Jurisdiction Reaction to Adjust Deposit Insurance Coverage, 2008 Crisis Adjustments

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Abstract

This study aims at: providing empirical evidence for the variables affecting the level of adopted coverage limit in explicit partial coverage deposit insurance systems; comparing the actual and predicted coverage limits, before and after the recent crisis adjustments; comparing the deviations among the developed and developing countries. This paper uses simple and multiple regression analysis will be applied for the sample data collected from 71 countries adopting explicit partial coverage deposit insurance system. The results found that per capita GDP and the ratio of deposit to GDP in the country were the most significant variables in determining the coverage limit. The results also found that most of the countries were adopting lower coverage than suggested by the models for the period before the financial crisis and higher than it after the crisis. The deviations for the developing countries were extremely higher than the deviations for the developed countries.

Keywords: Deposit Insurance, Coverage Limit, Bank Run, Moral Hazard, Financial Panic.

1. Introduction

Deposit insurance represents an important defense line against economic turbulences and financial shocks. It can be an effective risk management technique if designed and applied properly. Without deposit insurance the financial system in general and the banking system in specific will be vulnerable to the risk of bank run during financial panics. Bank run, as has been learned from the frequent financial crises, imposes serious threats on the liquidity and even the solvency of the financial institutions (Calomiris and Gary, 1991; Diamond and Dybvig, 1983). Liquidity of the bank will be extremely stressed to a degree that converts the solvent bank to an insolvent one and within a short period of time (Diamond and Raghuram, 2002).

In the same time, the over generous deposit insurance system will create, or at least increase, the moral and morale hazards in the banking system. Moral and morale hazards are likely to weaken the market discipline in the overall banking system and will eventually reduce the stability of the banking system, which will subsequently lead to higher consequential costs for the deposit insurance system than its benefits. Optimal benefits of a deposit insurance system will be utilized by properly designing the deposit insurance system,and carefully selecting the design features that consider a variety of topics (Demirguc-kunt and Ditragiache, 2000).The scope of this paper will be limited to the coverage limit of the deposit insurance as an exceptionally important feature in designing deposit insurance system. The insufficient coverage limit for the deposit insurance system will be weak in mitigating bank run, but it will not create moral and morale hazard, and it will not decrease the market discipline as well. The high coverage limit will be effective in mitigating bank run but it will create moral and morale hazard and will weaken the market discipline. The appropriate coverage limit should be selected in between, and should consider this trade off and its consequences on the banking system. Prior to establishing the explicit limited coverage deposit insurance systems, the deposit guarantee was implicitly adopted by governments, and that coverage was without any disclosed limit. The prevailing justification at that time was that the indirect cost of not guaranteeing the deposits can be higher than the direct cost of the reimbursement. The first explicit limited coverage deposit insurance system was created in the US in 1933 as a consequence of the 1929 crisis and the subsequent great depression, later, other countries started to adopt explicit deposit insurance systems (Garcia, 1999).The inherent massage of the explicit limited coverage system is that the system will guarantee all deposits below the said coverage limit, and will not guarantee the deposits above that adopted limit.

From this perspective, the uncovered depositors will be the large depositors which are considered sophisticated enough to practice continuous monitoring and supervision on the banks holding their deposits, and they will insure an acceptable levels of market discipline and risk tolerance (Hoggarth et. al., 2005; Gropp et. al., 2004; Demirguc-kunt and Ditragiache, 2000; Kane, 2000).This study attempts to capture the variables that are crucial in determining the adopted coverage limit for deposit insurance systems. These variables reclassified into quantitative and qualitative variables. This study will also investigate the actual adopted coverage limit compared to the theoretically regression generated coverage, and will highlight the deviations between them. The study will also compare the said deviations among developed and developing countries for the periods before and after the2008 crisis.

2. Literature Review

2.1 Coverage Limit and Bank Run

Bank run represents a major challenge for the banking system as a whole and for the deposit insurer in specific. Bank run can convert the solvent and liquid banks to insolvent and illiquid ones through the abnormal withdrawals of the bank's deposits. These withdrawals come out as a result of the financial panics prevailing during any financial crisis and the irrational behaviors for the investors (Diamond and Raghuram, 2002). Depositor, as all other investors, tend to behave in an irrational and imprudent way during panics, and these behaviors described in some literatures as herd behavior. Herd behavior will lead all investors and depositors to follow the behaviors of others preceding them without any rational justification. These behaviors may include group deposit withdrawals from bank's branches (Mishkin, 1991) which is called bank run. The default of a particular bank will produce a lot of panic, even for the depositors of other financial institutions. This panic will create herd behavior and make depositors rush to their banks and withdraw deposits, even though that their banks are completely clear of any financial turbulences, (Iyer and Puri, 2008; Wicker, 1980). Panic depositors will be afraid of problem transmission from the troubled banks to the safe banks without any notice and within a short period of time. Financial problems occurred at particular bank can be easily transfer to other solvent banks through the contagion effect. The problem is that what actually facilitate this contagion and make the problem transmission easier and easier is the financial panic itself and herd behavior. Herd behavior can create new problems by itself and facilitate the contagion from the troubled banks to safe banks. The unjustifiable random deposit withdrawal can stress the solvent banks and convert them to insolvent ones during a short period of time. Calomiris and Mason, (2003) showed that during financial distress, depositor panic cause liquidity problems for all banks, and that can increase the probability of default for those banks and amplify the contagion effect of problem banks.

