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Article

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Dynamics of Canadian Oil Price and its Impact on Exchange Rate and Stock Market

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ABSTRACT

The objective of this study is to analyse the impact of crude oil prices (COP) on exchange rate and stock market returns in Canada for the period of 1986–2015. The results of the study suggest that there was no cointegration among COP, exchange rate and stock market returns. Regression analysis shows that COP and exchange rate, and their variations have a positive and significant impact on the Canadian stock market returns. Policy implications are also discussed.

Keywords: Stock Market, Crude Oil, Exchange Rate, Rolling, Ordinary Least Square, Dynamic Ordinary Least Square, GARCH
JEL Classifications: L71, Q47, Q48

1. INTRODUCTION

Canada has a developed and resource based economy. One significant resource for the Canadian economy is oil and gas. The Oil and Gas industry is a integral part of The Canadian economy and labour force. The Canadian Association of Petroleum Producers indicates that the Oil and Gas Industry accounts for approximately 10% of the entire value of the Toronto Stock Exchange (TSX) (Canadian Association of Petroleum Producers, 2017). The energy sector accounts for almost 7% of Canada's gross domestic product (GDP) (Natural Resources Canada [NRC], 2018) and is responsible for 270,000 directly related and 600,000 indirectly related jobs (NRC, 2018) with the Oil and Gas Industry representing 500,000 of the total direct and indirect energy sector jobs spanning 12 of Canada's 13 provinces and territories (CAPP, 2017). The TSX and TSX Venture Exchange combined represent the 7th largest exchange group in the world based upon total market capitalization exceeding one trillion dollars, with over 40% of all trading originating outside of Canada (TSX, 2014).

As an oil exporting nation Canada is ranked third in the world (NRC, 2018) and therefore its economy is not only impacted by oil price uncertainty but is also impacted by fluctuations in nominal exchange rates. Increased uncertainty tends to decrease Canadian industrial production, output from goods producing industries, mining, and oil and gas extraction (Elder and Serletis, 2009). Fluctuations in nominal exchange rates influence the economies of oil importing and exporting nations. Oil exporting nations benefit when exchange rates increase, since importing countries will have to pay more to purchase the exporting nation's product. The real monetary value of fluctuations in nominal exchange rates is significant given the volume of oil exported. In 2016, Canada exported 180.2 million cubic metres of heavy and light crude representing a combined value of $49.8 billion dollars (National Energy Board, 2016).

From the above description, it can be followed that developing of a good understanding of the relationships between the three variables -- stock index, exchange rate, and crude oil price (COP), is of great important for policy makers of Canadian governments and companies and investors who are interested in investing in Canadian economy. This paper aims at having a better understanding of the aforementioned relationships.

We aim at achieving three objectives for our study. Specifically, there are as follows:
1. To analyse the trends of Canadian COPs, exchange rate, and stock index.

2. To measure the long run relationship between the variables.
3. To measure the long run elasticity between the study variables.

The remainder of the paper is organized as follows Section 2 provides reviews of relevant literature. Section 3 explains the research methodology used in the study with Section 4 presenting the empirical findings. The conclusions of the study are presented in Section 5.

2. REVIEW OF LITERATURE

Previous studies that examined the relationship between oil price, exchange rates and stock prices are far from conclusive. Ferraro et al. (2015), examined the short-term correlation between exchange rate and energy commodity prices on the basis of daily, monthly and quarterly data for the period 12/14/1984 to 11/05/2010. They used the asymmetrical model (Kilian and Vigfusson, 2009) to forecast the exchange rate values by using lagged values of commodity prices. Their research uncovered that measured on a daily frequency; energy commodity prices may forecast the nominal exchange rate. Ferraro et al. (2015) further suggested that when lagged values of the daily data of independent variable (energy commodity prices) were utilized the prediction of exchange rate spanned a very short time horizon and was applicable to a few commodities.

