The Nexus Between Currency Crises and Macroeconomic Variables: A Theoretical Perspective

Rahat Zabi
Research Scholar,
 Department of Business Administration, Khwaja Moinuddin Chishti Language University, Lucknow.
Email-Id: zabi.rahat123@gmail.com

Dr. Doa Naqvi
Assistant Professor,
Department of Business Administration, Khwaja Moinuddin Chishti Language University, Lucknow.
Email-Id: doa.naqvi@gmail.com

Dr. Neeraj Shukla
Assistant Professor,
Department of Commerce, Khwaja Moinuddin Chishti Language University, Lucknow.
 Email-Id: neerajshukla@kmclu.ac.in

Abstract:

Throughout history, the global economy has experienced repeated episodes of financial turmoil, including the Tulip Mania of 1636, the 1929 Great Depression, the 1992 European Currency Crisis, the Mexican Crisis 1994 the 1997 Asian currency turmoil, the 1998 financial crises in Russia and Latin America, Argentina's severe economic downturn between 1998 and 2002, the 2008 global subprime mortgage crisis, and the economic disruption associated with the COVID 19 pandemic. A financial crisis generally occurs when credit and asset prices change abruptly, the normal operation of financial institutions is disrupted, balance sheets in many parts of the economy become fragile, and large-scale support from the government is required. In the academic literature, crises are typically grouped into four categories: exchange rate crises, sudden stop episodes or balance of payments crises, crises involving sovereign debt and banking crises. A currency crisis arises when a currency comes under intense speculative pressure that leads to a marked devaluation or depreciation. In defending the currency, authorities may run down foreign exchange reserves, sharply increase interest rates, or introduce capital controls, particularly under fixed exchange rate regimes. Around such episodes, macroeconomic indicators such as international reserves, trade balances, exchange rates, interest rates, domestic credit, and foreign debt ratios tend to show pronounced movements. Speculative attacks, whether successful or not, often impose high adjustment costs, either through large exchange rate depreciation or through severe reserve losses and elevated interest rates.

Keywords: Financial Crisis, Currency Crisis, Macroeconomic Variables.

1. Introduction

Numerous financial crises have occurred throughout the history of the world economy. Some examples include the Tulip Mania of 1636, the 1929 Great Depression, the 1992 European Currency Crisis, the Mexican Crisis 1994, the 1997 Asian currency crisis, the 1998 Russian financial turmoil, the 1998 crisis episodes in Latin America, Argentina's deep recession between 1998 and 2002, the 2008 subprime financial crisis, and the economic downturn associated with the Covid 19 pandemic.

The 2007-09 global subprime crisis highlighted again how complex and multifaceted financial crises can be. In the more recent period, the Covid-19 pandemic and the weakening of the global economy associated with the Russia-Ukraine conflict have generated severe strains for many developing economies (Trebesch et al., 2021; Kose et al., 2022; Rijkers et al., 2022; Chuku et al., 2023).

According to the International Monetary Fund (2022), More than sixty percent of low-income economies are currently considered to face a high likelihood of debt distress, suggesting that they may not be able to meet their debt obligations and may have to seek external financial support. This share is around three times higher than that observed during the 2008 episode of global financial stress. Financial crises therefore threaten both small and large economies, regardless of their income level. Reinhart and Rogoff (2009) describe financial crises as a truly global hazard, cutting across time, geography, and institutional arrangements. Crises can originate from domestic sources or from global shocks, and they may emerge from either the public or the private sector.

Financial crises take many forms. They evolve over time, can spread rapidly across borders, and often demand swift and comprehensive policy responses. They typically involve major disruptions in financial markets and institutions, substantial changes in fiscal and monetary policies, and, in many cases, coordinated international action. The widespread repercussions of the most recent global crisis related to Covid-19 underline the importance of a thorough understanding of the nature, transmission, and consequences of crises. Recent experience has shown clearly that the fallout from financial collapses can be large and persistent, and that these events strongly shape the design of economic policies. As a result, the analysis of the impacts of crises and of appropriate policy responses has become central to contemporary policy debates.

In general, a financial crisis reflects a combination of factors. These often include large swings in asset

prices and credit volumes, severe disruptions in the process of financial intermediation, difficulties in balance sheets across sectors, and a need for sizable government intervention. Episodes of financial stress are frequently preceded by credit and asset price booms that eventually turn into busts, driven by a range of underlying forces. Consequently, many theoretical approaches to the origins of financial crises emphasize sudden shifts in credit conditions and asset valuations.

The literature distinguishes several types of financial crises. Common categories include sudden stop crises (also referred to as balance of payments or capital account crises), banking crises, debt crises, and currency crises. Although researchers have identified several factors associated with these events, it remains challenging to pin down their precise causes. Over time, several hypotheses have been developed to explain the fundamental drivers of crises. While core elements such as macroeconomic imbalances, external or domestic shocks, and structural weaknesses are frequently mentioned, important questions remain about the exact mechanisms that trigger crises. In addition, financial crises often appear to be influenced by seemingly "irrational" forces, such as waves of optimism and pessimism in financial markets.

