Analysis of the Effect of Cost Push Inflation on Road Transport Price in Rwanda (2006-2016)

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Abstract: **The efficient prices of transport are a critical component of economic development, globally and nationally. Cost-push inflation to road transport prices occurs when the inflation moves in the same direction as fuel prices, exchange rate of domestic to foreigner currencies and inflation on imported fuels and other Lubricants. Inflation destroys the terms of trade in a country by increasing the price of domestic goods and services more than the regional and the world market price. In additional to this effects from exchange rate developments dampened the effects of the oil price. In Rwandan economy, the macroeconomy has been characterized with the problem of inflation since 1973; Inflation has been mainly driven by various factors. The recent study on determinants of inflation in Rwanda considered international oil price and exchange rates as main determinants of inflation. The transport price is mainly linked to oil price such as fuel and lubricants price index and growth in exchange rate. The objectives of the research were to establish the relationship between determinants of cost push inflations with regards road transport prices in Rwanda, and to assess its causal effects since 2006-2016. The data were gathered in published reports by National Institute of statistics of Rwanda, and National Bank of Rwanda. The review of other related studies were done. The data was analysed using econometric and statistical analysis such as descriptive and correlation design, timeseries analysis, cointegration, granger causality and impulse response were tested. The results from the study revealed that the cost-push inflation which is the increase of inputs used in transport services, has a positive relationship to influence and affects the price of transport in Rwanda. The most influence to transport prices was observed from the change in price of fuel, lubricants, imported inflation of fuel, the fluctuation of exchange rate between US dollars and Rwandan francs. Inflations on transport have less influence than other variables. In other words, if the price of fuel and lubricants increases, it has immediately effect on increase of transport prices. The high growth of exchange rate between US dollars and Rwandan francs has an influence in fixing the price of transport in Rwanda. In additional to this, imported inflation on oil influences its price, which in turn affects the price of transport in Rwanda. The recommendations, along with the findings of this study could be used by policy makers in Rwanda to frame a suitable economy policy with regards to combating imported inflation on inputs used in transport services and to stabilize exchange rate. Moreover, the study found that inflation is mainly accelerated by the supply side (high cost of inputs transport) and external factors (import of fuel and lubricants and other transport services). Therefore, in Rwanda, Cost-push inflation can be efficiently controlled by monetary policy and fiscal policy through government spending, improvement in term of trades (not to depend on imports only). Additional to this the investors of inputs used in transport services should create fuel and other lubricants storage facilities to sustain the transport services and stabilize the transport prices in Rwanda.**

Keywords: **Cost push inflation, road transport price, determinants of cost push inflation.**

I. INTRODUCTION

The efficient prices of transport are a critical component of economic development, globally and nationally. Transport availability affects global development patterns and can be a boost or a barrier to economic growth within individual nations. Cost-push inflation to road transport prices occurs when the inflation moves in the same direction as fuel prices, exchange rate of domestic to foreigner currencies and inflation on imported fuels and other Lubricants. Inflation destroys

the terms of trade in a country by increasing the price of domestic goods and services more than the regional and the world market price (Valence, 2012). In additional to this effects from exchange rate developments dampened the effects of the oil price.

In Rwandan economy, the macroeconomy has been characterized with the problem of inflation since 1973; Inflation has been mainly driven by various factors. The recent study on determinants of inflation in Rwanda considered international oil price and exchange rates as main determinants of inflation (Ananias and Valence, 2012). The transport price is mainly linked to oil price such as fuel and lubricants price index and growth in exchange rate. The road transport prices in Rwanda face several constraints, of which the most critical is the excessive fuel price changes for the overall macroeconomic aggregates (Inflation, outputs). The land locked country as in the case of Rwanda leads to a huge increase in the price of the particular items (imported fuels and Lubricants) due to the high cost of transport from international markets or port to the inside country markets, this kind of inflation is known as imported inflation. In addition, inflation on transport services in Rwanda is also caused by inflation from external factors such as exchange rates; depreciation of domestic currency (Franc for Rwanda) to main currency (US dollar), which lead to increase in money spent in paying for transport services. In Rwandan economy, the macroeconomy has been characterized with the problem of inflation since 1973 (Rutayisire, 2013). The objectives of the research were to establish the relationship between determinants of cost push inflations with regards road transport prices in Rwanda, and to assess its causal effects since 2006-2016.

