Resilience and Stability of Algeria's Financial System towards – Resilience versus Stability - Approach

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Abstract

In the absence of a consensus on measuring Financial Stability. This research presents an attempt to construct a composite Financial Stability Index (FStI) for the Algerian financial system, which covers three composites indexes, represented by: the IMF's Financial Soundness Indicators (FSIs), the Financial Resilience Indicators (FRIs), and the Macroeconomic Resilience Indicators (MRIs). The novelty of the research resides in seeking the development of the – Resilience versus Stability- approach, by analyzing the evolution of and the relationship between the aforementioned composites indexes, their interactions, and their effects; and by ascertaining which one has more effects on the Financial Stability situation through Algeria's FStI. As a result, it has been concluded that FSIs and FRIs could reflect the Financial Stability situation unlike to MRIs that affect the financial system inversely and leads to the Financial Instability. However, it is worth noting that FRIs could better reflect the Financial Stability situation rather than FSIs which are mostly regulated. Therefore, to maintain Financial Stability, a certain level of Financial Resilience should be achieved. Particularly, Algeria should maintain its Financial Soundness, promote its Resilience be it financial or macroeconomic, and pay more attention and keep the former one.

Keywords: Resilience versus stability, Financial Stability Index, FSIs, FRIs, MRIs.

I. Introduction

Over the last three decades, especially following the eruption of the global financial crisis of 2008; several discussions have been raised by central bankers and economy policy makers about the Financial Stability issues that have become the dilemma of the world in the 21st century. The huge impact of this dilemma on the world economy has led to increasing attention for monitoring and assessing Financial Stability, focusing on macro-prudential approach by various authorities (See for instance BIS, 2009; FSB, IMF, BIS, G20, 2010 November; and FSB, 2011). Hence, IMF as an international financial institution that works to ensure the stability of the country's monetary and financial system, and the stability of the international financial system as a whole, deploys efforts in elaborating a framework to safeguard and promote Financial Stability. Among their efforts is strengthening macro-prudential orientation of financial regulation and supervision instead of micro-prudential approach, through developing a set of indicators used in IMF surveillance and Financial Stability assessment. However, according to Schinasi (2004) "while actual dynamism of finance, Financial Stability is thought of as occurring along a continuum" (p.7), this fact would make its assessment and measurement more difficult.

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In this context, it might be helpful to rely on the interplay between Resilience and Stability; considering that Resilience is the ability of systems to absorb changes and shocks that can disrupt Financial Stability as a dynamic process. So, built upon that idea, and as many studies have already proposed different indexes which would measure and reflect their countries' Financial Stability, this current research presents a tentative analysis aimed at developing a composite index for tracking Financial Stability in Algeria, by covering assumption of three important components in this index: Financial Soundness, Financial Resilience, and Macroeconomic Resilience. Thereafter, we seek to prove – Resilience versus Stability – approach, especially in the absence and the gap of a common Financial Stability measurement; in general. And on the light of the failure of many reforms adopted by Algeria's financial system, its small size, its limited integration into international financial markets, dominance of its banking system, and the real disturbances which could damage the real economy of Algeria and threaten its Financial stability; in Particular.

To fulfill the aforementioned purpose of this paper, the next section presents a literature review of eminent Financial Stability assessment indexes studies. The subsequent sections represent the field work in which the third section shows the investigated data, the fourth section analyzes the evolution of Algeria's Financial Stability Index (FStI), the fifth section describes the methodology used, while the econometric analysis of the index, the results and the interpretation are presented in section six. The seventh and last section, however, concludes the research.

2. Literature Review

The assessment and the measurement of the Financial Stability have changed over the years due to the need to deal with the impact of the successive crises and with the complex interconnection between the financial system components and the real economy, and between financial systems or economies among themselves in a globalized world. Generally, the Financial Stability assessment and measurement consist of several quantitative methods such as the early warning systems (EWS), the macro-stress tests, and the Financial Stability Indexes. The last method has been applied in numerous attempts to construct Financial Stability indexes for many different countries, given its easier technique unlike the early warning systems and the stress-tests. Among eminent attempts are aggregate Financial Stability Indexes for the Czech banking sector (Gersel and Hermanek, 2006); for the Romanian financial system (Albulescu, 2010); for the banking sector in Macao (Cheang and Choy, 2011); and recently an integral Financial Stability Index: a cross-country study (Arzamasov and Penikas,2014); They have all been constructed by using number of individual indicators.

On one hand, these indicators vary depending to the nature of each financial system and to the purpose of each study, under the context of indicating and tracking the Financial Stability situation of countries. On the other hand, the studies were based on international experience using IMF's core Financial Soundness Indicators, and presented their values within other selected indicators which characterize financial system development, vulnerability, regional economic climate, world economy climate, economic resilience, and so on. Accordingly, Financial Soundness Indicators recommended by the IMF represent the common indicators used.