Donayre and Wilmot (2016) analysed the asymmetrical effects on Canadian output and price level of oil price shocks using threshold vector auto-regression model for the period of January 1986–December 2013. They ponder that the existence of asymmetries associated with business cycles, size of the oil price shocks, and potential relationship between them. Donayre and Wilmot (2015) further found that positive oil price shocks yielded a stronger effect on Canadian output than negative oil price shocks. They further suggest asymmetry is more prone to occur in recessionary periods as opposed to expansion phases. It was also noted that in periods of low output growth predicated by negative oil price shocks, the decline in the inflation rate is greater than the increase in the inflation rate associated with a positive shock oil price of the same magnitude. Valdes et al. (2012), utilizing a diagonal BEKK model and GARCH (1,1), examined 30 companies listed on the Mexican Stock Market from January 2006 until December 2010. Their findings indicate a positive relationship between the price of oil and financial market activity.

Kumar (2014) examined the impact and long run relationship of Indian oil price shocks on stock and foreign exchange markets using BEKK- GARCH (1, 1) model and conducted cointegration tests for the period 2003–2012. Kumar (2014) found no long run association and further stated that the long run elasticity of oil price and exchange rates have a statistically significant positive effect on the stock market.

Aguilar (2013) analysed the correlation between oil prices and exchange rate by applying the error correction model to monthly data for the period of January 1972–September 2011. The study found a structural break in the relationship between energy price, oil price and exchange rate (CAD/USD). Furthermore, the study showed that an increase in oil price leads to an appreciation in exchange rate when outside the parity zone, but when the parity zone occurred, there was no effect on the movement of exchange rate as oil prices increase.

Masih et al. (2011) examined the impact of the oil price volatility and stock price fluctuations in South Korea using the VAR and vector error correction model (VECM) analysing monthly data for the period of May 1988–January 2005. They found that the core channel from short run to long run adjustment is the real stock returns. With respect to the relationship between the variables and the system, they found no evidence of a long run relationship. The researchers further found evidence to suggest that there is a small effect of banking on stochastic trends between the interest rate, industrial production, real stock returns, and oil price and oil price volatility. The utilization of VECM is of particular value in the event that a cointegration relationship among the variables exists (Guerre, 2017).

Jiménez-Rodríguez and Sanchez (2004) examined oil price shocks of selected OECD countries using linear and non-linear multivariate VAR model. Their findings are that the growth of GDP of oil import countries negatively affected by any increase in oil price except for Japan and that increases in oil prices affected the GDP growth to a larger magnitude than oil price increases have exerted a negative impact on economic activity in all the cases. But the above effect on oil export countries is ambiguous.

Joo and Park (2017) examined the effects of uncertainty of oil prices on stock market returns using data from the United States, Japan, Korea, and Hong Kong from the period of 1996 through until 2015. Utilizing the VAR-DCC-BGARCG-in-Mean model specification, they determined that uncertainty in the price of oil exerted significant negative, time varying, effects on stock market returns. Their research further indicated the degree of effect exerted on the stock market returns was related to the degree of the correlation between oil prices and stock market returns.

Coronado and Rojas (2016) studied the co-movements between oil price, stock index, and exchange rate in the Mexican economy using a number of nonlinear tests, their results identified periods of non-linear dependence among the study variables.

Our examination of the research literature revealed that researchers had used different models to explain the relationships between macroeconomic variables, and thus provided evidence supporting the application of time series analysis to the Canadian economy. This is one of the reasons for our study. On the basis of our study of the existing literature we discovered that while the Canadian economy is largely resource based and impacted by fluctuations in the price of crude oil and the CDN/USD exchange rate, there exists a research gap with respect to how volatility in these variables impacts upon the Canadian economy. Through this research paper we will add to the existing literature by studying the Canadian economy through time series econometric models so as to highlight, for investors and policy makers, the causes and consequences of volatility observed in the variables studied.

3. DATA AND METHODOLOGY

3.1. Data

In this study we used the monthly data on Canadian Stock market, the CAD/USD dollar exchange rate, and the COP taken for the period 1986 to 2015. Nominal exchange rate (Canadian dollar versus U.S Dollar) was obtained from Statistics Canada's CANSIM table while COP index and Canadian stock market index return were obtained from the website of www.investing.com.

3.2. Methodology

The first objective of the study was to use the rolling correlation at Twelve Months to examine the relationship between the study variables. The next step in our analysis was to measure the time series properties of the variables to determine whether these variables display a unit root problem or whether the variables have the same order of d, based on the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) test. The study also analysed the long run relationship, or cointegration between the set of study variables.

