

## ORIGINAL ARTICLES

### Predict the Financial Markets Crises (Forecasting Models and Their Applicability in the Arab Financial Markets)

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#### ABSTRACT

This paper aims to the possibility of a model or reliable way to predict financial crises or reduce them. In addition, when financial crises occur in the financial market given they quickly move to other financial market, and cause negative effects on other financial market, the meaning of that financial markets around the world are interdependent with each other directly or indirectly. Therefore, the financial markets demand to determines the form or the way to avoid financial crises or reduce the professions. The results of this study was that the financial crisis occurs when (the rate of domestic credit growth high, the evaluation of the exchange rate high compared to the general trend, the foreign interest rate is high, the foreign investment less than the external debt, the ratio of money multiplier high compared with the reserves and when there is a large deficit in the current account). If any financial market can control these factors, this does not mean that this market is to be subjected to a financial crisis that the financial crisis may occur in other financial market and raised up to this market. So, the way in which they can achieve the kind of financial crises is to establishment of the global financial markets to develop criteria for evaluating the performance of financial markets and should be the six criteria we mentioned are the most important criteria and indicators used in the evaluation. The financial market may be subjected to a financial crisis if there is any negative deviation from the criteria and assessment indicators for more than six months. In fact, these indicators measure the performance of the economic environment in which it operates the financial market, which affected directly the performance of the financial market in any country, and therefore these indicators and standards are an important tools for economic departments in improving the economic performance and development at the state level.

**Key words:** Financial markets. Economics, Financial Markets Crisis, STV Model, Frankel and Rose Model, KLR Model

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#### Introduction

In the past few years, many researchers and economists like Kaminsky, Lizondo, Reinhart all tried to make models to predict crises, part: the debt crises in Latin America of the 1980s are different from the Mexican crisis in 1994, which differs from the crises of South-East Asia in 1997 and the recent global economic crisis which affected virtually all countries of the world. Within each of these crisis episodes, every crisis presents some specificity. However, this does not preclude the existence of common features. It seems that the premise on which these researchers base their work is that; a forecast of the crisis reduces the potential economic losses. The threat of the crisis lies not only in the crisis, but rather the element of surprise that accompany it such as the earthquake that has ravaged a country, which could reduce its devastating effects when people expect the earthquake and framing the crisis do to reduce the human and material losses.

Despite the newness of the models, it addressed the issue of forecasting the financial markets crisis, but this topic is not new crises are not connected with the current financial system, Economic history indicates that many of the crises in both banking crises or foreign exchange markets, in the twentieth century there was

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a crisis, the French franc and the pound Sterling held in the sixties, and the collapse of the Breton Woods system in the early seventies and the global debt crisis in the eighties, This topic is not only about crises in the twentieth century, but also that the furnace, which has seen many previous crises, such as the exchange rate crisis in the United States in the period 1894 to 1896 and that struck gold base that was in that period.

But it must be noted that the contemporary financial crises are different from those that occurred in the past as a result of the tremendous development in the means of communication and integration of financial markets all over the world so that in the case with any financial market having positive or negative impact on the rest of the world financial markets, an important lag was geographical distances between them. The modern means of communication has made these financial markets a single one which was not present at the beginning of the last century, when financial markets were characterized by separation from another other, making the phenomenon of contagion among financial markets to be very limited.

#### *Literature review:*

Many crises happening in the financial markets can be identified as follows:

##### *Currency crisis:*

This type of crisis occurs when the market is exposed to currency speculation which leads to a significant deterioration in value, either decrease or reduction in these conditions and the monetary authorities are trying to defend its currency by introducing large amounts of foreign currency or interest rate increases in order to absorb excess money supply and therefore increase its value.