Contagion effect can be amplified by the herd behavior and financial panic, which may accelerate the problem transmission between banks in a way called domino effect (Brown et. al., 2014; Kaufman and Scot, 2003; Allen and Gale, 2000; Joseph and Swary, 1996). Diamond and Dybvig, (1983) analyzed the relationship between the bank liquidity represented by the demand (current) deposits and the vulnerability of bank run because of depositor panic during financial turbulences, they show how the bank run can hurt even the liquid and solvent banks. Domino effect is very clear in banking system more than other sectors, and the reason behind this is that the structure of the bank balance sheetmakeit more vulnerable to this phenomenon. This structure implies a maturity mismatch between the bank assets and liabilities, and this fact is considered as a characteristic of the banks balance sheet rather than a shortage in management (Clerc et. al., 2016; Farhi and Tirole, 2012). Friedman and Schwartz, (1963) showed how the banks depositing contracts were more vulnerable to bank run than any other financial institution's financing contracts. Maturity mismatch involves using all types of deposits with different maturities to make investments in short, mid, and long term. The average maturity of liabilities will be far less than the average maturity of assets, and that is mainly because of the short maturity of current deposits. Banks used to manage this liquidity gap very well, but on the other side, any external shock for this harmony (like bank run) will cause a lot of disorder, and will confuse the asset liability management (ALM) in the banks. Accordingly, the banks by its nature more vulnerable to turbulences during financial panics. The main objective of the explicit deposit insurance systems -since the first establishment in 1933- is to enhance the financial system stability (IADI, 2013).This objective will be achieved by providing the guarantee to the vast majority of the bank depositors, this guarantee will make the depositors more relaxed and less panic during the financial turbulences, those relaxed depositors will be less rush during panics, and they will be more convinced not to scramble to withdraw their deposits (Calomiris, 1992).

The empirical evidence proved the positive relationship between the size of the guarantee provided by deposit insurer and the effectiveness of deposit insurance system in achieving the goal of mitigating bank run (Diamond and Dybvig, 1983). Too small coverage limit for deposit insurance system will not be sufficient to convince depositors not to run to banks, and the large and generous coverage limit will mitigate bank run more effectively but unfortunately not more efficiently. Large coverage limit has some drawbacks, one of the most important drawbacks is the moral hazard. Its proven that the higher the coverage limit the higher the moral hazard in the banking system, and accordingly the lower the financial system stability (Garcia, 1999). The optimal coverage limit should be in between, not very low, to be able to mitigate bank run, and not very high to mitigate moral hazard as much as possible.

2.2 Moral Hazard and Market Discipline

Moral hazard exist in financial and banking system even before the adoption of deposit insurance, but the adoption of explicit deposit insurance system will increase this phenomenon and will make it clearer, and will contribute in making the banking system more fragile (Brewer and Thomas, 1994).Demirguc-kunt and Ditragiache, (1998) measured the macro variables that will increase the probability for systematic risk in the banking system, they found that the existence of explicit deposit insurance system is one of the significant variables in that. The main reason of this relationship is the lack of market discipline (Nier et. al., 2006). Market discipline can help regulatory authorities and supervisors to control the banking system. Large depositors have the capability and the accessibility to practice market discipline, they can have their own assessment for the safety and soundness of the operating banks, and they will allocate their investment based on this assessment. Accordingly, the regulatory authorities in general and deposit insurer in specific, should not lose these efforts in monitoring and supervising the banks (Demirguc-kunt and Huizinga, 1999; Sangkyun and Peristiani, 1998; Sangkyun, 1995).