The second objective of this study was to analyse the long run relationship between the variables. We utilized the Johansen Cointegration Method to fulfil this objective, cognizant that if there is evidence of a long run relationship among the variables, or if any of the variables will move together in the long run, then questions regarding the possible existence of a short run equilibrium or dis-equilibrium will need to be addressed. The study analysed the data using the VECM to determine the presence of short run disequilibrium.

The third objective of the study was to examine the long run elasticity using the non-linear Cobb-Duglas function. The proposed Cobb-Douglas function are as follows.

$$Y=b_0*L^{b1}*k^{b2} \quad (1)$$

Taking log on both the sides,

$$Log(Y)=b_0+b_1*Log(L)+b_2*Log(K) \quad (2)$$

From equation (2), the following equation can be derived:

$$Log(Y)=b_0+b_1*Log(LK)+(b_2-b_1)*Log(K) \quad (3)$$

Suppose we can use a country's main stock market index to represent the country's total production, the price level of its main product, COP, to indicate the collective investment in labour and capital, and the exchange rate with its main trading country to represent the difference between the contributions in labour and capital, then the logic described by the relationships between production and labour and capital prescribed by the cobb douglas production function can be applied to the relationship between stock index and COP and exchange rate.

To estimate the above regression equation, we used dynamic ordinary least square model (DOLS). In this function the stock return is the dependent variable and the COP and exchange rate are the regressors. As it may be possibility that these variables are not cointegrated and that white noise is deemed to be non-stationary, the problem of spurious regression may arise. To address this potential problem, we used DOLS method. DOL includes the lags of first difference of the independent variables in the set of original independent variables. DOL also provided a stable estimate of the coefficients associated with the regressor variables.

With respect to the relationship between stock market returns and oil price, we have utilized a threefold classification and regression mechanism which has been successfully applied to developed and developing countries. Some of these classifications suggested that there is an inverse relationship between stock market returns and oil price with respect to supply side shocks (Filis, 2010; Chen, 2009; Miller and Ratti, 2009; O'Neill et al, 2008; etc.). Demand side shocks have been shown in many studies to have a direct relationship between the stock market returns and oil price (Arouri and Rault, 2012; Filis et al., 2011; Narayan and Narayan, 2010; etc.). Many other studies however, have shown that changes in the price of oil yielded no impact on stock market returns (Jammazi and Aloui, 2010; Apergis and Miller, 2009; Lescaroux and Mignon, 2008; etc.).

From the above literature, our first task was to examine the trends and relationship between stock market return and COPs.

Figure 1 shows the trends and relationship between oil price and exchange rate (CAD/USD) from 1986 to 2015. From the figure we can ascertain that the oil price and the exchange rate have moved in the same direction and parallel to each other suggesting a relationship between the two variables. The oil price displays stability from 1986 to 2004 where it begins to increase over the exchange rate. As the oil price fluctuates with more volatility (price shocks) an inverse relationship is evidenced in the exchange rate data.

Further analyses of this relationship used a 12 months rolling correlation. Figure 2 shows the 12 months rolling correlation. The figure shows the high fluctuations between the two variables with one period of positive correlation followed by negative relation.

