

Crises

University Oran 2 Mohamed Ben Ahmed – ALGERIA-Faculty of Economic Sciences, Commerce and Management Sciences National Conference: Economic and Trade Policies in the Era of Economic Crises

Causes of Financial and economic Crises in Emerging Economies: An Empirical Study of MEXICO (1980-2008)

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Abstract: Financial crises are a global phenomenon, usually associated with large and persistent declines in GDP, investment and productivity as, in order to identify the fundamental factors explaining the financial crises in emerging countries, in particular Mexico. We conducted a standard study using the ARDL model for a set of possible macro indicators explaining the Mexican crisis 1994/95 and its impact on economic growth, based on annual data, during the period 1980-2008. The results indicate that there is a short-term relationship between the variables of the study, we also found a negative impact of all the explanatory variables on economic growth, and this proves the validity of the study.

Keywords: Financial Crises, Economic Crises, Economic Growth, Mexico, ARDL Model.

ملخص: إن الأزمات المالية هي ظاهرة عالمية، ترتبط عادة بانخفاضات كبيرة ومستمرة في الناتج المحلي الاجمالي والاستثمار والإنتاجية ومن أجل تحديد العوامل الاساسية المفسرة للأزمات المالية في الدول الناشئة، على وجه الخصوص المكسيك، أجرينا دراسة قياسية للمجموعة من المؤشرات الكلية المحتملة المفسرة للأزمة المكسيكية 95/1994 و أثرها على النمو الاقتصادي، باعتماد على بيانات سنوية، خلال الفترة ١٩٨٠–٢٠٠٨. تشير النتائج الى وجود علاقة قصيرة المدى بين متغيرات الدراسة، كما توصلنا إلى وجود تأثير سلبي لكل المتغيرات المفسرة على النمو الاقتصادي، وهذا ما يثبت صحة الدراسة.

الكلمات المفتاحية: الأزمة المالية، الأزمة الاقتصادية، النمو الاقتصادي، المكسيك، نموذج ARDL.

Résumé : Les crises financières sont un phénomène mondial, généralement associé à des baisses importantes et persistantes du PIB, de l'investissement et de la productivité, afin d'identifier les facteurs fondamentaux expliquant les crises financières dans les pays émergents, en particulier au Mexique. Nous avons mené une étude standard utilisant le modèle Ardl pour un ensemble de macro-indicateurs possibles expliquant la crise mexicaine de 1994/95 et son impact sur la croissance économique, sur la base de données annuelle, au cours de la période 1980-2008. Les résultats indiquent qu'il existe une relation à court terme entre les variables de l'étude, et nous avons également trouvé un impact négatif de toutes les variables explicatives sur la croissance économique, ce qui prouve la validité de l'étude. **Mots-clés :** la crise financière, la crise économique, la croissance économique, Mexique, ARDL.



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1. INTRODUCTON

Financial crises are a global phenomenon, usually associated with large and persistent declines in economic output, investment, and productivity. The recurring nature of financial crises with the uniqueness of each event makes policy making more complex. In all of these traumatic events, macroeconomic fundamentals have been severely affected by institutional and structural weakness. In the early 1990s, the world experienced a series of financial and economic crises that mainly affects the economies of emerging countries. (Allen, F., Babus, A., & Carletti, E., 2009)

The Most dramatic were the Mexican crisis that began in 1994, which declared the first real crisis in this emerging country, which lasted from 1994 to early 1995, which had devastating effects on the countries of the region, the East Asian crisis that began in July 1997, and the Argentine crisis, which started in 2001. (Yamina BELHIA, Faouzi TCHIKO, 2019)

The subject of financial crises is an important topic, as we find many studies that have referred to it. However, the literature on the search for the main causes that led to the outbreak of these financial and economic crises in emerging countries is still not enough to understand all its aspects. This call for research on: *An important issue, what are the main causes of the Mexican financial crisis of 1994/1995?*