II. LITERATURE REVIEW

The literature review of this research is based on theoretical perspectives and empirical reviews:
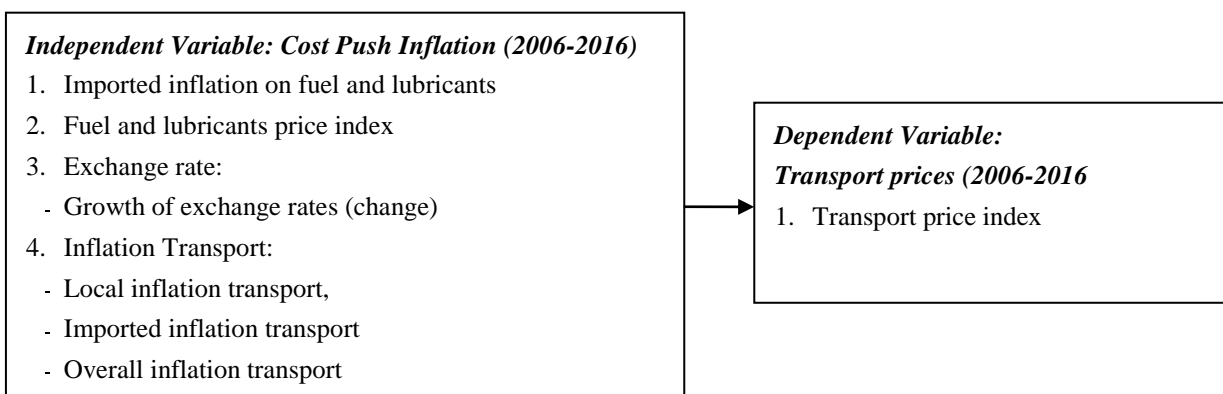
Cost Push Inflation Theory:

The theory of cost-push inflation became popular during and after the Second World War. This theory maintains that prices instead of being pulled-up by excess demand are also pushed-up as a result of a rise in the cost of production. Under cost-push inflation prices raise on account of a rise in the cost of raw materials, especially wages. The theory holds that the basic explanation for inflation is the fact that some producers, group of workers or both, succeed in raising the prices for either their product or services above the levels that would prevail under more competitive conditions (Willard Thorp, 1959). Regarding the context of the study, the rise of inputs used in transport services explains the rise of transport price. The rise in fuel prices and costs of lubricants leads to rise in prices of transport.

The theories of exchange rates on price of imported goods:

Actually, the exchange rates play an important role in inflation stabilization. Sometimes the exchange rate influences and move together with inflation, through relatively small lag in prices of imported goods. The exchange rate affects not only prices of imported goods, but also indirectly via import arbitrage, the prices of domestic goods, which are under competitive pressure from imported goods (Hodrick, Robert J. 1978).

Conceptual framework:

Conceptual framework is the schematic diagram which shows the variables included in the study.The purpose of conceptual framework are to clarify concepts and propose relationships among the concepts in a study. The figure below indicates the details.

Independent Variable: Cost Push Inflation (2006-2016)

1. Imported inflation on fuel and lubricants
2. Fuel and lubricants price index
3. Exchange rate:
    - Growth of exchange rates (change)
4. Inflation Transport:
    - Local inflation transport,
    - Imported inflation transport
    - Overall inflation transport

Dependent Variable:
Transport prices (2006-2016
1. Transport price index

Empirical Review:

DaCosta and Greenidge (2008) empirically investigated the determinants of inflations in Caribbean countries (Jamaica, Guyana, Barbados and Trinidad and Tobago) over the period of 1970-2006 using time series data. The authors selected the following variables: inflation rate, oil prices, world prices, real national income, interest rates, unemployment rate, money supply and exchange rates. They also employed dynamic OLS to capture the main drivers of inflations. The results revealed that the inflation in Caribbean is determined by both cost-push and demand-pull.