Bank managers will not be happy to lose large investors (depositors) because of the risky position of their investments; those managers should sake for satisfying the risk tolerance of their investors and depositors as well, to avoid losing market share. Demirguc-kunt and Huizinga, (1999) showed that explicit overgenerous coverage deposit insurance systems can weaken market discipline and make banking system more fragile. The generous guarantee provided by deposit insurer will make the investors and depositors more comfortable and relaxed, they will start to be less motivated to continuously monitor the risk level of the banks holding their money, and they will rely on the deposit insurance coverage to reimburse them should the default occurred (Demirguc-kunt and Kane, 2002; Shiers, 1994; Hannan and Hanweck, 1988; Baer et al., 1986).The guarantee provided has decreased the market discipline, and the market discipline is a key instrument in stabilizing the banking system. Losing this instrument will decrease the intensity of bank supervision, and the regulatory authorities will not be alone able to control all bank risky behaviors (Barth et. al., 2006, pp. 307-312). The regulatory authority will not be interested in losing the supervisory efforts of those depositors, and it will always adopt limited coverage deposit insurance system rather than blanket guarantee.

Empirical researches have proven the negative relationship between the level of guarantee provided by deposit insurer and the level of market discipline in the banking system (Demirguc-kunt and Ditragiache, 2000). This result imply a positive relationship between the coverage limit provided by deposit insurer and the level of moral hazard in the banking system. This means that the improper coverage limit may create problems more than what it can fix, and the resulted costs will be more than benefits (Angkinand and Whilborg, 2007).The coverage limit should be selected carefully, and all variables should be considered while taking this decision. Cull et al. (2000) explained how the inappropriately designed deposit insurance system will negatively affect the banking system safety and soundness and will be socially counterproductive. Some of these variables are quantitative variables, and some other are qualitative, some of them are objective and some other are subjective. In all cases, if the selected coverage is higher than optimal, then the moral hazard will increase, and if the coverage limit is lower than optimal, then the bank run will not be mitigated.

2.3 Variables affecting the coverage limit selection

The objectives of deposit insurance system can be efficiently achieved by selecting the optimal coverage limit, the two main goals of this coverage are to mitigate bank run and minimizing moral hazard (IADI, 2013). The achievement of these goals among different countries will be different, and the characteristics and conditions of each country are different as well (Laeven, 2004).

The too high coverage limit for certain countries will be too low for other countries, the coverage limit that is unable to mitigate bank run in certain countries will do mitigate it in other countries and may increase moral hazard, the lesson is; there is no one size fits all. The objective variables that affect the coverage limit selection can be quantitative and qualitative (Angkinand and Whilborg, 2007). The main reference for these variables can be represented by the level of population general welfare or the level of development of that country, the higher the welfare of the population, the higher the required coverage limit to convince those population not to panic, and the higher the coverage limit that may probably create moral hazard (Manz, 2009; Velikova and Rogers, 2009; Nicholas and Ketcha, 2007; Laeven, 2004; Laeven, 2002). The reverse holds true, the lower the welfare for the population (or the economic establishment) the lower the required coverage to cool them down during panics, and the lower the coverage that may create moral hazard. The welfare and economic development level for any country can be represented by the economic and social well establishment of the country and for the citizens living in that country, and there are many quantitative and qualitative variables used to measure this country-status. Some economists rely on single indicator to measure the economic establishment like the Gross Domestic Product (GDP), per capita GDP, per capita income, and the growth of the GDP (Velikova and Rogers, 2009; Nicholas and Ketcha, 2007; Laeven, 2004).But since the late 1990's the developing countries start to have a pretty high economic growth rate compared to the developed countries, and the GDP growth is no longer an accurate measure for such differentiation (Liu and Shu, 2002).

Some financial variables may be considered like the share of the banking or financial system out of the total economy (Velikova and Rogers, 2009). It does make scene torely on some composite indices that used a group of economic and financial variable along with other related variables, some of these indices are Human Development Index (HDI), the Index of Sustainable Economic Welfare (ISEW), the Genuine Progress Indicator (GPI), Environmentally Sustainable National Income (ESNI), Sustainable Development Indicators (SDI), National Accounts of Well-being (NAW), Calvert-Henderson Index, and others (Nielsen, 2011).

Qualitative variables on the other side can be related to some social welfare and Human Development Indicators (HDI).Some of these qualitative variable are quantified by certain proxies that reasonably measure these qualitative variables, and some other use Likert scale to quantify it. The level of public health care services provided in the country is one of these variables, health care can be measured numerically by the size of budget or expenditure on this sector, and can be measured by certain demographic indicators like life expectancy, average age, and mortality and fertility rates. Level of education and the education system in general is another important variable, the better the educational system, the better the prosperity of the population and the more sustainable growth of that community. Some numerical measures used are the level of expenditures on the education system, average number of years of education for the individual, achievement in competency tests, and others, Laeven, (2004) has found that the level of education for depositors is a significant variable in determining the coverage limit for the deposit insurance. The level of human rights and freedom in the country is reasonable measure to differentiate developed and developing countries, and assess the level of general welfare in the country, Likert scale is used to assess the level of freedom and human rights in the country, and this scale is issued by international nonprofit able unbiased institutions (Velikova and Rogers, 2009).Laeven, (2004) have inspected the effect of political-institutional variables related to the country adopting deposit insurance system, such as the level of democracy, and the level of coverage limit, and the study found no significant relationship for it.