The main objective of our research investigation, which revolves around the impact of macroeconomic indicators during the crisis, is to analyze the relationships between GDP, current account balance CA and GNS, trade balance CB, INF inflation, foreign debt FD, and real effective spending rate based on data provided by the World Bank. The contribution of this paper to the financial literature is to identify the possible negative repercussions of the factors explaining the financial crisis that affected the Mexican economy in 1995 on economic growth. For this purpose, we used standard economic modeling to investigate the significance of the relationships between the variables of interest to us. The remaining sections of the paper are as follows: the section analyzing the evolution of the Mexican financial crisis 1994/95, the section summarizing the literature review; Section IV implements an experimental application and summarizes the main findings. The fourth section deals with the conclusion of the study .

2. Theoretical foundations

- 2.1. The Mexico Financial Crisis 1994-1995
 - 2.1.1. Before the crisis

The Mexican crisis of 1994 is presented as the first financial crisis affecting an emerging country, at the beginning of the 19th century. However, it is more noticeable by its position as the first of a series of crises that will affect most emerging economies. Before the crisis, Mexico's economy did not foreshadow a crisis. She was doing very well in the last decade leading up to this crisis. The country had implemented many liberal-inspired reforms. (Le Page, 2003)

It had liberalized trade, abolished exchange controls, modernized its market, lifted restrictions on foreign investment and deregulated its economy. In the aftermath of the 1982 crisis, the country carried out macroeconomic and structural reforms, from 1998 to 1993, with the support of the IMF. He reinforced the stabilization process and implemented a strategy based on the liberalization of the economy. The country had achieved a satisfactory growth rate since 1989, with an average of 3.9%. (Camdessus, 1995)

These policies of stabilization and reform have had remarkable results. With a deficit of 15% of GDP in 1987, the overall balance of public finances turned into a slight surplus in 1991-1993. Inflation was reduced from 160% in 1987 to 8% in 1993. Real GDP growth picked up from an average of less than half a percent per year in 1985-1988 to 3% in 1989-1993.

2.1.2. The outbreak of the crisis

Mexico therefore entered 1994 with a stronger economy. Nevertheless, weaknesses persisted. Since 1989, its trade balance had been deteriorating and the deficit of current external transactions amounted to 6% of GDP in 1993 and 9% in 1994%, whereas this balance was almost balanced in 1987-1988. Increased domestic consumer spending also contributed to the current account deficit, and the Mexican currency was weak.

After rising dramatically on a real effective exchange rate basis of 76% between the end of 1987 and 1993, the peso was pegged to the dollar, with ranges of fluctuations. As a result, the real exchange rate became too high to maintain the international competitiveness of Mexican products. In the second quarter of 1994, the country experienced a series of events that further weakened the national economy.

However, there were two important facts that characterized the political environment and contributed to creating a climate of generalized uncertainty. It was culminated in the outbreak of the revolution in Chiapas, since the beginning of January 1994, and the assassination of Mr Colosio, the presidential candidate, at the end of March. (Radelet, S., Sachs, J. D., Cooper, R. N., & Bosworth, B. P., 1998)

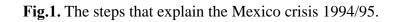
Another political assassination in September and a second revolution in Chiapas in December also increased the climate of political and economic uncertainty and, because of political instability, the outlook for the Mexican economy turned pessimistic. Foreign investors are becoming scarcer and capital has fallen sharply.

