
Factors Influencing Exchange Rate Volatilities: Sri Lanka Compared with Ukraine.

**Abeysekara, L.T.S.D.Z.^{*a}, Kothalawala, C.^b, Jayasinghe, V.T.^c,
Rupasinghe, B.N.^d & Jeewandarage, P.O.^e**

*a,b,c,d,e SLIIT Business School, Sri Lanka Institute of Information Technology,
Malabe, Sri Lanka*

*^atharushasathsara3@gmail.com, ^bcharuka.k@sliit.lk,
^cthenukajayasinghe1@gmail.com, ^dnovenya2728@gmail.com,
^epoojaomali@gmail.com*

Abstract

The exchange rate is the price of one country's currency in terms of another country. This study aims to identify the factors affecting the exchange rate volatilities in Sri Lanka compared with Ukraine. These two countries were selected as it is comparable to Sri Lanka based on the GDP Per Capita (PPP), population and Human Development Index (HDI), and colonization. The objectives of the study are to investigate whether the external value of the Sri Lankan Rupee is influenced by issues such as macroeconomic, sociocultural, and institutional factors and the factors behind them. A quantitative regression analysis technique was employed using data, collected from secondary sources such as the Central Bank of Sri Lanka, the National Bank of Ukraine, IMF databases, and World Bank databases for the period of 1992 to 2022. The discussion of the results was done from a critical perspective with the backing of the literature review. The findings of the study revealed that the major elements that have an impact on the exchange rate volatility of a country are GDP per capita, unemployment rate, social contributions, human capital index, foreign direct investments, and social contributions moderated it. The comparison analysis also showed that Sri Lanka has the highest level of exchange rate volatility when compared to Ukraine. The findings will be helpful for the researchers to advance their research studies in this field and for policymakers to develop sustainable frameworks for exchange rate stability which is identified as an essential ingredient of economic development.

Keywords: Exchange rate Volatility, Economic Growth, Foreign Trade flows, Inflation rates

01. Introduction

Exchange rate volatility is a major problem for developing countries since it may harm international trade, capital flows, and economic growth. Investors and regulators must have a

** tharushasathsara3@gmail.com*

good grasp of the factors influencing exchange rate volatility in order to mitigate exchange rate risks.

Exchange rate volatility refers to the tendency for foreign currencies to appreciate or depreciate in value, thus affecting the profitability of foreign exchange trades. The volatility is the measurement of the amount that these rates change and the frequency of those changes. There are many circumstances when exchange rate volatility comes into play, including business dealings between parties in two different countries and international investments (Kamalyan, 2023).

Sri Lanka and Ukraine are two nations that have recently seen a lot of exchange rate fluctuation. Political unrest, a high level of public debt, and a sizable trade imbalance among other things have an impact on Sri Lanka's currency rate (Central Bank of Sri Lanka, 2021). On the other hand, political tensions with Russia, economic sanctions, and a substantial current account deficit have all had an impact on Ukraine's currency rate (National Bank of Ukraine, 2021).

This analysis compares the variables affecting the volatility of currency rates in Sri Lanka and Ukraine and the research can offer insights into how policymakers and investors might manage exchange rate risk in developing markets by examining the similarities and differences in the factors impacting exchange rate volatility in these two nations.

Macroeconomic indicators and political instability are only a few examples of variables that might have an impact on the volatility of exchange rates in developing economies. Exchange rate volatility has been a factor in Sri Lanka due to rising inflation and budget deficits (Central Bank of Sri Lanka, 2021). The conflict with Russia, rising inflation, and political unpredictability have all had an impact on Ukraine's currency rate volatility (National Bank of Ukraine, 2021). According to Ibhagui (2019), in systems with floating exchange rates, central banks may occasionally intervene in the market for currency rates for a variety of reasons including part of their macroprudential arsenal, central banks frequently utilize foreign exchange interventions to address concerns about financial stability highlighted by excessive exchange rate volatility and abrupt changes in capital inflows.

The monetary theory of exchange rate determination can explain the impact of macroeconomic factors on exchange rate movements, especially since the introduction of the floating exchange rate system in the early 1970s. Therefore, the exchange rate volatility model should contain important macro information observed on a monthly or quarterly basis. The relationship between exchange rates and macroeconomic variables has attracted attention (Wang et al., 2023).