IMF undertakes a number of initiatives to assess financial system's Stability. However, the recognized importance of the macro-prudential analysis has further highlighted the need for developing indicators of financial soundness. On this basis, IMF has undertaken in 2000 a survey of its member countries to identify Financial Soundness Indicators (FSIs); also in 1999 IMF and World Bank launched the Financial Sector Assessment Program (FSAP)[3] designed to identify financial system strengths and vulnerabilities, which involved the use of FSIs. Consequently, a list of key FSIs was developed and presented to the IMF's executive board in June 2001, and the creation of a compilation guide of FSIs was discussed and finally published in March 2006, (Financial Soundness Indicators Compilation Guide, 2006). The FSIs are grouped into two sets -a core set, and an encouraged set- the core set includes 12 indicators and the encouraged set includes 27 indicators within a total of 39 indicators.

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[3] The Financial Sector Assessment Program (FSAP), established in 1999, is a comprehensive and in-depth analysis of a country's financial sector. FSAP assessments are the joint responsibility of the IMF and World Bank. See more about FSAP in:
http://www.imf.org/external/np/exr/facts/fsap.htm

On the other side, it should be noted that Arzamasov and Penikas' study (2014) unlike the other studies have combined the FSIs and the Resilience of the economy Index depending on IMD[4] data, where they have used FSIs as independent variables and Resilience of the economy indicator (ER) as a dependent variable.

However, in this current research we vigorously determined the Resilience Indicators that might be useful; through adopting -Financial Resilience Indicators (FRIs)- from the Financial System Resilience Index[5], and the -Macroeconomic Resilience Indicators (MRIs)- from the B-Index[6]; proceeding from the assumption that achievement of the Financial Stability requires the Resilience of the financial system, and also the Macroeconomic Resilience, taking into consideration that Macroeconomic conditions are one of the most important determinants of Financial Stability. We have tested their effects beside the FSIs on the Financial Stability, and sought the variable which could have more effect on the Financial Stability situation among the three variables.

Our main effort in this research is aimed at evoking the interplay between Financial Resilience- Macroeconomic Resilience- and the Financial Stability towards attempting to prove and achieve -Resilience versus Stability- approach. Knowing that in the literature, ecologists were the first to use the concept of Resilience and to combine Resilience and Stability in one approach, more than 30-years-ago (See Holling, 1973).

3. Data

As noted above, the FSIs, FRIs, and MRIs are the indicators that should be used in this research. Thereby, we have considered that they represent the composites indexes of the Algerian FStI.

3.1 Independent variables

The composites indexes of the FStI represent the independent variables. They were selected as follows:

The indicators used as Algerian FSIs in the Index are 12 among 39 indicators (available on the IMF's Compilation Guide of Financial Soundness Indicators), they have been selected and identified depending on published reports of the bank of Algeria and on the IMF data. For all the 12 indicators we used annually data during the period from 2009 to 2014. This is due to the lack of data of some indicators for previous years as the Financial Stability committee of Algeria has been setting up since 2008, and the IMF's FSIs were not published until 2006.

In regard to the Algerian FRIs, we relied on the Financial system Resilience Index, which included six (6) important Resilience factors represented by: Diversity, Interconnectedness, Financial system size, Asset composition, Liability composition, Transparency and complexity; then identifying Indicators for each of the six (6) factors, and included the leverage ratio as a final indicator making seven (7) indicators in total (Berry et al, 2014). That Index has allowed us to use five (5) indicators for the Algerian Financial system Resilience drawing on the availability of the data; all in annual periodicity from 2009 to 2014.

For the first factor –Diversity- we included an indicator of market concentration using -the banking concentration ratio- that includes the public bank assets to total assets, taking into account its measure through the -CR5-[7] and the fact that there are six (6) state-owned banks representing the top banks in Algeria's banking system (we calculated the six banks assets to total assets). The second and the sixth factors –Interconnectedness - Transparency and Complexity - are both excluded in this set of indicators, given the small size of the Algerian financial system, its limited integration into international financial markets, and the significant state ownership.

The third indicator taken here is compatible to the – Financial system size- factor, in which we measured Algeria's financial system size by the total bank assets relative to the size of the domestic economy (measured as a percentage of GDP).

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[4] The International Institute for Management Development (IMD), Switzerland.

[5] THE Financial System Resilience Index is an Index developed by researchers in the New Economic Foundation (NEF) to compare the financial system resilience of the G7 countries over time, based on 7 factors of Resilience; See more (Berry, Ryan-Colins, and Greenham, 2014).

[6] The B-Index is an Index developed by BRIGUGLIO, in a methodological framework for the analysis and measurement of Economic Resilience; See more (Brigulgio, Cordina, Farrugia, and Vella, 2008).

[7] The CR5 or CR is the Concentration Ratio that measures the relative weight of the top five banks on the overall banking System from the point of view of bank assets.