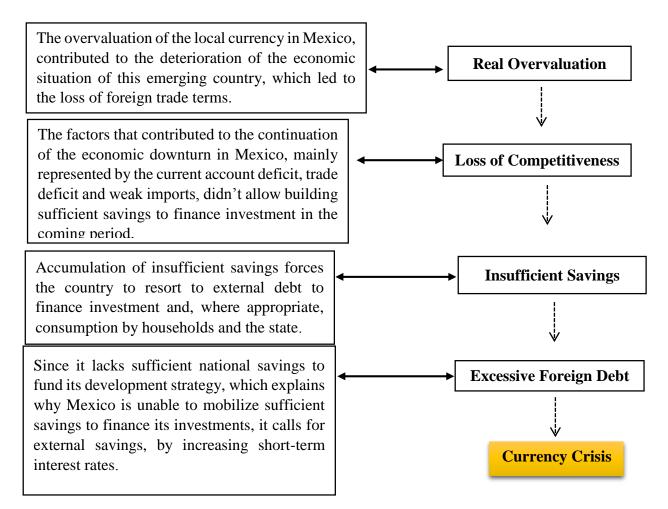
While the current account deficit reached 8% of GDP for the year as a whole and the exchange rate of the peso against the U.S. dollar was at the upper limit of its fluctuation base, a new administration with the new President Zedillo had taken office and new tensions resumed in Chiapas.

Faced with this instability, the authorities agreed on December 20 to devalue the peso by raising the upper limit of its intervention band by 15%, because international reserves had fallen to 10.5 billion dollars. However, this measure failed to stabilize the markets and two days later, after another loss of reserves of \$4 billion, they let the peso float.

This abandonment was another blow to confidence and the peso continued to fall sharply, and capital markets wondered whether Mexico would be able to service the debt in the short term. Industrial production fell by 15% and GDP by 6.2% and the peso was 40% lower than it was in mid-December, at the end of January 1995. In the weeks following the outbreak of the crisis, stock markets in Argentina, Brazil, Chile and Peru fell 20%, while other emerging markets fell, especially in Asia, where they also recorded significant declines. (Kehoe, 2011)

In the aftermath of this crisis, huge aid from the US Treasury, worth \$20 billion, and support from the International Monetary Fund, in the amount of \$18 billion, have been beneficial to Mexico in order to slow down the destructive process of the crisis. The International Monetary Fund has developed a rescue plan accompanied by deflationary measures. (Le Page, 2003)





Source: Estimated by Author's

3. Empirical framework of the study

The main objective of this study is to identify and analyze the impact of macroeconomic indicators, that is, the main factors of the recurrence of these crises on economic growth in emerging economies, specifically Mexico. Study covers annual data for the period of 1980–2008. The data were obtained from the World Development Indicator (WDI), is an electronic database of World Bank. The definitions of variables are presented in Table(1).

Tab.1. summary of variables used in the study

Variable Notation		Data source	Unit
Gross domestic product	GDP	Word Development Indicators	(ANNUAL %)
The current account CA		Word Development Indicators	(% of GDP)
The commercial balance CB		Word Development Indicators	(% of GDP)
Foreign debts FD		Word Development Indicators	(% of GDP)
Gross national savings GNS		Word Development Indicators	(% of GDP)
Real effective exchange rate REE		Word Development Indicators	(% of GDP)
Inflation	INF	Word Development Indicators	(%)
Inflation	INF	word Development Indicators	(%)

3.1. Analysis of Key Statistical Indicators of Central Tendency and Variationa) Descriptive Analysais of Variables

In the following, we present the descriptive statistics of our data by estimating the central tendency of the distribution via the mean and the median values for the variables of interst: The Table below indicates the mean, median and standard deviation of the variables for the period 1980-2008.

Tab. 2. Des	criptive	Statistics
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	GDP	CA	СВ	FD	GNS	REE	INF
Mean	2.708473	-1.913665	0.041709	35.35994	24.25460	102.4333	32.46183
Median	2.753554	-1.531721	-1.484808	29.74437	22.54653	105.9765	20.00788
Maximum	9.233252	3.756423	9.133967	75.12672	33.58774	137.5070	131.8274
Minimum	-6.291231	-6.730411	-5.040007	17.49135	18.15622	67.40622	3.629468
Std. Dev.	3.438229	2.498934	3.505672	16.23557	4.113157	16.08392	35.79195
Skewness	-0.515288	0.166648	1.083224	1.000181	0.744570	-0.276849	1.471157
Kurtosis	3.466838	3.028314	3.298084	3.191018	2.570317	2.859199	4.096307
Jarque-Bera	1.546697	0.135198	5.778679	4.879172	2.902616	0.394408	11.91308