The interaction between macroeconomic and financial variables during crisis episodes has been extensively studied. Even though crises differ in their specific features, the literature has developed relatively clear criteria for identifying distinct types of events. A currency crisis is typically defined as a situation in which intense speculative pressure on a currency leads to a devaluation or a sharp depreciation or forces the authorities to defend the currency by drawing down foreign exchange reserves, raising interest rates steeply, or imposing capital controls (Krugman, 1979; Kaminsky & Reinhart, 1999). A sudden stop, also known as a capital account or balance of payments crisis, involves a rapid and often unexpected decline in capital inflows or a sudden reversal of these flows, usually accompanied by a marked increase in the country's credit spreads (Calvo, 1998; Calvo et al., 2004). A banking crisis arises when a large part of the banking system becomes illiquid or insolvent, triggering bank runs, closures, and extensive government intervention (Laeven & Valencia, 2013; Reinhart & Rogoff, 2009). A sovereign debt crisis is observed when a government cannot, or is unwilling to, service its debt fully and on time, leading to default, restructuring, loss of market access, and often the need for external assistance (Eaton & Gersovitz, 1981; Reinhart & Rogoff, 2010). A twin

crisis refers to the close coincidence of a banking crisis and a currency crisis, which tend to reinforce each other and generate especially large real and fiscal costs (Kaminsky & Reinhart, 1999; Reinhart & Rogoff, 2009). An asset price or stock market crisis is characterized by the collapse of equity, housing, or other asset prices following a boom or bubble, with significant negative wealth effects and possible spillovers to the banking system (Kindleberger & Aliber, 2011; Shiller, 2000). Finally, a systemic financial crisis denotes a broad-based disturbance that severely impairs the functioning of the entire financial system, disrupting credit intermediation and payments on a large scale and usually requiring extensive public sector intervention (Laeven & Valencia, 2013; Claessens et al., 2010).

The main purpose of this study is to investigate the role of financial indicators during periods of currency crisis and to assess how these indicators can assist policymakers in making decisions both before the onset of crisis and in its aftermath. This research is structured as follows: next section provides an extensive review of the literature on currency crises and macroeconomic variables. The subsequent sections describe the methodology, present the empirical insights from literature, results and conclusion.

2. Currency Crises and Macroeconomic Variables: An Extensive Literature Review

The relationship between currency crises and macroeconomic variables is complex and has been widely examined in the economics literature. Currency crises typically arise when a country faces a sudden and sharp depreciation or devaluation of its currency, often accompanied by severe financial and macroeconomic instability. Understanding how macroeconomic factors behave before and during these episodes is essential for predicting, preventing, and managing such crises.

A large group of studies follows the early warning approach of Kaminsky et al. (1998), who organise indicators into three main blocks. The financial sector is described by the domestic credit to GDP ratio, the real interest rate, bank deposits, the lending to deposit rate ratio, the M2 multiplier, excess M1 balances, the ratio of M2 to reserves, and stock market prices. The real sector is represented by output. The external sector is captured through the real exchange rate, terms of trade, exports, imports, the real interest rate differential, and international reserves. This structure highlights the joint role of real activity, external competitiveness, and financial conditions in driving currency pressure.

According to Kawai (1998), one of the main lessons from the East Asian crisis is the need to address private sector debt overhang. Excessive reliance on short term, unhedged, foreign currency denominated debt exposes an economy to the danger of sudden loss of investor confidence, rapid capital outflows, and sharp exchange rate depreciation. This process worsens the balance sheet positions of firms and households and amplifies the overall economic downturn (Kawai, 1998).

Aziz et al. (2000) define a currency crisis as a speculative attack on a currency that leads to a devaluation or large depreciation or forces the authorities to defend the currency by running down international reserves or sharply raising interest rates. Their evidence shows that such crises occur more often and with greater intensity in low income and developing economies. Crises are classified into several types, including currency crashes driven by sharp exchange rate depreciation, reserves crises driven by large reserve losses, and twin crises linked to banking sector distress. In the run up to crises, key macroeconomic variables display systematic patterns. The real exchange rate tends to become overvalued, export growth slows, competitiveness weakens, and terms of trade often deteriorate just before the crisis. Meanwhile, inflation is higher than in tranquil periods, broad and narrow money growth rise above normal levels, and domestic credit expands, highlighting the combined impact of monetary expansion, credit booms, and price pressures in building vulnerabilities to currency crises.

Calvo and Reinhart (2000) note that currency crises remain a persistent challenge for many economies, especially in developing and emerging markets. These crises are often associated with sudden stops in capital inflows, sharp exchange rate depreciations, stress in the domestic financial system, and broader macroeconomic instability. The Exchange Rate Mechanism crisis in Europe in the early 1990s, together with the series of crises in emerging markets during that decade, underline the importance of gaining a clearer understanding of the forces that lead to currency instability.

Subsequent contributions broaden the information set in currency crisis analysis. Cerra and Saxena (2002) examine currency crises using a wide range of macroeconomic and financial variables, including the real effective exchange rate, the average nominal exchange rate, government consumption expenditure, unit values of exports and imports, total exports and imports, gross domestic product, capital inflows, an industrial production index, gross fixed capital formation, the

current account balance, a measure of political confidence, high powered money, domestic credit, and both government revenue and government expenditure.

Bird & Milne (2004) emphasize several macroeconomic variables that are closely linked to the likelihood of currency crises. Rapid capital inflows and heavy borrowing in foreign currency can increase an economy's vulnerability to a sudden reversal in capital flows. When such a reversal occurs, the exchange rate can depreciate sharply, and the financial system can experience severe stress. Weak macroeconomic fundamentals, including large fiscal deficits, high inflation, and an overvalued exchange rate, further heighten the risk by generating imbalances that eventually become unsustainable.

Kang (2004) analyses currency crises using a broad set of macroeconomic and financial variables, including export concentration, changes in the S and P rating, the ratio of foreign debt of the banking sector to reserves, the M2 multiplier, an industry inventory index relative to the output index, the price of the service sector relative to the manufacturing sector, reserves, the operation rate of the manufacturing sector, terms of trade, the capital account balance relative to GDP, the ratio of M2 to reserves, the fiscal deficit relative to GDP, the real effective exchange rate, the real interest rate differential, the bankruptcy rate, stock prices, the industrial production index, exports, bank deposits, excess real M1 balances, imports, and the current account balance relative to GDP (Kang, 2004). These studies underline that structural features, credit conditions, and external financing constraints all matter for crisis risk.

Peng and Bajona (2008) study currency crises by organising their indicators into three broad groups: financial, real, and external. In the financial area, they include the M2 multiplier, the domestic credit to GDP ratio, excess M1 balances, the real interest rate, the lending to deposit rate ratio, the ratio of M2 to reserves, bank deposits, and stock prices. The real area is represented by output, while the external area comprises terms of trade, international reserves, exports, the real exchange rate, imports, and the real interest rate differential.