Concerning the forth indicator- Asset composition – it has been measured through the Real economy ratio (the credits economy values relative to GDP values). And the fifth – Liability composition- indicator was measured depending on the non-core Liability ratio[8]. Note that non-core Liabilities consists of liabilities to financial institutions as **Table1** shows.

Table 1 : Core and Non-Core Liabilities

	Core Liabilities	Intermediate	Non-core Liabilities
	Households	Non-financial Corp's	Financial Institutions
Short Term	Demand deposits Short-term deposits (<1 month)	Demand deposits Short-term deposits (<3 months)	Demand deposits Funds from repo transactions Short-term payables to banks
Medium Term	Medium-term deposits (1 month-1 year)	Medium and long-term deposits	Medium and long-term deposits Medium and long-term payables to banks
Long Term	Long-term deposits (>1 year)		Securities issued Other borrowings from bank

Source: Akdogan and Yildirim (2014, p. 5)

The last indicator -Leverage-in the set of the Algeria's FRIs, was measured by the leverage ratio (bank Capital to assets).

Finally, for using and selecting the Algeria's MRIs, we have focused on the B-Index which includes four (4) variables: Macroeconomic Stability, Microeconomic Market efficiency, good Governance, and Social development (Brigulgio et al, 2008). However, since we know that the Macroeconomic conditions are one of most important determinants of Financial Stability, we have focused only on the Macroeconomic stability's component of Berguglio's Resilience index, so- called B-Index; by consisting on: The fiscal deficit to GDP ratio, the sum of Unemployment and inflation rates, and the External debt to GDP ratio, all in annual periodicity from 2009 to 2014.

3.2. Dependent variable

The FStI was used as a dependent variable containing two situations throughout the study period from 2009 to 2014 (depending on the analysis of evolution of the Algerian FStI in the next section):

The **Pre-2013** stage denotes the **Financial Stability** situation;
The **Post-2013** stage denotes the **Financial Instabilit**y situation.

4. Analysis of the Evolution of the Algerian FStI

All the independent Variables grouped into three composites Financial Stability indexes (each index represents a set of indicators. FSIs, FSRIs, MRIs), are presented in **Table2.**

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[8] The non-core Liability concept has been developed in recent literature, to encompass all the non-core Liabilities of both banks and nonbanks financial institutions. The more comprehensive concept of the non-core Liabilities produces a more analytically relevant measure of those financial (credit) intermediation activities comprising the Shadow Banking System; see (Harutyunyan, Massara, Ugazio, Amidzic, and Walton, 2015).

Table 2: The Individual Indicators of the Composites Indexes in Algeria's FStI

Indicators used in the **FStI** of **Algeria**	Years					
	2009	2010	2011	2012	2013	2014
FSIs (In Percent %)						
Capital Adequacy Ratio	26,15	23,64	23,77	23,62	21,50	16,02
Tier 1 Capital Ratio	19,09	17,67	17,00	17,48	15,51	13,31
NPLs / Regulatory Capital	33,88	21,06	17,89	16,11	17,12	21,35
NPL Ratio	21,14	18,31	14,45	11,73	10,56	09,21
Net NPL Ratio	7,31	4,68	4,02	3,54	3,36	3,20
Provisioning Rates for NPLs	65,41	73,48	72,15	69,79	68,19	65,22
Return on Equity	26,01	26,70	24,58	22,67	19,00	23,90
Return on Assets	1,75	2,16	2,10	1,93	1,67	2,01
Interest Margin / Gross Income	58,37	63,76	54,89	64,23	69,45	68,58
Non-Interest expenses / Gross Income	32,22	31,43	35,07	35,64	33,53	28,46
Liquid Assets / Total Assets	51,82	52,98	50,16	45,87	40,46	37,96
Short -term Assets / Short -term Liabilities	114,52	114,2	103,73	107,51	93,52	82,06
FRIs (In Percent %)						
Concentration Ratio	90	89,8	89,1	87,1	86,6	87,7
Total Bank Assets / GDP	73,7	66,9	62,1	60,1	62,1	69,9
Real Economy Credit Ratio	30,9	27,2	25,5	26,4	30,9	37,8
Non-core Liabilities Ratio	22	21	18	16	11	10,2
Leverage Ratio	5,8	7,9	7,9	7,9	7,5	8,4
MRIs (In Percent %)						
Fiscal Dificit /GDP Ratio	5,72	0,61	0,43	4,43	0,40	7,33
Sum of Unemployment & Inflation Rates	15,94	13,91	14,52	19,8 9	13,06	13,52
External Debt / GDP Ratio	4,34	3,51	2,30	1,73	1,55	1,64

