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Currency Crises, Characteristics, and Indicators

Crises de changes, caractéristiques et indicateurs

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Abstract

Currency crises have been common in modern society. The paper uses a signals approach to assess the indicators and characteristics of the currency crisis. Kaminsky et al. (1998) used a signals approach in identifying currency crises Currency crises are triggered by unsustainable economic conditions. The signal approach entails checking the advancement of currency variables. When the indicators deviate from the standard levels, the situation is a warning signal for the probability of currency crises over a specified period. The efficiency of the signal approach can be scrutinized by the extent to which indicators are useful in anticipating crises. According to the signal approach, variables that are significant in predicting crises include domestic inflation, international reserves; credit to the public sector, and domestic credit. Variables such as the fiscal deficit, GDP growth, export performance, trade balance, and money growth are used in the signal approach to predict the possibility of currency crises. The paper focused on examining the indicators that tend to show uncommon performance in the phases preceding the currency crisis. If a variable surpasses a certain threshold over twenty-hour months it signals the likelihood of a currency crisis in the future.

Key Words: Currency Crisis; international reserve; inflation; exchange rate; signals approach.

Résumé

Les crises monétaires ont été courantes dans la société moderne. Cet article utilise une approche par les signaux pour évaluer les indicateurs et les caractéristiques de la crise monétaire. Kaminsky et al. (1998) ont utilisé une approche par les signaux pour identifier les crises monétaires Les crises monétaires sont déclenchées par des conditions économiques insoutenables. L'approche par les signaux consiste à vérifier l'évolution des variables monétaires. Lorsque les indicateurs s'écartent des niveaux standard, la situation constitue un signal d'alerte pour la probabilité de crises monétaires sur une période donnée. L'efficacité de l'approche par le signal peut être examinée par la mesure dans laquelle les indicateurs sont utiles pour anticiper les crises. Selon l'approche par le signal, les variables qui sont significatives dans la prévision des crises comprennent l'inflation intérieure, les réserves internationales, le crédit au secteur public et le crédit intérieur. Des variables telles que le déficit fiscal, la croissance du PIB, les performances à l'exportation, la balance commerciale et la croissance monétaire sont utilisées

dans l'approche par le signal pour prédire la possibilité de crises monétaires. L'étude s'est concentrée sur l'examen des indicateurs qui ont tendance à montrer des performances inhabituelles dans les phases précédant la crise monétaire. Si une variable dépasse un certain seuil sur des mois de vingt heures, elle signale la probabilité d'une crise monétaire dans le futur.

Mots clés : Crise monétaire; réserve internationale; inflation; taux de change; approche par les signaux

Introduction

Currency crises have become frequent in modern society in developing countries. Currency crises affect capital flows and international trade. Financial crises comprise banking and currency crises. Currency crises entail any situation in the foreign exchange that contributes to an unexpected loss in substantial value of the currency relative to other currencies available in the market. There is a positive relationship between currency crises and socio-political crises. Currency crises are features of the international monetary system. Modern currency crises are related to the continued degradation of political and economic organizations and hyperinflation. Historical instances of currency crises include Argentina in 2018, Zimbabwe in 2008, Turkey in 2008, and Germany after the First World War, and Lebanon in 2020 (Ortiz and Cummins, 2012). The first currency crisis took place in 1992 in many European countries. The currency crises were due to the Exchange Rate Mechanism (ERM) (Buiter, Corsetti, and Pesenti, 2001). Mexico experienced a currency crisis in 1914. The currency crisis in Mexico was caused by the decision by the government to devalue its currency. The devaluation of the currency caused an economic crisis that affected the country's GDP (Saxto, 2003).

The research paper will focus on answering the question, **what are the indicators and characteristics of a currency crisis?** This research paper is based on the qualitative study on the causes of currency crises, characteristics of a country experiencing the crises, and the indicators of currency crises in a country. The first part of the paper will be to give a background of the research topic, where the origin of the financial crises across the globe is explained. Among the factors explained will include reckless lending and improperly regulated mortgages thus creating high-risk loans. The second part of the paper will involve a brief contextualization of the study topic. This will involve explaining the causes of currency inflation among third-world countries. The research paper will also include a review of literature on currency crises caused by poor policymaking. The paper will use a qualitative research methodology to review the documented literature on the early indicators of currency crises in a country through signals represented in Kaminsky and Reinhart's (1996) model. The signals will then be analyzed and the results discussed. The research paper will also have a conclusion and the recommended adjustments on the policies to solve the currency crisis.