##### *Banking crises:*

Is the situation where banks fail in the compilation of savings and face massive withdrawals by its customers leading to bankruptcy thereby prompting the government to intervene to prevent this bankruptcy by providing significant assistance

##### *Systemic financial crisis:*

This topic has caused disruption in the work of crises in financial markets in the area performing the function of financial markets, which could have negative consequences on the national economy. It is possible to coincide with the occurrence of currency crises, financial crises and currency crises but not necessarily did not include damage to the domestic payments system and thus to contact that would be a global financial crisis. A systemic financial Crisis requires a solution that will not take months but rather several years

##### *External debt crisis:*

This crisis occurs when the country is unable to pay its external debt or for its services abroad, whether private or governmental organizations. Generally, it cannot be separated from other crises because it is often involved in the causes, roots or have common origins with the other forms of crisis. It is also as a result of lack of confidence in the currency and a decrease in the value of financial assets, weakness in the economy in general and the collapse of many financial institutions and non-financial. On the other hand, it can occur with any of the other crisis at the same time, as is the case in the Asian crisis and the Mexican crisis. It is also possible that the crisis is limited to only one kind of crisis as is the case in the crisis of the European Exchange Rate in 1992\_1993, Which was mainly a currency crisis, although in some countries in northern Europe, it coincided with the currency crisis and the crisis of the banking sector. It is possible for crisis to start with one type and then go on to the other crises as the successive banking crises often precede currency crises, especially in developing countries, as happened in Turkey, and Venezuela in the mid-nineties. It does not necessarily have to be the cause of the other crisis in the first place.

#### *Sources of Crisis in Financial Market:*

Many economists pointed out that the most important sources or causes of crisis in financial markets and the economy in general due to some factors. These are often factors in cash and bank. This is explained further below;

a) Increase in interest rates and subsequent decline in investment and a consequent reduction in the level of economic activity.

b) Low stocks, as if this decline leads to lower net worth of companies, which reduces the willingness of lenders to provide money because the net worth of companies has the same function and if the collateral has fallen under this guarantee, the investor will feel uncertainty on investments.

c) Unexpected drop in the price level leads to a decline in net wealth of project; because the real value of debt will increase while the real value of the assets of the company does not increase and the result will be lower than the real value of net wealth.

d) Increase in uncertainty, which drives investors away from investments and economic growth.

e) Bank panic, leading to closure of many banks: This causes investors to withdraw their money and low cash balances for the bank lending which impedes the process of investment and economic growth.

From the above we can deduce that the five factors have focused on the former variable investment as the primary determinant of financial crises. The figure below shows the structure of the financial crisis.

The report of the International Monetary Fund in 1998 indicates that economic instability is one of the most important factors that cause financial crisis. In many cases, the financial policies add to the excessive monetary expansion in the borrowing process leading to further accumulation of debt, and also the excessive investment in real assets leading real estate and stock prices to levels unstable. When economic policies begin to contain inflation and to address balance of payments deficit, they will lead to a decline or slowdown in economic activity in addition to difficulties in paying the debt that was borrowed, and to increased rates of defaulting loans that threaten banks with bankruptcy and the creation of a state of financial panic.

Economic instability has had an important role in the occurrence of crises and turmoil in the financial sector in the countries of Latin America and also in the financial markets in many emerging countries. Relations as well have a role in the global economic crises and of financial market crises, especially emerging markets, where there is a shift in the terms of trade in global interest rates, and also the unexpected fall in export prices. Changes in interest rates in industrial countries have increasing importance for the emerging capital markets around the world and reflect the integration of financial markets; developed and emerging financial. Fall in interest rates in industrialized countries is causing a large flow of capital towards emerging countries, where foreign investors are always looking for profit associated with the highest degree of safety. In turn, higher interest rates in industrialized countries leads to stop the flow of external finance to emerging markets and thus increase the cost of borrowing from local banks, which constitutes an obstacle to investment in these markets. The components of foreign capital inflows have an important role in many of the financial market crises and that was what happened in the Southeast Asian crisis and the financial crisis in Mexico. It is the reason which for crises in some countries who rely on short-term loans or so-called hot money to address the imbalance in the current account balance of payments. Based on this, money transfer is fast and causes disruptions in these markets, while foreign direct investment and long-term method is safer and ensure stability to finance productive projects and economic development in general, as the short-term loans often tends to finance consumption rather than production.