Source: IMF data, Bank of Algeria's reports, and Author's calculation

After showing all composites Financial Stability indexes, and the values of each individual indicator in the table above, we can track the evolution of Algeria's FStI through the evolution of the FSIs, the FRIs, and the MRIs separately; and go about seek and analyze their relationship as components of the FStI, then their effects on the Financial Stability situation.
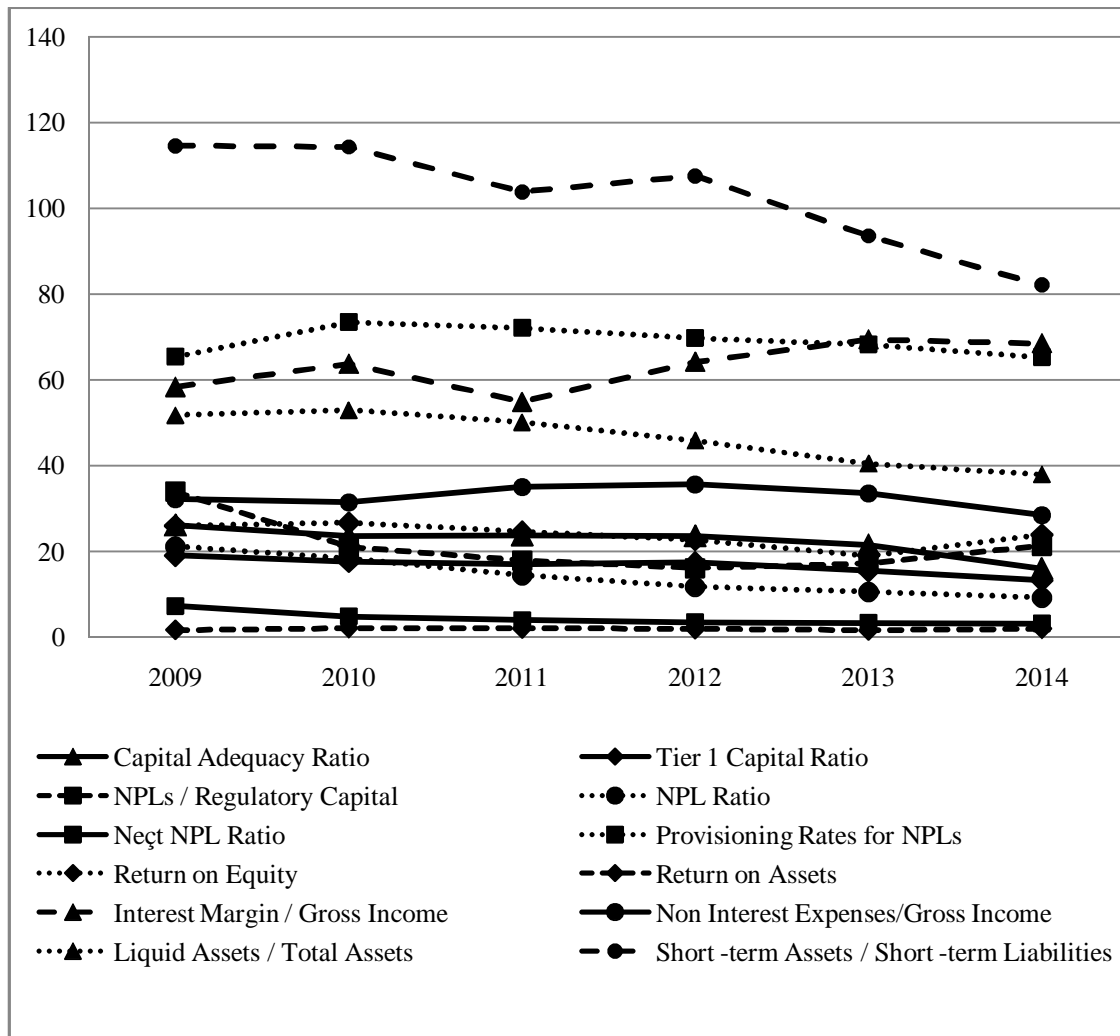
Figure 1. The trend of the FSIs