In Tanzania, Laryea and Sumaila (2001) employed Error Correction Model (ECM) to examine the short run and long run determinants of inflation. The study used quarterly data covering the period 1992:1 to 1998:4. The empirical result shows that in the short run inflation is influenced by money supply and economic growth. In the long run inflation is determined by exchange rate. The inflation in Tanzania is a monetary phenomenon for both short run and long run.

Ananias and Valence (2012) studied the determinants of inflation in Rwanda. They used quarterly data covering the period of January 2004 to June 2010. The following variables were used in this study, inflation, economic growth, exchange rate and international oil price. The authors employed Cointegration and vector error correction model. They found that in the long run economic growth affect inflation negatively. Also, results show that money supply, exchange rate and international oil price were the main determinants of inflation in Rwanda for the period of the study. Oil price increases in 1979 easily explain the divergent pattern of export and import unit values for crude materials.

Regarding relationship between fuel, lubricants price and transport price the World Bank and *global petrol price.com* indicates how the price of fuel fluctuated (increased) from 1998 up to date. The latest value for Pump price for diesel fuel (US$ per litre) in Rwanda was. Over the past 23 years, the value for this indicator has fluctuated between $1.73 in 2012 and 0.72 in 1998.The price of Gasoline fluctuated from $ 0.72 per litre to $1.47 per litre in year 1998-2014 (Global petrol price com, 2016).

Regarding critique and gap of previous literature, the previous studies focused on the research that aimed to show the determinants of inflation and their influence on macroeconomic level. The determinant of inflation stated that in the short run inflation is influenced by money supply and economic growth. In the long run inflation is determined by exchange rate (Laryea and Sumaila (2001). Other studies also showed that money supply, exchange rate and international oil price were the main determinants of inflation in Rwanda for the period of the study. Oil price increases in 1979 easily explain the divergent pattern of export and import unit values for crude materials (Ananias and Valence 2012). After getting information that exchange rate and international oil price were the main determinants of inflation in Rwanda, the researcher established that the previous studies did not go further to explore the effects of cost push inflation which was caused by the increase of oil price and exchange rate to transport prices or others variables that use oil. After getting information that exchange rate and international oil price were the main determinants of inflation in Rwanda, the researcher found that the previous studies did not go further to explore the effects of cost push inflation, which is caused by the increase of oil price and exchange rate to transport prices or others variables that use oil. This informed the researcher to establish the effects of cost push inflation through imported oil prices, growth of exchange rates to transport prices in Rwanda.

III. RESEARCH METHODOLOGY

The methodology described research design as descriptive and correlation designs, the research hypotheses were expected to be tested by difference statistical tests of relationship and causal effects between determinants of cost push inflation and transport prices in Rwanda. The main tests were correlation analysis which tested degree of associations between variables, regression and cointegration analysis which tested relationship between dependent and independent variables. The causal effects, dynamic and reaction of variables were also tested using granger causality and impulse response. The next chapter went to show data analysis, interpretation of models, findings and to take decisions basing the hypothetical conclusion through statistical and econometric tests.

Expressions variables in the models:

Model expressions	Expression of model variables
Transport price index	TPI
Imported inflation on fuel and lubricants	IMINFFUEL
Fuel and lubricants price index	F_RPI
Growth of exchange rates	GER

Local inflation transport	LNFLT
Imported inflation transport	IMINFLT
Overall inflation transport	OINFT

Testing of unit root and stationarity:

At this point the assumptions were: H_O: $\phi = 0$ "No stationarity" H_1: $\phi \neq 0$ '' Stationarity" in other hand, Absolute value ADF < $\alpha = 0.05$: Reject null hypothesis (non-stationarity). Absolute value ADF > α: Accept null hypothesis (stationarity), Where ADF is Augmented Dickey-Fuller test statistic and α: is test critical values using MacKinnon. Unit root tests, the time series data are stationary if their mean, variance and auto covariance are constant over period of time (Gujarati, 2004).

Description of variables: Descriptive statistics present the outlook of the data used in the study. The data are characterized by mean, minimum, maximum, standard deviation, skewness, kurtosis, Jarque-Bera and probability. All calculations are done by using Eviews7 statistical package. These statistics help to know how data are distributed and variations in 10 years (2006-2016).

