

THE ROLE OF STRESS TESTING SCENARIOS IN REDUCING THE BANKS- RISKS: AN APPLIED STUDY

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Abstract: The present research aims at drawing or forming a group of scenarios that a bank might be exposed to know the unexpected probable risks and then draw methodologies for facing and stopping or demolishing them. The present research has tackled one of the important parts in the system of banking- risks management which is represented by "stress testing" whose urgent need has arisen as a result of the global financial crisis and the negative effects accompanying it. Basel Treaty has focused on obliging banks to periodically make stress testing to ensure their being safe and the existence of sufficient capital for facing the shocks of unexpected risks. Obviously, this is also applicable to the traditional and Islamic banks as well. As far as the local environment is concerned, the environment of Iraq in particular and the regional area in general are characterized by political and economic instability, a matter that may expose banks to unexpected probable risks. The results shows that the apply stress testing presented by Basel's committee to some of The Iraqi banks. Stress testing have been useless because all the resultant or verified revenues have been the result of the bank- practicing minor activities that are related to banking-process returns (remittances commission).

Keywords: Stress Testing, Risks Management, Capital Sufficiency

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Introduction

Stress tests are used as part of the risk management system of banks. These tests are of a future dimension in risk assessment (Forward-looking Assessment of risk) (Bird, Karolyi, Ruchti, & Sudbury, 2015; Urbański, Haque & Oino, 2019). It is possible to say that stress tests are a control tool that helps the bank's management in the future planning and provides them with indicators of the size of capital required to face the impact of unexpected events related to many of the risks that may be exposed to the bank resulting from large economic and financial shocks (Hussain, Mosa, & Omran, 2018). Risk management tools to be used by the Bank in its risk management in accordance with the second pillar of the Basel II decisions (Hussain et al., 2012). Pressure tests are conducted with the Bank in order to assess the impact of emergency events on economic and market variables on each profit. And the economic value of its equity (Hussain, Mosa, & Omran,

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2017; Burianová & Paulík, 2014). As the banking sector has a major role in the development of the economy of all countries, therefore, the sound financial position of banks and their viability are among the most important criteria that central banks and governments work to maintain (Baud & Chiapello, 2017).

Banks always face a dilemma or problem of availability of liquidity, the fact that their activity depends on the financing of loans and long - term assets, depositors' money, which tend to be short - term, especially current accounts that the client can withdraw at any time (Rahman, Belas, Kliestik & Tyll, 2017).. Stress or stress tests are an important tool for risk management by banks as part of their overall risk management (Hussain, Musa, & Omran, 2018). Where tests in recent years have become one of the most important precautionary safety tools at the macro and micro level in the Iraqi banking sector, as they provide a picture of what will be the situation of banks under difficult but possible scenarios, and this allows the regulatory authorities and managers to assess the capabilities of banks to resist economic and financial shocks and take Measures such as capital consolidation, modification of operational procedures and development of advanced contingency plans in the event of risks in sight (Hussain, Musa, & Omran, 2019; Belás, Dvorský, Kubálek & Smrčka, 2018).

The developing Iraqi Banks are considered as having the luckiest fortune in the banking sector. This has resulted from the fact that Iraqi culture does not prefer commercial banks due to religious justifications, let alone the Islamic banking services which these banks introduce (Baud & Chiapello, 2017). As a result, the problem of the research lies in finding answers to the following enquiries: Is it possible to apply stress testing to the Islamic banks? Are stress testing of Basel's Committee, which are accredited by the Iraqi Central Bank, sufficient for measuring the safety of the banks status and the sufficiency of their capital? Is it possible to draw new scenarios for stress testing and the possibility of applying them to Islamic banks? The current research aims at: increasing the researchers' awareness of challenges that banks face in general and the Islamic ones in particular, and the probable scenarios drawn by Basel's committee and Iraqi Central Bank. Providing bank administration with a prospective evaluation, concerning the unexpected probable risks a bank may be exposed to, through preparing and drawing new scenarios in addition to the already existent ones (Laas & Siegel, 2017). Participating in compiling methodologies that help in ending or reducing the probable risks. Participation in identifying the minimum for capital sufficiency (Greenwood & Roederer- Rynning, 2015).