1- Background on currency crisis

The financial crisis in 2008 led to a currency crisis in many nations across the globe. The Global Financial Crisis in 2008 was the worst economic crisis experienced globally since the Great Depression. The toll of the crisis in 2008 was severe since it resulted in the loss of a trillion dollars. Before the crisis in 2008, the financial markets were showing signs of reckoning in 2007 by issuing cheap credits. The crisis in 2008 was triggered by deregulation in the economic sector. Deregulation enabled financial institutions to take part in hedge funds by exchanging derivatives. The financial institutions demanded mortgages to facilitate the profitability of sales through derivatives. Lending institutions and banks offered low interest on loans and mortgages to encourage individuals to take loans they could not afford. The mortgage-back securities created high-risk loans. Unregulated lending led to loan default among the borrowers, and many financial institutions collapsed and needed the government to bail out. The banks formulated interest on loans to enhance affordability to the borrowers. Banks offered reckless lending to individuals and families without following mortgage regulations. High-risk loans were bundled together and passed the set regulations (Stiglitz, 2010). The loans grew to an overwhelming degree, and most of the borrowers could not repay the loans, which created financial difficulties in the financial system.

The housing market was greatly affected by the Worldwide Financial Crisis in 2008. The collapse of the housing market in the US was a catalyst of the currency crisis that spread from the United States to other regions of the globe. The stock market began to plummet during the crisis, and many businesses collapsed, and this led to the loss of a lot of money, amounting to trillions of dollars. The failure of businesses in different parts of the world contributed to widespread layoffs and extended periods of unemployment. The decline in credit availability and the financial instability reduced investments and minimized international trade. The United States responded to the Global Financial Crisis in 2008 by enacting the American Recovery and Reinvestment Act of 2009. Mergers facilitated bank bailouts, and expansionary monetary policies were used in stimulating the economic growth in the US after the Global Financial Crisis in 2008 (Friedman and Friedman, 2009). The 2008 Global Crisis caused the world's banking system to collapse. Banks relied on government support to elevate them from bankruptcy. The

fiscal and monetary stimulus was used to contain the Great Recession, which prevented another Great Depression.

Expected inflation and an increase in inflation contribute to a currency crisis. A currency crisis is preceded by a phase of increasing inflation. An example of a currency crisis due to inflation is the case of Turkey. From 2010 and the first months of 2018, the Turkish economy developed steadily, and the nation's economy experienced a continuous phase of rising inflation. The inflation rate in Turkey increased subsequently after the 2008 currency crisis. The local banking crisis in a country signals a currency crisis (Friedman and Friedman, 2009).

The currency crisis begins with local financial organizations defaulting on debt payments. An example is the currency crisis in Germany after the First World War. The German financial institutions borrowed large sums of funds from foreign creditors to help in financing the post-war renovation due to the 1929 financial market collapse and the ensuing currency crisis. The German financial institutions could not make the loan repayments due to the nature of the local economy. Due to the inability to repay the loans, Germany experienced a severe currency crisis and hyperinflation, contributing to the government collapse. Turkey is among the major developing economies in the globe (Schuker, 1988). The country is the 17th leading economy on the globe. In 2008, the Turkish government enacted economic and political policies to attract international investors. After the 2008 and 2009 global financial crises, Turkey experienced a quick influx of international funds. Many nations decreased interest rates after the global financial crisis to meet the collective demand and promote investments. In 2018, the Turkish lira (TRY) fell by nearly 45% contrary to the US Dollar (USD). From 2010 to 2018, Turkey experienced a growth in GDP by 6.5%. Between 2010 and 2018, Turkish banks and businesses borrowed enormous sums of funds from foreign investors. The loan was dollar-dominated, and this showed that Turkey was remarkably vulnerable to the United States economic policy. The currency crisis in Turkey began when the United States Federal Reserve raised the interest rates in the first half of 2018 (Sumer and Ozorhon, 2020).