#### *Methodology:*

Economists use two types of approaches in their attempts to predict financial crises through the identification and study of some variables of the previous events or variables, self-styled leadership. The points of view of the two approaches are as follows:

#### *The first approach:*

Many economists try to identify a set of leading indicators and compare the behaviour variables prior to the crisis with their behaviour during normal times or non-volatile period. Based on this approach, they can rely on the variable and use it as an indicator of direction if it shows abnormal behaviour before a crisis and try this approach to achieve a balance between reducing the probability of the inability of the variable to predict the crisis and also reducing the likelihood of this variable to give the wrong signals about the crisis. The conclusion of the approach is to identify a set of variables that thing for takes odd behaviour before a crisis and use them for the purpose of prediction. The advantage of this approach is that it is easy to apply and does not include a specific standard model. But, the problem with this method is to determine the proper combination of these variables.

In fact, there are many possible variables that can be used as indicators of a crisis, but before that, a researcher or economic analyst must first understand the causes of the crisis. If he believes that the currency crisis is fundamentally the result of problems relating to the financial sector, he can use the following

leadership indicator variables which are: the fiscal deficit, government spending and credit extended to the public sector from the banking system. But if the researcher believes that the reason for the financial crisis is the banking system, then he can use the following indicators to predict the crisis: the growth of credit to the private sector, the degree of financial liberalization and the level of external indebtedness of the banking sector from short-term loans.

Variables can be used to predict the real financial crisis, such as GDP growth, unemployment rate and social and political developments at the state level.

#### *The Second approach:*

An approach that uses the standard models that includes the Direct Selection likelihood of financial crisis to identify variables that help us to develop statistical ability to make predictions. The advantage of this approach is the ability to make an assessment of many variables at the same time. In most cases, this approach is used according to annual data. For the purpose of developing this approach, it is best to use this method according to monthly data for the liquidation of the main economic variables that are suitable for use in leading indicators to predict the crisis. But the application of this approach in emerging markets is difficult and complex due to the lack of adequate transparency in the economic data on the financial market or the economy in general.

#### *Leading Models in the Forecasting of Financial Markets Crisis:*

In the first part of this paragraph, I reviewed the most important pilot studies in the field of building models to predict crises. Financial markets, especially currency crises touching on that aspect in Part II of some of the ideas that are useful in analyzing the behaviour of stock markets.

The most important pilot studies in the field of building models are to predict the financial markets crisis. Efforts in this area are still recent, but it certainly would open wide horizons for further research in this and I will try to give an idea of the most important three major models which were built in this area as follows:

#### *STV Model. Sachs, Tornell, and Velasco – 1996. Determinants of the size of the crisis:*

The objective of this model is to study the impact of financial crisis in Mexico in 1994 for the rest of emerging markets in 1995. The researchers analyzed data from twenty countries in 1995. Although, this model was not able to predict the timing of the crisis, it could answer the following question: any country more likely to suffer from the crisis in the event of any change in the international economic environment?

In fact, this model could be used to raise some observations for several reasons, including:

a) The process to predict when a crisis will occur is much more difficult to study than the impact of crisis in spreading to other financial markets.

b) The determinants of financial crisis could change over time or vary from one country to another.

Thus, this model is not designed to predict the crisis in the future, but to explain what happened in 1995, which could happen at other times, as happened in 1997.

I selected the form index; the crisis is the total weighted relative decline in reserves in addition to the relative decline in the exchange rate.

The researchers stressed that countries which had gone through the crisis and those that are expected to be exposed to the crisis countries are experiencing introduced three major features make it vulnerable to a crisis and these features banking system is weak, when the exchange rate is denominated in a calendar high and the fundamentals are weak sense of the growth of credit to the private sector significantly.