Literature Review

Many researchers and academicians have tackled the concept of stress testing since it is an important means used as a part of risks management process. It is represented by a technique that includes a group of scenarios aiming at testing the banks capacity of confronting the unexpected exceptional risks. This helps in measuring the banks capacity of enduring shocks when facing different financial

crises. Stress testing are defined as a common tool in banking practices that have rapidly been developed as a result of experience accumulation (Ha, Andersen, & Smiseth, 2019).

Stress testing, when being applied, achieve a number of important features. The tests of stressing positions have a prospective dimension in the assessment of risks as opposed to the samples that depend on the historical data which do not take into consideration the unexpected prospective events. The importance of stress testing lies in supporting the internal and external communications (Obokata et al., 2017). Identifying the banks capacity of risks endurance. Supporting the process of identifying and controlling risks. Reinforcing the tools of risks management in a complementary manner such as the value at risk in order to reach the whole assessment of risks. Improving the bank management of its capital and money. It is the first step in endurance-testing process that means oppressing the concentration on some activities or factors since it is impossible to identify them all. It is also possible to use a number of indicators for identifying them (Foy et al., 2017).

Where tests in recent years have become one of the most important precautionary safety tools at the macro and micro level in the Iraqi banking sector, as they provide a picture of what will be the situation of banks under difficult but possible scenarios (Cummings & Durrani, 2016). This allows the regulatory authorities and managers to assess the capabilities of banks to resist economic and financial shocks and take Measures such as capital consolidation, modification of operational procedures and development of advanced contingency plans in the event of risks in sight (Huang & Thomas, 2015).

This relies on a group of assumptions that are dependent on a number of banking, financial, economic or accounting variables like the rates of profit, the rate of capital sufficiency, rates of inflation, recess and depression and the prices of foreign currency and petroleum. On the basis of these variables, the scenarios building or formation is made to know how much the scenario affects the bank and what the expected losses are because of this scenario (Kapinos & Mitnik, 2016).

The interpretations accompanying the results of stress testing play an important role in showing the effect scale of the activity on the total scale of the bank, let alone taking part in scheduling the necessary procedures for stopping or reducing the unexpected probable risks. The announcement of stress-testing results may increase the awareness of administration about the various risks of the bank, in addition to the benefit which the administration gets through taking these results into consideration in its next programs of stress testing (Flood & Korenko, 2015).

Using this method helps in separately studying the effect of each variable on the financial status of a bank supposing the stability of the other variables in order to assess the vulnerability "sensitivity" of the bank financial position to a certain variable and then comparing this with the vulnerability "sensitivity" of other variables. This types aims to assess the effect of many grouped variables related to various risks that face the bank as far as its financial position is concerned (Levy-Carciente, Kenett, Avakian, Stanley, & Havlin, 2015).

Research Methods

Being the representative of the financial authority, the Iraqi Central Bank represents the research community. Iraqi Islamic Bank has been chosen to be the sample of the research. Stress testing with various scenarios have been applied to the sample of the research. Iraqi Islamic Bank is a private Iraqi bank located in Baghdad. Iraqi Islamic Bank for Investment and Development was established on December 19, 1992. The capital was raised to (250) billion Iraqi dinars. The bank started his full-fledged activity by the Central Bank of Iraq on February 23, 1993. The Bank worked to share the wheel of economic development and growth in the country.

Findings

Islamic Banks are characterized by presenting credit services that differ from those presented by trading banks, such as "monetary credit and insurance or commitment credit". They include a number of services represented by ((Murabaha) gaining, (Musharakah) cooperation and (Mutajarah) trading).The credit concentrations per activities are distributed as shown in table 1.

