Research Article

Forex Reserves: A Catalyst For Economic Sustainability

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ARTICLE INFO	ABSTRACT
	The intersection of foreign exchange reserves allocation and the pursuit of Sustainable Development Goals 8 (SDG 8) stands at the forefront of contemporary economic discourse. This research paper conducts a comprehensive analysis aimed at understanding the intricate relationship between countries' Foreign Exchange Reserves and their progress toward achieving sustainable development. Through quantitative analysis, this research evaluates the alignment of foreign exchange reserves with SDGs 8 by identifying the linkage between Forex and GVA. The findings reveal valuable insights into the patterns of foreign exchange allocation and their significance for sustainable development initiatives. Moreover, this study offers a clear perspective for optimizing foreign exchange reserve management to better serve the aspirations of sustainable development which will provide vital framework for policymakers, economists, and transnational institutions striving to harmonize economic stability with sustainable development priorities on a global scale. Granger Causality test have been considered for Quantitative analysis of data.
	Keywords: SDG 8, Forex Reserves, GVA, Granger Causality test

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Introduction:

In the intricate web of global economics, the judicious management of foreign exchange reserves act as a strong base for nations striving toward sustainable development. The UN SDGs, which aim for advancement on a broad range of particular social, economic, and environmental goals, make the conundrum very evident. The guiding idea of "leave no one behind" serves as the foundation for the Sustainable Development Goals. The SDGs and India's national development goals are closely aligned, and India is anticipated to play a major role in determining the global success of the SDGs (David, 2018). In order to eradicate poverty, safeguard the environment, and ensure that everyone enjoys prosperity, the Sustainable Development Goals (SDGs) serve as a global call to action. The distribution of foreign exchange reserves emerges as a key factor in determining a nation's capacity to accomplish these challenging goals. The interaction between various components shifts as well as additional factors enter a new frame adding to its complexity. The formation of the SDGs in 2015 created a new context for the connection between financial risk and sustainability, although the results are not immediately apparent. (Benau et al., 2021) This research paper embarks on a critical exploration at the nexus of foreign exchange policies and sustainable development aspirations, illuminating the profound impact of foreign exchange reserves allocation on key sectors essential for societal progress. In an era marked by interconnectivity, nations grapple not only with the challenge of bolstering economic stability but also with the imperative of aligning their policies with sustainable development imperatives. The prudent allocation of foreign exchange reserves plays crucial part in addressing it. From funding education initiatives to fortifying healthcare systems, from constructing resilient infrastructures to preserving environmental integrity, the decisions made concerning foreign exchange reserves resonate across sectors critical to human well-being. This study embarks on a comprehensive analysis, delving into the depths of India's foreign exchange policies and their profound implications on sustainable development goals. By scrutinizing the intricate strategies governing foreign exchange reserves allocation, this research endeavours to decode the complexities of

economic decision-making in the context of sustainable development. Through quantitative analysis this paper inquires not only to clear-up the current patterns but also to envision the latent potentialities associated with the alignment of foreign exchange policies specifically with SDG 8. As we stand at the cliff of transformative change, this research aims not just to provide insight but might open roads for actionable strategies. The outcomes that emerge from this study are not theoretical constructs but practical pathways, guiding policymakers, economists, and international organizations toward a harmonious integration of economic stability and sustainable development priorities. With a clear perspective and a determined focus, this research endeavours to bridge gap of India's forex practices and the imperative of sustainable development, contributing a vital framework for navigating global economics.