The policy changes made by the US Federal Reserve escalate the loan debt payments that the Turkish banks and businesses had to pay. The policy changes contributed to global investors losing trust in the capability of the Turkish administration to sustain economic growth. The aspects led to the radical decline in the demand for the Turkish lira in the international markets.

The decrease in the demand for the Turkish Lira led to the decline in conversion rates from the Turkish Lira to the USD. The decrease in the exchange rates increased the minimal rate of the USD-denominated loan owed by Turkish companies and banks. The decline in exchange rates gave rise to the currency crisis in Turkey (Sumer and Ozorhon, 2020).

The Asian Financial Crisis of 1997 to 1998 was initiated by Thailand's choice to drift its currency. The baht abandoned the pegged dollar in 1997, and the value of the dollar increased sharply, and this caused Thailand's currency to lose its value in the international market. Thailand's falling currency caused the foreign investors to reassess other economies that could increase return on investments (Goldstein, 1998). Foreign investors withdrew their capital investments in Thailand, and this caused nations such as Malaysia, South Korea, Indonesia, and Taiwan to mire in the financial and currency crisis in different degrees. The widespread financial and currency crisis in Asia led to the stall of trade agreements and hindered regional and global economic growth due to reduced funds outflows and inflows. The characteristics of the currency crisis in Asia from 1997 to 1998 include overvaluing of the region's currency, over-reliant on short-term foreign borrowing, weak regulation of the finance companies and private banks, and lack of necessary political consensus by the government that was needed to enhance the stabilization of the economy (Goldstein, 1998).

2- Presentation of the research issue, research interest, and contextualization

Currency crises have been frequent in modern times and have contributed to the rapid expansion of fiat currencies. A currency crisis causes the devaluation of a country's currency. Currency crises may occur under flexible exchange rates. Increased sophistication and integration of financial markets contributed to the creation of new reforms and globalization. Currency crises are forms of financial instability. The Great Depression, World War I, and World War II triggered the main currency crises in the world. The collapse and instability of the European Exchange Rate Mechanism have rekindled interests in policy circles and academic literature in assessing the causes and indicators of a currency crisis. This research study aims to example the indicators and characteristics of a currency crisis.

Currency crises are caused by series of market, political and economic forces that cause pressure on the exchange rate. Countries with currency crises have current account deficits, huge public debt, import more goods than the goods exported, and have short-term maturities used in

financing public budget deficits and long-term projects. Capital inflows from foreign investors can shift in the emerging markets, reducing the exchange rates and causes depletion of reserves. Projected capital outflows put pressure on the currencies in the dynamic emerging markets in the world.

3- Literature review

Many researchers have focused on currency crises over the past years. The currency crisis remains an exclusive goal for policymakers and academics since it is essential to design and improve warning systems that help check whether countries can get into situations that can lead to crises. Theoretical concepts of currency crises are classified as the first, second, and third generations. The first generation of concepts focuses on the discrepancies amongst the local macroeconomic principles such as exchange rates and tenacious government budget deficits (Corsetti, Pesenti, and Roubini, 1999). Government budget deficits imply that the government ought to borrow funds to finance its operations or exhaust assets such as international reserves. Lack of fiscal reforms in a country prompts the government to generate funds to finance the budget deficits. Excess cash generation contributes to inflation, and it is not consistent with managing fixed exchange rates. Countries finance large budget deficits by printing money. The creation of cash causes loss of international competitiveness and inflation. Countries that engage in excess money creation eventually run into trade deficits that have to be financed by foreign investments. Foreign investors tend to stop their investment ventures since the local currency loses value in the international financial market (Goldstein, 1998). Large trade deficits signal the likelihood of crisis when the foreign investments stop.

The second-generation models of currency crises focus on the policymaker's ability to evaluate the costs and importance of protecting the currency and are prepared to give up an exchange rate objective if the expenses exceed the importance (Corsetti, Pesenti and Roubini, 1999). In the second generation of models, the doubt concerning whether the government is prepared to sustain the exchange rates leads to several equilibria. The procedures executed may not be consistent with the exchange rates. The frameworks affected defend certain exchange rate levels, such as increasing domestic interest rates. The policies increase the cost of increasing bank financing expenses. The private sector in a country may question the guarantee of the fixed exchange rates when the macroeconomic goals are compromised (Corsetti *et al*., 1999). A

currency crisis is likely to thrive in such situations if the higher interest rates weaken the banking sector conditions.