Saliya (2022), reveals that Ukraine has similar characteristics such as people density, population, and per capita income with Sri Lanka. Appendix 01: shows the standing of this country compared to its size in terms of per capita income. Saliya (2022), attempts to plot these 11 countries and provide insight into the comparability of these countries. The size of the bubbles represents the comparative amount of the GDP per capita at current US\$ prices and the vertical position of the relevant country.

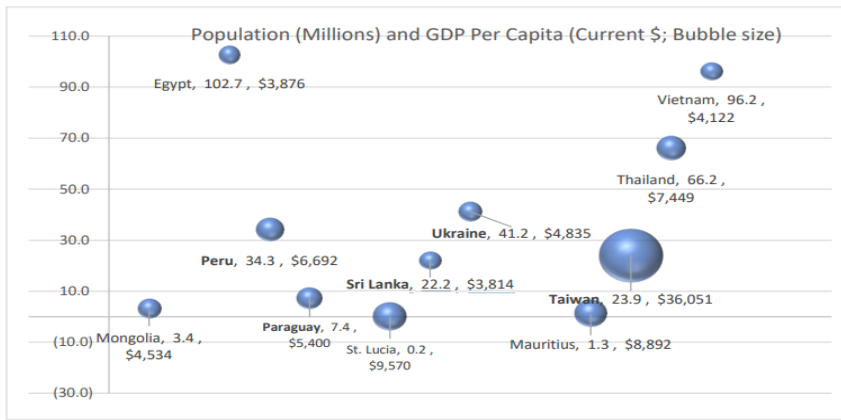


Figure 1: A comparison of socioeconomic factors of 14 countries (Saliya, 2022).

02. Research Problem

The macroeconomic stability of a country's economy as well as commerce and investment can be significantly impacted by exchange rate fluctuation. Sri Lanka is a small island nation in South Asia and Ukraine is a sizable nation in Eastern Europe. In this study, the authors have considered factors such as Macroeconomic, Sociocultural, Social, and Institutional. The main research problem of this study is “What is the impact of certain Macroeconomics, Institutional factors, political factors, and social factors influencing the exchange rate volatilities in Sri Lanka, and how they are compared with the same of Ukraine?”

Research Questions

- How do macroeconomic factors have an impact on the exchange rate volatilities of SL?
- How do institutional factors have an impact on the exchange rate volatilities of SL?
- How do socio-cultural factors have an impact on the exchange rate volatilities of SL?
- How do social factors have an impact on the exchange rate volatilities of SL?

Research Objectives

- The impact of Macroeconomic factors on exchange rate volatilities in Sri Lanka.
- The impact of Institutional factors on exchange rate volatilities in Sri Lanka.
- The impact of Sociocultural factors on exchange rate volatilities in Sri Lanka.
- The impact of social factors on exchange rate volatilities in Sri Lanka

03. Literature Review

The exchange rate volatility can have an impact on economic stability and growth, it has become a big concern for regulators all over the world. Both Sri Lanka and Ukraine are

emerging nations with distinctive economic traits and monetary policies. This assessment of the literature compares the variables affecting the volatility of currency rates in Sri Lanka and Ukraine.

Foreign trade has been known for creating many favorable and unfavorable effects on an open economy's macroeconomic environment. Trade creates absolute and comparative gains long-term prosperity, a stable economic transition, and increase domestic production. Besides, trade has also been known to exacerbate income inequality between and within countries. With unexpected fluctuations in the real exchange rates, an open trade policy can negatively affect importers/exporters. This is because such fluctuations affect the current account balance as it reflects changes in the prices of domestic commodities which again will affect the level of output to be exported. As stated above, it has been symmetrically observed the negative effect of volatility on exports in both short-term and long-term (Yu et al., 2023)

First, for Australia, Canada, New Zealand, and South Africa, commodity constitutes a significant component of their exports. World commodity price fluctuations potentially explain a major component of their terms-of-trade fluctuations in these countries. Second, world commodity price is exogenous in comparison to the exchange rate to a large extent. An explanation for the failure of reduced-form models with macro variables in forecasting exchange rates is that they are endogenously determined in equilibrium (Liu et al., 2020).