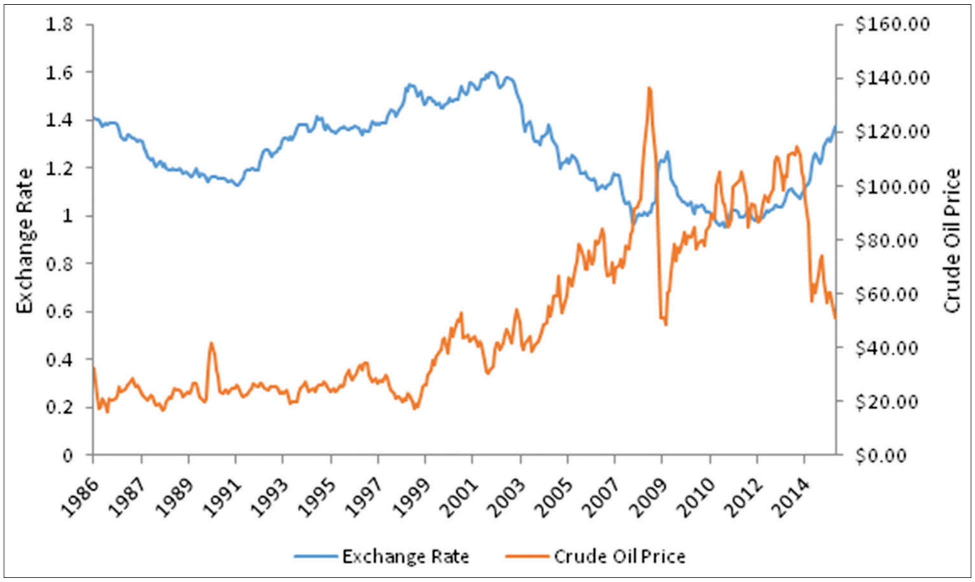
Figure 3 shows the trends of Canadian stock market and COP for the period 1986–2015 in monthly form. The figure reveals that over a period of time both variables moved in the same direction. In the beginning of the series COPs are less than stock market return at its close but since 2007 COPs surpassed the stock market returns and then decreased in 2008. This is because of various shocks hit the Canadian economy. In 2014 COP decreased again exerting negative influence on the stock market returns.

Figure 4 shows the twelve-month correlation between stock market and COP for the period 1986–2015. Using data from a rolling correlation analysis we can say that there are high fluctuations between these two variables. A high positive period is followed by negative correlation. Since 1990 there is a negative correlation between these two variables followed by positive relationship; however, from 2004 there is positive correlation among these two variables.

3.3. Unit Root Test Analysis of the Canadian Macro-economic Variables

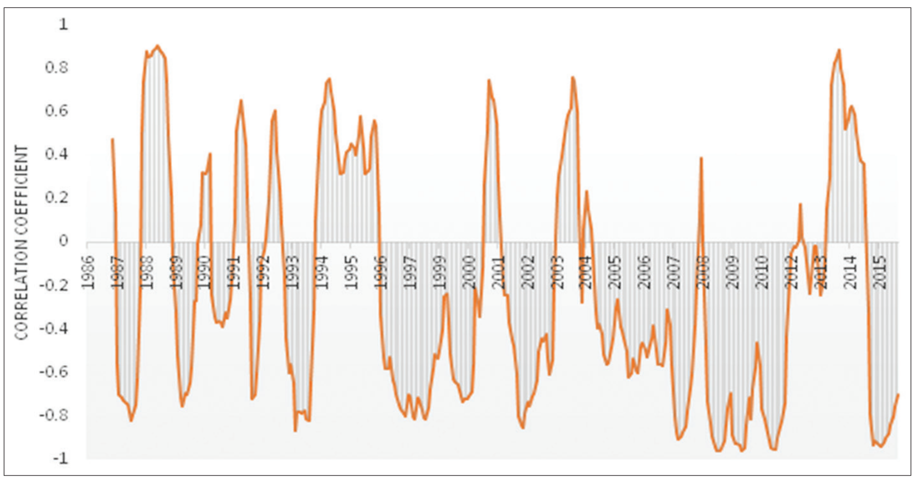
Table 1 reveals the time series properties of the exchange rate (CAD/USD), COP, and stock return at close. The study used

Figure 1: Trends of between Canadian crude oil price and exchange rate



Source: Based on authors calculation

Figure 2: Rolling correlation between crude oil price and exchange rate



Source: Based on authors calculation

Table 1: ADF test results

Unit root test at level				
Variables	**ADF test**		**PP test**	
	T-statistic	**Critical values**	**T-statistic**	**Critical values**
Exchange Rate	−1.233	−3.422**	−1.249	−3.422**
COP	−3.549	−3.983*	−3.763	−3.422**
Stock Market Return	−3.429	−3.983*	−2.983	−3.422**
Unit root test at first difference				
Variables	**ADF test**		**PP test**	
	T-statistic	**Critical values**	**T-statistic**	**Critical values**
Exchange rate	−13.733	−3.422**	−13.831	−3.422**
COP	−15.144	−3.983*	−14.959	−3.422**
Stock market return	−15.113	−3.422**	−14.783	−3.422**