The third-generation currency crisis models emphasize how misrepresentations in the banking systems and financial markets contribute to the financial crisis. Misrepresentations may merge in the form of loan restrictions in the banking system. According to Aghion, Bacchetta, and Banerjee (2000), initial depreciation of currencies increases the cost of foreign-currency loan liabilities of companies and contributes to a decrease in business revenues. Deprecation of currencies limits the loan when the credit is constrained. Borrowing limitations contributes to subsequent falls in investment and productivity, which may decrease the demand for domestic currency and prompt a currency crisis. According to the third-generation currency crisis models, government promises on the private sector obligations and monetary liberalization can create unmanageable deficits and moral hazards that can generate a currency crisis. According to MCKinnon and Pill (1995), deposit insurance combined with financial liberalization causes financial institutions to fuel a loaning boom comprising domestic and international loan expansion, ultimately leading to currency and banking crises. According to Burnside, Eichenbaum, and Rebelo (2004), explicit and implicit regime promises to the banking system give financial institutions an enticement to take international loans, increasing the possibilities of a currency crisis. The possibility of currency crises triggers the banks to hike the local interest rates, which may ultimately lead to the downfall of the local currency in the financial markets.

According to Krugman (1979), currency crises are triggered by weak economic principles such as excessively expansionary fiscal and monetary guidelines. Excessive monetary and fiscal policies cause persistent losses on foreign reserves that prompt the government to abandon parity. Depletion of official international reserve causes currency crisis. Krugman's (1979) model shows that expansion of domestic credit and fixed exchange rate causes the excess demand of money, which gradually leads to persistent loss of international reserve, and these causes currency crisis in a country. The crisis causes the depletion of reserves and prompts authorities to abandon parity. Fixed exchange rate regimes collapse during the currency crisis, and this causes financial loss on their fortunes of local currencies. Krugman's (1979) concept proposes that the phase preceding the currency crisis is categorized by a steady and tenacious decrease in foreign reserves and continuous domestic credit increase concerning the demand for

the money. Krugman's (1979) model emphasizes the role of decreasing foreign reserves in escalating the likelihood of the collapse of fixed exchange rates.

According to Krugman's (1979) models, excess money creation, expansion of domestic credit, and fiscal imbalances serve as indicators of looming currency crisis. Deterioration of trade balances and real currency appreciation signals the possibility of a currency crisis in a nation. Expansionary credit and fiscal policies result in higher demand for traded and non-traded goods and chattels, which contributes to the fall in the trade balances and increase in the relative cost of the products in the market and causes the actual increase in the value of the currency. Future currency crises are characterized by lower competitiveness, a rise in nominal wages, and the occurrence of gummy costs. Uncertainties concerning credit policies increase the possibility of crises. According to Krugman's (1979) models, real wages, current account balances, trade balances, real exchange rates, and local interest rates represent the primary indicators of currency crises.

According to Ozkan and Sutherland (1995), authorities play a critical role in keeping fixed nominal exchange rates to enhance the credibility of reducing inflation. Fixed exchange rates increase international interest rates and contribute to higher local interest rates, and this reduces the intensities of outputs, increasing the overall cost of maintaining parity. When the foreign interest rates exceed the set critical levels, it prompts authorities to abandon equality. It increases the costs of keeping fixed interest rates since it surpasses the perceived benefits. According to Ozkan and Sutherland (1995), domestic interest rates, foreign interest rates, and evolution of output are indicators of a currency crisis. Elements that affect the government's objective functions can be used as variables of currency crises. Greater interest rates reduce the effectiveness of the financial system, which can prompt the government to undervalue rather than incur the expenses of bailing out. The presence of financial problems shown by a large decline in deposits, relative price of bank stocks, central bank credit to banks, and the proportion of non-performing loans indicate the possibility of a currency crisis.