Candelon and Dumitrescu (2012) concentrate on indicators from the external and financial sectors. For the external sector, they use imports, exports, the ratio of M2 to foreign reserves, the one-year growth rate of international reserves, and the one-year growth rate of the M2 to reserves ratio. The

financial sector is described by domestic credit over GDP, its one-year growth rate, the real interest rate, and the degree of real exchange rate overvaluation. This specification highlights how movements in external buffers and domestic credit conditions act as important determinants of currency pressures.

Ari (2012) attributes the Turkish crises to a combination of macroeconomic imbalances and structural weaknesses. These include large budget deficits, rapid growth of the money supply, an overvalued real exchange rate, a steep rise in short term external debt, vulnerabilities in the banking sector, and adverse external shocks, particularly those related to the terms of trade.

Cumperayot and Kouwenberg (2013) identify a comparable group of indicators as central for evaluating currency crisis risk. Their set of variables comprises the real effective exchange rate, imports, exports, international reserves, terms of trade, the real exchange rate, the real interest rate, the domestic credit to GDP ratio, the real interest rate differential, excess real M1 balances, the M2 multiplier, the lending to deposit rate ratio, real commercial bank deposits, output, the ratio of M2 to reserves, stock market prices, total foreign debt, and the share of short term foreign debt.

More recent studies add fiscal variables, commodity prices, and country specific indicators. Rao Rao Balaga and Padhi (2017) specify a financial sector block that comprises excess M1 balances, the M3 multiplier, bank credit, the real interest rate, stock prices with the BSE stock index as a proxy, the lending to deposit ratio, and the ratios of M3 to reserves and to total deposits. Their external sector block includes exports, terms of trade, the real exchange rate, gold prices, imports, international reserves, the current account deficit, and crude oil prices. The real sector is proxied by output, measured through the index of industrial production, and the fiscal sector is represented by the fiscal deficit expressed as a percentage of GDP.

Adams and Metwally (2019) focus on the EGP to US dollar exchange rate, the budget deficit, the current account balance, exports, imports, the interest rate spread, national debt, deviations of the real exchange rate, the real interest rate, terms of trade, foreign exchange reserves, and the United States interest rate.

Mohana Rao and Padhi (2019) use a comparable framework. In the financial sector block, they include the M3 multiplier, bank credit, the real interest rate, a stock market indicator based on the

BSE stock index, excess M1 balances, and the ratios of M3 to reserves and to total deposits. Their external sector block consists of exports, terms of trade, the real exchange rate, imports, international reserves, the current account balance as a share of GDP, gold prices, and crude oil prices. The real sector is represented by the index of industrial production, while the fiscal sector is captured by the fiscal deficit expressed as a percentage of GDP.

Finally, Abdelsalam and Abdel Latif (2020) propose a more compact set of indicators that explicitly combine external, monetary, and financial variables. They consider the ratio of the change in exports to the change in imports, the change in the demand for domestic credit, the real exchange rate, a stock market index, the change in the ratio of broad money to foreign reserves excluding gold, the change in the price of crude oil, the United States interest rate, and a foreign exchange pressure index (Abdelsalam & Abdel Latif, 2020). This specification aims to capture shifts in trade performance, domestic credit conditions, global financial conditions, and direct pressure on the currency.

Together, these studies show that currency crises are closely linked to the interaction of macroeconomic fundamentals, financial sector conditions, and external vulnerabilities. They also provide a set of indicators that can be used to monitor crisis risk and to design timely policy responses.

2.1 Currency Crisis Models and Their Key Indicators

The literature distinguishes three broad generations of currency crisis models; each associated with a specific set of macroeconomic and financial indicators and with a different emphasis on the mechanisms that lead to crisis.

1- First Generation Models

First generation models emphasise the mismatch between a fixed exchange rate arrangement and domestic macroeconomic policies. In this framework, ongoing fiscal deficits, frequently financed through rapid monetary expansion, generate strong growth in the money supply, higher inflation, an overvalued real exchange rate, and increasing current account and trade deficits. At the same time, foreign exchange reserves are gradually run down, and domestic interest rates usually rise as the authorities try to maintain the exchange rate. When investors come to believe that the fixed parity

can no longer be sustained, they engage in a speculative attack that leads to a sharp depreciation of the currency or the abandonment of the peg. The main indicators associated with first generation models are rising fiscal budget deficits, rapid monetary growth, high and increasing inflation, overvalued real exchange rates, sizeable current account and trade deficits, substantial losses of foreign reserves, and upward pressure on domestic interest rates (Krugman, 1979; Ari, 2012).

2- Second Generation Models

Second generation models shift the emphasis from purely fundamental imbalances to the role of expectations and policy trade-offs. In this framework, governments face a choice between maintaining the exchange rate commitment and pursuing other objectives, such as supporting output or employment. If defending the peg requires very high interest rates or deep recessions, the authorities may decide that abandoning the fixed rate is preferable. Expectations become self-fulfilling in this setting. When investors anticipate that the government will eventually devalue, their actions raise the cost of maintaining the peg and can turn devaluation into the rational policy choice even when fundamentals are not extremely weak. The central indicator in second generation models is therefore the presence of self-fulfilling expectations driven by investor beliefs about future policy actions (Obstfeld, 1996; Ari, 2012; Ari & Cergibozan, 2016).

3- Third Generation Models

Third generation models incorporate financial sector fragilities, balance sheet problems, and cross-country contagion. These models highlight how currency crises are linked to mismatches in the balance sheets of banks, firms, and sometimes the public sector, especially when banks and firms carry large obligations in foreign currency but hold most of their assets in the home currency. A sharp depreciation of the exchange rate can then trigger a sudden deterioration in net worth, leading to banking distress, corporate failures, and a deeper macroeconomic contraction. Moral hazard, created by explicit or implicit guarantees, encourages excessive risk taking and foreign currency borrowing, which amplifies vulnerabilities. In addition, contagion effects can transmit crises across countries through financial linkages and shifts in investor sentiment. The main indicators associated with third generation models are balance sheet mismatches, moral hazard in borrowing and lending, and the presence of contagion effects across economies (Ari, 2012; Ari & Cergibozan, 2016).