b) Analysis of Correlation

Tab. 3. Correlation matrix for the variables of interest

Correlation	GDP	CA	СВ	FD	GNS	REE	INF
GDP	1.000000						
CA	-0.460989	1.000000					
СВ	-0.449248	0.794899	1.000000				
FD	-0.393084	0.462127	0.788670	1.000000			
GNS	-0.095306	0.437091	0.802738	0.599247	1.000000		
REE	0.437242	-0.553075	-0.599634	-0.776303	-0.258453	1.000000	
INF	-0.342825	0.538281	0.801925	0.921914	0.650441	-0.676722	1.000000

Source: Produced by the author using the Eviews software.

From the above table, it is clear to us that most of the correlations differ between medium and strong. Values greater than or equal to 0.5 indicate that the variables are negatively closely correlated, depending on the variable effect viewed from the other side.

According to the results of the table, we notice a strong and negative relationship between external debt (FD) and the real effective exchange rate (REE), where the correlation coefficient was estimated at (-0.776303), while the rest of the variables were estimated. Negative correlation with the gross domestic product (GDP) growth rate.

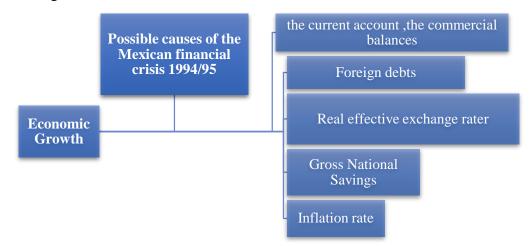
c) Econometric Models

We used the software EViews version 9.0 to estimate econometric models. Analyses are based on the ARDL method; The autoregressive distributed lag (ARDL) is a technique that allows us to simultaneously estimate the short-run and long run dynamics of our model, even when the time-series are stationary I (0) or integrated of order I (1).

The variables may include a mixture of stationary and non-stationary time-series for ARDL Bounds testing approach proposed by (PESARAN, M. Hashem, 1997), (Pesaran, M. H., Shin, Y., & Smith, R. J, 2001). We employed ARDL model analysis to investigate the relationships between GDP, CA, CB, FD,GNS and REE,INF.

The Model Analysais

The figure below shows the impact of the macro indicators that caused the Mexican crisis on economic growth:



Stress the model specified in equation 1 is used to express the relationship between variables:

$$GDP = f(CA, CB, FD, GNS, REE, INF) \dots (1)$$

The mathematical representation of an ARDL regression model is:

$$\begin{aligned} \text{RGDP}_{(t)} &= \beta_{(0i)} + +\beta_{(1)} \ CA_{(it)} + \beta_{(2)} \ CB_{(it)} + \beta_{(3)} \ FD_{(it)} + \beta_{(4)} \ GNS_{(it)} \\ &+ \beta_{(5)} REE_{it} + \beta_{(6)} INF_{it} + \mu_{(t)} \end{aligned}$$

♦ Where:

 $\boldsymbol{\beta}_{(0)}$ Represent the intercept of the function or we can say the constant, and μ is a random (disturbance) term. Then β 1; β 2; β 3; β 4; β 5; β 6 are parameter to be estimated.

d) Unit Root Tests for the Variables

Before presenting empirical results of the ARDL model, we apply the following econometric steps of the stationary and non-stationary Tests of the time series data by Augmented Dickey-Fuller (1979) (ADF). (Dickey, D.A. & W.A. Fuller, 1979) Test. The Augmented Dickey-Fuller (ADF) test results for the time series variables are presented in Tables (1) below.

