RESEARCH ARTICLE

FACTORS AFFECTING STOCK PRICES IN RWANDA.

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Manuscript Info	Abstract
	This paper investigated dominant factors that affect stock prices in Rwanda. It specifically determined factors that affect stock prices in Rwanda and the direction of causality between stock prices and its determinants employing quarterly data spanning from 2011-2015. Having identified all the variables to be of the same order this study employed Johnsen cointegration test to assess long run relationship. The trace test tests the null hypothesis that there are at most *r* cointegrating relationships. In other words, a rejection of the null hypothesis means that there are more than *r* cointegrating relationships. The null hypothesis of two cointegrating relationships is rejected given that the trace statistics exceeds the critical value. The trace statistics (72.20544) exceeds the critical value of 69.81889 at 95 percent confidence level. The result confirms that there is three cointegrating relationship among the variables employed for the use of this study. The results from Maximum Eigen Statistics indicate that the eigenvalue test statistics (43.29838) exceeds the critical value (40.07757) at 95 percent confidence level. Hence, the failure to reject the alternative hypothesis indicates that there is two cointegrating relationship among the variables. These results confirm the presence of a long-run relationship between the explained variable and one of the explanatory variables. In order to determine the relationship between the variables under study, the study adopted ordinal least square (OLS) approach and the results presented indicate that the relationship between the stock price is affected positively (27.16009) at 5 level of significance by CPI (inflation) followed by money supply and interest rate at 5 percent and 10 percent level of significance respectively. Both interest rate and money supply affect stock prices negatively. Moreover, the co-efficient of determination indicates that only 74. 95 of change in stock prices could be attributed to changes in interest rate, dividend per share, money supply, consumer price index, real GDP and oil prices within the study period. Additionally, the F-statistic (0.011517) reveals that all these variables jointly and significantly affect stock prices in Rwanda. To determine the direction of causal relationship between stock prices and its factors in Rwanda Results from Grange causality reveals that independence of causality is suggested between stock prices with all the independent variables used in this study. Putting together these results, policy implications

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would be for the inflation authority in Rwanda (BNR) to continue taking appropriate policy measures to control inflation and hence inflation through continued better coordination complimented by effective communication with the public to reduce the impact of inflation inertia. Additionally, BNR should also take appropriate measures to tackle exchange rate movements to reduce inflation pressures on imported inflation for the great benefit for Stock Exchange through demand pull way of more investor in stock market, and supply push way of more extensional investment of companies. Moreover, we recommend further analysis of other variables (GDP, EPS, DPS and oil prices) with annual data and a bigger sample size.

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Introduction:-

Since the 1990's capital markets have grown rapidly in Africa. There were only 8 stock exchanges in the entire continent before 1989 (Emmanuel Asoluka Ihejirika 2015). At present, over 50% of the 54 countries in the continent formed stock exchanges. Although the continent has shown remarkable economic growth since 2001 with continental annual average economic growth in excess of 5% for the past 7 years, a lot still needs to be done to lift the continent from lingering poverty, unemployment and overall economic underdevelopment. To sustain the current level of economic growth and encourage both domestic and foreign investment in the continent, Africa needs to rapidly expand, develop and modernize its financial markets. Evidence from recent empirical economic studies suggests that deeper, broader, and better functioning financial markets can stimulate economic growth (Ndikumana, 2001).

A financial market is a broad term describing any marketplace where buyers and sellers participate in the trade of assets such as equities, bonds, currencies and derivatives. Financial markets are typically defined by having transparent pricing, basic regulations on trading, costs and fees, and market forces determining the prices of securities that trade. Investors have access to a large number of financial markets and exchanges representing a vast array of financial products. Some of these markets have always been open to private investors; others remained the exclusive domain of major international banks and financial professionals until the very end of the twentieth century. Stock markets allow investors to buy and sell shares in publicly traded companies. They are one of the most vital areas of a market economy as they provide companies with access to capital and investors with a slice of ownership in the company and the potential of gains based on the company's future performance. This market can be split into two main sections: the primary market and the secondary market. The primary market is where new issues are first offered, with any subsequent trading going on in the secondary market.