3. Methodology

This study use international comparison approach among a sample of countries that adopt the explicit limited coverage deposit insurance system. It inspects the variables that were significant in explaining the variability in the level of coverage limits among sample countries (Velicova and Roger, 2009; Nicholas and Ketcha, 2007; Laeven, 2004;). This comparison is applied using various quantitative approaches including cross countries regression analysis on the sample data. First; simple regression models are going to be applied using variety of variables including per capita GDP as an independent variables.The hypothesis that is going to be tested is whether the variation of independent variables can explain the variation in coverage limit adopted by countries. Second; Multiple regression model will be applied using a group of independent variables already applied in the simple regressions. The variables used in the model are selected carefully among variety of quantitative and qualitative variables related to the coverage limit variability among countries.

Third; the deviation between actual and fitted points of the regression will be calculated and will be interpreted in particular variables to answer the questions of this study. The sample will be discriminated to developed and developing countries, and the indicators will be applied to both clusters and then highlight the differences among the two groups. The suggested model uses the coverage limit adopted by the deposit insurance system in each country as a dependent variable (COV), and a group of independent variables. The statistically significant variables will be considered as explanatory variables in determining the coverage limit for the countries in the selected sample. This study will provide an empirical trial to catch the actual variables that contribute to determine the coverage limit adopted by any country. The deviation of the actual points from the projected points of this regression can be justified by different reasons such as the omitted variables in the model, and the nonlinear relationship of the model, but, in the same time these deviations can be treated as inefficiency in selecting coverage limit, which is the question of our study. Some limited amount of subjectivity in coverage limit determining can be justified in certain circumstances; these circumstances may include immature financial and banking system, where we cannot rely on the deposit insurance design features in insuring the stability of the banking system. Another circumstances may be the unusual economic and financial conditions like that prevailed in the 2008 crisis, during that crisis, about 48 country adopted emergent decisions to increase the coverage limit of their deposit insurance systems, some of these decisions were temporary and some other were permanent (IADI, 2013). The idea behind those decisions lays in the credibility and reliability of the coverage limits from the depositors and regulators perspective (Singh and Walter, 2009; Bradley, 2004). Even though that the old adopted coverage limit was consistent with all objective variables considered in selecting this coverage limit, but during the crisis the tendency for depositor to practice herd behavior will be higher, and the probability that we may have a bank run will be higher, and the depositor confidence in the deposit insurance guarantee will be lower, and the jurisdiction is trying to provide more confidence for this guarantee by rising the coverage limit by certain amount (Bradley, 2000; Kroszner, 1998).

The amount of increase in the coverage limit adopted in the emergent decision may be supported by certain quantitative variables, the perception of the decision maker on the overall condition of the banking system, and the special characteristics of their own population. Some of these characteristics can be quantified and some other cannot, and the deviation of the actual points from the projected points generated by the regression will explain some of these characteristics. The model adopted will try to control the related quantitative and qualitative variables that may affect in selecting the coverage limit for any deposit insurance system from the sample countries. Independent variables should control the economic establishment of the individuals living in the country, and this variable will be controlled using per capita GDP (PGDP). Poverty level can be controlled in the model as an adjusted measure for economic establishment and wealth allocation within the country, and the appropriate measure for that is the income inequality indicator represented by Gini Index (GI) (Becker et. al., 2005; Nielsen, 2011; Dalton, 1920).

Level of education in the country should be controlled as well, and the variable that can represent it is the Education Index (EI) which is used in calculating the composite Human Development Index (HDI). Education Index uses the average of number of schooling years and number of expected schooling years.Health care services provided in the country and its quality should be included, the long term quality of health care services will be best represented by the general mortality rate in the country or the average life age in the population over particular age and life expectancy (LE) (Velikova and Rogers, 2009). Average deposit size (AD) in the banking system will be used to control for the level of sophistication of country's depositors. The strength of the banking system and the strength of the investors in this banking system will play a vital role in determining the coverage limit, the stronger the bankers in the economy the stronger the lobby that will practice pressures on the decision maker to have higher coverage limit(Randall et. al., 1998; White, 1998). The strength of the banking system or bankers in the economy will be represented by the share of total assets in the banking system out of total GDP (ASTGDP), or the total deposit in the banking system to the GDP (DEPGDP) (Velikova and Rogers, 2009; Laeven, 2004; Kane and Wilson, 1998). Spread between the credit interest and debt interest in the banking system (SPREAD) will also be considered. The quality of the credit portfolio in the banking system will be considered as well as an explanatory variable, and this variable will be proxied by the non-performing loan ratio out of total loan portfolio (NPL). Level of population dependency on the banking system services can be effective in their requirement for guarantee, the more dependency on the banking system services, the more the sophisticated the depositors and the higher the coverage limit required to calm their panic during distress.