Asterisk *.** indicates the significance of critical value at 1% and 5% and ***indicates the significance of P value, ADF: Augmented Dickey Fuller test, PP: Phillips Perron, COP: Crude oil price

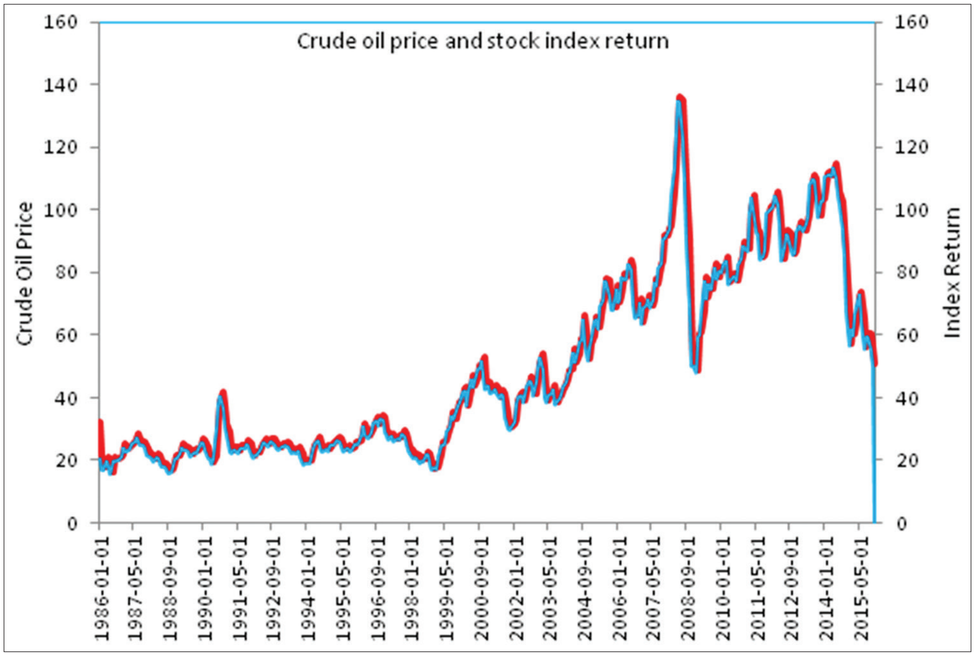
three tests; Johansen cointegration test, ADF test, PP test. These tests are used to determine whether the series are stationary or not, or have any structural breaks in the series. We found that exchange rate and stock market rates are significant at the 5% level of significance and COP at the 1% level of significance. After satisfying the time series properties we computed the cointegration test to determine whether the study variables display a long run relationship.

Table 2 shows no long run relationship between Exchange rate, COP and stock market.

We accepted the null hypothesis on the basis of the trace statistic and Max Eigen values, in this case both critical vales found more than the trace statistic values.

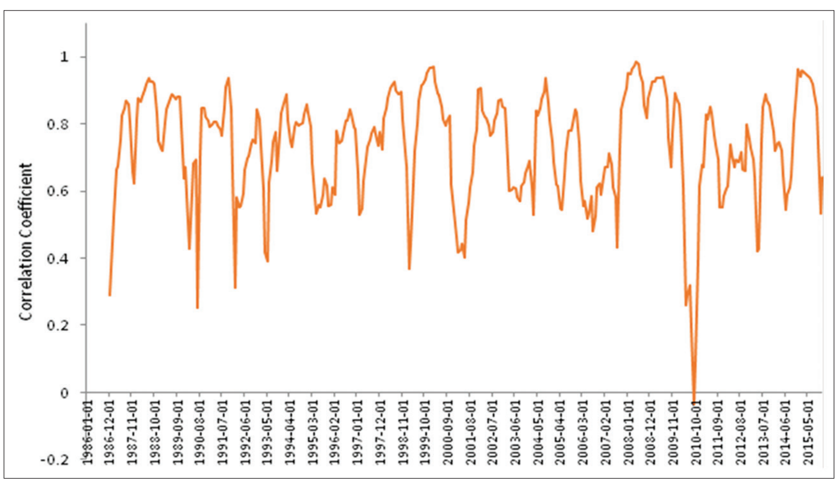
As far as Gregory and Hansen (1996) cointegration test is concerned, the study used BIC, alike information criterion (AIC) and schwarz criterion to select the optimal lag length. These test statistics show that one lag is optimal, and for deterministic components we used a constant as a deterministic component. We also used full break for all coefficients. The Trace test and Max Eigen Value specify the existence of one co-integrating equation at the 5% level of significance. Thus, these macroeconomic variables display long-run equilibrium relationship. But for the short run, it might be possibility that a deviation or diversion may exist in the short-run equilibrium, so it is necessary to authenticate whether