Figure1 displays the evolution of Algeria's FSIs during the period from 2009 to 2014, which shows that although Non performing Loans (NPL) were high, most of indicators demonstrated a situation of Financial Stability, When (Capital Adequacy Ratio) was not low than (21%) except in 2014 (16,02%); (Tier1 Capital Ratio) was greater than 17% during all pre-2013; and the rest of indicators were also relatively at high level except some declines observed in the period of 2013 and 2014. **Figure 2** shows a considerable Resilience in the Algerian Financial System Except some setbacks observed in the concentration ratio in 2013, in the total assets to GDP in 2012 and 2013, and the rise in leverage ratio since the end of 2013 to 2014 (the same period in which Financial Stability situation deteriorated in most of FSIs).
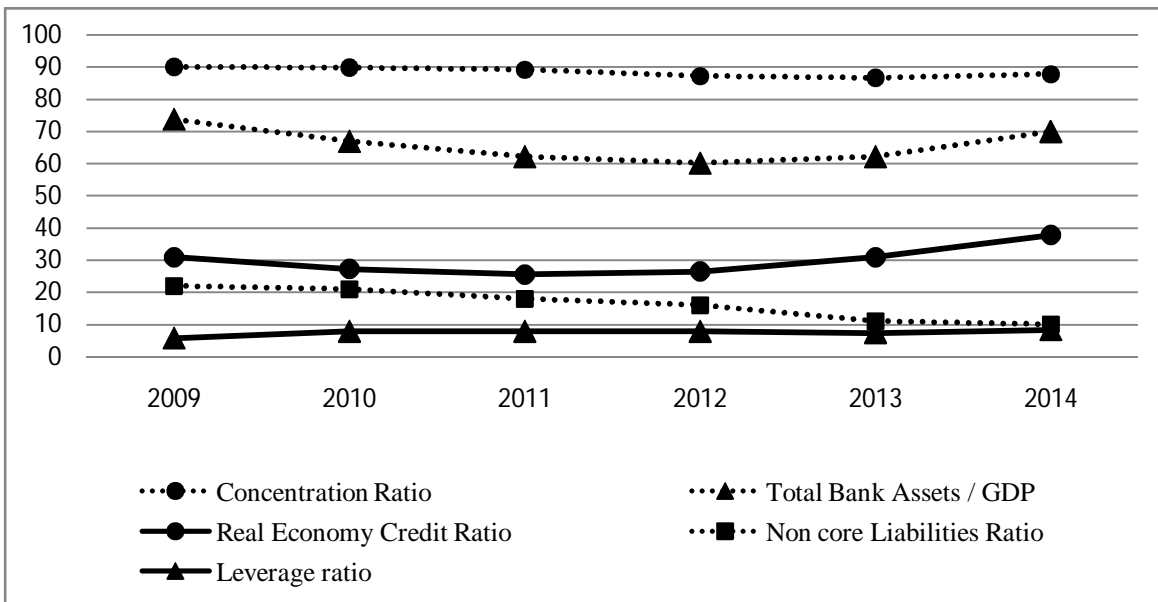
Figure 2. The trend of the FRIs

The situation of the disturbance observed in **Figure 1** and **Figure 2** since 2013, was confirmed as Financial Instability situation period, by the governor of the bank of Algeria in the published reports. This situation was considered as a result of decline in oil revenues (Which form the proportion of 96.7% of GDP in Algeria). It has emphasized in respect to the increasing of MRs since 2013 to 2014 in **Figure 3.**
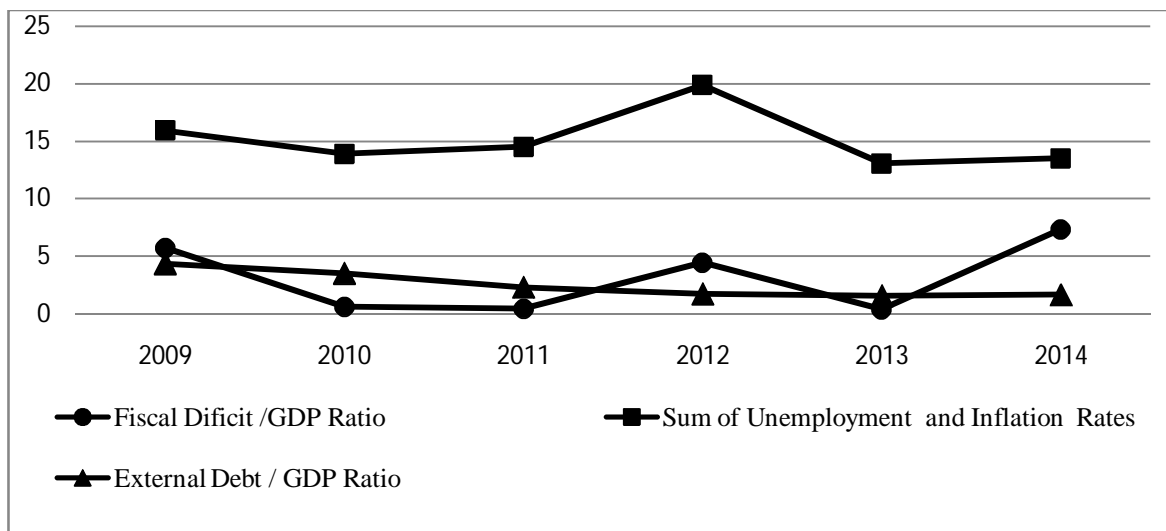

Figure 3. The trend of the MRIs

In **Figure 3**, the period since 2013 that reflect the Financial Instability displays that there is a rise in the both Fiscal deficit/ GDP ratio and unemployment and inflation rates whilst external debt/ GDP ratio remains low even in that period.