According to Obstfeld (1994), expectations of currency crises lead to lower employment and higher wages, stimulating the regime to abandon parity over the concerns of output. The high unemployment rate forces the government to lower the interest rates on credits so that individuals can spend more. Lower interest rates cause the depreciation of currency since

governments use lower interest rates to stimulate the economy. The government abandons the parity due to the probability of an escalation in the costs of revamping public debt. Obstfeld (1996) asserts that the escalation in interest rates may affect the administration's impartial role. The increase in interest rates increases the possibility of the banking crisis and fiscal costs of the bailout. Currency crises are preceded by increasing rates in the money market, the collapse of central bank reserves, and the deterioration of government balances. According to Bordo and Schwartz (1996), currency crises take place when interior economic situations mismatched the external circumstances circles for the currency

According to Chang and Velasco (1998), the domestic banking sector is exposed to currency crises and exchange rate risks due to short-term lending. A currency crisis precedes the banking crisis. Huge foreign debt shows that the nation might not be able to pay its international debts if the creditors demand the payments, which signals a looming crisis. According to Kaminsky *et al.* (1998), the variables of currency crisis include local inflation, local credit, international reserves, and credit to the public sector. The Early Warnings System (EWS) model for currency crisis was formulated to help in the identification of unusual variations and downturns in the foreign exchange markets. Instabilities and downturns permit regimes to adopt preventive policies (Kaminsky *et al*., 1998). Predicting the actual time of the currency crisis is difficult for policymakers and academic researchers. EWS is a valuable technique for appropriate assessments of the possibility of currency crises over a certain period.

4- Methodology

The research design for this research study was qualitative research. The research study focused on reviewing documented literature on the early warning signs of currency crises. Secondary data was used as the source of data related to indicators and characteristics of a currency crisis. Secondary data provided in-depth data related to indicators of currency crises. Secondary data provided approaches used in evaluating the likelihood of a currency crisis. The K-step approach was used in the research study to estimate the likelihood of currencies depreciation in the multivariate logic model.

The research paper used a comparison of the variables used in assessing the possibility of a currency crisis centered on the Kaminsky and Reinhart (1996) model. Kaminsky and Reinhart's (1996) model records the presentation of individual variables and offers the foundation of in-

depth information on the issues that escalate the likelihood of currency crisis. The model provides an overview of the estimation of a likelihood of a crisis based on the conditions of a crisis issued by the signals of different indicators. The possibility of a crisis depends on the consistency of the variables in sending signals. The signal approach was suitable for the research paper since it acted as a basis for giving early warnings for the probability of a crisis. The signal approach was appropriate for the research study since it has literature that assesses the capability of financial and economic time series in predicting economic growth and the likelihood of crises.

5- Data analysis

5.1. The Signals Approach

The variables of currency crises are used in analyzing and predicting the probability of a looming problem in the financial markets. The signal approach consists of two stages that are used in predicting the possibility of currency crises. The first stage of the signaling approach involves analyzing the role of indicators such as current account, inflation, and the percentage of debt to GDP ratio in forecasting the possibility of a crisis in the future. The second stage of the signaling approach involves setting a threshold for each indicator in minimizing the signals for a looming crisis. If the indicators exceed the set thresholds, the crisis is more likely to occur in the future. The signal approach was appropriate for this research since it provides informative and accessible data on currency crises. The signals approach uses Exchange Market Pressure Index (EMPI) in predicting the possibility of a currency crisis.

5.2. Exchange Market Pressure Index Equation

EMPIu = seu- (qse /qsr)SRu

Where:

se1= (et-et-1)/et-1

SR1= (Rt-Rt-1)/Rt-1

e1= the exchange rate at the time

Rt= Foreign reserves at the time

qsr= the standard deviation of the rate of change of foreign reserves

qse = the standard deviation of the rate of change of the exchange rate

From the calculation, the appreciation in the exchange rate is linked to the EMPI. The accumulation of foreign reserves is negatively associated with EMPI. The severity of the exchange rate instability causes a currency crisis, resulting in the depreciation of the local currencies. Suppose the major depreciation of the local currency takes place. In that case, central banks in a country are forced to increase the interest rate and tend their foreign reserves to obtain domestic currencies. The loss of foreign reserves and exchange rate instabilities act as good predictors for a distinctive currency crisis.