According to Beckmann and Reitz (2020), to understanding and forecasting exchange rates remains one of the central areas of research in international economics due to its importance for portfolio allocation and policy making. However, rigorous empirical evidence on market participants' exchange rate forecasts is available only since the mid-1980s. The growing interest in survey data of exchange rate forecasts in this period can be understood against the backdrop of empirical evidence rejecting the joint hypothesis of uncovered interest parity and rational expectations.

3.1. Macroeconomic Factors

Macroeconomics is a branch of economics that studies how an overall economy—the markets, businesses, consumers, and governments—behaves. Macroeconomics examines economy-wide phenomena such as inflation, price levels, rate of economic growth, national income, gross domestic product (GDP), and changes in unemployment.

Some of the key questions addressed by macroeconomics include: What causes unemployment? What causes inflation? What creates or stimulates economic growth? Macroeconomics attempts to measure how well an economy is performing, understand what forces drive it, and project how performance can improve. Macroeconomics is the branch of economics that deals with the structure, performance, behavior, and decision-making of the whole, or aggregate, economy.

The macroeconomic factors used in our research are:

GDP per capita:

GDP per capita is an economic metric that breaks down a country's economic output per person. Economists use the same to determine how prosperous countries are based on their economic growth. GDP per capita is calculated by dividing the GDP of a nation by its population. Countries with a high GDP per capita tend to be those that are industrial, developed countries (Testik & Sarikulak, 2021).

Foreign direct investments:

Foreign investments can be classified in two ways: direct and indirect. Foreign direct investments (FDIs) are the physical investments and purchases made by a company in a foreign country, typically by opening plants and buying buildings, machines, factories, and other equipment in the foreign country. These types of investments find a far greater deal of favor as they are generally considered long-term investments and help bolster the foreign country's economy.

According to Desai et al. (2008), Foreign indirect investments involve corporations, financial institutions, and private investors buying stakes or positions in foreign companies that trade on a foreign stock exchange. In general, this form of foreign investment is less favorable, as the domestic company can easily sell off their investment very quickly, sometimes within days of the purchase. This type of investment is also sometimes referred to as a foreign portfolio investment (FPI). Indirect investments include not only equity instruments such as stocks but also debt instruments such as bonds.

Unemployment rate:

The unemployment rate is the percentage of the labor force without a job. It is a lagging indicator, meaning that it generally rises or falls in the wake of changing economic conditions, rather than anticipating them. When the economy is in poor shape and jobs are scarce, the unemployment rate can be expected to rise. When the economy grows at a healthy rate and jobs are relatively plentiful, it can be expected to fall (Weber, 2002).

3.2. Sociocultural Factors

Socio-cultural factors include consumers' lifestyles, buying habits, education, religion, beliefs, values, demographics, social classes, sexuality, and attitudes. These factors determine the suitability of an organization's products and services for its customers' needs.

The sociocultural factors in this study are:

Gini index:

The Gini coefficient also called the Gini index or Gini ratio, is the most commonly used measure of income distribution—simply put, the higher the Gini coefficient, the greater the gap between the incomes of a country's richest and poorest people. A country's Gini coefficient is important because it helps identify high levels of income inequality, which can have several undesirable political and economic impacts. These include slower GDP growth, reduced income mobility, greater household debt, political polarization, and higher poverty

rates (Liang, Liu, & Wang, 2023).

Human capital index:

The Human Capital Index (HCI) is an international metric that benchmarks key components of human capital across countries. Measuring the human capital that a child born today can expect to attain by her 18th birthday, the HCI highlights how current health and education outcomes shape the productivity of the next generation of workers. In this way, it underscores the importance for governments and societies of investing in the human capital of their citizens. Voumik et al. (2023), say that the HCI was launched in 2018 as part of the Human Capital Project (HCP), a lobal effort to accelerate progress towa a world where all children can achieve their full potential.

Labor force participation rate:

The labour force participation rates is the number of persons who are employed and unemployed but looking for a job divided by the total working-age population says (Erten & Metzger, 2019).