The analyzed period in **Figure1**, **Figure2,** and **Figure3** shows that it can be divided into two stages, in terms of decline in the FSIs, the FRIs, and the increase in MRIs as follows:

- The **Pre-2013** stage; where it denotes the **Financial stability** situation.

- The **Post-2013** stage that denotes the **Financial Instability** situation. Those have been considered as dependent variable.

5. Methodology

Based on the FStI' analysis and the main objective of this research, we assumed that the last two years of study period (2013 and 2014) represent the Financial Instability. Then we started from aggregating indicators using the Geometric Mean (GM) of variables. GM results and trends are presented in **Figure4** which shows the common change in the trend of composites Financial Stability indexes since 2013, and which confirms the Financial Instability aforementioned.
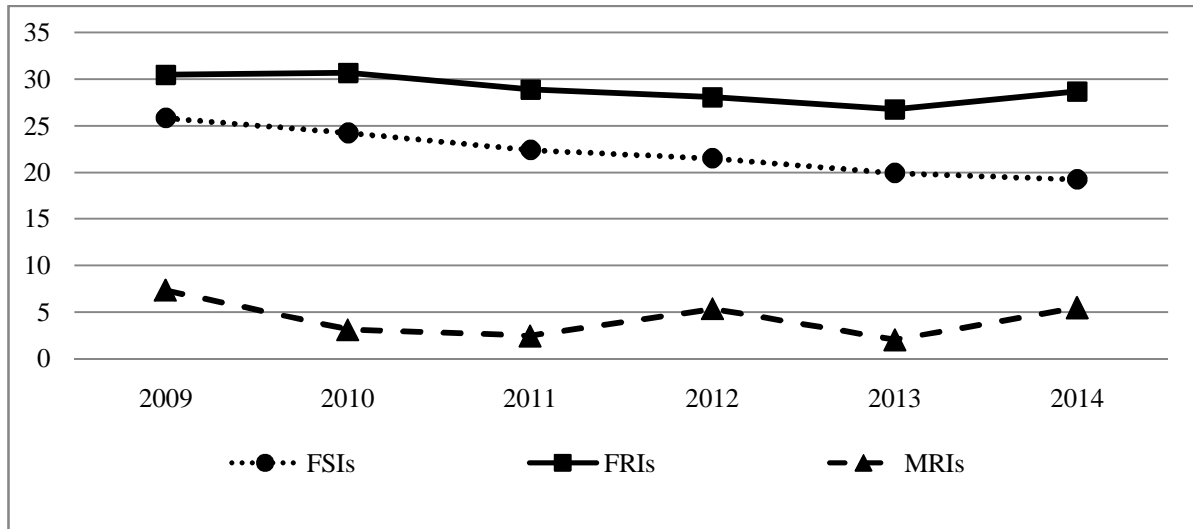
Figure 4. The trend of the composites Financial Stability Indexes based on their GM

After identifying one dependent variable and three independent variables being FSIs, FRIs, and MRIs; the methodology used was based on General Linear Model- Repeated Measures procedure in SPSS software- which provides an analysis of variance when the same measurement is made several times on each subject, and which tests main effects within and between subjects. This is in order to test differences between the FStI components in the two cases of Financial Stability or Instability stages (FSt/FInst).

The model Hypothesis was verified by- Mauchly's test- and –Levene's test- At (5%) significance level. And -Bonferroni adjustment test- was used for multiple comparisons.

6. Econometric Analysis and Results

6.1. Test of model hypothesis

To test the model hypothesis we had to test the homogeneity of variances within and between subjects. **Table3** and **Table4** show the within subjects factors; and the between subjects factors respectively**.**

Table 3. Within-Subjects Factors

global_model	Dependent Variable
1	FSIs
2	FRIs
3	MRIs

Table 4. Between-Subjects Factors

		Value Label	N
Dependent variable FStI		INstability	2
		Stability	4

Therefore we adopted Mauchly's Test of sphericity for the within subjects effects where:
H_0: there would be variance's sphericity [P-value > 0.05]
H_1: there would not be variance's sphericity [P-value < 0.05]
Results from Mauchly's Test of Sphericity are shown in **Table 5**.

Table 5: Mauchly's Test

Mauchly's Test of Sphericity .a							
Within Subjects Effect	Mauchly's W	Approx. Chi-Square	Df	Sig.	Epsilon .b		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
global_model	,606	1,501	2	,472	,718	1,000	,500
Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.							
a. Design: Intercept + FStI Within Subjects Design: global_model							
b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.							