Figure 3: Trends between Canadian crude oil prices and stock index return



Source: Based on authors calculation

Figure 4: Rolling correlation between crude oil price and stock market



Source: Based on authors calculation

Table 2: Johansen cointegration test results

Johansen cointegrationa test				
Hypothesis	**Trace statistic**	**Critical values**	**Max eigen values**	**Critical values**
No cointegration	36.450	29.797*	30.752	21.131*
One cointegration	0.009	15.494*	3.218	14.387*
Two cointegration	0.006	3.841*	2.479	3.841*

Asterisk *denotes Statistical Significance at 5% level such disequilibrium converges on the long-run equilibrium. This problem is addressed by the VECM which generates short-run dynamics or equilibrium. From the data obtained by the VECM mechanism we can correct the disequilibrium in the next period.

For estimation of VECM, the pre-requested condition is that variables should be of the same order I (d), and there should be long run cointegration and optimal lag. The AIC was used to test that the variables met the preconditions as requested by the VECM. According to the AIC, a lower value indicates a better model fits. In this study the AIC suggested that there should be 3 lags in the model. We therefore used the 3 lags as an optimal lag. Once the optimal lag had been determined we performed the Johansen Cointegration Test to determine the Long run relationship among the variables. The Johansen Cointegration Test advised us that there is at least one cointegration relationship between the variables.

4. EMPIRICAL ANALYSIS

4.1. VECM Model

$$\Delta LRE = \begin{array}{l} 0.001 - 0.359EC^{1}_{t-1} + C(2)*\Delta LRE_{t-1} \\ +C(3)*\Delta LRE_{t-2} + C(4)*\Delta LRE_{t-3} \\ +C(5)*\Delta LEXC_{t-1} + C(6)*\Delta LEXC_{t-2} \\ +C(7)*\Delta LEXC_{t-3} + C(8)*\Delta LOIL_{t-1} \\ +C(9)*\Delta LOIL_{t-2} + C(10)*\Delta LOIL_{t-3} \end{array} \quad (1)$$

$$\Delta EXC = \begin{array}{l} -0.002\text{-}0.608EC^{2}_{t-1}+C(13)*\Delta LRE_{t-1} \\ +C(14)*\Delta LRE_{t-2}+C(15)*\Delta LRE_{t-3} \\ +C(16)*\Delta LEXC_{t-1}+C(17)*\Delta LNEXC_{t-2} \\ +C(18)*\Delta LEXC_{t-3}+C(19)*\Delta LOIL_{t-1} \\ +C(20)*\Delta LOIL_{t-2}+C(21)*\Delta LOIL_{t-3} \end{array} \quad (2)$$

$$\Delta LOIL = \begin{array}{l} 0.004+0.136EC?^{3}_{t-1}+C(24)*\Delta LR_{t-1} \\ +C(25)*\Delta LRE_{t-2}+C(26)*\Delta LRE_{t-3} \\ +C(27)*\Delta LEXC_{t-1}+C(28)*\Delta LEXC_{t-2} \\ +C(29)*\Delta LEXC_{t-3}+C(30)*\Delta LOIL_{t-1} \\ +C(31)*\Delta LOIL_{t-2}+C(32)*\Delta LOIL_{t-3} \end{array} \quad (3)$$

Where C (1, 2, 3…….32) is the number of coefficients.

In this system equation model (VECM), EC^{1}_{t-1}, EC^{2}_{t-1}, EC^{3}_{t-1} is the speed of adjustment towards the equilibrium. In other words, these are the error correction terms in the model. As far as VECM is concerned, it has two tasks. The first task is to depict long run causality while the second task is to depict the short run causality.