Taken together, these three generations of models provide a structured theoretical framework that links specific indicators to the likelihood and form of currency crises and helps to interpret empirical evidence on crisis episodes.

Overall, the literature on currency crises and macroeconomic variables is broad and multifaceted. Existing research has identified a range of factors that influence both the onset and the severity of crises, including rapid credit expansion, low levels of international reserves, overvalued exchange rates and large current account deficits (Chang & Velasco, 1999; Willett et al., 2004). Together, these studies underline that currency crises are rarely the result of a single weakness. Rather, they emerge from the interaction of domestic macroeconomic imbalances, fragile financial structures and external shocks.

3. Methodology

This research is built on a theoretical literature review that focuses on the relationship between currency crises and macroeconomic variables. A theoretical literature review helps to locate and examine existing theories, clarify how they are connected, assess the depth and scope of prior investigations.

The framework used in a study is grounded in the author's academic discipline and in the body of literature related to the topic and the theoretical perspective adopted. A theoretical framework brings together existing ideas, relevant constructs, and empirical evidence (Rocco & Plakhotnik, 2009; Luft et al., 2022).

4. Empirical Insights from the Literature

Empirical insights from the literature show that key indicators are used to examine how macroeconomic variables behave in the period before currency crises. Building on this evidence, this section analyses the behaviour of selected macroeconomic variables to assess whether their movements signal rising vulnerability to currency crises.

1. **Exchange Rate**

The choice of exchange rate regime plays a central role in determining a country's exposure to currency crises. Fixed or tightly managed exchange rates can create significant vulnerabilities when domestic macroeconomic policies are not fully aligned with the requirements of maintaining the peg.

In such situations, any inconsistency between fiscal, monetary and external sector policies and the fixed exchange rate can invite speculative pressure. The 1997 Asian Financial Crisis provides a clear illustration. Several countries with pegged exchange rate systems experienced massive speculative attacks and sharp devaluations once capital flight intensified and the authorities were no longer able to sustain the fixed parity (Eichengreen & Hausmann, 1999).
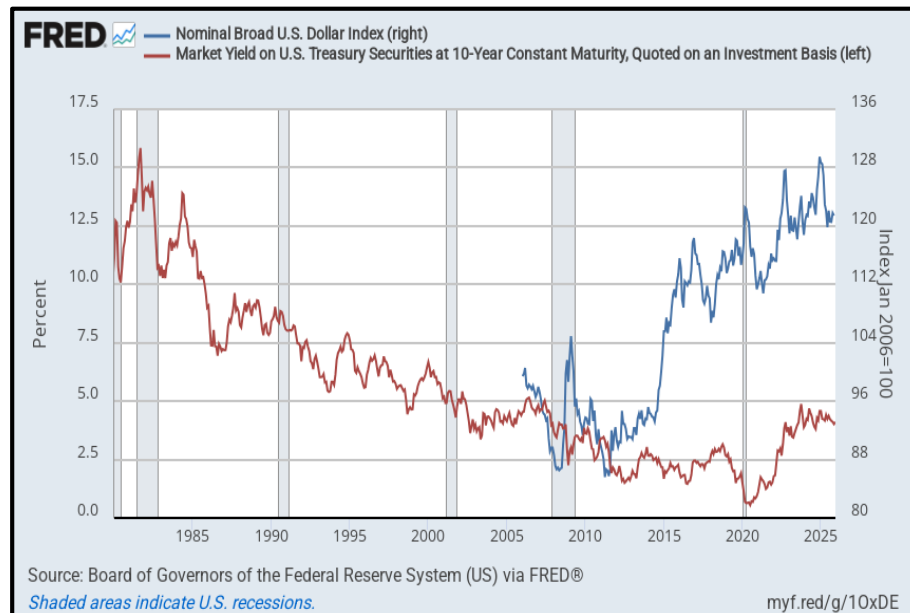

Figure-1
Source: fred.stlouisfed.org

Figure 1 suggests that movements in the nominal broad dollar index may provide signals of upcoming crises. In the period before the subprime crisis the earlier decline in the index slowed and then reversed, pointing to rising demand for dollar assets and tighter global financial conditions. In the years just before covid 19 the index was already on an upward path, and its further appreciation at the start of the pandemic indicated renewed haven flows and growing stress. Taken together, these patterns imply that a sustained appreciation of the nominal exchange rate index can be interpreted as a potential early warning indicator of heightened crisis risk.

2. **Current Account Deficits**

Large and prolonged current account deficits show that a country is spending more than it earns and is relying on external borrowing or capital inflows to cover the gap. This situation increases the

economy's vulnerability to a sudden interruption of those inflows. If foreign investors lose confidence and cut back their holdings, the resulting reversal of capital can cause a sharp fall in the currency's value and trigger a crisis (Krugman, 1979).
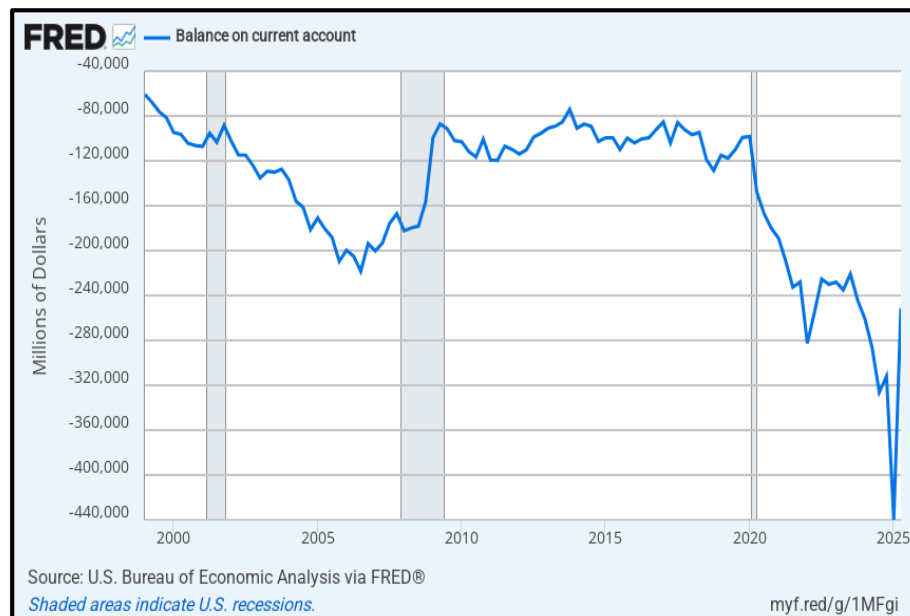