According to EMPI, a currency crisis occurs when the index exceeds the standard deviation and exceeds the set mean.

Let:

The mean of the index be *uEMPI*

The standard deviation of the index be *qEMPI*

Then the crisis is denoted by Crisis= *uEMPI* > *qEMPI*

5.3. Self-Existing Threshold Auto regression (SETAR) Model

SETAR model was used in analyzing and predicting the threshold of the indicators used in predicting currency crises. SETAR models are non-linear models used in analyzing economic data. The models are used in forecasting exchange rates and analyzing the possibility of economic recession. SETAR model is illustrated in the formula as follows

$yt = \alpha+\beta yt-1+\lambda 1t$ if $yt-d \leq \gamma$

$\eta+\rho yt-1+\lambda 2t$ if $yt-d > \gamma$

Where

y = the threshold level that is estimated

d= delay parameter

$\lambda 1t$ and $\lambda 2t$ = independent random variables

α and η= the constants

The verge (y) is assessed by the means of the maximum-possibility technique. The threshold is selected through a network exploration to exhaust the possibilities of a currency crisis behavior during a certain period. The binary signals for individual indicators are denoted by 1= warning

signal and 0= none. The binary signals define certain threshold levels for indicator variables. The indicators that tend to increase before the crisis such as domestic credit, interest rates, and imports have a higher verge. The variables that tend to decrease before a crisis such as bank deposits, exports, and real exchange rates have a lower threshold. The indicators issue warning signals concerning the likelihood of a currency crisis when the indicators cross the thresholds set within a certain period.

Table 1: Description of verges of the indicators

Indicators	**Tail**	**Comments**
Imports	Upper	Continuous increase in imports
Foreign reserves	Lower	The decline of foreign reserves
Exports	Lower	Decline in exports
Real exchange rate	Lower	Overstating real exchange rates
Terms of trade	Lower	Decrease in the competitiveness of the local businesses
Real interest rate	Upper	A high-interest rate contributes to the reversal of capital flows.
Domestic credit	Upper	Expansion of local credit before a crisis
Bank deposits	Lower	The banks lose deposits at the beginning of a crisis

Source: Author

6- Results and Discussions

The effectiveness of the signals approach is examined using individual currency crisis indicators. According to Kaminsky and Reinhart (1996), the analysis of currency crisis depends on ranking

the predicting ability of the variables and examining the persistence of the indicators. The examination of the effectiveness of individual indicators is shown in table 2 below.

Table 2: The performance of an indicator

Signal	A crisis within twenty-four months	No crisis within twenty-four months
Signal issued	A	B
No signal issued	C	D

Source: Author

From the table, A signifies the total months in which a variable showed a positive signal, B signifies the total months in which a variable displayed a negative signal. C signifies the total months in which a variable did not display a signal. D represents the total months in which a variable desisted from displaying a signal which could have been bad. The combination of C and B with a zero value is suitable for a perfect variable. A perfect variable has values in cells A and D. According to Kaminsky *et al.* (1998), a variable threshold minimizes the ratio of false indicators and increases good indicators which are denoted by (B/B +D)/ (A/A+C). The equation helps in the assessment of the effectiveness of individuals indicators. If the value from the equation is below one then the indicator will be significant in forecasting the likelihood of a currency crisis. If the value from the equation is above 1, it is not significant and thus cannot be used in forecasting the possibility of a currency crisis in the future.

Table 3: Indicators of Crises from Scholarly Journals and Articles

Author	**Country Coverage**	**Indicators**
Blanco and Garber (1980)	Mexico	The growth of domestic credit
Bilson (1979)	32 countries	Shadow exchange rates International reserve
Boonman *et al.* (2019)	Fifteen emerging economies (Five in Central and Eastern Europe, Five in Asia, and Five in Latin America)	Losses of International reserves Increase in domestic interest rates