If the coefficient of speed of adjustment has the negative sign and is significant then we can say that there is a long run causality. In this model we found that our two coefficient (i.e., EC^{1}_{t-1}, EC^{2}_{t-1}) have the negative sign but third coefficient, EC^{3}_{t-1}, does not the negative sign which means that COP has no long run causality or cause and effect. For short run causality, Wald test statistics has been used as a rule of thumb (Table 3).

Table 3: VECM results

Independent variables	ΔLRE	ΔLEXC	ΔLOIL
EC_{t-1}	$EC^{1}_{t-1}=-0.359$	$EC^{2}_{t-1}=-0.608$	$EC^{3}_{t-1}=0.136$
[t statistic]	[−0.207]	[−1.844]	[5.468]
(P value)	(0.836)	(0.073)	(0.000)
ΔLRE_{t-1}	0.594	0.580	0.835
[t statistic]	[0.342]	[1.759]	[33.635]
(P value)	(0.732)	(0.088)	(0.000)
ΔLRE_{t-2}	−4.779	0.966	−0.177
[t statistic]	[−1.319]	[1.403]	[−3.413]
(P value)	(0.188)	(0.152)	(0.001)
ΔLRE_{t-3}	4.804	1.140	0.0165
[t statistic]	[1.333]	[1.665]	[0.320]
(P value)	(0.183)	(0.102)	(0.704)
$\Delta LEXC_{t-1}$	−0.663	0.243	−0.002
[t statistic]	[−2.288]	[4.420]	[−0.454]
(P value)	(0.023)	(0.000)	(0.611)
$\Delta LEXC_{t-2}$	0.339	−0.075	−0.003
[t statistic]	[1.136]	[−1.330]	[−0.657]
(P value)	(0.257)	(0.145)	(0.557)
$\Delta LEXC_{t-3}$	−0.452	−0.014	0.004
[t statistic]	[−1.596]	[−0.252]	[1.012]
(P value)	(0.111)	(0.870)	(0.335)
$\Delta LOIL_{t-1}$	4.851	−0.999	0.183
[t statistic]	[1.299]	[−1.409]	[3.424]
(P value)	(0.195)	(0.150)	(0.001)
$\Delta LOIL_{t-2}$	−4.933	−1.192	−0.016
[t statistic]	[−1.329]	[−1.690]	[−0.294]
(P value)	(0.185)	(0.097)	(0.760)
$\Delta LOIL_{t-3}$	−0.105	−0.006	−0.001
[t statistic]	[−1.960]	[−0.614]	[−1.360]
(P value)	(0.050)	(0.593)	(0.160)
Constant	0.001	−0.002	0.0004
[t statistic]	[0.116]	[−1.437]	[4.245]
(P value)	(0.907)	(0.178)	(0.000)

Source: Authors calculation based on VECM results

The null hypothesis for short run causality can be described as follows: If the coefficient are equal to zero then, no short run causality. In this study we found that there is short run causality as well.

Table 4 reveals that using the granger causality test (GCT), the nominal exchange rate does not influence the stock market return at the 5% level of significance. Therefore, the null hypothesis is rejected and the alternative hypothesis, exchange rate causes changes in stock returns in accepted. The next hypothesis tested using the GCT is that change in COP does causes the change in stock return, which is accepted.

The third hypothesis tested using GCT, that the change in stock market returns does not cause change in the exchange rate, is also accepted thus suggesting that the change in the stock return does not elicit causation. Therefore, there is no cause and effect between stock return and exchange rate. The fourth null hypothesis, that COPs does not have a causal effect on the exchange rate, is also accepted based upon GCT analysis.

The fifth null hypothesis, stock market returns do not cause a change in oil prices, is rejected based up CGT analysis. The analysis suggests a two-way causation between the stock market return and COP.

The sixth, and last hypothesis, that a change in the nominal exchange rate does not have a causal effect on COP, is accepted based upon GCT analysis.

4.2. Long Run Elasticity Analysis

$$Ln(stock)=\beta_0+\beta_1 Ln(COP)+\beta_2 Ln(CAD/USD)+\varepsilon_t \quad (4)$$

Where β_0 is intercept, COP is COP and ε_t is Error term.

