## Making Depository Insurance Prudent: the Case of One Ukrainian

**Bank Run** 

By

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#### ABSTRACT

This thesis examines the ability of Ukrainian Deposit Guarantee Fund to serve as a preventive mechanism in case of bank runs. The context of the research is a case study of Ukrainian bank run of 2008. The theoretical basis of analysis is represented by the major economic models on bank runs such as the Diamond-Dybvig Model. After applying the findings of the model and its extensions to the case study, the results show that the Ukrainian Deposit Guarantee Fund does not represent a prudent bank run resolution framework. In the aftermath of the findings, a set of important policy recommendations are developed in order to provide a viable safety net function and, consequently, ensure the stability of the Ukrainian financial system.

Keywords: Deposit Guarantee Fund, Diamond-Dybvig Model, bank run

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### LIST OF ABBREVIATIONS

- BIS Bank for International Settlements
- CB Central Bank
- DGF Deposit Guarantee Fund
- ECB European Central Bank
- ESFS European Financial Stability Facility
- ESRB European Systemic Risk Board
- FOREX Foreign Exchange Market
- ILOLR International Lender of Last Resort
- LOLR Lender of Last Resort
- LTV Loan-to-Value
- NBU National Bank of Ukraine
- SBA Stand-by Agreement
- SIFIS Systemically Important Financial Institutions
- UAH Ukrainian Hryvnia

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#### **CHAPTER 1. INTRODUCTION**

The year 2008 represented one of the most difficult years for the Ukrainian economy since gaining its independence in 1991. The global crisis seriously aggravated internal economic problems and the country found itself in the position of stagnant macroeconomic fundamentals and namely a depressed banking sector. For those countries with a continental type of financial systems rather than an Anglo-Saxon one, sound and prudent operation of the banking system is even more important for successful economic development. Ukraine is not an exception in this regard.

Bank runs and panics make any financial system particularly vulnerable to negative economic tendencies, both external and internal, create a contagious effect within the banking sector and are rather hard to control for policy makers. Thus, prudent macro-prudential policies and safety nets such as deposit insurance arrangements should be in place, in order to prevent outcomes of this nature.

There exist a number of major theoretical models in the research field that explain the conditions and the means of bank run prevention, which could be potentially used by policy makers to solve the problem of bank runs. The core model taken for the bank run evaluation in the case of Ukraine is the Diamond- Dybvig Model on bank runs(D. W. Douglas, P. H. Dybvig 1983). In line with this basic model, some extended versions of the core model are analyzed and discussed in the context of the Ukrainian case, such as the model of Corsetti, Roubini, and Guimaraes (2003) that explicitly deals with the ILOLR role and the model of financial crises by Chang and Velasco (2001).

However, in my research I argue that none of the models presented can fully explain the inability of the Ukrainian DGF to prevent systemic scale bank runs as predicted by the

conventional theoretical framework. For this purpose I will use a case study analysis of a major Ukrainian bank run that served as a trigger for a wave of further bank runs in the Ukrainian banking system. The bank run "wave" happened despite the fact that the DGF was in place and fully operational, as well as despite the fact that the ILOLR help was also present at that time. The originality of the given research lies in the analysis of the Ukrainian DGF from the perspective of models that involve bank run scenarios and, consequently, in making further policy recommendations in this regard.

The purpose of the study is to analyze whether the Diamond-Dybvig model on bank runs or its extensions explain the situation with the bank runs in Ukraine and analyze the existence of flaws in the safety net of the country. The methodology used to achieve the principal findings includes a case study of the 2008Ukrainian bank run and the analysis of the data obtained from representatives of the local banking sector, who wished to remain anonymous.

The principal findings of the research stress the inability of the current Ukrainian DGF arrangement to prevent bank runs, even in the case of the ILOLR participation in the banking run resolution. Thus, a number of policy recommendations have been made with regard to the current DGF arrangement, as well as with regard to the general policy making line of the Ukrainian authorities.