According to Levine (1997), over the past two decades, stock market has been a catalyst for long-run growth in developing countries. He further argues that without a stock market, many profitable long-term investments would not be undertaken because savers would be reluctant to tie up their investments for long periods of time. In contrast, equity market allows savers to sell their shares easily, thereby permitting firms to raise equity capital on favorable terms. By facilitating longer-term, more profitable investments, a liquid market improves the allocation of capital and enhances prospects for long-term economic growth.

Recent empirical studies found that countries with relatively competitive stock markets in 1976 grew much *faster over the next 18 years than countries with uncompetitive markets, even after adjusting for differences in other factors that influence growth, such as education levels, inflation rates, and openness to trade. The studies also indicate that, in promoting economic growth, an effective stock market complements a strong banking system, suggesting that banks and stock markets provide different bundles of financial services to the economy (Levine, 1997). Financial markets are,* therefore, the life blood of the economy. In recognition of the importance of stock

markets in economic development, several African countries launched *stock exchanges during the past two decades. At present more than 50% of the 54 African countries operate stock exchanges. The Government of Rwanda established* The Rwanda Stock Exchange Limited on 7th October 2005 with the objective of carrying out stock market operations. The Stock Exchange was demutualized from the start as it was registered as a company limited by shares. The company was officially launched on 31st January 2011. *Rapid expansion of stock exchanges in the African continent contributed to economic development in various ways. These are, among others, facilitating the privatization process, diversifying the financial services, facilitating long term capital mobilization, provision of alternative investment opportunities, attracting foreign capital inflows and serving as a signal of overall macroeconomic performance.* However, most African stocks exchange markets are still at early stage of development and face several constraints. The main challenges are: political instability in some economies, high volatility in economic growth, macroeconomic uncertainty, liquidity constraints, limited domestic investor base, underdeveloped trading and settlement structures, and limited market information.

Inspite of the emergence of several studies on the factors affecting stock prices, the findings reveal a mixed opinion regarding their positive or negative impact each makes on market price. We also cannot find a general consensus in the factors affecting the market price of shares as they are the joint outcome of both micro and macro factors. A gap is also noticed in the regions analyzed, and a review of prior studies reveal the absence of research on this topic in the Rwandan economy. This paper will therefore fill the gap by conducting a comprehensive study of Stock Prices as function of Earning per share, Money Supply, Gross Domestic Price, Inflation, dividend per share, interest rate and oil prices to determine their extent of impact on the stock prices in the Rwandan economy. Availability of knowledge about the factors which can affect stock prices determines the success of investments, reduces the cost and risk for underwriters and market makers. It also reduces the cost for investors via ensuring lower volatility and transaction cost. Thus, from a macro perspective, effective stock prices are essential for the efficient allocation of capital, which results in lower cost of capital for issuers. At the micro level, an efficient stock price ensures access to a diverse range of investors with various trading strategies. This study is developed with the intention to be used by investors both public and private in their investment analysis and decisions. It is also developed to help the government of Rwanda and other interested parties to educate the population on how stock prices change in Rwanda and their relationship with other factors in the economy.

Literature review:-
Theoretical review:-
When it comes to investing, there is no shortage of theories on what makes the market tick or what a particular market move means. The two largest factions on Wall Street are split along theoretical lines into adherents to an efficient market theory and those who believe the market can be beat. Although this is a fundamental split, many other theories attempt to explain and influence the stock market and the actions of investors in the markets. The basic theories this study relied on are.

