Exploring the Link between Exchange Rate and the Price of Primary Export Commodities: The Case of US-Liberian Dollar Exchange Rate

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Abstract:

The exchange rate is a major determinant of the volume, value and profitability of international trade. Since the early 1970s, when the Liberian –US dollar exchange rate was stable at $L1.00 to $US1.00, the exchange rate has fluctuated significantly due to unexplained economic factors and currently equals $L90.00 to $US1.00. The volatility and depreciation of the exchange rate has increased interest in uncovering its economic determinants. This study explores the link between the U.S. Liberian Dollar exchange rate and the price of primary export commodities. Using selected empirical methods, we extend the literature by investigating how the fluctuations in prices of Liberia's primary exports, natural rubber and iron ore, are associated with the volatility of its exchange rate. The results of this study show that the prices of Liberia's primary exports including, natural rubber and iron ore, are correlated with the exchange rate. Specifically, as the commodities' prices fall during global recessions, the exchange rate appreciates. This result is inconsistent with economic theories, which suggest that a rise in the price of a country's primary export would increase its reserves of foreign currency, increasing the demand for the local currency, and causes the exchange rate to appreciate. The study also finds that the other major variables associated with the exchange rate were exports, imports and the money.

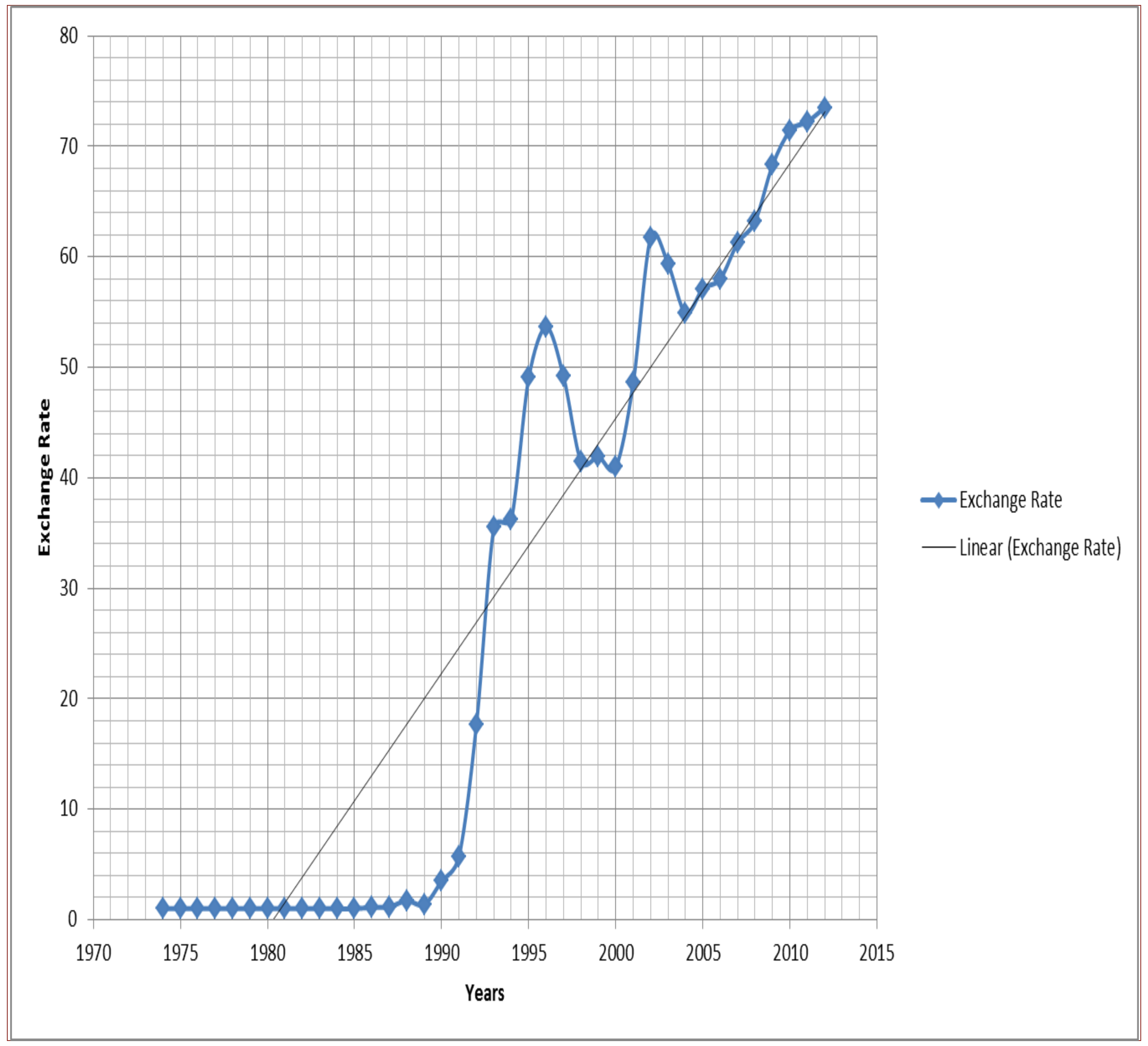
Review of Previous Studies:

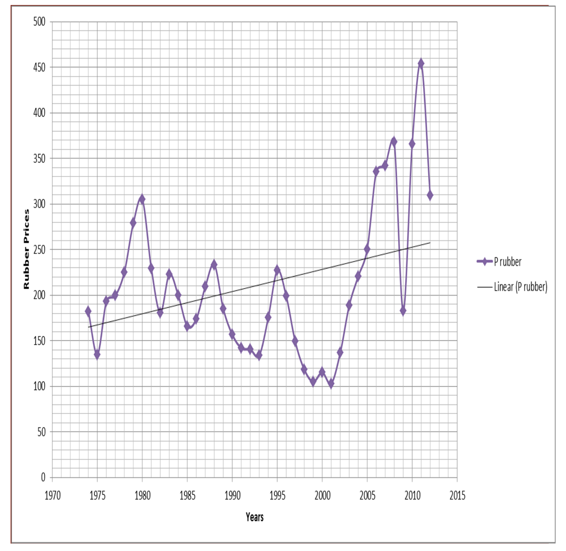
Empirical Studies on the Relationships Between Macroeconomic Variables and Exchange Rate Volatility

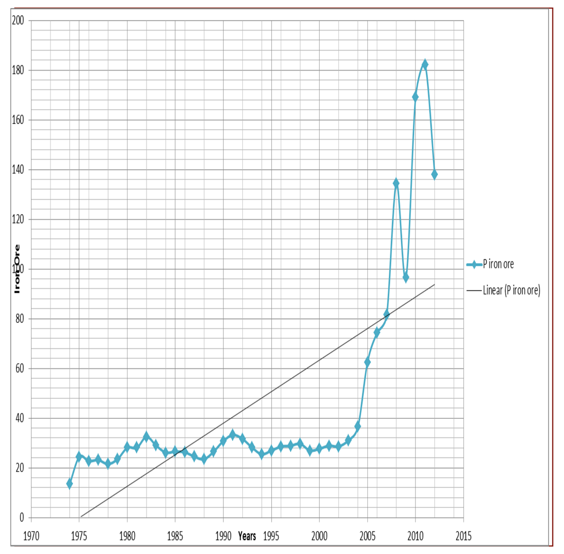
- Anita Mirchandani (2013)
  - Reviewed the impact of major economic variables on exchange rate volatility.
  - Used secondary data and correlation analysis.
  - The results were that exchange rates are associated with many variables direct and indirectly.
- Arezki et al (2014)
  - Observed the relationship between the volatility of commodity prices and the volatility of South Africa Rand's real exchange rate in the short and long run.
  - Used data from UNCTAD , The Phillip's Perron and Dickey Fuller Test.
  - Results found no significant relationship between gold prices and real exchange rate volatility. However with the long-run, gold prices volatility were driven by real effective exchange rate.
- Shehu et al (2012)
  - Identified the relationship between exchange rate volatility, trade flows, and economic growth in Nigeria.
  - Used Augmented Dickey Fuller Test, Co-integration Test, and Granger Causality Test.
  - Results were that effects of exchange rate volatility have vital causality links with GDP, exports, and imports in Nigeria.