Review of Literature:

The linkage between foreign exchange reserves allocation and the pursuit of Sustainable Development Goals (SDGs) became a focal point in contemporary economic literature. Scholars have recognized that appropriate management of forex is pivotal in gearing nations towards achieving their goals. The Sustainable Development Goals, encompassing diverse areas from poverty alleviation to environmental conservation, present a multifaceted challenge that necessitates a holistic economic approach. Studies by Smith (2020) and Rivas et al. (2020) underscore the significant impacts of forex allocation on key sectors such as education and Poverty reduction. Forex, when channelled strategically, have the potential to bolster these sectors by providing stable funding, thereby enhancing the quality and accessibility of essential services. Additionally, research by Chua et al. (1994) and Martinez-Solano (2000) has illuminated the role of forex reserves in fortifying infrastructural development, highlighting the far-reaching implications for societal progress. Plenty of literature has delved into the challenges faced by nations in aligning their foreign exchange policies with SDGs. Zeng et al. (2020) discuss the complexities of balancing economic stability with sustainable development imperatives, emphasizing the need for nuanced policy frameworks. Furthermore, studies by Rao (2023) and Sidharth et al. (2023) and Ray (2012) shed light on the opportunities inherent in forex management. Studies by Chanda et al. (2020) is to anticipate India's forex using historical data and soft computing methods, notably the rear transmission of Artificial Neural Network (A.N.N). The outcome represents that, it is possible to predict the probable value of forex for a specific financial year by considering various criterion such as FDI, total expenditure on plan schemes, ratio of export to import, average rate of import duty, followed by India's GDP. According to Sharma & Baby (2019) Both industrialized and developing nations' forex are analysed in terms of the variables affecting their currency composition and it is more economical to manage the currency composition of a nation's net foreign asset position by changing the currency of obligations and assets that are not kept as reserves. Bhasin (2019) used ordinary least squares regression analysis to investigate the factors that affecting inward flows of FDI into the Indian services sector. The outcome shows that these factors, along with trade openness, FDI openness, and the availability of trained labour, have a noteworthy effect on FDI inflows. The study affirms that FDI in the services sector seeks efficiency, and that better access to skilled workers in India results in increased FDI inflows to the sector.

Objectives of the Study:

➢ To explore India's contribution in SDG 8.
➢ To understand Forex Reserve composition of India.
➢ To find out of Foreign Exchange Reserves on Economy's GVA for identifying the linkage with SDG.
   Hypotheses:
• H_o: Forex does not Granger cause GVA.
• H_a: Forex does Granger cause GVA.

Methodology:

The focus of paper is on analysis of Forex reserves, and its effect on the total GVA of Indian Economy. It uses secondary data that is being compiled from different web sources like World bank, RBI, etc. for analysis. The period of data starts from 1980 till 2022 which was required for a Time Series Analysis. For testing of Hypotheses, Granger Causality test is used which is performed using Eviews 12 student version software.
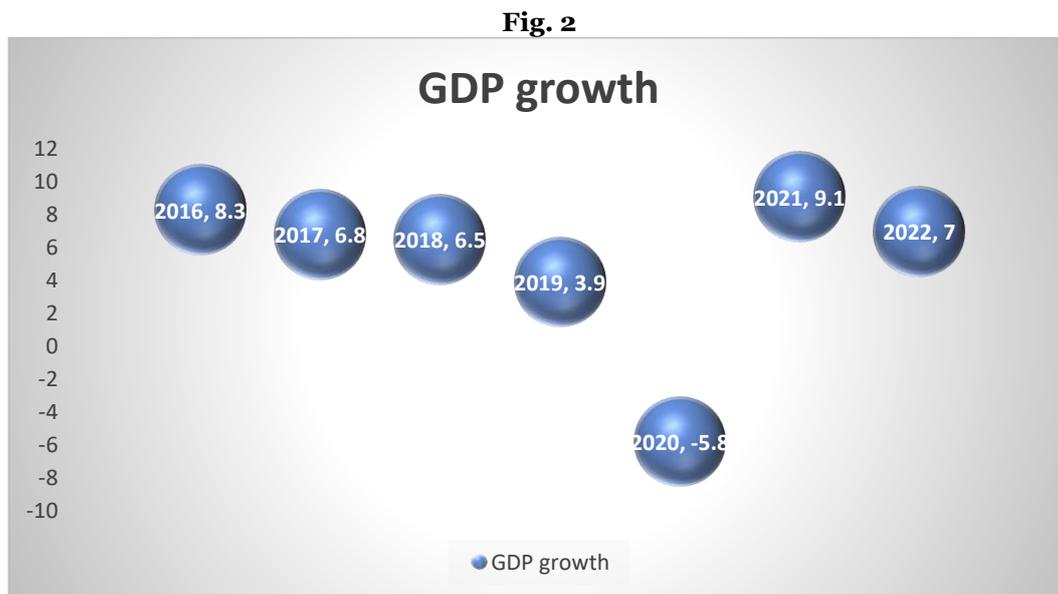
Analysis of Data:
➢ **To explore India's contribution in SDG 8:** the 17 goals listed by the UN for 2030 Agenda of Sustainable Development is called Sustainable Development Goal 8 (SDG 8). The global economy and social well-being are largely driven by it. SDG 8 is focused on encouraging sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. Fig. 1 shows the breakdown of SDG 8:

Fig.1

Source: Sustainable Development Goals (SDG 8) | United Nations Western Europe (unric.org)

1. Economic Growth: SDG 8 highlights the value of economic growth as a key factor in development. To ensure that it benefits all facets of society, this growth must be inclusive and sustainable. The set target for this goal is to achieve 7% growth rate annually in terms of GDP for least developed countries. India is a developing economy which has shown robust growth in recent years. Fig. 2 shows the GDP growth per cent of India since 2016:

Fig. 2

*Authors own compilation **Source:** GDP growth (annual %) - India | Data (worldbank.org)

It is evident from fig.2 that Indian economy was showing continuous growth. It was 8.3% in 2016 it was greater than the set target of 7% as per SDG 8 for developing economies. After that due to certain global circumstances, it has started to be declining, which was 6.8% in 2017, 6.5% 2018 and decrease up to 3.9 % in 2019. The Indian economy grew by just 4% in 2019–20, which was the lowest GDP rate in ten years. They emphasize that the manufacturing sector, which experienced a decline of more than 2% in 2019–20, was where the growth slowdown was predominantly concentrated (Goldar, 2022). The GDP growth became negative in 2020 in four decades, but it increased with a pace and reached to 9.1 % in 2021 followed by 7% in 2022. India is successfully achieving the set target of SDG 8 despite of several challenges.

1. Entrepreneurship, Creativity, and Innovation: as accelerators for economic growth, the objective supports entrepreneurship, creativity, and innovation. This entails assisting new ventures, small firms, employment creating projects and advance the economy. India has achieved a wide spectrum of industrial growth and variety, credit to the MSME sector's outstanding performance. The MSME sector has significantly

aided in the creation of jobs and the development of rural industries thanks to its low-cost structure and large workforce (Gorde et al., 2022). This success has been accomplished through the formalized structure and specialised skills of MSMEs.

2. Efficiency in production and consumption globally: The target "Improvement in Global Resource Efficiency in Production and Consumption till 2030" reflects a global shifting toward more eco-friendly resource utilization. The emphasis is on collective global action while minimizing waste in production and individual consumption. There is still much to learn about how society could transition to responsible production and consumption habits, as well as the factors that can make this possible, the focal point has been on transition of energy and fossil fuel consumption. (Sharma, 2020). Achieving this goal, which is in line with global sustainability goals for 2030, helps to fight environmental degradation, save money, and increase climate change resistance. The sustainability of the world depends on this endeavour and India has a long way to go.

3. Creation of balanced work opportunities for Men and Women with equal Pay: A crucial step toward attaining gender equality worldwide is the 2030 target of equal pay and career options for men and women. It places a strong emphasis on reducing the pay gap between men and women in the workforce and promoting equal pay for all. It is the major issue in India. Despite progress, India's gender pay gap remains high by international standards. In 1993-94, women earned 48% less than men, decreasing to a 28% gap in 2018-19 according to NSSO data (The Gender Pay Gap, Hard Truths and Actions Needed, 2022). To achieve this target equality should be maintained at workplace.