This reliance or dependency is professionally called financial inclusion, and it is been measured by different ways like the level of urban versus rural population in the country (URB).

$COVi = \alpha + \beta 1PGDPi + €i$….. (1)

$COVi = \alpha + \beta 1PGDPi + \beta 2EIi + \beta 3LEi + \beta 4ADi + \beta 5URBi + \beta 6SPREAD + \beta 6DEPGDPi + \beta 7NPLi + €i$… (2)

After estimating the models properly, the deviations between the actual points of coverage and the projected points of these regressions can be calculated, and a group of descriptive indicators will be calculated, the indicators are summarized as follow:-

- Average Coverage Limit for the Whole Sample Countries in 2008.
- Average Coverage Limit for the Whole Sample Countries in 2011.
- Average Coverage Limit for Developed Countries in 2008.
- Average Coverage Limit for Developing Countries in 2008.
- Average Coverage Limit for Developed Countries in 2011.
- Average Coverage Limit for Developing Countries in 2011.
- Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for the Whole Sample in 2008.
- Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for the Whole Sample in 2011.
- Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for Developed Countries in 2008.
- Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for Developing Countries in 2008.
- Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for Developed Countries in 2011.
- Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for Developing Countries in 2011.

The assumed threshold between the developed countries and developing countries will be $10,000 PGDP, the countries with PGDP above $10,000 will be considered ad developed countries and the ones below this level will be considered as developing countries.

4. Findings and Discussion

The implementation of the model was on a sample from 71countries that adopt explicit limited coverage deposit insurance system, the data that are going to be used for the regression analysis will be for the year 2008as the years just before the crisis, and 2011 as the year just after the recovery of the crisis consequences. Some countries have applied immediate reactions for the crisis including adjustments on the coverage limits, some of the countries adopted temporary blanket guarantee provided by the government like Austria, Denmark, Germany, Hong Kong, and other (IADI, 2013), some countries raised the partial coverage temporarily to new levels that is more capable to mitigate bank run like Australia, Brazil, Netherland, and Switzerland and other (IADI, 2013), and some countries raised the partial coverage permanently to higher levels like Belgium, Finland, and Poland and other (IADI, 2013).

Temporary changes occurred to the coverage limit in 2008 and 2009 made the data for COV for those years less representative to the actual position. The validity and reliability of the regression results using these data will be lower and the chance for over-setor under-set coverage limits will be most likely. That is why the study used the 2011 data to try to avoid any distortion of the temporary changes. The first model used simple regression analysis for the above mentioned variables, and the results was summarized in table (1).The results show that the coefficient of the PGDP was positive and statistically significant, which means that the level of per capita GDP can explain the level of the coverage limit. The R^2 was more that 30%, which means that the variation of per capita GDP among sample countries succeeded in explaining more than 30% of the variation in the coverage limit adopted by the countries in this sample.

Table 1

	Coefficient	**R^2**	**F stat.**	**Prob (F stat.)**	**Durbin Watson Stat.**
PGDP	1.25	30.20%	29.30000	0.00000	2.3
Deposit/GDP	217.7	11.20%	8.30000	0.00530	2.3
PR	-5532.04	4%	303.00000	0.07450	2.4
LE	1715.108	3.90%	2.80000	0.09823	2.25
NPL	-4797.821	5.50%	0.03400	0.06919	2.1
spread	-12511.44	1.10%	0.65000	0.42173	2.5
EI	93928.82	7.90%	5.90000	0.01748	2.2
BNKGDP	183.104	6.90%	4.97900	0.02900	2.46
AD	0.353455	3.10%	2.19000	0.14340	2.3
URB	685.9	8.70%	6.51600	0.01294	2.17
Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
	8150.72	6231.887	1.307906	0.1952	NA
PGDP	2.184294	0.372415	5.865209	0	2.64
AD	-0.922155	0.284374	-3.24275	0.0021	2.05
EI	-68886.73	67408.36	-1.021932	0.3115	3.93
LE	-521.7268	1517.449	-0.343818	0.7324	2.69
URB	458.6852	304.1705	1.507987	0.1376	1.68
SPREAD	-3603.437	12330.02	-0.292249	0.7713	1.07
R-squared	0.48				
F-statistic	7.718796				
Prob. (F-statistic)	0.000006				
Durbin-Watson stat	2.3				