Table 5 shows the long run elasticity of stock return market with respect to COP and exchange rate. The study used OLS and DLS method to compute the elasticity.

Given that there is long run cointegration among the macro-economic series, we were interested to know whether our variables have a long run elasticity or whether there was any proportionate sensitivity among the variables. Our prime objective was to investigate the responsiveness of the stock market with respect to the oil price and stock exchange in the Canadian economy. The concept was, holding other variables constant, what percentage of stock return market in Canada will change by a one-unit increase or decrease in oil price and exchange rate. The Table 5 shows that DOLS results of the model. The computed R^2 value was sufficient to support the goodness of fit for the model.

The study further used the Hansen parameter instability test to check the reliability of the DOLS coefficients. Table 5 shows the Instability test result. From Table 6 we can say that the parameters are stable because the computed P value is significant.

4.3. Diagnosis of the Parameters

The study further used the Hansen cointegration instability test to check the reliability of the estimated parameter. The result of the Hansen test shows that the parameters are stable in the model based on the value of the Lc statistic and P. value.

5. CONCLUSION

The main objective of this study is to analysis the dynamics of Canadian stock market, COP and exchange rate. The study used the monthly data and transformed all the variables into log form to normalise the series.

We found that over a period of time the Canadian COP, exchange rate and stock market return displayed a trend. The rolling correlation between stock market and COP was computed along with a rolling correlation between the exchange rate and COPs. We further analysed the time series properties of the variables where we determined that the variables displayed a unit root and stationarity at first difference. This means that the variables had a similar order d(1) at first difference. We proceeded to measure the long run elasticity of the variables with the help of DOLS. The regression coefficients were highly significant. Next the study utilized the VECM to analyse the short run and long run error correction mechanism of the Canadian Stock Market return. The model suggested that both COP and exchange rates have significant impact on stock market which means that the stock market is influenced by these two variables.

Table 4: Results of GCT

Null hypothesis	Chi²	P-value	Decision
ΔLEXC does not cause ΔLRE	7.418	0.059	Rejected
ΔLOIL does not cause ΔLRE	6.900	0.075	Accepted
ΔLRE does not cause ΔLEXC	6.093	0.107	Accepted
ΔLOIL does not cause ΔLEXC	5.663	0.129	Accepted
ΔLRE does not cause ΔLOIL	1330.661	0.000	Rejected
ΔLEXC does not cause ΔLOIL	1.582	0.663	Accepted

Source: Authors calculation based on …. Data. GCT: Granger causality test

Table 5: Elasticity analysis between the variables

Variable	Coefficients	Standard error	t-Statistic	P value
Constant	−0.13353	0.00288	−46.3613	0.000
LNEXC	0.016986	0.00276	6.154034	0.000
LNOIL	1.027153	0.000652	1574.712	0.000
R^2	0.999981			
Add. R^2	0.999981			
Standard error of regression	0.002595			

Asterisk **indicated the statistical significance at 5% level and comparison between the OLS and DOLS coefficients. OLS: Ordinary least square, DLS: Dynamic least square

Table 6: Cointegration test - HPI

Lc Statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	P value*
0.002	2	0	0	>0.2

*Indicate Hansen (1992b) Lc (m2=2, k=0) P value, where m2=m-p2 is the number of stochastic trends in the asymptotic distribution. HPI: Hansen parameter instability

With the help of this study we have come to the conclusion that Canadian economy needs more research in future with respect to the influence price fluctuations of macro-economic variables exert on the Canadian economy. We suggest to investors that the Canadian economy/stock market possesses significant investment opportunities that could potentially enhance the investment returns for investors. For policy makers we can say that Canadian economy needs a good policy, derived through the study of macro-economic volatility influences and effects. The results of such a proposed study will have the potential to attract investors to the Canadian stock market. The creation of explanative models highlighting the flow of macro-economic effects through not only the Canadian stock markets, but capital markets in general, will ameliorate some aspects of investor uncertainty and provide policy makers with a holistic view of the impact of macro-economic fluctuations. The formation of policies predicated upon the holistic view of macro-economic fluctuations will enhance investor confidence and strengthen the Canadian economy.

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