4. Strengthening of Banking, Insurance and Financial Services: this sub goal is essential for economic growth. Banking measures ensure stability and promote investments. The insurance sector provides financial security through diverse products. Enhanced financial services, including digital banking, enhance accessibility and financial literacy. In India, major bank locations spread in metropolitan areas as well as rural areas, reflecting higher development indices. The industry's evolution is driven by trends like enhanced customer focus, boosting competitiveness. Mobile-friendly services, facilitated by channels like Point of Sale (PoS) terminals, have transformed the sector. These channels were predicted to handle 87% of all transactions in 2020, showcasing the sector's digital revolution (BFSI Sector – an Overview of the Banking Industry, 2020).

5. Promotion of economic productivity through diversification of Industry, Tech Upgrades, and Innovation: Sustainable growth depends on enhancing economic productivity through diversification of industries, advancement of technologies advancements, and innovation. Diversification lessens reliance on industries, reducing risks. While innovation encourages creativity and the creation of cutting-edge products, technological advancements increase productivity and worldwide competitiveness. India hold 40th place in between 132 economies, jumping from 81st rank in 2015 to this outstanding achievement, which attests to nation's continued improvement in several innovation-related indicators. Together, these tactics increase economic productivity, assuring future preparedness and resilience.

➤ **To understand Forex Reserve composition of India:** India's economic policy is anchored by how its foreign exchange reserves are managed. These assets served as an essential buffer during the global financial crisis in strengthening India's economy and boosting trust among foreign investors. Prudent management keeps everything in balance, protecting the economy without endangering the state of the budget. India's forex management remains a key pillar for stability and growth among the complexity of the world economy. Gold, Special Drawing Rights (SDR), Foreign Currency Assets (FCA), and the Reserve Tranche Position (RTP) held by the International Monetary Fund (IMF) make up foreign exchange reserves of India. Their overview and current balances till October 6 have been provided in the following section:

FCA: The most significant element of India's foreign exchange reserves is its foreign currency reserve. It comprises of USD, EURO, Pound sterling, etc. It stood to USD 519529 million.
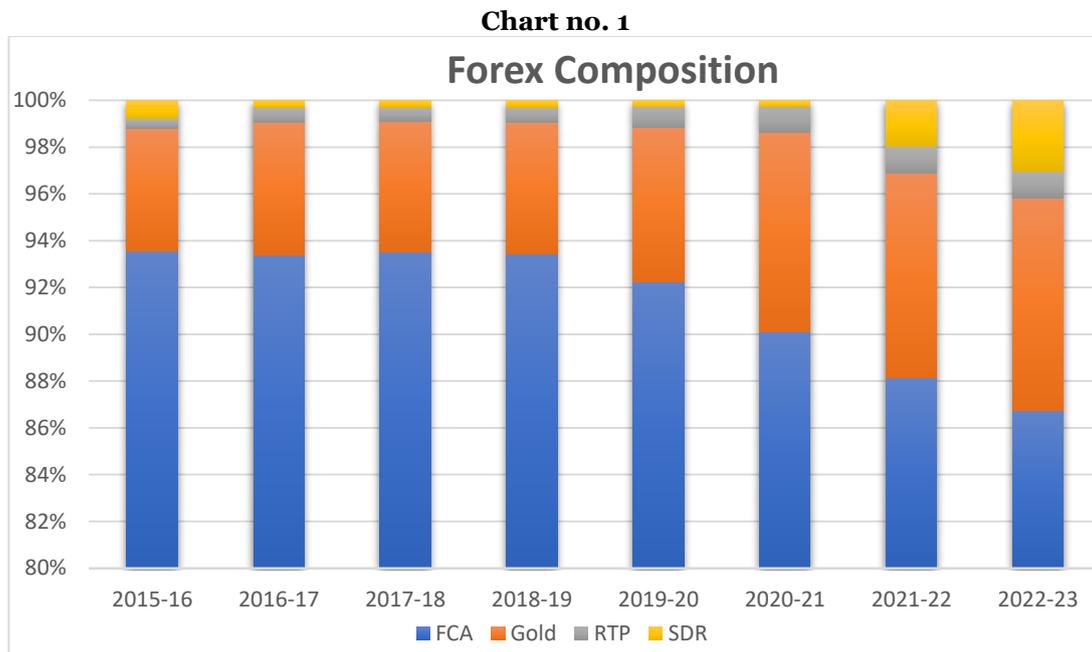
Gold: it acts as safety blanket during economic uncertainty, gold serves as a monetary protection. It stands at USD 42306 million.