Considering the theory of Efficient Market Hypothesis, stocks always trade at their fair value, making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. As such, it should be impossible to outperform the overall market through expert stock selection or market timing, and that the only way an investor can possibly obtain higher returns is by chance or by purchasing riskier investments. Fama (2012). Very few people are neutral on efficient market hypothesis (EMH). You either believe in it or adhere to passive, broad market investing strategies, or you detest it and focus on picking stocks based on growth potential, undervalued assets and so on. The EMH states that the market price for stocks incorporates all the known information about that stock. This means that the stock is accurately valued until a future event changes that valuation. Because the future is uncertain, an adherent to EMH is far better off owning a wide swath of stocks and profiting from the general rise of the market. Opponents of EMH point to Warren Buffett and other investors who have consistently beat the market by finding irrational prices within the overall market. Gann (1900s) documented that, before continuing, an observed trend will undergo a price correction of one-half to two-thirds of the change in price. This means that if a stock has been on an upward trend and gained 20%, it will fall back 10% before continuing its rise. This is an extreme example, as most times this rule is applied to the short-term trends that technical analysts and traders buy and sell on. This correction is thought to be a natural part of the trend, as it's usually caused by skittish investors taking profits early to avoid getting caught in a true reversal of the trend later on. If the correction exceeds 50% of the change in price, it's considered a sign that the trend has failed and the reversal has come prematurely.

Prospect theory created in 1979 and developed in 1992 by Daniel Kahneman and Amos Tversky, people's perceptions of gain and loss are skewed. That is, people are more afraid of a loss than they are encouraged by a gain. If people are given a choice of two different prospects, they will pick the one that they think has less chance of ending in a loss, rather than the one that offers the most gains. For example, if you offer a person two investments, one that has returned 5% each year and one that has returned 12%, lost 2.5%, and returned 6% in the same years, the person will pick the 5% investment because he puts an irrational amount of importance on the single loss, while ignoring the gains that are of a greater magnitude. In the above example, both alternatives produce the net total return after three years. Prospect theory is important for financial professionals and investors. Although the risk/reward trade-off gives a clear picture of the risk amount an investor must take on to achieve the desired returns, prospect theory tells us that very few people understand emotionally what they realize intellectually. For financial professionals, the challenge is in suiting a portfolio to the client's risk profile, rather than reward desires. For the investor, the challenge is to overcome the disappointing predictions of prospect theory and become brave enough to get the returns you want.

In the theory of rational expectations the players in an economy will act in a way that conforms to what can logically be expected in the future (Thomas, 1987). That is, a person will invest, spend, etc. according to what he or she rationally believes will happen in the future. By doing so, that person creates a self-fulfilling prophecy that helps bring about the future event. Although this theory has become quite important to economics, its utility is doubtful. For example, an investor thinks a stock is going to go up, and by buying it, this act actually causes the stock to go up. This same transaction can be framed outside of rational expectations theory. An investor notices that a stock is undervalued, buys it, and watches as other investors notice the same thing, thus pushing the price up to its proper market value. This highlights the main problem with rational expectations theory: it can be changed to explain everything, but it tells us nothing.

The short interest theory posits that a high short interest is the precursor to a rise in the stock's price and, at first glance, appears to be unfounded. Common sense suggests that a stock with a high short interest that is, a stock that many investors are short selling is due for a correction. The reasoning goes that all those traders, thousands of professionals and individuals scrutinizing every scrap of market data surely can't be wrong. They may be right to an extent, but the stock price may actually rise by virtue of being heavily shorted. Short sellers have to eventually cover their positions by buying the stock they've shorted. Consequently, the buying pressure created by the short sellers covering their positions will push the share price upward.

Empirical review:-
Studies on factors affecting stock prices cover many today international studies. Irfan and Nishat (2002) identified factors exerting impact on the stock prices in Karachi Stock Exchange for the period between 1981 and 2000. The study employed cross-sectional weighted least square regression and analyzed the impact of six variables viz. dividend yield, payout ratio, size, asset growth, leverage and earning volatility on share prices. Of these the payout ratio, size, leverage and dividend yield emerged as the significant factors affecting the stock market prices in Karachi. This suggests that firm specific factors have a significant impact on market price of stocks.

In the same vein, Das and Pattanayak (2009) examined 30 shares constituting the Bombay Stock Exchange – Sensitivity Index in order to study the factors affecting stock price movements. The analysis revealed that higher earnings, return on investment, growth possibility and favorable valuation have positive impacts on the market price of shares while higher risk and volatility have inverse impacts. Building on the same lines, Nirmala, Sanju and Ramachandran (2011) used panel data and examined three sectors namely auto, healthcare and public sector undertakings over the period 2000-2009 in order to infer the main factors affecting share prices in India. The study employed the fully modified ordinary least squares method and results revealed that dividend, price-earnings ratio and leverage are major determinants of stock prices for all the sectors under consideration.