		Floating exchange rates Open capita accounts
Goldstein (1998)	Mexico, Chile, Brazil, and Argentina	Weak banking sector Short-term borrowing Real exchange rates International interest rates
Kanin (2003)	General study	Changes in export prices GDP growth
Krugman (1996)	Italy, Spain, Sweden, United Kingdom, and France during the 1992 and 1993 crises.	High public debt High unemployment rate High inflation rate
Vlaar (2000)	31 emerging markets (Turkey, Portugal, Poland, Philippines, Russia, Jordan, India, Greece, Korea, Argentina, Brazil, Morocco, Peru, Pakistan, and other countries)	Real exchange rates Inflation rates International reserves International debt Bank credit
Terra and Gomes (2015)		Fixed exchange rates High-interest rates policies
Amri and Willett (2015)	European crises of 1992 to 1993	Pegged-exchange rates High risk in interest rates Increase in payment deficits
Glick and Hutchison (2013)	Argentina	Deterioration of bank balances The decline in foreign capital inflows Debt defaults Weak fiscal position
Bordo and Meissner (2016)	Asian Crisis	Foreign currency liabilities Pegged exchange rates

Collins (1996)		International reserves GDP growth Inflation
Kaminsky and Reinhart (1996)		Changes in reserves Changes in terms of trade Real interest rates Changes in stock prices Banking crises
Kamin (1988)		Export growth, Import growth Real exchange rate Inflation Trade balances
Zhao *et al.* (2014)	88 countries	International reserves Inflation Domestic growth rate

Source: Author

From the research findings, intermediate and pegged exchange rate managements are vulnerable to currency crises in emerging and developing economies. Early Warning Systems (EWS) are used in determining the indicators that predict the probability of a crisis. From the documented data, the increase in external debt signals the possibility of a currency crisis. If the external debt is higher than the GDP, there is an increase in a currency crisis. When the current account to GDP ratio is less, there is a possibility of a currency crisis in the future.

Kaminsky *et al*. (1998) used a signals approach in identifying currency crises. The signal approach entails checking the advancement of economic variables. When the variables deviate from the normal levels, the situation is a warning signal for the probability of currency crises over a specified period. The efficiency of the signal approach can be scrutinized by the extent to which indicators are useful in predicting crises. According to the signal approach, indicators that

are valuable in predicting crises include domestic inflation, foreign reserves; credit to the public sector, and domestic credit. Variables such as the fiscal deficit, GDP growth, export performance, trade balance, and money growth are used in the signal method to predict the possibility of currency crises. The rapid depreciation of exchange rates signals a looming currency crisis. The collapse of the foreign exchange reserves shows the unsustainability of the macroeconomic imbalance in a country. When the exchange rates exceed the threshold, it means that countries are highly vulnerable to economic changes such as currency crises. Huge debts signal a looming currency crisis.

Conclusion

Currency crises affect the global economy and constitute international concern. Crises cause huge costs in the public and private sectors. Empirical studies provide data on how countries can predict the possibility of crises promptly. Early Warnings System (EWS) was used in this research paper to examine the indicators of currency crises. Various indicators are used in analyzing and predicting currency crises. The major indicators used in predicting currency crises include real exchange rates, domestic credit, interest rates, and foreign reserves. The major suggestion associated with the key findings is giving room for the inclusion of more indicators in the financial sector in the prediction of the currency crisis. In the interconnected economy, other financial indicators play a critical part in forecasting a looming currency crisis. The signals approach is a good tool that is used in crisis detention. The approach plays an integral part in predicting early warning signs for a looming currency crisis in a nation. Predicting a currency crisis in a nation is inclined by the behavior of economic variables in the preceding periods before the onset of a crisis. Stakeholders, banks, and policy-makers can use signals approach to take precautionary measures when the financial and currency variables show unusual behavior. The signals approach helps in designing a good currency early warning system.

Policy implications and recommendations for further research

A currency crisis negatively affects the economy of a country. The currency crisis exhausts international reserves, increases interest rates, and devalues the local currency. Policymakers and governments should closely watch currency crisis indicators to plan the economic strategies that will cushion the economy from extreme collapse. From the results obtained in the research study,

governments should find ways of attracting investors to their countries to reduce the possibility of being affected by a crisis. The macroeconomic management in a country should focus on attracting foreign inflows. Governments should focus on neutralizing the currency crisis by investing in the education sector, increases physical and human capital, and increasing wages and salaries. Further research should be done on the effects of the currency crisis on the economy.

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