SDR: it is asset reserve used internationally established by IMF. It isn't a physical currency but represents a potential claim on freely usable currencies of IMF member countries, providing liquidity and financial stability. Currencies like USD, Pound Sterling, Yen, Yuan, Euro determines its value. It stands up to USD 17923 million.

RTP: The reserve quota in the IMF denotes India's authorized portion in the organization, highlighting India's position and sway inside this global financial institution. It was USD 4983 million.

Forex at a glance:

India's foreign exchange holdings for the week ending October 6 totalled USD 584742 million, as per report of RBI. It took India on 4th spot globally after China, Japan, Switzerland. Chart 1 shows the Forex currency diversification of India. We have taken data from 2015-16 to 2022-23.

Chart no. 1

Author's own compilation Source: Reserve Bank of India - Publications (rbi.org.in)

As shown in Chart 1, historically FCA has contributed the most in Forex Reserves of India. It was 3941347 USD million in 2015-16 and increased with a diminishing rate up to 4687477 in 2022-23. After 2018, the contribution of Gold has been increased and reached from 221723 USD million to 532282 USD million. RTP and SDR has also increased and reached to 65453 USD million and 177579 USD million respectively in 2022-23.

➢ **To find out the impact of Foreign Exchange Reserves on Economy's GVA for identifying the linkage with SDG 8:** The Gross Value Added (GVA) of an economy is greatly influenced by foreign exchange reserves. They serve as a stabilizing force, providing protection against external shocks, facilitating seamless trade, and enhancing investor trust. A healthy reserve position leads to currency stability, fostering optimal conditions for economic growth. Stable exchange rates, facilitated by ample reserves, encourage international trade, and attract foreign investments, positively impacting a nation's GVA. Additionally, these reserves help maintain a balanced current account, minimising sudden currency devaluations and inflation rise. In summary, robust foreign exchange reserves significantly contribute to economic stability, trade expansion, and overall enhancement of a nation's Gross Value Added.

Do Forex Reserves act as a Catalyst for GVA?

For answering this question, we have framed two hypotheses. We utilized a dynamic Granger causality test to explore the causation between Forex and Economy's GVA of India. The deliberate choice of this method over other alternatives was made because it performs well with both large data samples. This approach ensures the reliability and relevance of our results, offering a strong foundation for comprehending the link between the variables. The data has been taken from 1980 to 2022 from the database of World Bank. For checking the stationarity of Forex and GVA data, Augmented Dickey Fuller (ADF) test at 2 lag difference is being used, which is necessary in granger causality test.

H_0: D(Forex,2) has a unit root

Table 1

		t-Statistic	Prob.*
Augmented Dickey-Fuller	test statistic	-5.941811	0.0000
Test critical values:	1%	-3.615588	
	5%	-2.941145	
	10%	-2.609066	

*MacKinnon (1996) one-sided p-values.

Table 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FOREX (-1),2)	-3.398119	0.571900	-5.941811	0.0000
D(FOREX(-1),3)	1.595369	0.416226	3.832936	0.0005
D(FOREX(-2),3)	0.554251	0.225053	2.462760	0.0190
C	3.602248	5.472626	0.658230	0.5148

After applying the Augmented Dickey-Fuller (ADF) test, the data exhibits stationarity trends at 5% level of significance as shown in Table 1 & 2. As a result, the null hypothesis stating that forex has a unit root has been rejected. This implies that the data does not possess a unit root, indicating a stable and non-random pattern, which is essential for further statistical analysis.