Continuing the chain of research, Khan et al. (2011) analyzed the impact of dividend policy on Stock prices in Malaysia after controlling for factors such as earnings per share, profit after tax and return on equity. The research applied fixed and random effect models on a panel data for 55 companies listed at KSE-100 Index for the period of 2001-2010. Results revealed that dividend yield, earnings per share, return on equity and profit after tax are positively related to stock prices while retention ratio have negative relation with stock prices and significantly explains the variations in the stock market prices.

A more focused study of the impact on dividends (proxied by dividend yield and dividend payout) along with other control variables on share prices were studied by Okafor and Mgbame (2011) in the Nigerian market. The multivariate regression analysis was applied on 10 firms for a eight year period from 1998-2005. Results revealed a negative impact of dividend yield on share price changes while dividend payout revealed inconsistent results of positive and negative relationships during the different years studied. Similar studies conducted by Black and Scholes (1974), Capstaff, Klaeboe, and Marshall (2004) and Pani (2008) also found a positive relationship between dividend policy and stock returns. However Baskin (1989) posits a negative relationship between dividend yield and dividend payout on share price changes. This is mainly attributed to the dividend irrelevant hypothesis and the notion among investors that dividend payments are the outcome of the past performance of the firm rather than a reflection of future performance. Similar views related to the irrelevance concept of dividend was expressed by Uddin (2003), Denis and Osobov (2008) and Chen and Dhiensiri, (2009) and in their study of Bangladesh, New Zealand and Nigerian market respectively.

Another significant and positive determinant of stock prices which emerged in the studies conducted by Balkrishnan (1984), Zahir and Khanna (1982) and Sharma (2011) was the book value per share. The studies suggest that a higher book value per share depicts a sound financial performance of the company as book value is a major representation of owners' funds. This in turn affects the stock prices in a positive way. A review of the above studies and findings suggest that firm specific factors (internal factors) have significant impact on the market price of the share. This shows that investors are continuously scrutinizing the performance of the company in order to base their future investment decisions.

Deviating from the above Somoye, Akintoye, and Oseni (2009) conducted a survey on 130 companies traded in the Nigerian stock exchange between 2001 and 2007 in order to analyze the impact of various macro economic factors on the market price of shares. The study employed OLS regression and regressed stock prices on earnings per share, dividend per share, oil price, gross domestic product, lending interest rate and foreign exchange rate on stock price. All the variables revealed a positive correlation to stock prices with the exception of lending interest rate and foreign exchange rate. Similar findings were echoed by Zhao (1999) studied the relationships among inflation, industrial output and stock prices in the Chinese economy for the period 1993-1998. Results revealed a negative relationship existing with both the variables studied on market price per share.

Al-Qenae et al. (2002) made a significant contribution to the topic by basing his research on the Gulf Cooperation Council (GCC) market. He analyzed the impact of the effect of earnings and other macroeconomic variables on the stock prices of Kuwait Stock Exchange during the period 1981-1997. The macroeconomic variables examined were gross national product (GNP), interest rate, and inflation. The study found that earnings and GNP were positively related to stock prices (Midani, 2001) while inflation and interest rate showed a significant negative impact on the stock prices in Kuwait. The reason attributed for the effect in Kuwaiti shares is that the Kuwait share market is highly responsive to the sentiments of public and external events. This suggests the extreme vigilance and scrutiny of external factors by the people of Kuwait while basing their investment decisions.

The United Arab Emirates (UAE) economy was also studied from 1995-2005 to infer the most prominent factors affecting stock price in the respective market (Al-Tamimi, Alwan, & Rahman, 2011). The ordinary least squares regression revealed that earnings per share had a significant impact on stock prices in the UAE followed by money supply and GDP. It suggests that investors rely on the earnings per share to judge the efficiency and credibility of the company, therefore it is recommended to adopt those steps which can improve the earnings per share of firms. Similar studies focusing the impact of macro-economic variables on share price were studied by Mukherjee and Naka (1995), Chaudri and Smiles (2004) and Allahawiah and Al Amro (2012).