#### *Frankel and Rose Model-1996:*

Of the report of a possible crisis by researchers in the framework of this model, estimate of the likelihood of collapse in the currency using the annual data of 100 developing country imbalance from 1971 to 1992. But the use of annual data would limit the possibility of its application as a system and early warning, but allows analysis of many variables such as the components of external debt, and have tested (F and R) following hypothesis: that there are certain characteristics of capital flows inwards associated with a detectable correlation crisis. Features of these include:

a) The rate of foreign direct investment compared to a few capital flows inward.

b) When the rate of debt that characterized certain privileges of development banks is low (such as low interest rates).

c) When the rates of government debt or short-term loans from commercial banks are high.

The researchers gave the concept of the financial crisis that the decline in the exchange rate by at least 25% and to exceed the decline in the exchange rate changes over the previous year by 10% at least. According to the model by (F and R) the magnitude of the crisis is increasing in the following cases.

a) When foreign interest rates are high.

b) When there is a high growth in credit.

c) When the exchange-rate appreciation of its value and the highest by a large margin compared to the average rate.

d) When the ratio of the current account deficit of GDP is high.

e) When there is a decrease in the proportion of foreign loans that have certain privileges.

f) When the rate of foreign direct investments are few compared to the size of external debt.

*KLR Model .Kaminsky, Lizondo and Reinhart 1998:*

According to this model, the crisis occur when the weighted average of the percentage of reduction in the monthly exchange rate and the ratio percentages of the monthly decline in reserves by more than three standard deviations. This model studies a range of indicators or variables that tend to show abnormal behaviour before a crisis limited to about 24 months. Already researchers have chosen 15 indices based on economic theory and the availability of monthly data for these variables. These variables are as follows: international reserves, volume of imports, volume of exports, terms of trade, deviations in exchange rates, the difference between interest rates on deposits in local and foreign, the money supply, the money multiplier, the proportion of domestic credit, real interest rates on deposits, the proportion of lending to the size of deposits, volume of deposits in commercial banks, the proportion of money to the total international reserves, production index and stock price index.

From the above we note that despite differences in the three models in the way of analysis or results, they all agreed that standards of financial market crisis are as follows:

a) When the rate of growth of domestic credit is high.

b) When evaluating the exchange rate high compared to the general trend.

c) When they double the proportion of the cash reserves.

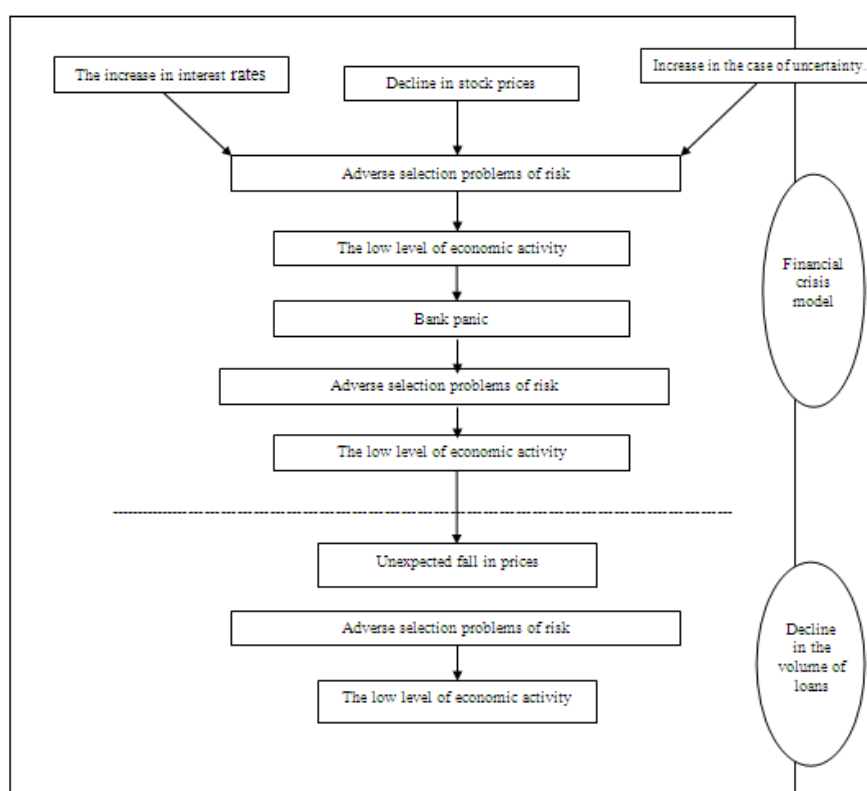
d) When it gets a large deficit in the current account.