The results of this test showed that P-value = 0.472 > 0.05 significance level. Hence, we accepted the null hypothesis H_0 which assumed variance's sphericity within the three subjects factors (FSIs, FSRIs, MRIs), and we rejected the alternative hypothesis H_1. Then for testing the homogeneity of variances between subjects (Stability or Instability), we used Levene's test as shows **Table6,** where:

H_0: there would be variance's homogeneity [P-value > 0.05]
H_1: there would not be variance's homogeneity [P-value < 0.05]

Table 6. Levene's Test

Levene's Test of Equality of Error Variances .a				
	F	df1	df2	Sig.
Financial Soundness Indicators	4,577	1	4	,099
Financial System Resilience Indicators	,079	1	4	,793
Macreconomic Resilience Indicators	,010	1	4	,926
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.				
a. Design: Intercept + FSTI Within Subjects Design: global_model				

Since p-value of FSIs; FRIs; MRIs= 0.099; 0.793; 0.926 respectively are greater than 0.05 we could not reject the null hypothesis H0, and concluded that there is variance's homogeneity between subjects.

6.2. Within-subject main effects and interactions

In order to test the relationship between the three components of the FStI; the main effect of each within-subject variable and interactions, can be found in the Tests of Within-Subjects Contrasts in **Table 7** ,and in the Tests of Within-Subjects Effects in **Table 8**. The former is shown below:

Table 7. Tests of Within-Subjects Contrasts

Source	global_model	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
global_model	Linear	804,252	1	804,252	287,935	,000	,986
	Quadratic	886,808	1	886,808	793,840	,000	,995
global_model *FStI	Linear	6,271	1	6,271	2,245	,208	,360
	Quadratic	,280	1	,280	,250	,643	,059
Error(global_model)	Linear	11,173	4	2,793			
	Quadratic	4,468	4	1,117			

Through the results of this table, we concluded that the relation of the global model (FSIs, FRIs, and MRIs) is Linear and Quadratic because P-value are less than 0.05 significance level. And there is no Linear or Quadratic relation of global_model* FStI since P-value > 0.05.

The curve of the estimated marginal means in the FStI which is shown in **Figure 5,** notes that both means of factors1 and factor2 of the global_model in the Financial Stability situation are greater than means in the Financial Instability Situation. Accordingly, we affirmed that FSIs and FRIs contribute to achieve the Financial Stability as we assumed at the beginning of this research. While the third mean's Factor of the globel_model in the Financial stability situation is very close to its mean in the Financial Instability situation, which could interpret the opposite relationship and effect of the MRIs on the Financial Stability as we assumed.

The factor 2, which represents the Financial Resilience, has the most effect on the situation of the Financial Stability, the fact that it reflects the biggest estimated marginal mean.
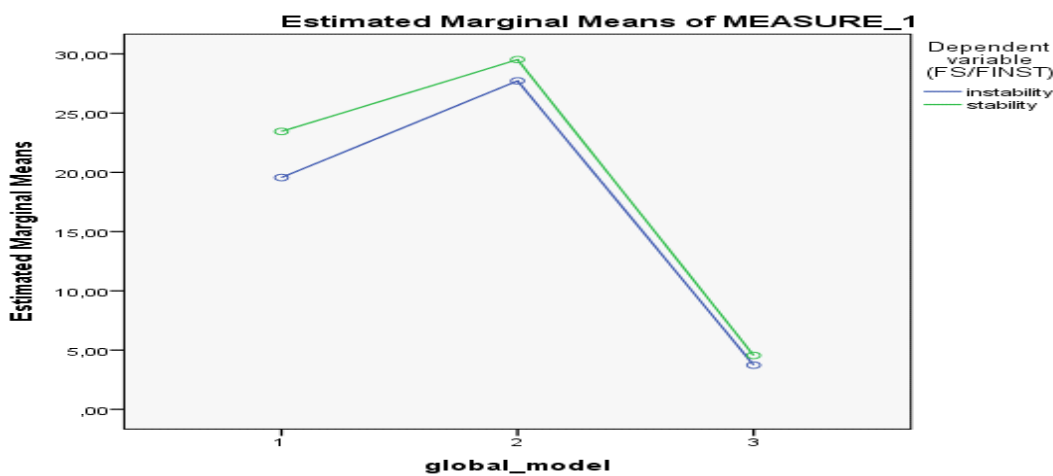
Figure 5. curve of estimated marginal means

The interaction between Financial Stability and Instability's situations of the global_model was also clearly shown when there was no parallelism in curves in both situations (FSt/FInst), and imposes testing the significance of the global model in the two cases. However, this fact requires testing Within-Subjects Effects**.** See **Table8.**

Table 8. Test of Within-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
global_model	Sphericity Assumed	1691,060	2	845,530	432,465	,000	,991
	Greenhouse-Geisser	1691,060	1,435	1178,310	432,465	,000	,991
	Huynh-Feldt	1691,060	2,000	845,530	432,465	,000	,991
	Lower-bound	1691,060	1,000	1691,060	432,465	,000	,991
global_model * FStI	Sphericity Assumed	6,551	2	3,275	1,675	,247	,295
	Greenhouse-Geisser	6,551	1,435	4,565	1,675	,259	,295
	Huynh-Feldt	6,551	2,000	3,275	1,675	,247	,295
	Lower-bound	6,551	1,000	6,551	1,675	,265	,295
Error(global_model)	Sphericity Assumed	15,641	8	1,955			
	Greenhouse-Geisser	15,641	5,741	2,725			
	Huynh-Feldt	15,641	8,000	1,955			
	Lower-bound	15,641	4,000	3,910			