A general overview of prior studies discussed above on the investigation of the most prominent factors affecting share prices reveals that dividends, earnings per share, price earnings ratio, debt policy, GDP and firm size hold substantial roles in influencing the same. This suggests that dividend paying firms are better valued by investors as every investor prefers a consistent dividend policy. Also shares with higher Price earnings ratio indicate that such firms will have a promising future in the eyes of investors. Leverage is another imperative element affecting share prices and this suggests that investors attach more value to those firms which employ less debt as increased of debt minimizes the earnings of the stakeholders. Stakeholders also prefer firms which have high earnings per share as it ensures them a better return on the share. Return on Equity is also assumed to hold an important position as it assures the shareholders the amount earned on their investment. Inspite of the emergence of several studies on the

factors affecting stock prices, the findings reveal a mixed opinion regarding their positive or negative impact each makes on market price. We also cannot find a general consensus in the factors affecting the market price of shares as they are the joint outcome of both micro and macro factors. A gap is also noticed in the regions analyzed, and a review of prior studies reveal the absence of research on this topic in the Rwandan economy. In the empirical industrial organization literature, stock exchanges are examined only to a limited extent despite their central role in the financial market infrastructure. Hence, the literature is growing rapidly (e.g: Schmiedel 2004 for a review), However pricing of stocks in the stock market has so far not been considered. Instead, numerous articles study the total cost of share trading from the investor's perspective without mentioning the extensive literature on market microstructure (E.g Stoll 2001). This raises interesting questions about the manner in which Stock prices are affected in the stock market. It was in this regard the researcher comes up with an idea of conducting a research in addressing these questions. This paper will therefore fill the gap by conducting a comprehensive study of Stock Prices as function of Earning per share, Money Supply, Gross Domestic Price, Inflation, dividend per share, interest rate and oil prices to determine their extent of impact on the stock prices in the Rwandan economy.

Methodology:-
Model Specification and data source:-
In line with existing theories and empirical studies, this study assessed Stock prices as a function of dividend per share, interest rate, earning per share, exchange rate, and a set of intervening variables that affect stock price level namely inflation, money supply, gross domestic product. **SP=f (EPS, DPS, M₃, GDP, CPI, Interest rate, Oil Prices)** Where: **SP:** Stock Prices, **EPS:** Earning per share, **M₃:** Money Supply, **GDP:** Gross Domestic Price, **CPI:** Inflation and **DPS:** Dividend per share.

This study applied the multi-factor model, which employs the ordinary least square (OLS) method to estimate the equation:

$$SP_t = \beta_0 + \beta_1 EPS_t + \beta_2 M3_t + \beta_3 RGDP_t + \beta_4 CPI_t + \beta_5 ir_t + \beta_6 INTOIL_t + \beta_7 DPS_t + \varepsilon_t$$

Where: β_0 is the constant term, β_i are the parameters to be estimated, and all the variables are defined as above. This study applied log transformation for all the variables expect for interest rate in order to determine the elasticity for each variables in the study. Finally, ε_t is a random error term.

The study used entirely secondary data from the Rwanda Stock Exchange (RSE), the National Bank of Rwanda (BNR) data base. These included quarterly data spanning the period from 2011 to 2015 the aforementioned variables.

Data processing and analysis:-
Testing for unit root:-
Testing for the order of integration is standard in applied econometric work because knowing the order of integration is crucial for setting up an econometric model and do inference (Sjöö, 2008). This study applied the Augmented Dickey-Fuller (ADF) unit root test in order to analyze the presence of a unit root.

Testing for long run equilibrium: Cointegration test:-
Testing for unit roots precedes cointegration test. After classifying variables as integrated of order I(0), I(1), I(2) etc. is possible then to set up models that lead to stationary relations among those variables, and where standard inference is possible (Sjöö, 2008). There are several tests for cointegration. Sjöö (2008) argues that the Johansen test is the most fundamental test) given that it has all desirable statistical properties. Johansen's methodology with two different test statistics namely the Trace test statistic and the Maximum Eigen-value test statistic have been used.

