 10(1), 71–81
- Lee, J. (2009). Does The Size Matter in Firm Performance? Evidence from US Public Firms, *Internal Journal of the Economic of Business*, 16(2), 199- 203
- Li, L. (2016). *Prices and Bubbles: Factors Affecting the Chinese Real Estate Market Master Program in International Economics with a focus on China*, Lund University, Sweden
- Liargovas, P. & Skandalis K. (2008). *Factors affecting firm's financial performance*. The case of Greece, Athens. University of Peloponnese Press
- Loyford, M. M. & Moronge, M. (2014). Effects of economic factors on performance of Real Estate in Kenya. *European Journal of Business Management*, 1(11), 181-200
- Makena, J. S. (2012). *Determinants of Residential Real Estate Prices in Nairobi*. Unpublished MBA Project. University of Nairobi
- Maku, O. A. & Atanda, A. A. (2010). Determinants of stock market performance in Nigeria: long-run analysis. *Journal of Management and Organizational Behavior*, 1(3), 5-16

- Malkiel, B. G., & Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383-417
- Markowitz, H.M. (1952): *Portfolio Selection*. New York: John Wiley and Sons
- Masika, A. M. (2010). *Factors Influencing Real Estate Property Prices. A Survey of Real Estates in Meru Municipality*, Kenya. Kenya Methodist University, Meru
- McKinnon, R. I. (1973). *Money and capital economic development*, Brookings Institution (Washington, D.C.)
- Mishkin, R. J. (2004). From efficient markets theory to behavioral finance. *The Journal of Economic Perspectives*, 17(1), 83-104
- Mishkin, F.S. & Eakins S. (2009). *Financial Markets and Institutions* (6th ed.). Pearson Prentice Hall.
- Muchoki, D.N. (2013). *Investigation into the Challenges Facing Real Estate Development in Kenya (A Case Study of Kenol Town, Murang'a County)*. Unpublished MBA Project. University of Nairobi
- Muli, N. F. (2013). *An assessment of the Factors Affecting the Growth in Real Estate Investment in Kenya*. Unpublished MBA research project, University of Nairobi.
- Muthee, K. M. (2012). *Relationship between economic growth and real estate prices in Kenya*. Unpublished MBA Project, University of Nairobi
- Njoroge, A. (2014). *Relationship between capital structure and financial performance*. Unpublished MBA research project, University of Nairobi
- Nzalu, F.M. (2012). *An Assessment of the Factors Affecting the Growth in Real Estate Investment in Kenya*, Unpublished MBA Project, University of Nairobi
- Pal, K. & Mittal, R. (2011). Impact of Macroeconomic Indicators on Indian Capital Markets. *Journal of Risk Finance*, 12 (2): 84-97
- Raissa, K. (2014). *The Effect of Corporate Governance on the Financial Performance of Commercial Banks in Rwanda*. Unpublished MBA research project, University of Nairobi
- Regan, R. (2017). *Capital Markets, Infrastructure Investment and Growth in the Asia Pacific Region*, Australia, Faculty of Society and Design, Bond University, Gold Coast.

- Renigier-Biłożor, M., & Wiśniewski, R. (2012). The Impact of Macroeconomic Factors on Residential Property Price Indices in Europe. *Folia Oeconomica Stetinensia*, 12(2), 103- 125.
- Rodenholm, R., & Dominique, B. (2013). *Macroeconomic effects on securitized real estate markets. A comparative study of Sweden and Switzerland*. KTC.
- Sharma, G. D., Singh, S. & Gurvinder, S. (2011). *Impact of Macroeconomic Variables on Economic Performance: An Empirical Study of India and Sri Lanka*. Rochester, New York
- Shiblee, L. (2009). *The Impact of Inflation, GDP, Unemployment, and Money Supply on Stock Prices*. Arab Bank – Syria
- Shostak, F. (1997). In Defence of Fundamental Analysis: A critique of the efficient market hypothesis. *The Review of Austrian Economics Rev Austrian Econ*, 10(2), 12-19.
- Sill, P. (1996). Stock Prices, Money Supply and Interest Rates: the Question of Causality, *Applied Economics*, 20, 163-1611.
- Sorensen B. & Stuart E. (2000). Age, obsolescence and organizational innovation. *Academy of Management journal*, 25(6), 121-132
- Suheyli, R. (2015). Determinants of Insurance Companies Profitability in Ethiopia. *Unpublished Msc. Thesis*. Addis Ababa University, Ethiopia
- Tobin, J. (1958). Liquidity preference as behavior towards risk, *The Review of Economic Studies*, 25, 65-86
- Wiśniewski R. (2011). Modeling of residential property prices index using committees of artificial neural networks for PIGS, the European-G8, and Poland. *Economic Modelling* (sent to the publisher)