Tab. 4. Summary results of unit root test (The Augmented Dickey-Fuller test)

			At I	Level				
		GDP	CA	CB	FD	GNS	REE	INF
with Intercept	t-statistic	-5.106772	-2.851531	-1.862373	0.724135-	1.029131	-3.814435	- 1.830079
	prob.	(0.0003)***	(0.0641)*	(0.3442)	(0.8234)	(0.9958)	(0.0076)**	(0.3589)
with Intercept & trend	t-statistic	-5.011458	-2.787065	-2.679109	-4.368179	-1.316239	-5.897336	- 4.129886
	prob.	(0.0020)***	(0.2132)	(0.2518)	(0.0094)**	(0.8643)	(0.0004)***	(0.0159)**
withouat Intercept & trend	t-statistic	-3.793213	0.132653	-1.897152	-0.966716	2.944287	-0.572491	- 1.435633
	prob.	(0.0005)***	(0.0182)**	(0.0563)*	(0.2895)	(0.9986)	(0.4602)	(0.1378)
			At First I	Difference				
with Intercept	t-statistic	/	-5.424344	-4.309134	/	-3.586963	/	/
	prob.		(0.0001)	(0.0023)		(0.0125)**		
with Intercept & trend	t-statistic	/	-5.382990	-4.294618	/	-3.949476	/	/
	prob.		(0.0009)***	(0.0111)**		(0.0225)**		
withouat Intercept & trend	t-statistic	/	-5.499691	-4.394575	/	-2.920362	/	/
	prob.		(0.0000)***	$(0.0001)^{***}$		(0.0050)**		
Order of integ	ration	I(0)	I(1)	I(1)	I(0)	I(1)	I (0)	I(0)

(***) significant at the 1%,(**) significant at the 5%,(*) significant at the 10%.(No) Not significant.

Source: Produced by the author using the Eviews software.

We note from the table that the variables (GDP,FD,REE,INF) are stable at the level where the probability values of the ADF test indicated that it is less than 5%, and therefore we reject the null hypothesis and accept the alternative hypothesis, which is, both series are devoid of unit root.

There is also a group of other variables that did not settle at the level and they are as follows (CA, CB, GNS), so that the probability value was greater than 5%, so we accept the null hypothesis, and after taking the first difference, the probability values indicated that it is less than 5%.

In order to reach the best results to explain the nature of the relationship between economic growth and the most important determinants of economic diversification in Turkey, the ARDL model will be estimated because it combines the stable variables at the level I(0) and the first difference I(1). It is consistent with the nature of the stability of its variables on the one hand moreover, in line with the goal of our study in knowing the nature of the relationship that combines economic growth and the most important determinants of financial crisis in the short or long term, or both.

e) ARDL Bounds test estimation results

The ARDL Bounds co-integration test is used to determine the true long-run relationship between the independent variable (financial crisis) and the dependent variable (economic growth (GDP). The results of the ARDL bounds testing approach (Pesaran, M. H., Shin, Y., & Smith, R. J, 2001) are shown in Table 5.

ARDL Modele	Optimum Lag Length	F-statistic		
Variables :				
GDP;CA;CB;FD;	6	6.827868		
GNS;REE;INF				
Significance	Critical Value Bounds			
Significance -	lower	upper		
10%	2.12	3.23		
5%	2.45	3.61		
2.5%	2.75	3.99		
1%	3.15	4.43		

Source: Produced by the author using the Eviews software.

The empirical findings lead to the conclusion that, there is relationship between economic growth and the determinants that explain the financial crisis, over the period of the study (1980 to 2008). The value of the calculated F-statistic (6.827868) was found to be higher than the upper bound I(1) critical values at all levels of significance, implying the existence of co-integration. The null hypothesis can be rejected. The next step involved examining the effect of the explanatory variables of financial crisis on economic growth.

f) Short-run relationship: ECM estimates

After estimating the long-run equation, this section estimates the short-run relationship between the variables in our study to calculate the speed of adjustment. To do so, the ECM-ARDL model is estimated. Table 7 reports the results of the short-run relationship.