3.2.3 Ordinary Least Squares (OLS):-
The Ordinary Least Squares (OLS) Technique of regression was used to determine different factors affecting stock prices in Rwanda. Although regression analysis deals with the dependence of one variable on other variables, it does not imply causation-that is, it is assumed that the variables in question are not bilaterally related, the independent variables are not collinear, and the disturbance terms are normally distributed and not serially correlated. Thus, the OLS technique is suitable because of its simplicity and the validity of its assumptions.

Testing for direction of Causality: Grange causality:-
The Granger causality test is a well-established model to test the contagion effects between two variables. This test was a type of VAR model, which is very effective in testing the presence of the contagion effect between two stock markets. The structure of Granger causality provides information about the ability of one variable or a group of variables to predict the other variables. Suppose two variables, xt and yt have an effect on each other with distributed lags, this relationship between these variables can be measured by Granger (1969).
The Granger causality test consisted of running regressions from stock prices on its lagged values to other variables under study. If the lagged values of stock prices do not yield a statistically significant relationship, then it could be concluded that stock price does not cause other variables.

Findings:-
The main objective of this study was to investigate dominant factors affecting stock prices in Rwanda. Before testing for long run relationship it was important to test stochastic properties of the variables under study.

Data stationarity: Stationary test statistics (ADF statistics):-
The first in step in attempting to determine factors affecting stock prices in Rwanda is to test for the presence of unit root. Theory cautions that in order to apply standard inference procedures in econometric empirical studies, the variables in the system need to be stationary due to the fact econometric analysis is widely built on assumption of stationarity. This study employed Augmented Dicky Fuller (ADF) unit root tests to show the order of integration of each time The results of the stationary tests are represented in the table below.

Table 1:- Stationary test statistics (ADF statistics)

Variable	ADF Test		
	Level	1st difference	I(d)
LSP	-0.370128	-2.835864***	I(1)
LDPS	**-1.170348**	**-4.043190***	I(1)
IR	0.218058	-2.633328***	I(1)
LOP	0.847113	-3.997190*	I(1)
LM	1.138904	-4.037375*	I(1)
LRGDP	-0.784580	-7.901859*	I(1)
LCPI	-3.122452**	-4.106683	I(0)

Source: Author's estimation

(*)(**)(***) denotes rejection of the hypothesis at the 0.1; 0.05 and 0.01 level of significance.
The results from Augmented Dickey Fuller (ADF) unit root tests indicate that all variables have unit roots (i.e not stationary) at level but become stationary when they are first differenced which indicate that all the variables are I (1) except consumer price index.

Long run relationship: Cointegration analysis:
This study employed Johansen cointegration technique to identify and clarify the long run relationships between integrated variables. The results from Johnsen cointegration test are summarized below.

Table 2:- Johansen Cointegration results: Trace statistics.

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.964855	179.1211	125.6154	0.0000
At most 1 *	0.897599	115.5038	95.75366	0.0011
At most 2 *	0.792328	72.20544	69.81889	0.0319
At most 3	0.635431	42.34131	47.85613	0.1494
At most 4	0.574497	23.16956	29.79707	0.2378
At most 5	0.296381	6.934400	15.49471	0.5853
At most 6	0.013360	0.255560	3.841466	0.6132
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The trace test tests the null hypothesis that there are at most r cointegrating relationships. In other words, a rejection of the null hypothesis means that there are more than r cointegrating relationships. From the table above, the null hypothesis of two cointegrating relationships is rejected given that the trace statistics exceeds the critical value. The third row of table above shows that the trace statistics (72.20544) exceeds the critical value of 69.81889 at 95 percent confidence level. This result confirms that there is three cointegrating relationship among the variables employed for the use of this study.