The structure of the thesis is as follows. The next chapter represents a case study on Ukrainian bank run. It also contains a brief background to the current stance of the Ukrainian economy as well as a description of the unraveling of crisis events in Ukraine. The chapter gives explicit attention to the banking sector and the DGF arrangement in the country. The third chapter presents a general overview on macro-prudential policy making with a special role of safety net arrangements such as deposit insurance schemes. The chapter stresses the need to ensure safe and sound macro-prudential environment in order to make any financial system in general and banking system in particular resilient to both internal and external shocks. In addition, the chapter covers the theoretical models of bank runs, while taking the Diamond-Dybvig model as a baseline for the work. A number of limitations and extensions relevant to the further research on Ukrainian banking system are also discussed. Finally, given all the theoretical and empirical information presented in the previous chapters, the forth chapter explains why the Diamond-Dybvig model and its extensions are not applicable to the case of Ukrainian bank run. The reasons for that and therefore, the relevant policy recommendations are presented and elaborated on in the last chapter and concluding remarks.

#### **CHAPTER 2. CASE STUDY OF UKRAINIAN BANKING SYSTEM**

#### 2.1. Evidence from a Recent Bank Run

This chapter presents a detailed analysis of the case study that is the core of the given research, as well as all the necessary background information concerning the stance of Ukrainian economy, banking sector in particular, and the DGF arrangement, in order to make further analysis of the case study in the context of the Diamond-Dybvig model on bank runs and its extensions. Let me begin with the evidence from a 2008 bank run in Ukraine.

There exist a number of systemically important banks in Ukrainian banking system. During the recent recession one such bank triggered a number of problems in the banking sector, mainly including the problem of confidence that is stressed in all the following chapters of the given research.

Prominvestbank was founded in 1992 as a successor of the USSR Prombudbank, and has been extensively used by Ukrainian and foreign economic agents to conduct export-import business transactions. The bank was established by the first Governor of the NBU – V. Matvienko. To understand the scope and the possible economic consequences of a very likely liquidation of the institution, it is enough to mention that in the year 2001 Prominvestbank won a tender for conducting pensions and financial aid payments; in the year 2005 the bank supported a number of strategic national projects and was given a legitimate right to distribute wages to state companies' employees as well as social aid for the scale of the entire country(PSC Prominvestbank 2011).

The Bank's key objective as of today, which is closely correlated with the current ownership of Prominvest, is to "facilitate cooperation between Russian and Ukrainian enterprises-partners and to maintain the economy interaction of these countries" (PSC Prominvestbank 2011). As of today the bank is owned by the Russian State Corporation "Bank for Development and Foreign Economic Affairs" (Vnesheconombank).

Prominvestbank, the sixth largest banks in the system, experienced internal problems heavily aggravated by massive deposit withdrawals and banking panic among its clients. Rumors concerning the insolvency of the bank took place in late September 2008 and since then a number of other big and small banks experienced massive deposit withdrawal problems, even despite the fact that one of the measures conducted by the NBU in order to restore confidence in the banking sector was to raise the payable amount of deposit in case of a bank failure from 50,000 UAH up to 150,000(NBU Statistics and Reporting Department 2009). Total amount of deposits in the banking system was decreasing since April, 2008, and experienced a sharp drop in October that year, even though a growth in household foreign currency deposits in UAH equivalent could have been still noticed, but solely due to the weakening of hryvnia against USD and EUR(NBU Statistics and Reporting Department 2009).

Depositors were to withdraw circa 5 bln UAH ( $\approx$  1 bln USD) from their accounts in Prominvestbank(Ukrinform 2008). Thus, as of the 7th of October 2008, NBU took the bank under its control and decided to allocate a stabilization credit for the institution, initially proclaimed as being worth of 5 bln UAH, however, the final amount constituted 2 bln UAH and financing was suspended. NBU also introduced restraint on creditors' claims for the period of six month and announced the need of Prominvestbank nationalization.