Establishing relationship between cost push inflation and road transport prices: Correlation analysis measures the relationship between two or more variables. The Correlation does not make a priori assumption as to whether one variable is dependent on the other(s) and is not concerned with the relationship between variables; instead it gives an estimate as to the degree of association between the variables. In fact, correlation analysis tests for interdependence of the variables.

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{\left(n\sum x^2 - (\sum x)^2\right)\left(n\sum y^2 - (\sum y)^2\right)}}$$

Ordinal and Polynomial regression model: In this study, regression analysis was used as quantitative research method which helped in modeling and analyzing relationship between determinants of cost push inflation and transport price in Rwanda. The determinants of cost push inflation from 2006 onwards were in neither quadratic nor cubic characteristics. The Model was developed as follow: $\hat{Y}_t = \beta_0 + \beta_1 X_t + \beta_2 X_t^2 + \cdots + \beta_n X_t^n + \mu_{\sim}$ -$TP_t = \beta_0 + \beta1$ IMINFF$_t$ + $\beta2$ F&RPI$_t$ + $\beta3$ GER$_t$ + $\beta4$ LOINFT$_t$ + $\beta5$IMINFFt + $\beta5$LOINF$_t$+ ϵt…, Where TP (index) represents transport prices, IMINFFt is imported inflation of fuels and lubricants, F&RPIt is fuel and lubricant price index, GER is growth in exchange rate, LOINFT is local inflation transport, IMINFLT stands for imported inflation transport, OINFT is an overall inflation transport, β_0 is an intercept, $\beta1$, $\beta2$, $\beta3$, $\beta4$ and $\beta5$ are the slope coefficients, t denotes time period and ϵt is an error term, t denotes time period.

Short-run and long-run relationships using Cointegration (the Johansen Tests). The Johansen tests are called the maximum eigenvalue test and the trace test. Let r be the rank of Π. This is the same as the number of Cointegration vectors. The Johansen tests are likelihood-ratio tests. There are two tests: 1. the maximum eigenvalue test, and 2. the trace test. For both test statistics, the initial Johansen test is a test of the null hypothesis of no cointegration against the alternative of cointegration. The tests differ in terms of the alternative hypothesis: Maximum Eigenvalue Test The maximum eigenvalue test examines whether the largest eigen value is zero relative to the alternative that the next largest eigenvalue is zero. The first test is a test whether the rank of the matrix Π is zero. The null hypothesis is that rank (Π) = 0 and the alternative hypothesis is that rank (Π) = 1. For further tests, the null hypothesis is that rank (Π) = 1, 2,.. and the alternative hypothesis is that rank (Π) = 2, 3,.... In more detail, the first test is the test of rank (Π) = 0 and the alternative hypothesis is that rank (Π) = 1. This is a test using the largest eigenvalue. If the rank of the matrix is zero, the largest eigenvalue is zero, there is no Cointegration and tests are done.

Testing causal effects_Granger causality: The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another, A time series X is said to Granger-cause Y if it can be shown, usually through a series of t-tests and F-tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y. Regarding this study, Granger causality tested that if the increase in price or inflation of one among determinants of cost push inflation have predicted the future increase of transport price.

Impulse response: In economics, impulse response functions are used to describe how the economy reacts over time to exogenous impulses, which economists usually call shocks. An impulse response is the reaction of any dynamic system in response to some external change. In both cases, the impulse response describes the reaction of the system as

a function of time (or possibly as a function of some other independent variable that parameterizes the dynamic behaviour of the system). In all these cases, the dynamic system and its impulse response may be actual physical objects, or may be mathematical systems of equations describing such objects. Since the impulse function contains all frequencies, the impulse response defines the response of a linear time-invariant system for all frequencies.