_	VARIABLE	COEFFICIENT	STD. ERROR	T-STATISTIC	PROB.
	D(GDP_(-1))	-0.171341	0.152057	-1.126826	0.2788

D(CA)	-1.008812	0.562623	-1.793051	0.0946
D(CB)	-0.068509	0.654958	-0.104601	0.9182
D (FD _)	-0.309693	0.105493	-2.935667	0.0108
D(GNS)	0.660885	0.310163	2.130769	0.0513
D(REE_)	-0.111595	0.054224	-2.058050	0.0587
D(INF_)	-0.025779	0.034247	-0.752735	0.4641
COINTEQ(-1)	-0.847362	0.284565	-2.977745	0.0100

Source: author's work based on the Outcome of E-views version.09

The results of the estimation in the short term, confirm that there is a common correlation between the variables of the study in the long- run, because the error correction coefficient, which measures, the speed of return to equilibrium is negative and statistically significant. The error correction coefficient (CointEq (-1) = -0.847362) and therefore it is statistically significant at 5%. Where the differences, turmoil and shocks in the country of Mexico will be corrected at a speed of 84.7362% in the coming period.

- ✓ The results of our estimation confirm that there is a statistically significant negative relationship between the current account and GDP growth in Mexico, such that an excessive current account deficit of 1% leads to a lower level of economic growth by -1.190%. This is consistent with economic theory.
- ✓ The study proved the existence of a strong negative relationship with statistical significance between the real effective exchange rate and GDP growth. Thus, it was found that the exaggeration and increase in the real effective exchange rate by 1% for this emerging country results in a decrease in the size of the GDP by -0.13% and thus a decline in economic growth.
- ✓ On the other hand, the estimation results showed a negative and significant effect of the trade balance variable on the GDP, as the trade balance contributes to the decline in economic growth. -1.46% in the emerging countries under study. That is, there is an inverse relationship between the two variables in line with the economic theory, and with statistical significance at the 1% level. This result is consistent with the logic of economic theory, which indicates that excessive trade balance deficit leads to a decline in economic growth. This result is also consistent with several studies such as (Papadimitriou, 2008).
- ✓ The study also proved that the external debt index is significant and its sign is negative at the level of 1%, which means an increase in the value of external debt by 1%, which will

lead to a decrease in economic growth expressed in terms of GDP by -0.07%. The result of this study is consistent with many studies and researches such as those conducted by GÖVDELI, Tuncer. (2019), as well as with the empirical study of Calderón, C., & Fuentes, JR (2013), whose study focused on Latin American countries and showed the negative impact of external debt on economic growth for the period from 1970 to 2010.

✓ There is a negative and insignificant effect of the rate of inflation on economic growth, whenever the rate of inflation rises by 1% will lead to a decrease in economic growth by - 0.0019% and this result is consistent with economic theory. However, this variable is not considered a major cause of the financial.

g) Long-run relationship: ARDL estimates

Since there exists cointegration between variables, we can estimate long-run relationships. The long-term equation is estimated, as reported in Table 3.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CA	-1.190533	0.814761	-1.461205	0.1660
СВ	-1.464040	1.483963	0.986575	0.3406
FD	-0.071776	0.170505	-0.420960	0.6802
GNS	-0.048432	0.558883	-0.086658	0.9322
REE	-0.131697	0.083849	-1.570650	0.1386
INF	-0.097742	0.065717	-1.487318	0.1591
С	20.184574	23.078882	0.874591	0.3966

Tab .6. Long-run relationship: ARDL estimates

Source: author's work based on the Outcome of E-views version.09

The table above indicates the results of the long-term estimation, as it shows us a Fisher probability of 0.000, which indicates the presence of quality in the model and the ability of the independent variables to explain the dependent variable, which expresses economic growth at 0.81. However, the probability of all variables is higher than 5%. This indicates that there is no effect of the financial crisis on the GDP in the long- run. I had this effect for a while and soon this risk is addressed.

h) Robustness checks of ARDL results: diagnostic tests

After estimating the ARDL model, we performed some diagnostic tests to assess the adequacy of the dynamic model. The results of these tests, which are reported in Tables below, were quite satisfactory.