H_0: D(GVA,2) has a unit root

Table 3

		t-Statistic	Prob.*
Augmented Dickey-Fuller	test statistic	-5.585948	0.0000
Test critical values:	1%	-3.632900	
	5%	-2.948404	
	10%	-2.612874	

*MacKinnon (1996) one-sided p-values.

Table 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GVA (-1),2)	6.786015	1.214837	-5.585948	0.0000
D(GVA(-1),3)	4.704791	1.130935	4.160091	0.0003
D(GVA(-2),3)	3.637798	0.985928	3.689719	0.0010
D(GVA(-3),3)	2.505676	0.774235	3.236323	0.0031
D(GVA(-4),3)	1.517713	0.500766	3.030784	0.0052
D(GVA(-5),3)	0.852912	0.258904	3.294317	0.0027
C	27.96480	16.86038	1.658610	0.1084

Table 3 & 4 has demonstrated stationary trends at significance level of 5%. Consequently, the null hypothesis, suggesting the presence of a unit root in GVA data, has been rejected. This rejection indicates that the data lacks a unit root and possesses a stable, non-random pattern.
The main hypotheses of this study are:

H_0: Forex does not Granger cause GVA.
H_a: Forex does Granger cause GVA.

Table no. 5

Pairwise Granger Causality Test			
Null Hypothesis	Obs.	F-Statistic	Prob.
Forex Doesn't Granger Cause GVA	41	9.81592	0.0004

The results shown in table 5 represents higher F-statistic 9.81592 indicating a strong relationship between the variables that are tested. The p-value is 0.0004 at 5% level of significance, indicating that there is a small probability of observing such a strong relationship between the variables by chance. The low p-value leads to rejection of null hypothesis. This implies there is strong evidence to suggest Granger causality between the variables. In other words, past values of forex reserve significantly predict the GVA and Forex does granger cause GVA.

Interpretation of results: the results obtained are statistically significant through which we can infer that forex reserves have direct impact on economy's GVA. We have found compelling evidence to support the idea that forex reserves play a significant and direct role in shaping the economic performance of a country, as measured by its GVA.

Conclusion:

A country's Gross Value Added (GVA) and economic stability are greatly influenced by its foreign exchange reserves. India's forex is envelope of FCA, Gold, SDR and RTP. They serve as a financial safety net, fostering stability and confidence in the economy. Well-managed reserves have an impact on exchange rates, which directly affect GVA. A strong reserve position promotes economic growth and currency stability, which draw

foreign investments. Exchange rates that are stable promote international trade and attract foreign investment to the country. Reserves protect against unexpected currency devaluations in uncertain economic times, maintaining GVA. These financial security-providing reserves contribute significantly to improving a country's economic environment. The contribution of Forex in GVA of India is remarkable to achieve SDG 8. The set targets of SDG can be achieved not merely by Forex but the contribution of other factors too. So, we need holistic and inclusive approach.

Suggestions:

Managing foreign exchange reserves responsibly must be a top priority for all countries. This entails ongoing assessment and adjustment to the state of the world economy to maintain a solid position against possible shocks. Furthermore, promoting economic resilience by increasing openness in reserve management practices can boost investor and market confidence. Efforts to share best practices in reserve management through international cooperation should be made. Additionally, investing in research and development to comprehend the changing dynamics between foreign exchange reserves and economic indicators may offer insightful information that can help nations make better judgments. Forex reserves stabilize economies, enabling investments in key SDG sectors like education and healthcare, technology, and innovation. Well-managed reserves enhance international trade, attracting investments crucial for SDG advancement. Moreover, they offer stability amid economic uncertainties, ensuring steady funding for sustainable projects.

Recommendations:

This study has primarily focused on the trends in foreign exchange reserves and its role in SDG8. However, SDG 8 is also influenced by a number of other factors also, including exports, MSMEs, BFSIs, FDIs, FIIs, Agriculture, Sevices sector, Manufacturing Sector, etc. There is a scope of further study to determine how these factors affect India in achievement of SDG 8. This study was concentrated on one nation i.e. India. So, there is a possibility to do a comparative analysis between different nations.

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