3.3. Institutional Factors

Institutional factors are social institutions that guide behavior and influence organizations. They include rules, norms, and routines that are derived from the regulatory framework, government agencies, and prevailing cultural and social practices¹. Institutional factors can exist within an organization or the structure may be part of the culture in a particular area¹. Institutional factors are internal dynamics that reflect the governmental or non-governmental organizations' efficiency of performance. They produce economic outcomes in the markets² (Tausig & Fenwick, 2011).

The institutional factors used in our research are:

Political stability:

Political behavior is any act by any member of a society that affects the distribution of power to make decisions. Political behavior is ubiquitous. Members of society behave politically in so far as, in obeying or disobeying the laws of the society, they support or undermine the power stratification system. Obedience to the law constitutes political behavior just as much as contesting elections does Okara (2023).

Rule of law:

According to Lane (2011), a process, institution, practice, or norm that promotes the equality of all individuals before the law, secures a system of government devoid of arbitrary action, or more broadly, protects against the abuse of power. Absolutism, authoritarianism, totalitarianism, and despotism all display arbitrary behavior. Despotic regimes may even be highly institutionalized, with the top of the power structure being able to act whenever it

pleases without being bound by the law.

3.4. Social Factors

According to Yane et al. (2020), Social factors are things that affect lifestyle, such as religion, wealth, or family. It is important for businesses to be aware of these factors as they change because it is a very important component in proper marketing.

The social factor used in our research is:

Social contributions :

According to Thiri et al. (2022), Social Contributions means all contributions, including but not limited to, payroll contributions, unemployment insurance, retirement, social security or other social benefits or labor-related payments or contributions which any of the Company or its Subsidiaries is required to pay, withhold or collect.

04. Methods

The analysis findings were used to determine which independent factors have the strongest relationships with exchange rate volatility as well as how social unrest influences those relationships. The link between the independent variables and exchange rate volatility is moderated by social factors. According to Kros and Keller (2010), each independent variable (IV) was multiplied by the moderator variable (MV) to construct the interaction terms in this regression model. If an interaction term's coefficient is statistically significant, it is likely that the moderator variable moderates the link between the associated independent variable and the dependent variable. This model examines how the MV modifies the impact of all IVs, not just the initial one.

For this research, a sample size of 30 annual data points is selected from Sri Lanka with Ukraine. The reasons for selecting the countries are summarized in the literature review above. Few proxy variables are selected to represent the factors such as Macroeconomic, Sociocultural, Institutional, and Social factors. Social contribution is used as the moderator variable under social factors to moderate the relationship between the dependent and independent variables.

Equation 1 :

$$\text{Annual Exchange Rate Fluctuation} = \frac{(\text{Annual Average Exchange Rate of the Current} - \text{Annual Average Exchange Rate of the Previous Year})}{\text{Annual Average Exchange Rate of the Previous Year}} \times 100$$

Since this research is focusing on secondary data, the researchers hope to obtain the data and information regarding the independent variable from various databases such as CBSL, National Bank Of Ukraine, IMF, and World Bank databases. The study hopes to cover the

period ranging from 1992 to 2022.

Equation 2: Equation used to calculate exchange rate volatility.