Figure-2
Source: fred.stlouisfed.org

Figure 2 reports the United States current account balance, which remains in deficit throughout. Before the subprime crisis the deficit widens, suggesting rising external imbalance, but it narrows once the crisis begins. Around covid 19 the deficit deepens sharply mainly during the shock. Thus, the current account behaves more as a concurrent indicator of stress than as a clear early warning of crisis.

3. **Foreign Exchange Reserves**

The level of foreign exchange reserves is another critical determinant of crisis vulnerability. Countries with low reserve buffers are more exposed to speculative attacks because they have limited capacity to intervene in foreign exchange markets when their currencies come under pressure. Reserves function as a line of defence, allowing the authorities to smooth temporary shocks and to signal strength to markets. During periods of global turbulence, countries with substantial reserves, such as China during the 2008 global financial crisis, were generally better positioned to absorb external shocks and to avoid disorderly currency adjustments (Obstfeld et al., 2010).

Figure-3
Source: fred.stlouisfed.org

Figure 3 presents United States total foreign exchange reserves excluding gold. The series is broadly stable before the subprime crisis and then rises during and after both the subprime and covid 19 episodes, with no clear fall in reserves ahead of these crises. This pattern is consistent with the role of the United States as a developed economy and issuer of a reserve currency. In many emerging economies, by contrast, a sustained decline in reserves often appears as an early signal of an impending currency crisis.
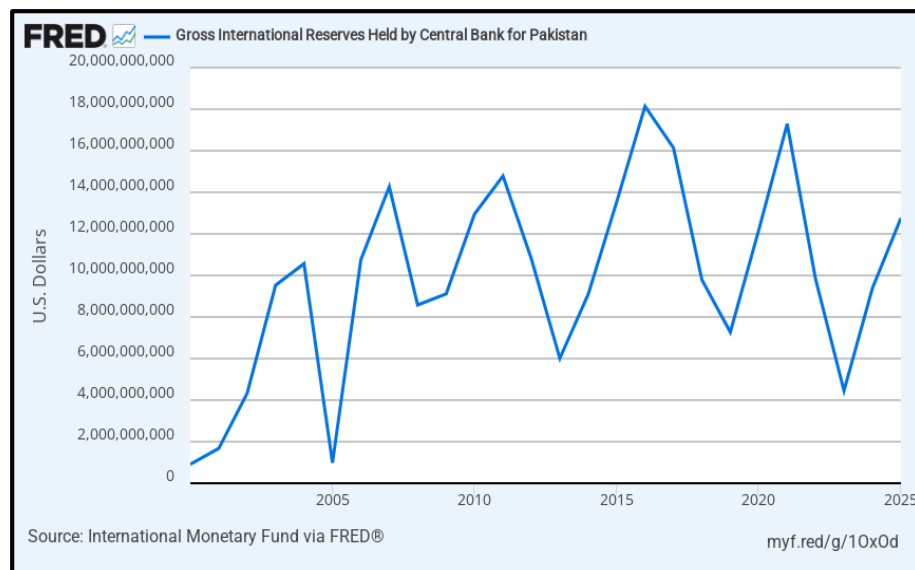

Figure-4
Source: fred.stlouisfed.org

For an emerging country like Pakistan, gross international reserves show (see figure-4) a clear declining trend around both the subprime crisis and the covid 19 period. The sharp falls in reserves during these episodes indicate rising external pressure and act as an early signal of possible currency and balance of payments crises.

4. **Debt Levels**

The total stock of external debt, and in particular the proportion that is short term, is strongly linked to the likelihood of a currency crisis. When external indebtedness reaches very high levels, or when a large share of that debt must be refinanced frequently, doubts about the country's solvency or liquidity can arise. If investors come to expect default or refinancing problems, they may pull out their funds quickly. Such an abrupt withdrawal can lead to a steep depreciation of the currency and trigger a full-scale crisis (Ari, 2012). The exposure is even more serious when a large part of the debt is denominated in foreign currency.
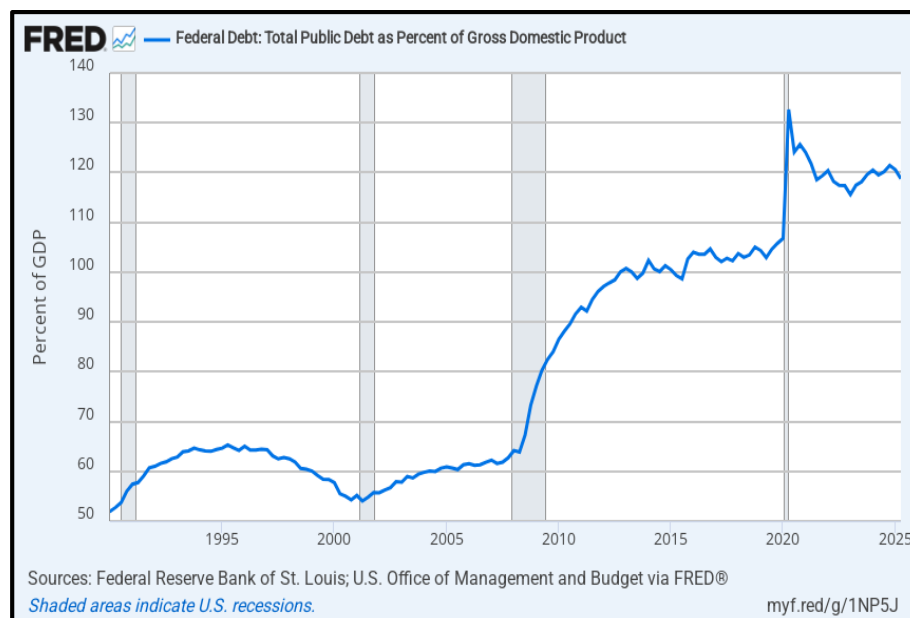