The coefficient for the PGDP was about to (1.25), which means that every (1%) increase (decrease) in the PGDP, the coverage limit adopted for that country's deposit insurance system should increase (decrease) by (1.25%). This justify that the economically developed countries with high PGDP should adopt higher coverage limit, and that make sense based the theoretical framework explained before. Without this higher coverage limit, the deposit insurance system will not be able to mitigate bank run in the banking system of this country. On the other hand, the less developed countries with lower PDGP should adopt lower coverage limit, because despite the low limit, it is enough to mitigate bank run in this country base on the economic conditions available. In the same time, less developed countries with appropriate coverage limit will have lower likelihood to have moral hazard. The Durbin Watson statistic show moderate levels of autocorrelation, along the errors but it are still within the acceptable ranges.

The other variables were less reliable in explaining the variation in coverage limit for countries, deposit to GDP ratio for example significantly explained about 11% of the variation in coverage limit alone, and URB significantly explained 9% of COV, and EI for about 8%, but the major significant explanation was for the PGDP as explained. The second model involves more than one independent variable, and because of the existence of the multicolinearity between the independent variables, we cannot take all variable one time in single run, instead we apply different regression runs for different combinations of the independent variables. Table (2) and (3) show a proposed model for the selected variables. In both models the sign of the PGDP is always positive and statistically significant, which consistent with the theoretical framework and with the first model. With respect to the AD it was negative and statistically significant, and that is inconsistent with the theoretical framework where the higher the AD require higher coverage limit to achieve the goal of mitigating bank run. The rest of variables were statistically insignificant on the individual level, EI coefficient was negative and statistically insignificant, which is inconsistent with the theory, were the developed countries should have higher educational level and accordingly higher educational rank, and they will need higher coverage limit to achieve the goal of mitigating bank run. The LE was also negative and statistically insignificant and this is inconsistent with the theoretical framework, were the developed and rich countries are expected to have high level of health care services, and better quality of life, so they are expected to live longer, and the required coverage limit by them will be higher.

URB coefficient was positive but statistically insignificant, the sign was consistent with what was expected where the higher the ratio of citizen living in urban areas, the higher the financial inclusion ratio in the country and the higher the required coverage limit for them. SPREAD coefficient was negative and insignificant, the sign was consistent with the theory where the developed countries in general have lower spread than the developing countries, accordingly, and the countries with low spread will need higher coverage limit. Despite all that, the model as a whole was statistically significant and reliable, where the F statistic show a significant model, and the R^2 was about to 48%, see table(2).

Table2

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	25664.8	31408.93	0.817118	0.4175	NA
PGDP	1.708495	0.674396	2.53337	0.0143	8.929764
AD	-1.572033	0.733682	-2.14266	0.0368	18.27586
EI	-43734.1	45314.91	-0.96512	0.3389	2.076276
DEPGDP	534.5182	210.3041	2.541644	0.014	6.842371
NPL	-1350.805	2046.717	-0.65999	0.5121	1.352723
R^2	22%				
F sta.	2.9				
P (F sta.)	0.02				
D. W.	2				

In this case the insignificant variables individually are considered insignificant to explain the variation in the coverage limit among sample countries, but the model as a whole is still significant in doing so, which means that these variables collectively succeeded in explaining the variation in the coverage limit for sample countries. These variables collectively explained around 48% of the variation in coverage limit for the sample countries. Durbin Watson statistics show a moderate autocorrelation for the error terms. Variance Inflation Factor VIF shows no multicolinearity between the repressors. The third model is similar to the second one but with the emergence of new variables, table (3) show the results for this model, the new in this variable is that the coefficient of DEPGDP was positive and statistically significant, which means that this variable is reliable in explaining the level of coverage limit in the sample countries. The result is consistent with what was expected, where the higher DEPGDP the higher the share of the banking system from the whole economy, and the higher the importance of this banking system and its stakeholder in the country, accordingly the higher the guarantee that will be provided to them by the deposit insurance system.

Table3

Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
	8150.72	6231.887	1.307906	0.1952	NA
PGDP	2.184294	0.372415	5.865209	0	2.64
AD	-0.922155	0.284374	-3.24275	0.0021	2.05
EI	-68886.73	67408.36	-1.021932	0.3115	3.93
LE	-521.7268	1517.449	-0.343818	0.7324	2.69
URB	458.6852	304.1705	1.507987	0.1376	1.68
SPREAD	-3603.437	12330.02	-0.292249	0.7713	1.07
R-squared	0.48				
F-statistic	7.718796				
Prob. (F-statistic)	0.000006				
Durbin-Watson stat	2.3				

The reliability of the model was lower than the first two models, where the $R^2$was about 22% which means that all included independent variables could not succeed to explain more than 22% of the variation in coverage limit along sample countries. The model as a whole was statistically significant as indicated by F statistics. Durbin Watson statistics was optimal and lead to no autocorrelation between regression error terms. VIF test show multicolinearity problem between the explanatory variables and particularly in the variable AD.