$$ERV = [(Y_t Y_{t-1}) / (Y_t - 1)] \times 100$$

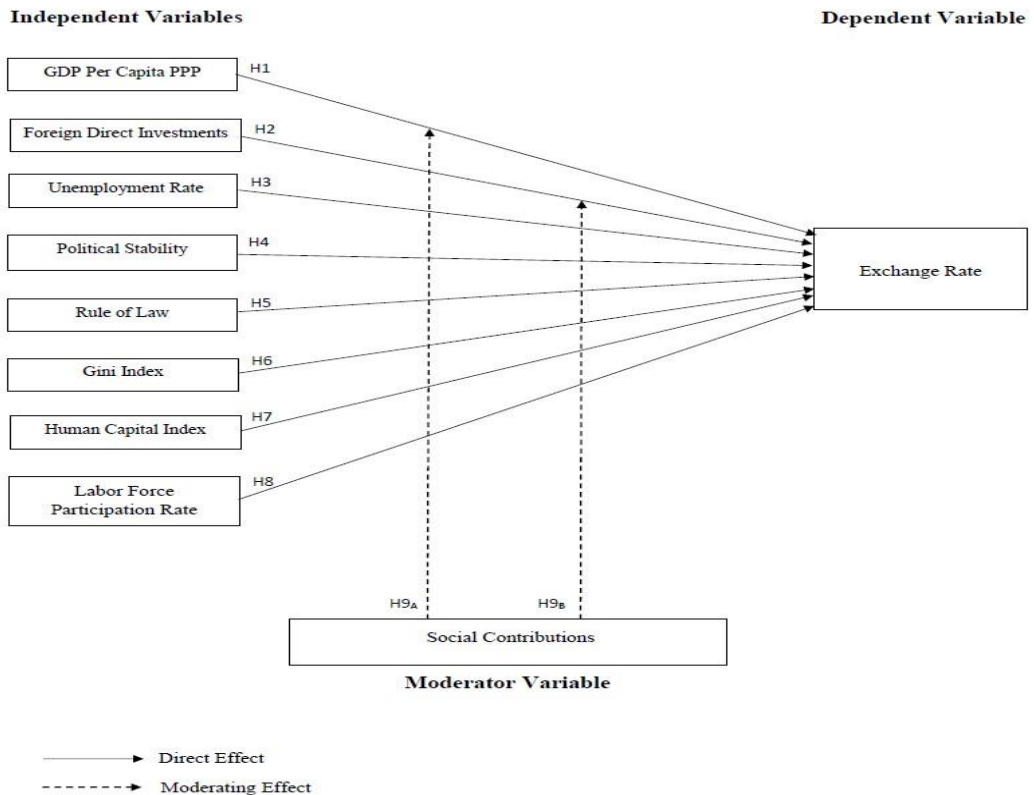


Figure 2: Conceptual Framework

Regression analysis

In this research, the authors have used four independent variables: Macroeconomic, Institutional, sociocultural, and social factors. The dependent variable is exchange rate volatility. The moderator variable of this study is social factors. Interaction terms for each independent variable are created to examine the moderating effects of social factors on the relationship between the independent variables and exchange rate volatility. Therefore, the multiple regression model that the authors would estimate is:

Equation 3 : Regression analysis

$$DV = \beta_0 + (\beta_1 \times IV_1) + (\beta_2 \times IV_2) + (\beta_3 \times IV_3) + (\beta_4 \times IV_4) + (\beta_5 \times IV_5) + (\beta_6 \times IV_6) + (\beta_7 \times IV_7) + (\beta_8 \times IV_8) + (\beta_9 \times MV) + (\beta_{10} (IV_1 \times MV)) + (\beta_{11} (IV_2 \times MV)) + \epsilon$$

Where,

DV: Dependent variable (exchange rate volatility)

IV: Independent variable

MV: Moderator variable (social factors)

β_0 : Intercept.

ϵ : Error term

Coefficients β_1 - β_8 represent the effects of the independent variables on the dependent variable, holding constant the effects of the other independent variables and the moderating variable. The coefficient β_9 represents the main effect of the moderating variable on the dependent variable. The coefficients β_{10} - β_{11} represent the interaction effects between each independent variable and the moderating variable, indicating whether the effect of the independent variable on the dependent variable is stronger or weaker under different levels of the moderating variable.

05. Data Analysis

With a sample size of 30 annual data points from 2 countries Sri Lanka with Ukraine the study hopes to cover the period ranging from 1992 to 2022. The literature study up top provides a summary of the factors that went into choosing the nations. To reflect elements including macroeconomic, socio-cultural, institutional, and social factors, a few proxy variables have been chosen. The relationship between the dependent and independent variables is moderated by using social contribution as the moderator variable under social factors.

The data suggests that due to its higher FDI inflows, lower unemployment rate, relative political stability, stronger rule of law, lower income inequality, higher human capital index score, and higher labor force participation rate, Ukraine may be less vulnerable to exchange rate volatility than Sri Lanka. It is crucial to keep in mind that these elements are intricately linked and that additional aspects of the economy, society, and politics may also have an impact on the volatility of the exchange rate.