Figure-5
Source: fred.stlouisfed.org

Figure-5 shows United States federal debt as a percentage of GDP. The debt ratio moves up gradually in the early 2000s and then rises more quickly around the subprime crisis, which suggests increasing fiscal pressure before and during the 2007 to 2009 recession. Around covid 19 the debt ratio jumps

sharply as crisis related spending expands, so in this case the movement mainly reflects the fiscal response once the shock has occurred rather than a clear advance signal

5. **Inflation and Interest rates**

High and unstable inflation tends to undermine investor confidence and can contribute to capital outflows. When prices rise rapidly, the real value of financial assets denominated in domestic currency declines, and investors may seek safer assets abroad. In response to exchange rate pressures, authorities sometimes raise interest rates aggressively to defend the currency. While higher interest rates can temporarily support the exchange rate, they also weaken domestic demand, increase the burden of existing debt and may deepen financial stress. An inappropriate interest rate response can therefore aggravate the crisis rather than resolve it (Kaminsky et al., 1998).
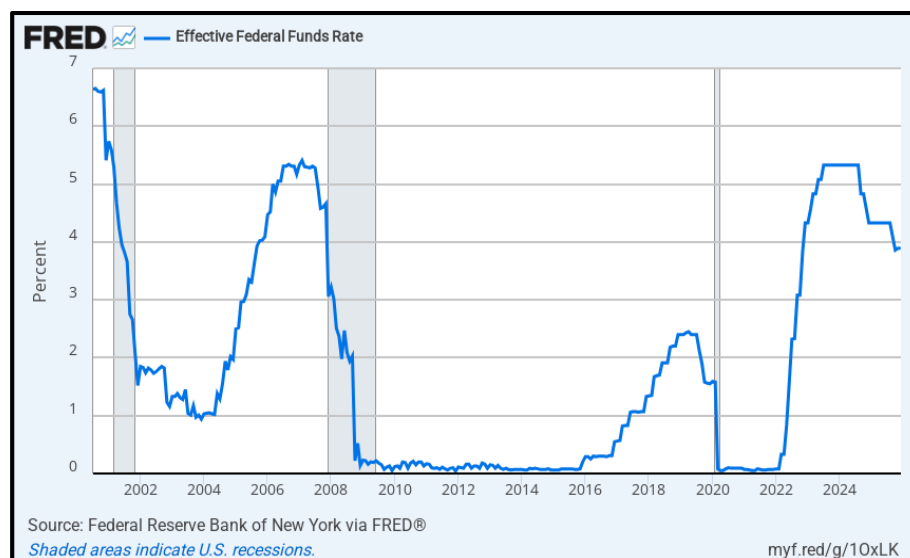

Figure-6
Source: fred.stlouisfed.org

Figure-6 shows the United States effective federal funds rate, which is the primary short-term interest rate set by the Federal Reserve. Before the 2007 to 2009 subprime crisis this US rate rose for several years and was then cut very quickly when the crisis began. A similar pattern appears around covid 19, with steady increases before 2019 and sudden cuts to near zero at the start of the pandemic. This suggests that a long period of rising US interest rates followed by fast reductions can signal growing stress in the economy.

6. Capital flight and Speculative Attacks

Expectations play a crucial role in the dynamics of currency crises. When investors anticipate that a currency will depreciate soon, they tend to move their capital out of the country in advance. This behaviour can become self-fulfilling. Capital flight reduces reserves, intensifies pressure on the currency and encourages further speculation. Many empirical studies document that speculative attacks and sudden reversals of capital flows often precede and accompany currency crises (Kaminsky et al., 1998).
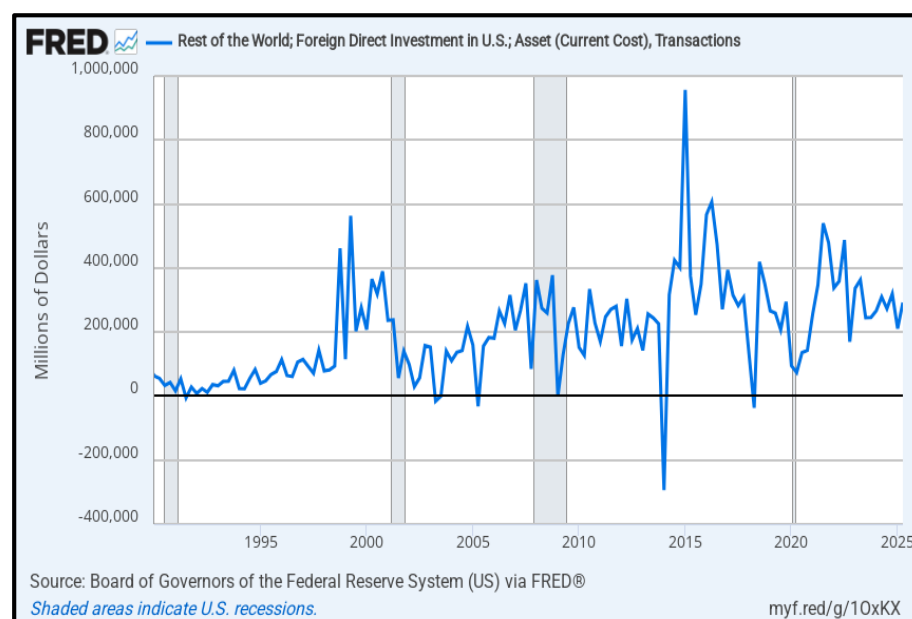

Figure-7
Source: fred.stlouisfed.org

Figure-7 reports foreign direct investment flows from the rest of the world into the United States. The series rises over the long run but is very volatile. Inflows drop sharply around the subprime crisis, and there is another decline during the covid 19 period. These movements show that foreign direct investment reacts to episodes of stress, but its volatility means it is a noisy indicator rather than a clear advance signal of crisis.