The deviation between the actual points and the forecasted points represent the gap (GAP), and this gap was extracted using the actual data for the years 2008 (pre-crisis adjustments) and for the year 2011 (exactly post crisis adjustments), this gap was negative in most countries and positive in some other. We noticed that the deviations pre-crisis adjustments were extreme in the countries with negative deviation, while the positive deviation was relatively lower, while deviations post-crisis adjustments were much higher in the positive side and much lower in the negative side. This means that the post crisis adjustments were relatively exaggerated in some countries, and that may be justifiable due to the large panic prevailed in the markets that time. Jurisdictions night mare of having bankruptcies in the banking system drove them to make such decisions, and provide over generous coverage limit along with other generous bail out campaigns to insure no bank run. Figure I and 2 elaborate the difference between the per crisis and post crisis positions for the sample countries.

Figure (1)

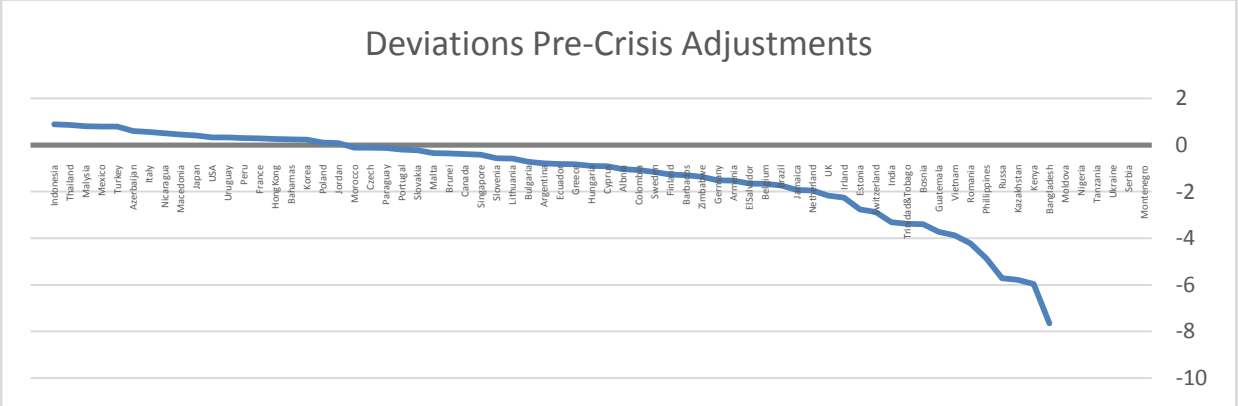
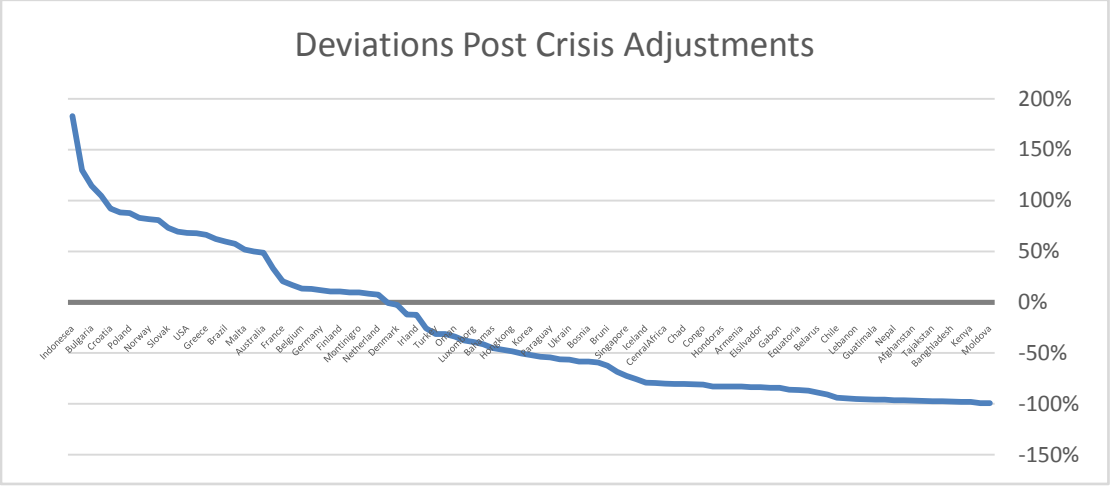


Figure (2)



With respect to the Descriptive Indicators mentioned above, table (4) presents the results for them in details. In 2008 and exactly before the international financial crisis hits; the average coverage for the sample countries was about ($27,751), while the average for the same sample in 2011 was ($80,232), which means that the average coverage level for the sample has increased by about (189%) which is relatively high as a permanent adjustment for the coverage limit.