According to Madurapperuma (2022), the Main focus of this research study is to identify how the recent economic crisis as well as the unrest situation in SL has impacted the exchange rate fluctuations and what are the main dimensions that have resulted in fluctuations. Since this research is focusing on secondary data, the researchers hope to obtain the data and information regarding the independent variable from various databases such as CBSL, National Bank of Ukraine, IMF, and World Bank databases.

5.1. Results and Discussion

Multiple R is used to determine the multiple correlation coefficient between three or more variables, according to Subramaniam et al. (2021). R-Squared, which may be calculated as $(\text{Multiple R})^2$, is a measure of how much variance in the response variable of a regression model can be explained by the predictor variables. This number ranges from 0 to 1. The multiple R symbol stands for the multiple correlation coefficient. A measure of how. In any case, the regression model matches the data. The mean of squares error is a term used to describe the error in the regression line used as a model to understand the data. Du (2018) R-squared is a statistical measure of how closely the data

follow the fitted regression line. It is also known as the coefficient of determination or the coefficient of multiple determination for multiple regression. 100% denotes that the model completely accounts for all variance in the response data around the mean. Multiple R is the correlation between the actual and predicted values of the dependent variable in multiple regression. It can only fall between 0 and 1, as it is calculated using a sum of squares, which cannot be negative.

5.1.1. Sri Lanka

GDP per capita has a significant impact on the exchange rate volatilities of a country since the p-value is 0.0009. Here since the p-value is less than 0.05, we reject the null hypothesis which states that GDP per capita has no impact on the exchange rate volatilities of a country. Therefore, we can conclude that GDP per capita has an impact on the exchange rate volatilities of a country and both factors have a positive significant relationship (Table 01). Likewise, Foreign Direct Investments (p value: 0.006), Social contributions (p value: 0.001), Unemployment (p value: 0.006) and Human capital index (p value: 0.004) has a positive significant impact on the exchange rate volatilities of Sri Lanka (Table 01). Unemployment and CPIA property rights have a negative significant relationship with the exchange rate volatilities in Sri Lanka since the p-value is greater than 0.05 (Table 01). Also, both the interactive terms social contributions *GDP Per Capita growth (Annual %) and social contributions, Foreign Direct Investments P value of 0.001 and 0.009, respectively. Therefore, we can say that these two terms have a positive significant relationship with the exchange rate volatilities in Sri Lanka. (Table 01).

Table 1 : Significant levels of the variable affecting the exchange Rate volatility in Sri Lanka.

	Coefficients	Standard Error	t Stat	P- value
Intercept	805.9498	199.3245	4.0434	0.0007
GDP per capita, PPP (US \$)	-20.6805	5.2573	-3.9337	0.0009
Foreign Direct Investments, Net Inflow (% of GDP)	101.7438	32.8648	3.0958	0.0060
Unemployment, total (% of total labor force) (national estimate)	-3.5123	3.3572	-1.0462	0.3086
Labor force Participation Rate, total (% of total population ages 15+)	-14.0229	3.6961	-3.7939	0.0012
Human capital index (HCI) (scale 0-1)	-109.7059	50.9899	-2.1515	0.0445
Gini index	2.9776	0.8171	3.6443	0.0017
CPIA property rights and rule-based governance index	-8.4855	9.7083	-0.8740	0.3930
Political stability	-28.5487	8.7562	-3.2604	0.0041
Social contributions (% of revenue)	97.1518	20.5151	4.7356	0.0001
SC*GDP per capita, PPP (US \$)	14.1101	3.6174	3.9006	0.0010
SC*Foreign Direct Investments, Net Inflow (% of GDP)	-83.4424	28.7270	-2.9047	0.0091

Note: R-Square 0.9393, Adjusted R -Square,.9042, * $p < .05$, ** $p < .01$

5.2. Ukraine

Labor force Participation Rate, Human capital index (HCI), Social contributions with p values 0.04, 0.004 and 0.003 respectively shows that they have a positive significant relationship with the exchange rate volatilities of a country since the p value is lesser than 0.05 (Table 02). The other terms GDP per capita, PPP, Unemployment, Gini index, and CPIA property rights with p-values of 0.9, 0.7, 0.7, 0.8 respectively show that there is a negative significant relationship between these terms and exchange rate volatility since their p-value is greater than 0.05 (Table 02). The interactive terms social contributions *GDP Per Capita growth and social contributions *Foreign Direct Investments show that there is a positive relationship with exchange rate volatilities since the p values are 0.98 and 0.63, respectively (Table 02). In conclusion, we can say that social contributions *Foreign Direct Investments, Net Inflow (% of GDP) and social contributions *GDP Per Capita growth (Annual %) can be moderated for Ukraine (Table 02)