Insights from the literature show that studies on currency crises rely on a broad set of indicators from the real, external, financial, and fiscal sectors. In line with the literature, the examined variables in this study suggest that exchange rates, current account deficits, foreign exchange reserves, interest

rates, inflation, government debt, investor behaviour, and capital inflows and outflows can provide useful signals about the risk of an upcoming crisis.

At the same time, the review and analysis indicate that other variables also deserve attention as potential early warning indicators. Output, exports, imports, terms of trade, monetary aggregates, domestic credit, stock prices, and fiscal balances all appear in earlier research as relevant for tracking rising vulnerability to currency crises and can be incorporated in future empirical work.

5. Results

Based on the evidence discussed in this paper, the results show that currency crises are linked to a broad set of macroeconomic and financial variables rather than a single indicator. The analysis and the literature together suggest that the nominal exchange rate, the current account balance, foreign exchange reserves, interest rates, inflation, government debt, and capital flows are central for signalling rising crisis risk. In addition, output, exports, imports, terms of trade, monetary aggregates such as M2 and broad money, domestic credit, stock prices, bank deposits, and fiscal balances also appear as important early warning variables. Taken as a whole, the evidence indicates that monitoring these key indicators in combination can help to predict upcoming currency crises more effectively than focusing on any single variable.

6. Conclusion

In conclusion, the relationship between currency crises and macroeconomic variables is complex but clearly systematic. Theoretical models and empirical studies together show that crises do not arise from a single weakness, but from the interaction of several real, external, financial, and fiscal indicators. A currency crisis usually appears when a country faces sharp depreciation of its currency, capital flight, and loss of foreign exchange reserves. These outcomes are closely linked to underlying macroeconomic variables, especially in fixed exchange rate regimes where low reserves and policy inconsistencies make the system more vulnerable to speculative attacks.

The evidence reviewed in this study suggests that a range of macroeconomic and financial variables can help in understanding currency crisis episodes. The literature frequently employs indicators such as the nominal exchange rate, the current account balance, foreign exchange reserves, interest rates, inflation, government debt, capital flows, and investor behaviour in currency crisis analysis.

Consistent with this, the present study has concentrated on a subset of these variables, namely the nominal exchange rate, the current account balance, foreign exchange reserves, public debt, foreign direct investment, and the interest rate, using foreign exchange reserves for both a developed and an emerging economy. The analysis indicates that these variables behave differently across country types. For a developed economy and issuer of a reserve currency, movements in the nominal exchange rate, the interest rate, and the current account balance provide clearer signals of changing conditions, while changes in reserves mainly reflect policy responses. For an emerging economy, by contrast, declining reserves emerge as a more direct sign of rising external stress and possible currency crisis risk.

Taken together, the results of this research support the view that there is a strong and clear relationship between currency crises and key macroeconomic variables. Monitoring these variables in combination, rather than in isolation, can help policymakers detect rising vulnerability at an early stage. This, in turn, can guide the design of sound macroeconomic, financial, and external sector policies aimed at reducing the probability of future crises and limiting their impact when they occur.

References:

Abdelsalam, M. A. M., & Abdel-Latif, H. (2020). An optimal early warning system for currency crises under model uncertainty. *Central Bank Review*, *20*(3), 99–107. https://doi.org/10.1016/j.cbrev.2020.03.002

Adams, J., & Metwally, A. (2019). Identifying currency crises indicators: the case of Egypt. *African Journal of Economic and Management Studies*, *10*(2), 241–259. https://doi.org/10.1108/AJEMS-06-2018-0156

Ari, A. (2012). Early warning systems for currency crises: The Turkish case. *Economic Systems*, *36*(3), 391–410. https://doi.org/10.1016/j.ecosys.2012.07.001

Ari, A., & Cergibozan, R. (2016). The Twin Crises: Determinants of Banking and Currency Crises in the Turkish Economy. *Emerging Markets Finance and Trade*, *52*(1), 123–135. https://doi.org/10.1080/1540496X.2016.1105683

Aziz, J., Caramazza, F., & Salgado, R. (2000). Currency Crises: In Search of Common Elements. *IMF Working Paper*, *WP/00/67*.

Bird, G., & Milne, A. (2004). Miracle to Meltdown: A Pathology of the East Asian Financial Crisis. *International Finance and the Developing Economies*.

Calvo, G. A. (1998). Capital flows and capital-market crises: The simple economics of sudden stops. *Journal of Applied Economics, 1*(1), 35–54.

Calvo, G. A., Izquierdo, A., & Mejía, L.-F. (2004). *On the empirics of sudden stops: The relevance of balance-sheet effects* (NBER Working Paper No. 10520). National Bureau of Economic Research.

Calvo, A. G., & Reinhart, M. C. (2000). When Capital Inflows Suddenly Stop: Consequences and Policy Options. *International Monetary Fund*, 175–201.

Candelon, B., & Dumitrescu, E. (2012). How to Evaluate an Early-Warning System: Toward a Unified Statistical Framework for Assessing Financial Crises Forecasting Methods. In *HURLIN Source: IMF Economic Review* (Vol. 60, Issue 1). https://about.jstor.org/terms

Cerra, V., & Saxena, S. C. (2002). What Caused the 1991 Currency Crisis in India? *IMF Staff Papers*, *49*, 395–425.