Table 1. Credit concentrations per activities

Details	Total credit at \$ assessed at I.D.	Total credit at I.D.	Sum	Percentage
Agriculture, hunting and forests	0	11,147,447,463	11,147,447,463	7%
Coal and coal mining	0	0	0	0%
Transformational industries	0	0	0	0%
Electricity and gas	0	10,334,192,576	10,334,192,576	6%
Wholesale, retail, restaurants and hotels	10,324,331,603	22,622,865,950	32,947,197,553	19%
Transportation, storing and communication	0	6,406,699,427	6,406,699,427	4%
Finance, insurance and properties	0	3,447,720,330	3,447,720,330	2%
Community services and social services	7,847,045,640	8,111,128,018	15,958,173,658	9%
External world	0	0	0	0%
Structuring and building	288,760,640	87,165,194,518	87,453,955,158	51%
Delayed debts, letters of guarantee	1,428,000,000	1,215,465,361	2,643,465,361	2%
Total	19,888,137,883	150,450,713,643	170,338,851,526	100%

It can be noticed in table 3 that the given credit concentration has been on the structure and building activities. If this type of credit flounders, this will be reflected on the non-productive credit and then making the required benefits according to the instructions of calculating the non-productive debts appropriation of the returns as explained in table 2.

Table 2. types of credit post-shock

Credit classification	Post-shock			
	Shock scenario without the factor (shock amount)	Credit after the shock	The appropriation after shock	Change in appropriation
Good	10,352,974,703	120,846,433,212	2,416,928,664	-207,059,494
Medium	404,627,038	4,723,061,319	472,306,132	-40,462,704
Total 1	8,921,623,751	125,569,494,530	2,889,234,796	-247,522,198
Less than medium	1,992,928,647	7,190,279,544	1,797,569,886	498,232,162
Bad	407,099,176	1,468,771,539	734,385,769	203,549,588
Loser	8,357,573,919	30,153,258,556	30,153,258,556	8,357,573,919
Total 2	1,835,977,991	38,812,309,639	32,685,214,211	9,059,355,668
Total =1+2		164,381,804,169	35,574,449,007	8,811,833,470

It can also be noted that the appropriation can be calculated as shown in table 3. First, the data in the table refers to the given credit-statement (pre-shock) i.e. on 31/12/2018 for the Bank showing the type of credit according to its importance whether it is productive or non-productive. Second, stress testing, on the other hand, will depend on three scenarios stemming from: The increase or rise in the debts that are non-productive of returns at about 50% of their balance will be reflected on all kind of non-productive debts maintaining on the actual percent to cover the qualifying securities for each type of credit and then making the required benefits via the instructions of calculating the non-productive debts appropriation of the returns depending on the percent above as explained in table 4 which

presents the required benefits according to the instructions of calculating the non-productive debit appropriation of returns.

Table 3. credit given according to the importance (pre-shock) on 31/12/2018

Credit type	Credit classification	Pre-shock			Importance for total finance
		Present stock	appropriation ratio	appropriation amount	
Product	good	131,199,407,915	0.02	2,623,988,158	0.962
	medial	5,127,688,357	0.1	512,768,836	0.038
Total product		136,327,096,272		3,136,756,994	0.829
Non- productive	Less than medial	5,197,350,897	0.25	1,299,337,724	0.185
	Bad	1,061,672,363	0.5	530,836,182	0.038
	Loser	21,795,684,637	1	21,795,684,637	0.777
Total of non-productive		28,054,707,897		23,625,858,543	0.171
Total sum		164,381,804,169		26,762,615,537	