IV.   RESEARCH FINDINGS

To respond to the study objectives and to approve the research hypotheses, the time series data was collected as secondary data from National institute of statistics in national account documents (Price indices), Rwanda National Bank provided data on exchange rates and inflation. The collected data was for 10 years from 2006 up to 2016. For analysing these data; the researcher used statistical and econometric modelling using E-VIEWS 7. The Model specifications were:

- **Stationary test were checked:**

In order to check the stationary, the unit root test is conducted. In this regard, a decision of concluding that the data are stationary is made based on the calculated statistic and Mackinnon critical value in comparison with the critical values. A variable is considered non stationary if its calculated value (ADF)is less than the Mackinnon s critical value and we justify the existence of a unit root. On the other hand, a variable is considered stationary if its calculated values are higher than the critical value and this confirmed the absence of unit root. At this point the assumptions were: H_O: $\phi = 0$ "No stationarity" H_1: $\phi \neq 0$ '' Stationarity" in other hand, Absolute value ADF < α = 0.05: Reject null hypothesis (non-stationarity). Absolute value ADF > α: Accept null hypothesis (stationarity), Where ADF is Augmented Dickey-Fuller test statistic and α: is test critical values using MacKinnon (Gujarati, 2004).

The unit root tests show that most of the variables were stationary at level except fuel and lubricant price index (F_RPI) and overall inflation on transport (OINFLT). These two variables become stationary after first difference test. The results revealed that fuel and lubricants price index (2006-2016) data are stationary at different (1), Growth Exchange rate (GER) 2006-2016, data are stationary at level, Imported inflation on fuel and lubricants (2006-2016) data are stationary at level, Imported inflation transport (2006-2016), data are stationary at level, Local Inflation transport (2006-2016), data are stationary at level, Overall inflation transport (2006-2016), data are stationary at difference (1).

- **Descriptive statistics were calculated:**

In this study, descriptive statistics is a brief descriptive coefficient that summarizes a given data set, regarding to the characteristics of data (time series data). The central tendency of mean, median, skewness helped to compare the value of variables and measures of variability, or spread such as standard deviation also helped to know the variation between variables year by year and also show how data were spread from the mean. These helped the researcher to know the increase in prices or changes in value of independent and dependent variables for better conclusion. The results indicate that the data are normally distributed except imported inflation transport; transport price index and fuel and lubricants price index are negatively skwned. The Growth on exchange rates and imported inflation on fuel data spread from the mean by standard deviation closer to zero and one whereas other variable spread at Standard deviations of $\sigma = 3$ to $\sigma = 6$.

- **Correlation and regression Models were established:**

The Correlation does not makes a priori assumption as to whether one variable is dependent on the other(s) and is not concerned with the relationship between variables; instead it gives an estimate as to the degree of association between the variables. In fact, correlation analysis tests for interdependence of the variables. Results show that fuel and lubricants price index correlates with transport price index at coefficient of (r=0.4831); Growth on exchange rate (r=0.1060), Imported inflation on fuel (r= 0.013034); Other variables have negatively correlated with transport price index, those variables are imported inflation transport (r = -0.3082), local inflation transport (r = -0.253) and overall inflation transport (r= -0.30855). These results revealed that the most correlations and relationship of cost push inflation and transport price is observed in fuel, lubricants prices (48.3%) and in change of exchange rate of US Dollars to Rwandan francs (10.6%). Other variables are negligible in influencing the transport price in Rwanda. According to the regression model; the results revealed that the variables included in the model account for 43.5% variations in dependent variable, indicated by moderate adjusted r-square of 0.43. This shows that the coefficient of determinations, R^2 is greater than adjusted R^2, (R^2=0.47 >Adj.R^2=0.43). Thus, it confirms the fitness of the model. Results revealed that the independent variable included in the model significantly affect the dependent variable (transport price) with Statistics =11.55445, probability (F-Statistics =0.000). These results lead to the conclusion that the cost push inflation which is as of inputs in transport affects road transport prices in Rwanda. The coefficients tables indicate that fuel and lubricants price index, growth in

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exchange rate, imported inflation on fuel and local transport inflation have contributed more than other variables, where fuel and lubricants price index has (β=0.445, p =0.000); growth in exchange rate (β=134.4, sig. =0.013), imported inflation on fuel contributed (β=0.065, p =0.008) and local inflation transport contributed to (β=0.2199, sig. =0.034). Other variables have negligible influence on transport prices and they have negative regression coefficients. This results regarding correlation and regression analysis revealed that, the increase or change of transport prices are positively caused by the increase of prices for fuel and lubricants, it is also caused by imported inflation on fuel and the fluctuation of exchange rate between Rwandan Francs and US dollars as king of international currency in money market exchange.