In regard to global model, the sphericity is assumed; this means the significance of the global model, and indicates that there are significant differences between FSIs, FRIs, and MRIs factors. Nevertheless, the results show that p-value= 0.247 is greater than significance level, and indicate that there is no difference between means of the global_model in the two situations (global_model*FStI). After being reported in Tests of Within-Subjects Effects, that there are significant differences between FSIs, FRIs, and MRIs factors in the global model; and no differences between means of the global_model in the two situations (global_model*FStI). The two next Tables of pairwise comparisons compare the level of within subjects and between subjects pair by pair.

Table 9. Pairwise Comparisons of within subjects

(I) global_model	(J) global_model	Mean Difference (I -J)	Std. Error	Sig.b	95% Confidence Interval for Difference .b	
					Lower Bound	Upper Bound
1	2	-7,110*	,534	,001	-9,225	-4,994
	3	17,366*	1,023	,000	13,313	21,420
2	1	7,110*	,534	,001	4,994	9,225
	3	24,476*	,931	,000	20,788	28,164
3	1	-17,366*	1,023	,000	-21,420	-13,313
	2	-24,476*	,931	,000	-28,164	-20,788
Based on estimated marginal means						
*. The mean difference is significant at the ,05 level.						
b. Adjustment for multiple comparisons: Bonferroni.						

Table10. Pairwise Comparisons of between subjects

(I) Dependent variable (FS/FInst)	(J) Dependent variable (FS/FInst)	Mean Difference (I-J)	Std. Error	Sig.a	95% Confidence Interval for Difference.a	
					Lower Bound	Upper Bound
Instability	Stability	-2,167	1,206	,147	-5,516	1,182
Stability	Instability	2,167	1,206	,147	-1,182	5,516
Based on estimated marginal means						
a. Adjustment for multiple comparisons: Bonferroni.						

Since P-value =0.000 or 0.001 both values are less than 0.05 in **Table9** , they indicate that the three means differences are significant , note that Factor 2 is more reflecting the Financial Stability situation. Logically because its indicators might go up or down depending on the financial situation, while most other indicators of the Factor 1 are regulated such as -Tier one Capital Ratio- which should not fall below than 8%. And according to **Table10** There is no significant difference since the p value in the two situations Stability and Instability is the same (p value= 0.147).
This could be due to the Algerian government support and the interfering of public authorities in the Instability situations to maintain the level of those indicators through various financial and economic policies such as the austerity policy adhered to recently on one side; or due to the Small size of observations, on other side. Therefore, it could be more credible if there were more observations which could ensure the role of public authorities in safeguarding Financial Stability if there is an equal in the three means of the global model.

As a result, to maintain Financial Stability, we must maintain not only the Financial Soundness but also keep and maintain a certain level of Financial Resilience even in difficult macroeconomic conditions, where it could absorb changes and shocks that disrupt the Financial Stability, trough for example persevering loans to the economy.

7. Conclusion

The successive disrupts in the financial systems, especially following the eruption of the global financial crisis of 2008, and the absence of a common Financial Stability measurement; reveal an increasing attention among researchers towards reaching a general agreement on Financial Stability measurement and therefore assessment, through constructing Financial Stability indexes by combining various indicators.

In addition to the IMF's Financial Soundness Indicators as international indicators, and through what we have drawn from the results of this research; the Resilience may contribute to assess and better reflect the Financial Stability. In this research, we have started from the assumption of three composites Financial Stability indexes including Financial Soundness, Financial Resilience, and Macroeconomic Resilience, and considered them as independent variables.

Then, using econometric analysis, we have relied on General Linear Model-repeated measures to test and analyze the relationship, the effects and differences between the variables in two situations (Financial stability and Financial Instability) throughout the evolution of the Algerian Financial Stability Index which represented the dependent variable. Besides, the combination of the three composite indexes has allowed us to construct a Financial Stability Index of Algeria despite its small period and the lack of data; and conclude that there is a Financial Instability in Algeria since 2013 given to the increase in their MRIs which was caused particularly by the worsening Fiscal deficit because of the continuing decline in oil prices. To achieve Financial Stability, the Financial Soundness must be maintained and especially Financial Resilience that should be kept, and that could monitor and reflect the financial system capacity to absorb shocks by its indicators those are closer to the reality compared to financial soundness indicators that are regulated (e.g. Tier1 capital ratio).

Finally, the Financial Stability Index needs to be supported by other relevant data in a long period for making sound judgment. However, RESILIENCE versus STABILITY approach is modestly demonstrated and needs more attention by researchers.

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