Table 2 : Significant levels of the variable affecting the exchange Rate volatility in Ukraine

	Coefficients	Standard Error	t Stat	P-value
Intercept	160.0122	75.6540	2.1151	0.0479
GDP per capita, PPP (US \$)	-0.0680	0.9747	-0.0697	0.9452
Foreign Direct Investments, Net Inflow (% of GDP)	0.6907	2.2081	0.3128	0.7578
Unemployment, total (% of total labor force) (national estimate)	0.1110	0.3792	0.2926	0.7730
Gini index	0.0219	0.0826	0.2649	0.7939
Labor force Participation Rate, total (% of total population ages 15+)	-2.7353	1.2941	-2.1136	0.0480
Human capital index (HCI) (scale 0-1)	36.0986	11.1575	3.2354	0.0044
Political stability	-3.2198	1.6031	-2.0085	0.0590
CPIA property rights and rule-based governance index	-0.1248	0.5191	-0.2404	0.8126
Social contributions (% of revenue)	-0.7082	0.2130	-3.3250	0.0036
SC*GDP per capita, PPP (US \$)	-0.0006	0.0276	-0.0228	0.9821
SC*Foreign Direct Investments, Net Inflow (% of GDP)	-0.0323	0.0672	-0.4810	0.6360

Note: R-Square 0.9691, Adjusted R -Square,.9512, * $p < .05$, ** $p < .01$

06. Conclusion

This research study is with regards to exchange rates which are influenced by a country's economic activities. The macroeconomic, institutional, sociocultural, and social factors that will have an impact on Sri Lanka's exchange rate volatility will all be thoroughly examined by the research. The authors also compared the impact of the moderating variable with each independent variable of Ukraine to find out the similarities and differences between the countries in terms of the factors influencing exchange rate volatility in Sri Lanka. The study

will use secondary data from the years 1992 to 2022 to explore the exchange rate of Sri Lanka and the factors affecting the volatility of the exchange rate in Sri Lanka. This research undertakes a thorough analysis utilizing interest rates, capital inflows, and terms of trade as the primary exchange rate drivers in order to comprehend how these variables relate to the exchange rate. This article focuses in particular on how capital inflows affect the exchange rate. The suggested empirical study will be deductive in character, testing well-known hypotheses with evidence pertaining to Sri Lanka. Secondary data from the Central Bank of Sri Lanka, the National Bank Of Ukraine, the IMF, and the World Bank will be used for the empirical analysis. Therefore authors used a moderator variable of social contributions which is a social factor that will moderate the effect of the relationship between the dependent and independent variables of the exchange rate volatility in Sri Lanka. Macroeconomic and Social factors are the most significant factors which affect a country's exchange rate volatility. GDP per capita, unemployment rate, and social contributions are the most significant proxy variables under the factors mentioned above. As per the interactive term, when Foreign Direct Investments are moderated by Social Contributions (moderating variable), it also becomes a significant proxy variable under social factors. The variation of a dependent variable to the independent variables in the regression model acquires a high value. In Sri Lankan context; GDP per capita, Foreign Direct Investments, Unemployment rate, and Human capital index are the most significant variables concerning the exchange rate volatility of Sri Lanka. As a result, it is clear that Macroeconomic factors and Sociocultural factors have the greatest impact on the exchange rate volatility in Sri Lanka. Correspondingly, regression analysis reveals that institutional factors; Political stability and absence of violence, and rule-based governance index variables do not significantly influence Sri Lanka's exchange rate volatility. Hence, as a nation, Sri Lanka should focus more on strengthening the institutional foundations of the country to maintain a favorable relationship with its exchange rate volatilities.