▪ **Cointegration test helped to see the sort run and long run relationship between a series of variables:**

The aim is to check the relationship in short and long run between transport price in Rwanda and determinants of cost push inflation caused by the inputs used in transport services. The table below indicate the hypothesis which states that there is none cointegration in series of variables. $H_{0 =}$ none cointegration, if the probability is less 0.05 for none*, Therefore the data provide enough evidence to conclude that there is cointegration and if probability is greater than 0.05.

▪ **Granger Causality test:**

The results of Granger causality test suggest that determinants of cost push inflation such as fuel and lubricants prices index, imported inflation on fuel, overall inflation transport have a significant granger effects on transport price in Rwanda. In other hand the results show that there is no granger cause on growth in interest rate and transport price index at 5% significance level.

▪ **Impulse response:**

The impulse response is explained by the estimates from VAR in dotted lines represent 95% confidence intervals. The vertical axis shows the deviation from the series of data of targeted variables in response to change in the shock variable of one standard deviation, the horizontal axis presents the number of years elapsed after the shock.

Impulse response1 of TPI to F_RPI examines the effect on both fuel Lubricants price index and transport prices. The results approve that TPI Responds positively to a shock in fuel and lubricants price index from January 2006 up to December 2016. These results revealed that the change in price of fuel and lubricants affects immediately the price of transport in Rwanda.

Impulse response 2 of TPI to GER examines the effect on both Growth in exchange rate (GER) and transport prices (TPI). The results approves that TPI responds positively to a shock in growth exchange rate from 4th years from 2009 onwards. These results revealed that the variation of exchange rate between US Dollars vs Rwandan Francs influences the cost of inputs used in transport services and those increase in costs of the inputs used in transport affects the transport price in Rwanda from 2009 to 2016.

Impulse response3 of IMINFFUEL to TPI examines the effect on both imported inflation fuel (IMINFFUEL) and transport prices (TPI). The results approves that IMINFFUEL responds positively to a shock in Transport price index from 4th years from (2009Q2) to 6 th years (2011Q2). These results revealed that the imported inflation on fuel in years 2009Q2 to 2011Q2 affects the price of transport in Rwanda.

Impulse response4 of IMINFT to TPI examines the effect on both imported inflation transport (IMINFT) and transport prices (TPI). The results approves that IMINFT responds positively to a shock in Transport price index from 1st year from (2006Q1) to 3rd year (2008Q3). These results revealed that the imported inflation transport in years 2006Q1 to 2011Q3 affects the price of transport in Rwanda. This means that if there is inflation in transport of neighbouring or transport at international or regional level can affect the price of local transport in Rwanda

Impulse response5 of LNFT to TPI examines the effect on both Local inflation transport (LNFT) and transport prices (TPI). The results approves that LNFT responds positively to a shock in Transport price index from 1st year from (2006Q1) to upward. These results revealed that the local inflation transport in years 2006Q1 to 2016Q4 affects the price of transport in Rwanda. This means that if there is local inflation in transport can affect the price of transport in Rwanda

Impulse response5 of ONFLT to TPI examines the effect on both Overall inflation transport (OINFLT) and transport prices (TPI). The results approves that OINFLT responds positively to a shock in Transport price index from 1st year from (2006Q2) to upward. These results revealed that the Overall inflation transport in years 2006Q2 to 2016Q4 affects the price of transport in Rwanda.

V. CONCLUSION AND RECOMMENDATIONS

Conclusion:

In general, this research project attempted to investigate the relationship and effects between costs push inflation on transport prices in Rwanda. The results of this study revealed that the cost push inflation as the increase of inputs used in transport services has a positive relationship and affects the price of transport in Rwanda. The most influence to transport prices was observed from the change in price of fuel, lubricants, imported inflation of fuel, the fluctuation of exchange rate between US dollars and Rwandan francs. Inflations on transport have less influence than the other variables. In other words, if the price of fuel and lubricants increases, it has immediate effect on transport prices. The high growth of exchange rate between US dollars and Rwandan francs influences the fixing of the price of transport in Rwanda. In additional to this, imported inflation on oil influences the selling of this oil, which affects the price of transport in Rwanda.