Similarly, the eigenvalue test tests the null hypothesis of r versus $r+1$ cointegrating relationships. This test rejects the null hypothesis if the eigenvalue test statistics exceeds the respective critical value. The results are presented below:

Table 3:- Johansen Cointegration results: Maximum Eigen Statistics.

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.964855	63.61729	46.23142	0.0003
At most 1 *	0.897599	43.29838	40.07757	0.0210
At most 2	0.792328	29.86413	33.87687	0.1400
At most 3	0.635431	19.17175	27.58434	0.4014
At most 4	0.574497	16.23516	21.13162	0.2114
At most 5	0.296381	6.678841	14.26460	0.5278
At most 6	0.013360	0.255560	3.841466	0.6132
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's estimation

The results from Maximum Eigen Statistics indicate that second row of the above table shows that the eigenvalue test statistics (43.29838) exceeds the critical value (40.07757) at 95 percent confidence level. Hence, the failure to reject the alternative hypothesis indicates that there is two cointegrating relationship among the variables. These results confirm the presence of a long-run relationship between the explained variable and one of the explanatory variables. In order to determine the relationship between the variables under study, this study adopted ordinal least square (OLS) approach.

Factors affecting stock prices in Rwanda: Ordinal Least Square (OLS):-
The Ordinary Least Squares (OLS) Technique of regression was used to determine different factors affecting stock prices in Rwanda. Although regression analysis deals with the dependence of one variable on other variables, it does not imply causation-that is, it is assumed that the variables in question are not bilaterally related, the independent variables are not collinear, and the disturbance terms are normally distributed and not serially correlated. Thus, the OLS technique is suitable because of its simplicity and the validity of its assumptions.

Table 4:- Regression Results.

	Coefficient	Std. Error	t-Statistic	Prob.
LSP(-1)	0.148851	0.274243	0.542769	0.5981
LDPS(-1)	-0.146452	0.512968	-0.285500	0.7806
IR(-1)	-0.212925	0.111460	-1.910319	0.0825
LOP(-1)	0.291394	1.124095	0.259226	0.8002
LM(-1)	-6.328042	2.106624	-3.003877	0.0120
LRGDP(-1)	-0.053003	3.083656	-0.017188	0.9866
LCPI(-1)	27.16009	8.941275	3.037608	0.0113
C	-75.04438	24.57435	-3.053769	0.0110
R-squared	**0.749455**	Mean dependent var		6.321748
Adjusted R-squared	0.590018	S.D. dependent var		0.550161
S.E. of regression	0.352267	Akaike info criterion		1.046709
Sum squared resid	1.365016	Schwarz criterion		1.444368
Log likelihood	-1.943737	Hannan-Quinn criter.		1.114009
F-statistic	4.700623	Durbin-Watson stat		2.756924
Prob(F-statistic)	0.011517			

Source: Author'estimation

The results presented in the table above indicate that the relationship between the stock price is affected positively (27.16009) at 5 level of significance by CPI(inflation) followed by money supply and interest rate at 5 percent and 10 percent level of significance respectively. Both interest rate and money supply affect stock prices negatively. All the remaining variables (Dividend per share, oil price and real GDP) were revealed to have no significant effect over stock prices in Rwanda.

Moreover, the co-efficient of determination indicates that only 74. 95 of change in stock prices could be attributed to changes in interest rate, dividend per share, money supply, consumer price index, real GDP and oil prices within the study period. Additionally, the F-statistic (0.011517) reveals that all these variables jointly and significantly affect stock prices in Rwanda.

Direction of causal relationship: Grange causality:-
The Granger technique has been adopted to determine the direction of causal relationship between stock prices and its factors in Rwanda. This study applies the Granger causality model which consisted of running regressions of stock prices on the remaining factors. The results are presented below:

Table 5:- Granger causality results

Pairwise Granger Causality Tests Sample: 2011Q1 2015Q4 Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
LDPS does not Granger Cause LSP	19	1.33601	0.2647
LSP does not Granger Cause LDPS		0.86312	0.3667
IR does not Granger Cause LSP	19	0.31828	0.5805
LSP does not Granger Cause IR		0.17004	0.6856
LOP does not Granger Cause LSP	19	0.46105	0.5068
LSP does not Granger Cause LOP		0.18214	0.6752
LM does not Granger Cause LSP	19	0.12120	0.7323
LSP does not Granger Cause LM		0.06831	0.7971
LRGDP does not Granger Cause LSP	19	0.14725	0.7062
LSP does not Granger Cause LRGDP		0.45907	0.5077
LCPI does not Granger Cause LSP	19	0.41953	0.5264
LSP does not Granger Cause LCPI		1.25506	0.2791

Source: Author's estimation
The results from Grange causality reveals that independence of causality is suggested between stock prices with all the independent variables used in this study.

Conclusion and recommendations:-

The study aimed at determining dominant factors affecting stock prices in Rwanda with data spanning from 2011 to 2015. This study first tested for the presence of unit root in order to ensure that the parameters are estimated using stationary time series data. The results from Augmented Dickey Fuller (ADF) unit root tests indicated that all variables have unit roots (i.e not stationary) at level but become stationary when they are first differenced which indicate that all the variables are I (1) except consumer price index. Having identified all the variables to be of the same order this study employed Johnsen cointegration test to assess long run relationship. The trace test tests the null hypothesis that there are at most *r* cointegrating relationships. In other words, a rejection of the null hypothesis means that there are more than *r* cointegrating relationships. The null hypothesis of two cointegrating relationships is rejected given that the trace statistics exceeds the critical value. The trace statistics (72.20544) exceeds the critical value of 69.81889 at 95 percent confidence level. This result confirms that there is three cointegrating relationship among the variables employed for the use of this study.

The results from Maximum Eigen Statistics indicate that the eigenvalue test statistics (43.29838) exceeds the critical value (40.07757) at 95 percent confidence level. Hence, the failure to reject the alternative hypothesis indicates that there is two cointegrating relationship among the variables. These results confirm the presence of a long-run relationship between the explained variable and one of the explanatory variables. In order to determine the relationship between the variables under study, the study adopted ordinal least square (OLS) approach and the results presented in the table above indicate that the relationship between the stock price is affected positively

(27.16009) at 5 level of significance by CPI (inflation) followed by money supply and interest rate at 5 percent and 10 percent level of significance respectively. Both interest rate and money supply affect stock prices negatively. In contrast to previous studies conducted in other countries where that dividends, earnings per share, price earnings ratio, debt policy, GDP and firm size hold substantial roles in influencing stock prices which suggests that dividend paying firms are better valued by investors as every investor prefers a consistent dividend policy. Also shares with higher Price earnings ratio indicate that such firms will have a promising future in the eyes of investors. Leverage is another imperative element affecting share prices and this suggests that investors attach more value to those firms which employ less debt as increased of debt minimizes the earnings of the stakeholders. Stakeholders also prefer firms which have high earnings per share as it ensures them a better return on the share. Return on Equity is also assumed to hold an important position as it assures the shareholders the amount earned on their investment. In Rwanda Dividend per share, oil price and real GDP) were revealed to have no significant effect over stock prices.

Moreover, the co-efficient of determination indicates that only 74. 95 of change in stock prices could be attributed to changes in interest rate, dividend per share, money supply, consumer price index, real GDP and oil prices within the study period. Additionally, the F-statistic (0.011517) reveals that all these variables jointly and significantly affect stock prices in Rwanda. To determine the direction of causal relationship between stock prices and its factors in Rwanda Results from Grange causality reveals that independence of causality is suggested between stock prices with all the independent variables used in this study. Putting together these results, policy implications would be for the inflation authority in Rwanda (BNR) to continue taking appropriate policy measures to control inflation and hence inflation through continued better coordination complimented by effective communication with the public to reduce the impact of inflation inertia. Additionally, BNR should also take appropriate measures to tackle exchange rate movements to reduce inflation pressures on imported inflation for the great benefit for Stock Exchange through demand pull way of more investor in stock market, and supply push way of more extensional investment of companies. Moreover, we recommend further analysis of other variables (GDP, EPS, DPS and oil prices) with annual data and a bigger sample size.

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