Table 4. Tests Stress Testing for credit in proportion 50%

Credit classification	Post-shock			
	Shock scenario without the factor (shock amount)	Post-shock credit	Post- shock appropriation	Change in appropriation
Good	13,499,741,306	117,699,666,609	2,353,993,332	-269,994,826
Medium	527,612,643	4,600,075,714	460,007,571	-52,761,264
Total	14,027,353,949	122,299,742,324	2,814,000,904	-322,756,090
Less than medium	2,598,675,449	7,796,026,346	1,949,006,586	649,668,862
Bad	530,836,182	1,592,508,545	796,254,272	265,418,091
Loser	10,897,842,319	32,693,526,956	32,693,526,956	10,897,842,319
Total	14,027,353,949	42,082,061,846	35,438,787,814	11,812,929,271
		164,381,804,169	38,252,788,718	11,490,173,181

The increase in the debts that are non-productive of returns at about 100% of their balance is also reflected on all types of non-productive debts with keeping the

actual percent to cover the qualifying securities for each type of credit and then making the required benefits according to the instructions of calculating the debts appropriation that are non-productive of returns depending on the above percent. Table 5 presents credit classification (post-shock) and the proportion of change in debts appropriation as shown below:

Table 5. Cash Credit Pressure in proportion 100%

Credit classification	Post-shock			
	Shock scenario without the factor (shock amount)	Post-shock credit	post- shock appropriation	Change in appropriation
Good	26,999,482,612	104,199,925,303	2,083,998,506	-539,989,652
Medium	1,055,225,285	4,072,463,072	407,246,307	-105,522,529
Total	28,054,707,897	108,272,388,375	0	-645,512,181
Less than medium	5,197,350,897	10,394,701,794	2,598,675,449	1,299,337,724
Bad	1,061,672,363	2,123,344,726	1,061,672,363	530,836,182
Loser	21,795,684,637	43,591,369,274	43,591,369,274	21,795,684,637
Total	28,054,707,897	56,109,415,794		23,625,858,543

The increase in debts that are non-productive of returns at about 200% of their balance is reflected on all types of debts that are non-productive with maintaining the actual ratio to cover the qualifying securities for each type of credit and then making the required benefits according to the instructions of calculating the debts appropriation that are non-productive of returns depending on the above percent. This is clarified in table 6.

Table 6. The increase in debts that are non-productive of returns at about 200%

Credit classification	Post-shock			
	Shock scenario without the factor (shock amount)	Post-shock credit	post- shock appropriation	Change in appropriation
Good	53,998,965,224	77,200,442,691	1,544,008,854	-1,079,979,304
Medium	2,110,450,570	3,017,237,787	301,723,779	-211,045,057
Total	56,109,415,794	80,217,680,478	0	-1,291,024,362
Less than medium	10,394,701,794	15,592,052,691	3,898,013,173	2,598,675,449
Bad	2,123,344,726	3,185,017,089	1,592,508,545	1,061,672,363
Loser	43,591,369,274	65,387,053,911	65,387,053,911	43,591,369,274
Total	56,109,415,794	84,164,123,691	1,544,008,854	47,251,717,086

Risks of cash flow require drawing up deposits (governmental, private sector and banking) at a percent of 10%, 25% from the total deposits during a month. This is reflected on reducing the first three classes' value (shown in the table according to the merit-scale) with conserving the same quantity of the drawings up from the assets, and maintaining the actual ratio for each of these classes. As far as the liabilities are concerned, the value of the drawn deposits from the seven temporal classes must be reduced (shown in the table according to the merit-scale), and also conserving the actual ratio for each class (rate and proportion). Its effect on money (LR) must also be measured.

Basic indicator approach= total average income for three years (positive)* Alpha factor/ Basel inverted 8%

Table 7. Change in capital adequacy ratio

Statement	Pre-shock	Post-shock	Change in capital ratio adequacy
Operational risks size	56,185	0.15	64,613
Total organizational capital	258,249,065,744		258,249,057,316
Risk-weighted assets	1,850,000		1,841,572
Capital adequacy ratio	13,959,409		14,023,292

It is possible to use or apply stress testing to some of the Iraqi Banks. Are stress testing established by Basel's committee and accredited by the Iraqi Central Bank enough for measuring the safety of banks and their capital adequacy. It is possible to design new scenarios for stress testing and applying them to some of the Iraqi Banks.