Recommendations:

The findings of this study could be used by policy makers in Rwanda to frame a suitable economy policy with regards to combating imported inflation on inputs used in transport services and to stabilize exchange rate. Moreover, the study found that inflation is mainly accelerated by the supply side (high cost of inputs transport) and external factors (import of fuel and lubricants and other transport services). Therefore, in Rwanda, cost push inflation can be efficiently controlled by monetary policy and fiscal policy through government spending and improvements in term of trades (not only to depend on imports). Additional to this the investors of inputs used in transport services should create fuel and other lubricants storage facilities to sustain transport services and stabilize the transport price in Rwanda.

REFERENCES

[1] Ananias, G. M. and Valence, K. (2012), "Modelling inflation in Rwanda", Economic review, National Bank of Rwanda.

[2] National Institute of Statistics of Rwanda (2006- 2017), National account reports.Autoregression Model", South Asia Economic Journal, 12(2): 271–286.

[3] Bashir, F. (2011), "Determinants of inflation in Pakistan: An econometric analysis using Johansen Co-integration approach", Australian Journal of Business and Management

[4] Gujarati, D. N. (2004), "Basic Econometrics", Fourth Edition, McGraw−Hill, USA.

[5] Haberler, G. (1960), "Inflation its causes and cures", American Enterprise Association Washington, D.C.

[6] IMF. (2015), "World Economic Outlook Database", Washington, D.C.

[7] Laryea, S.A. and Sumaila, U.R. (2001), "Determinants of inflation in Tanzania", WP No.12.

[8] Lim, C. H. and Papi, L. (1997), "An Econometric Analysis of the determinants of Inflation in Turkey", IMF Working paper no. 170.

[9] Econometrics Analysis, Using Johansen Co Integration Approach", European Journal of Business and Management, 5(30): 115-122.

[10] Rutayisire, M. J. (2013), "Threshold effects in the relationship between inflation and economic growth: Evidence from Rwanda", African Economic Research Consortium (AERC), 1-33.

[11] Salvatore, D. and Diulio, E. (2003), "Principles of economics: Schaum's Easy Outline".

[12] Shammari, N. and Sabaey, M. (2012), "Inflation Sources Across Developed and Developing

[13] Countries; Panel Approach", International Business & Economics Research Journal, 11(2): 185-194.

[14] Snowdon, B. and Vane, H. R. (2005), "Modern Macroeconomics: its origins, Development and current state", Edward Elgar publishers (UK&USA).

[15] Winston, C (2013). On the Performance of the U.S. transportation system: Caution ahead. Journal of Economic Literature, 91(3), pp 773-824. 24 Eddington, R (2006), the Eddington Transport Study. HMSO/HM Treasury;

[16] Webster, F.V and Bly, P.H (eds) (1980) The Demand for Public Transport, Report of an international collaborative study, Transport and Road Research Laboratory, Crowhome, Berkshire,

[17] Glaister,S, and D. Graham (2000) The effect of fuel prices on motorists, transport research part a, 37,pp 351-372.

[18] Ministry of infrastructure (2012), Public Transport Policy and Strategy for Rwanda;

[19] Robert Barro and Vittorio Grilli (1994), European Macroeconomics, Ch. 8, p. 139, Fig. 8.1. Macmillan, ISBN 0-333-57764-7. (https://economictimes.indiatimes.com/definition/cost-push-inflation)

[20] O'Sullivan, Arthur; Sheffrin, Steven M. (2003), Economics: Principles in Action. Upper Saddle River, New Jersey: Pearson Prentice Hall. p. 79. ISBN 9780131334830. Colander, David C. Microeconomics 7th ed. pp. 132–133. McGraw-Hill 2008.

[21] Passenger transport, American Public Transit Association, Washington, D.C., February 2, 1987, p.12).