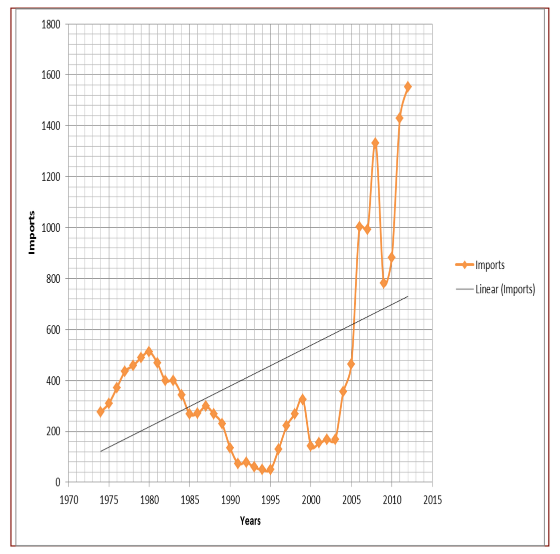
Methods:

- Graphs to observe behavior of the exchange rate and other economic variables over the period of 1974 to 2012
- Empirical Methods
  - Descriptive Statistics: Mean, Standard Deviations, Range, etc.
  - Pearson Correlation Analysis









Hypotheses:

1) There is an inverse relationship between exchange rates and the price of rubber.
2) Increases in iron prices is associated with an appreciation of the Liberian Dollar.
3) The exchange rate depreciates as imports increase due to a loss in U.S. dollars to purchase imports.
4) Exchange rates appreciates as exports increases.
5) Increases in money supply is associated with the deprecation of the Liberian Dollar.

Correlation Coefficients & P-Values

	EXCHR	M2	Prub	Piron	Import	Exports
EXCHR	1					
M2	0.4614*	1				
	0.0016					
Prub	0.4445*	0.7633*	1			
	0.0025	0				
Piron	0.7016*	0.9069*	0.8049*	1		
	0	0	0			
Imports	0.5575*	0.8968*	0.8514*	0.9078*	1	
	0.0001	0	0	0		
Exports	-0.1965	0.5711*	0.5265*	0.3025*	0.5379*	1
	0.2011	0.0001	0.0002	0.046	0.0002	

Discussion of Results:

- The positive correlation between money supply and exchange rate confirms Hypothesis 5.
- Rubber and Iron Ore prices are correlated with exchange rates. The findings contradicts Hypothesis 1 and 2.
- Imports prices are positively related to exchange rates. This suggest that when imports are higher we can expect the value of the Liberian dollar to fall confirming Hypothesis 3.
- Exports are negatively correlated with exchange rates. This suggest that there is an inverse relationship between the two. Hypothesis 4 is confirmed.

Summary:

- This paper investigates the empirical behaviors of exchange rates, commodity prices, and other macroeconomic variables in Liberia.
- The empirical evidence supports the assumption that increases in Liberia's money supply is associated with a rise in the exchange rate. This implies that the value of the Liberian Dollar weakens, while the U.S. Dollar strengthens as the money supply increases.
- Commodity prices are related to the exchange rate although the relationship between iron ore and exchange rate is stronger than that of rubber.
- Imports were found to have a stronger significant relationship with the exchange rate than exports.

Recommendations:

- There is a need for further research to explore why exports relationship with the exchange rate is not significant.
- Need to study the sub-samples before and after the civil wars.
- Study the behavior in similar countries in the region to check whether our results are robust.
- Study using other advanced methods in order to evaluate the determinants of Liberian-U.S. Dollar exchange rate.

References on separate paper