Chang, R., & Velasco, A. (1999). Liquidity Crises in Emerging Markets: Theory and Policy. *National Bureau of Economic Research*, *Working Paper 7272*. http://www.nber.org/papers/w7272

Chuku, C. Chabert, G. Chamon, M. Hakura, D. and Zettelmeyer, K. (2023), "Another systemic debt crisis in low-income countries can be prevented – if we act now", VoxEU.org, 30 May.

Claessens, S., Kose, M. A., & Terrones, M. E. (2010). The global financial crisis: How similar? How different? How costly? *Journal of Asian Economics, 21*(3), 247–264.

Cumperayot, P., & Kouwenberg, R. (2013). Early warning systems for currency crises: Amultivariate extreme value approach. *Journal of International Money and Finance*, *36*, 151–171. https://doi.org/10.1016/j.jimonfin.2013.03.008

Eaton, J., & Gersovitz, M. (1981). Debt with potential repudiation: Theoretical and empirical analysis. *Review of Economic Studies, 48*(2), 289–309.

Eichengreen, B., & Hausmann, R. (1999). Exchange Rates and Financial Fragility. *National Bureau of Economic Research*, *Working Paper 7418*, 1–54. http://www.nber.org/papers/w7418

Glick, R., & Hutchison, M. M. (2012). Models of Currency Crises. In *The Evidence and Impact of Financial Globalization* (pp. 485–497). Elsevier. https://doi.org/10.1016/B978-0-12-397874-5.00004-X

International Monetary Fund. (2022). World Economic Outlook Update: Gloomy and More Uncertain. *International Monetary Fund*.

Kaminsky, G., Lizondo, S., & Reinhart, C. M. (1998). Leading Indicators of Currency Crises. *IMF Staff Papers*, *45*(I), 1–48.

Kaminsky, G. L., & Reinhart, C. M. (1999). The twin crises: The causes of banking and balance-of-payments problems. *American Economic Review, 89*(3), 473–500.

Kang, I. S. (2004). A Study on the Early Warning Indicators of Currency Crisis : A Regional Perspective. *International Area Review*, *7*(1), 159–178.

Kawai, M. (1998). The East Asian Currency Crisis: Causes and Lessons. *Contemporary Economic Policy*, *16*, 157–172.

Kindleberger, C. P., & Aliber, R. Z. (2011). *Manias, panics and crashes: A history of financial crises* (6th ed.). Palgrave Macmillan.

Kose, M. A, Ohnsorge, F. and Ha, J. (2022), "From stagflation to debt crises", VoxEU.org, 12 July.

Krugman, P. (1979). A Model of Balance-of-Payments Crises. *Journal of Money, Credit and Banking*, *11*(3), 311–325. http://www.jstor.org/stable/1991793

Laeven, L., & Valencia, F. (2013). Systemic banking crises database. *IMF Economic Review, 61*(2), 225–270.

Luft, J. A., Jeong, S., Idsardi, R., & Gardner, G. (2022). Literature Reviews, Theoretical Frameworks, and Conceptual Frameworks: An Introduction for New Biology Education Researchers. *CBE Life Sciences*

Education, *21*(3), rm33. https://doi.org/10.1187/cbe.21-05-0134

Meyer, L. H. (1999). Lessons from the Asian Crisis: A Central Banker's Perspective. *Levy Economics Institute of Bard College, Annandale-on- Hudson, NY*, *276*. https://hdl.handle.net/10419/186949

Mohana Rao, B., & Padhi, P. (2019). Identifying the Early Warnings of Currency Crisis in India. *Foreign Trade Review*, *54*(4), 269–299. https://doi.org/10.1177/0015732519874206

Obstfeld, M. (1996). Models of Currency Crises with Self-fulfilling features. *European Economic Review*, *40*, 1037–1047. https://doi.org/https://doi.org/10.1016/0014-2921(95)00111-5

Obstfeld, M., Shambaugh, J. C., & Taylor, A. M. (2010). Financial stability, the trilemma, and international reserves. *American Economic Journal: Macroeconomics*, *2*(2), 57–94. https://doi.org/10.1257/mac.2.2.57

Peng, D., & Bajona, C. (2008). China's vulnerability to currency crisis: A KLR signals approach. *China Economic Review*, *19*(2), 138–151. https://doi.org/10.1016/j.chieco.2007.09.003

Rao Balaga, M., & Padhi, P. (2017). Evaluating Indian economy's vulnerability to currency crisis. *Theoretical and Applied Economics*, *XXIV*(3), 97–114.

Reinhart, C. M., & Rogoff, K. S. (2009). This Time Is Different: Eight Centuries of Financial Folly. *Princeton University Press*. https://doi.org/10.2307/j.ctvcm4gqx

Reinhart, C. M., & Rogoff, K. S. (2010). From financial crash to debt crisis. *American Economic Review,* *101*(5), 1676–1706.

Rijkers, B. Falcone, G. Porto, G. and Artuc, E. (2022), "War-induced food price inflation imperils the poor", VoxEU.org, 1 April.

Rocco, S. T., & Plakhotnik, S. M. (2009). Literature reviews, conceptual frameworks, and theoretical frameworks: Terms, functions, and distinctions. *Human Resource Development Review*, *8*(1), 120–130. https://doi.org/10.1177/1534484309332617

Shiller, R. J. (2000). *Irrational exuberance*. Princeton University Press.

Trebesch, C. Meyer, J. Reinhart, C. and Luckner, C. G. von. (2021), "External sovereign debt restructurings: Delay and replay", VoxEU.org, 30 March.

Willett, T. D., Nitithanprapas, E., Nitithanprapas, I., & Rongala, S. (2004). The Asian Crises Reexamined. *Asian Economic Papers*, *3(3)*, 32. https://doi.org/10.1162/1535351054825184