Table4:The Main Indicators for Comparing Coverage Limit

Variable	2008	2011	% Change
Average Coverage Limit for the **Whole Sample** Countries	$27,751	$80,232	189%
Average Coverage Limit for **Developed** Countries	$38,985	$111,548	186%
Average Coverage Limit for **Developing** Countries	$17,732	$55,508	213%
Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for the **Whole Sample**	844%	729%	
Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for **Developed** Countries	92%	95%	
Average Percentage Deviation between Actual Coverage and Regression Fitted Coverage for **Developing** Countries	1514%	1254%	

Average coverage limit for the developed countries from the sample in 2008 was ($38,985), while the average for the developing countries for the same year was ($17,732), which means that the developed countries were adopting 2.2 double the coverage limit for the developing countries in 2008.The same average coverage limit for developed countries for the year 2011 was ($111,548), and for the developing countries it was ($55,508). The developed countries average coverage has increased by (186%), while the developing countries average coverage has increased by (213%), which indicates that the developing countries on average have reacted more severely than the developed ones. On the other hand, the developed countries average coverage became about 2times the developing countries average coverage. The average percentage deviation between the actual and fitted points for the coverage limit for the whole sample in 2008 was (844%), while the same average for the whole sample in 2011 was (729%), which indicates that post crisis adjustments lead to less deviation from the regression fitted points. When discriminating the developed and developing countries for this indicator, we find that average percentage deviation for the developed countries in 2008 was (92%), which is a reasonable percentage, while the average percentage deviation for the developing countries in the same year was (1514%), which is obviously an extreme deviation compared to the developed countries deviation. Post crisis adjustments percentage deviation for developed countries was (95%), and for the developing countries it was (1254%), which means that the deviation for the developing countries has decreased relatively but it is still large compared to the developed countries.

5. Conclusion and Policy Implication

This study is trying to provide an empirical explanation to the level of adopted coverage limit in explicit deposit insurance systems among a sample of 71 jurisdictions that adopt this approach. The models used investigated the comparative (cross sectional) changes in the adopted coverage limits among countries in relation to particular quantitative and qualitative variables. The objective of such comparison is to recognize the significant variables in explaining the adopted coverage limit among deposit insurance corporations. That will enable jurisdictions to assess its own levels of coverage based on these standards. The importance of suitable coverage limit has been discussed thoroughly above, and the main two boundaries that jurisdictions should consider when setting coverage limit are bank run for the under set coverage and moral hazard for over set coverage.

The results of the analysis show that the per capita GDP was a leading variable in determining the level of coverage limit, PGDP alone was significant in explaining more than 30% of the variation in coverage limit, and in all models applied the coefficient of PGDP was always positive and significant. The variation between the actual values and the predicted values for coverage limit vary between negative and positive deviations. The high negative deviation means that the actual adopted coverage limit is much lower than the predicted one, and that indicate an insufficient conservatism from that jurisdiction and its regulatory authorities. This may lead to conclude that this banking system will be highly vulnerable to bank run once depositors panic.

Indicators show that the average deposit has increased after the financial crisis adjustments for the whole sample and for the developed and developing countries on a separate base as well, but at different growth rates. The whole sample average coverage has increased by 189%, and for the developed countries, the average coverage has increased by 186%, while for the developing countries the average coverage has increased by 213%, which obviously indicates that the developing countries reaction was stronger than the developed ones, and they may be more exaggerating in the reaction than the developed countries.

The indicators show that the average percentage deviation for developing countries was much greater than the average percentage deviation for developed countries before and after the crisis adjustments. The average percentage deviation for developed countries was 92% before the crisis and 95% after the crisis, while for the developing countries the percentage was 1514% before the crisis and 1254% after the crisis. Which obviously indicate that developing countries have greater deviation from the expected coverage than developed countries, and the developed countries are more efficient or at least more objective in setting the coverage limit than developing countries? When discriminating between the developed countries and developing countries we found that the developed countries has a close pre and post deviation for the coverage (92% vs. 95%) compared to developing countries (1514% vs. 1254%),which indicates that they actually may need higher adjustments to convince depositors not to panic and run to their banks during crises.

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