Breusch-Pagan-Godfrey Test

The probability of the Breusch-Godfrey test (Prob. Chi-Square(12) = 0.4628) for Turkey is greater than 5% which means that we accept the null hypothesis of non-self-correlation of the error terms.

Tab.	9.	Breusch-	Pagan-	Godfrey	Test
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Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	0.904076	Prob. F(12,14)	0.5648	
Obs*R-squared	11.78806	Prob. Chi-Square(12)	0.4628	

> ARCH Test :

The probability of the ARCH test (Prob. Chi-Square (1) = 0.4012) for Turkey is greater than 5% which means that we accept the null hypothesis, this proves that there is no autocorrelation between the residues.

Tab.10. ARCH Test

Heteroskedasticity Test: ARCH				
F-statistic	0.668702	Prob. F(1,24)	0.4215	
Obs*R-squared	0.704790	Prob. Chi-Square(1)	0.4012	

Source: Produced by the author using the Eviews software.

> Structural stability test results for the estimated ARDL model

Finally, to ensure the robustness of the specified models along with both short-run and long run coefficients, the study used a cumulative sum (CUSUM) and cumulative sum squares (CUSUMSQ) tests proposed by (Brown, Robert L, Durbin, James, & EVANS, James M, 1975) To achieve this, the structural stability of the estimated parameters in the UECM format of the ARDL model is achieved if the graph of the statistics of both CUSUM and CUSUMSQ falls within the critical limits at a significant level 5 %. The stability tests based on the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ), reported in Fig. 5, observe that at the 5% level of significance all the specified models are stable and have test lines that fall within the boundary. It implies model

robustness along with the stability of both long run and short run coefficient acceptability over the sample period of 1980–2008.

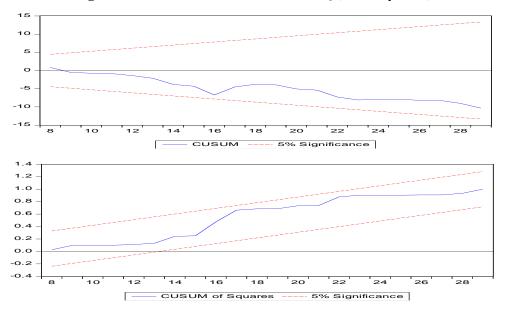


Fig. 5. Plot of CUSUM and CUSUMSQ (Stability Test)

Source: Produced by the author using the Eviews software.

Conclusion

This paper empirically tests the validity of the role played by macroeconomic indicators, i.e. the main factors of the recurrence of the crisis in the deterioration of economic growth during the 1994/95 financial crisis were made in an emerging country (Mexico) covering the period 1980-2008. In this study, an ARDL Model was used to find out the effect of remittances on economic growth.

The study concluded that there is a negative and significant impact of the current account balance and the real effective exchange rate on economic growth, and the results showed that there is a negative impact of inflation, trade balance and foreign debt on the Mexican economy in that period.

The study also concluded the long-term negative impact of total national savings on economic growth, and this result is consistent with theoretical and empirical studies that discussed the reasons that reflect the potential impact of macroeconomic indicators, and act as triggers for these crises. So that these phenomena appear as a disturbing economic fact for the country's economy, which was referred to by economic researchers in emerging markets such as the famous economic thinker (Artus, 2006) and included in: exaggeration, real exaggeration and loss of competitiveness, excessive external debt, excessive government deficit. The current

study opens an engaging conversation in the literature looking at economic growth and the factors influencing it.

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