References

- Beckmann, J. &. (2020). Information rigidities and exchange rate expectations. *Journal of International Money and Finance*. 105, 102136.doi:DOI: 10.1016/j.jimonfin.2020.102136.
- Ibhagui, O. W. (2019). Monetary model of exchange rate determination under floating and non-floating regimes. *China Finance Review International* 9 (2), 254 - 283.
- Kamalyan. (2023). Real exchange rate dynamics in the New-Keynesian model. *International Economics*. 174, 250-255. doi:https://doi.org/10.1016/j.inteco.2023.04.004
- Kros, J. F. (2010). Seasonal regression forecasting in the U.S. beer import market. In: LAWRENCE, K. D. & KLIMBERG, R. K. (eds.) *Advances in Business and Management Forecasting*. 73 – 96, *Emerald Group Publishing Limited*. doi:DOI:10.1108/S1477-4070(2010)0000007008
- Lane, J. E. (2011). Law and economics in the ASEAN+3 region: the rule of law deficit. *International Journal of Social Economics*. 38 (10). 847-857.
- Liang, L. L. (2023). Periodicity measure of cyclo-stationary impulses based on low sparsity of Gini index and its application to bearing diagnosis. *ISA Transactions*. 138, 611-627, doi:doi:https://doi.org/10.1016/j.isatra.2023.02.017
- Liu, L. T. (2020). Can commodity prices forecast exchange rates? *Energy Economics*. *Energy Economics*. 87, 104719, doi:doi:https://doi.org/10.1016/j.eneco.2020.104719
- Madurapperuma, W. (2022). The dynamic relationship between economic crisis, macroeconomic variables and stock prices in Sri Lanka. *Journal of Money and*

Business.

- Metzger, E. &. (2019). The real exchange rate, structural change, and female labor force participation. *World Development*, 117, 296-312., doi:https://doi.org/10.1016/j.worlddev.2019.01.015
- Okara, A. (2023). Does foreign direct investment promote political stability? Evidence from developing economies. *Economic Modelling*, 123, 106-249. doi:https://doi.org/10.1016/j.econmod.2023.106249
- Qi, J. &. (2008). Spillover effect of FDI on China's knowledge creation. *Chinese Management Studies* 2 (2), pp. 86-96.
- Saliya, C. A. (2022). Stock market development and nexus of market liquidity: the case of Fiji. *International Journal of Finance & Economics*, 27(4), 4364-4382.
- Subramaniam, R., Nakkeeran, S., & Mohapatra, S. (2021). Importance of team characteristics in determining team performance. In team work quality: why it matters in enhancing the creativity of software organizations, 17-53.
- Testik, M. C. (2021). Change points of real GDP per capita time series corresponding to the periods of industrial revolutions. *Technological Forecasting and Social Change*, 170. doi:https://doi.org/10.1016/j.techfore.2021.120911
- Thiri, M. A.-T. (2022). How social movements contribute to staying within the global carbon budget. *Evidence from a qualitative meta-analysis of case studies. Ecological Economics*, 195, 107-356. doi:https://doi.org/10.1016/j.ecolecon.2022.107356
- Voumik, L. C. (2023). Going away or getting green in BRICS: Investigating the EKC Hypothesis with human capital index, nuclear energy, urbanization, and service sectors on the environment. *World Development Sustainability*. doi:https://doi.org/10.1016/j.wds.2023.100060
- Wang, X. Q. (2023). How do monetary shock, financial crisis, and quotation reform affect the long memory of exchange rate volatility? Evidence from major currencies. *Economic Modelling*. 120, 106155. doi:https://doi.org/10.1016/j.econmod.2022.106155
- Weber, B. A. (2002). The link between unemployment and returns to education: evidence from 14 European countries. *Education + Training*., doi:10.1108/00400910210432059
- Yane, E. S. (2020). Social factors that influence the preeclampsia event in Palu City. *Enfermería Clínica*, 30, 167-170, doi:https://doi.org/10.1016/j.enfcli.2020.02.013
- Yu, Z. L. (2023). Central bank swap arrangements and exchange rate volatility: Evidence from China. *Emerging Markets Review*. 101044, doi:https://doi.org/10.1016/j.ememar.2023.101044