*Discussions:*

Economic literature can refer to many of the opinions and ideas from an economic interest in the equity markets and how that can happen to stock prices, causing a financial crisis in financial markets that the effects of moving from one market to another. United States economist (George Berly Sprinkel) and leading economists who were trying to predict the decline in stock prices and the financial crisis, noted that the financial crisis caused by the sharp decline in prices is caused by the decline in money supply, and that the time period between the decline in liquidity in the economy and lower stock prices is up to 15 months. The method adopted by the arrival of the economic result in image analysis and the use of methods to measure the economic well-known for estimating the relationship between changes in money supply and stock prices, and this method is the cause of criticism by some economists. Both (Har and Jaffe) tried to predict the large movements of the level of stock prices in an attempt to develop a way for (Sprinkel).Where researchers used a regression equation on the level of stock prices at the current level of money supply, it got to slow rates in a timely manner. Based on the value of a high coefficient of determination and the value resulting from the move of using stock prices of both trends in supply and the common property, researchers have used the money supply, in addition to the rate of growth of current money supply for the purpose of predicting stock prices. It depends on the ability of investors to predict a growth rate of money supply. A summary of these ideas and opinions to predict the incidence of financial crisis through a decline in stock prices is that there is a relationship between changes in interest rates and stock markets in predicting the crisis which can be done by adding the interest rates in the market. Therefore the researcher says he cannot rely on any form of these models to predict the occurrence of financial crisis in absolute terms, because each form of these models was designed to study a particular case or economy of a particular country thus, may cannot achieve the same results if it were used to study the economy of another nation knowing that the economic environment and the pattern of the labor market differs from one country to another. The success of predictability is associated with the ability of analysts to analyze the economic environment firstly and then try to adapt the conditional variables of the models used to predict the development of a model in line with the changes of the economic environment under study.

### *The Position of the Arab Financial Markets of These Models:*

While the listed models are designed primarily to predict crises in financial markets, we believe that the usefulness of these models will be limited to the Arab money markets because of the multiplicity of economic indicators used in these models, which are not available and accurate data continues to Arab money markets in addition to the difference of the physical environment and the difference in the development of financial institutions. Thus, these models we have reviewed could be useful, at least in the establishment of early warning system for Arab financial markets and adoption of indicators that could have a role in the prediction of indicative crisis in financial markets. The reality of past experiences undergone by the financial markets world and the use of an early warning system for the Arab money markets commensurate with the needs of economic indicators and what we want in the future?



**Fig. 1:** The Structure of the Financial Crisis

### *Conclusion:*

During the research on former works on the said crisis, it was noticed that the prediction of financial crises in the markets are beginning to worry many economists and financial experts. What are caused by the adverse economic and social and political problems? Despite the fact that some of these ideas, which linked the changes taking place in one of the economic variables and stocks on the stock market return to the beginning of this century, but the studies which we have dealt with which attempts to predict the financial markets crisis has taken a more serious trend of the previous number of crisis that have occurred in recent times and repeated from time to time and the danger inherent in the ease of moving quickly to other markets. While researches that we have mentioned were not very successful in predicting the crisis in financial markets, these crises continues to pose serious danger in the draft if not complete and therefore we cannot talk about theory or model being crucial in this area.

But all of these forms, and attempts before to help us develop our capabilities and our tools for forecasting the financial markets crisis, have been coming period would witness many of these attempts, both in finding the best variables that can be used to predict the variables indicative of crises or in terms of the standard methods used, and this , all the development and progress is happening in other branches of science, especially the statistical reflect positively on future efforts in this area.

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