Conclusions

It is possible to apply stress testing presented by Basel's committee to some of The Iraqi Banks. Stress testing have been useless because all the resultant or verified revenues have been the result of the bank- practicing minor activities that are related to banking-process returns (remittances commission). Focusing towards designing new scenarios related to the equation of cash flows concerning the essential and minor operational activities. The post-shock capital adequacy averages have exceeded the minimum limits specified by Basel's Committee. As a result, it can be noticed that the bank has depended on minor activities to achieving returns, on one hand, and on the other ever invested in essential activities.

Designing new scenarios of stress testing particularly for the revenues and banks of operational activities, and revealing cash flow with average and crucial levels of

sensitivity. Directing the bank towards the essential activities related to credit granting and forming serious rules and controls for giving these credits.

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ROLA SCENARIUSZY TESTÓW STRESU W OGRANICZENIU RYZYKA BANKÓW: STUDIUM EMPIRYCZNE

Streszczenie: Obecne badania mają na celu narysowanie lub sformułowanie grupy scenariuszy, na które bank może być narażony w celu poznania nieoczekiwanego prawdopodobnego ryzyka, a następnie opracowanie metodologii stawienia im czoła, powstrzymania lub zniszczenia. Obecne badania dotyczyły jednej z ważnych części systemu zarządzania ryzykiem bankowym, którą reprezentują „testy warunków skrajnych”, których pilna potrzeba pojawiła się w wyniku globalnego kryzysu finansowego i towarzyszących mu negatywnych skutków. Traktat bazylejski koncentruje się na zobowiązaniu banków do okresowego przeprowadzania testów warunków skrajnych, aby zapewnić ich bezpieczeństwo i istnienie wystarczającego kapitału na pokrycie wstrząsów nieoczekiwanego ryzyka. Oczywiście dotyczy to również banków tradycyjnych i islamskich. Jeśli chodzi o środowisko lokalne, w szczególności środowisko Iraku i ogólnie region regionalny charakteryzują się niestabilnością polityczną i gospodarczą, co może narażać banki na nieoczekiwane prawdopodobne ryzyko. Wyniki pokazują, że zastosuj testy warunków skrajnych przedstawione przez komitet bazylejski w odniesieniu do niektórych banków w Iraku. Testy warunków skrajnych były bezużyteczne, ponieważ wszystkie uzyskane lub zweryfikowane przychody były wynikiem wykonywania przez bank drobnych działań związanych ze zwrotami z procesu bankowego (prowizja za przekazy pieniężne).

Słowa kluczowe: testy warunków skrajnych, zarządzanie ryzykiem, wystarczalność kapitału

应力测试场景在降低银行风险中的作用:应用研究

摘要:本研究旨在绘制或形成一组场景,使银行可能了解未知的可能的风险,然后绘制用于应对和阻止或拆除这些风险的方法。本研究解决了以“压力测试”为代表的银行风险管理系统中的重要部分之一,由于全球金融危机及其带来的负面影响,已经产生了迫切需求。《巴塞尔条约》的重点是强制银行定期进行压力测试,以确保其安全性和足够的资本来应对意外风险的冲击。显然,这也适用于传统和伊斯兰银行。就当地环境而言,特别是伊拉克的环境以及整个地区的特点是政治和经济不稳定,此事可能使银行面临意料之外的可能风险。结果表明,巴塞尔委员会对一些伊拉克银行进行了压力测试。压力测试是无用的,因为所有产生的或经过验证的收入都是与银行业务流程收益(汇款佣金)相关的银行业务小型活动的结果。

关键字:压力测试, 风险管理, 资本充足率