Various sources (UkrainianJournal Staff Report 2008) identify different reasons that led Prominvestbank to the situation of massive bank withdrawals that led to insolvency. One of the grounds mentioned was the dispute between the shareholders that triggered media publications concerning the bank's bankruptcy state. The reason presented by the authorities, namely NBU, was information attack with the aim of hostile takeover. Nevertheless, the lack of liquidity was obviously exacerbated by the banking panic. Some experts argue (L. Verkhovodova, K. Ageyeva, D. Zgortiuk 2009) that the rehabilitation of Prominvestbank and its sale to the strategic owner constituted one of the few positive examples in Ukrainian banking practice. In addition, the authors claim that given the fact that Ukrainian banking sector was already experiencing some problems and represented a quite fragile stance, the Prominvestbank situation was just a minor drop that led to an overall banking crush. However, I would argue that this event was crucial in undermining the confidence in the Ukrainian banking sector among depositors, despite the fact that the DGF has been reformed since then, and the safety net was improved accordingly. To give evidence for this, let me refer to the changes in the value of deposits in the bank for the period of July 2008 – April 2009 and compare it with the situation of the following years (see Figure 1 and Figure 2).



Figure 1- Change in the private deposits, Prominvestbank, September-December 2008

Source: data obtained via personal contacts with the bank employees, who wished to remain anonymous



Source: data obtained via personal contacts with the bank employees, who wished to remain anonymous

One can see a slight decline for the period of September-October 2008 and a rather sharp decline in deposit value on the bank's liabilities side starting from October up till November – the period of rehabilitation announcement and temporary administration appointed by the NBU. From January 2009 up till July 2009 the situation continued to be stable, but the amount of deposits in the bank never came back to the initial level, despite the fact that the temporary administration has already been abolished and the ownership of the bank has been changed. The situation started to improve starting from July 2009 up till January 2011, but has shown a stagnant tendency ever since. There are several major reasons for the situation becoming stagnant again.

The first one can be referred to the overall unfavorable economic environment in the country that contributed to a big extent to decreasing aggregate demand and household income and, consequently, fall in saving and deposit levels of private depositors. The other reason, which has direct relevance to the topic of the given research, is that the amount of banking institutions being liquidated and the value of deposits that had to be reimbursed by the DGF has

increased dramatically. It has already been mentioned that insolvency of the Prominvestbank served as a trigger for the wave of banking collapses in the country.

According to the DGF data the number of banks that experienced deposit reimbursement by DGF increased from 5 to 22 for the period of 01.01.2010 – 01.01.2013 (see Appendix, Table 1). Financial resources of the Fund did increase accordingly (see Appendix, Table 2). However, the value of private deposits did not increase at the same pace and the confidence in banking sector needed for future bank run preventions has yet to be restored. The ratio of the growth of the DGF's financial resources to the growth of reimbursed deposits is not stable and not adaptive according to the situation in the banking sector; moreover, in 2010-2011 the DGF's resources alone were not enough to cover the reimbursement. This matter also contributes to the growing concerns of depositors with regard to the future safety of their deposits (see Figure 3 presented below).



Figure 3 - DGF Financial Resources Growth and the Value of Reimbursed Deposits

Source: data taken from DGF: http://www.fg.gov.ua/eng/statistics/

The situation is further aggravated in light of the unfavorable world and local economic situation.

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Thus, in the case of Ukraine, the fact that according to the official data deposits of liquidated banks have been reimbursed and some are still in the process of being reimbursed, does not automatically mean that bank runs and distrust in the banking sector are going to be eliminated in the future periods. This fact presents a dangerous threat to the future of banking sector and has to be addressed accordingly.

In the following subsection I will describe the broad environment of the Ukrainian banking sector, touch upon the dynamics of the financial, as well as real sector crisis in the country. In addition, I will also present the Ukrainian DGF arrangement in order to analyze its connection with the previously presented case study on the bank run.

# 2.2. Current Stance of Ukrainian Banking Sector, Crisis Dynamics and Ukrainian DGF

Ukrainian banking system is relatively young since it started its formation only after the collapse of the Soviet Union, however, the licenses to operate in the country were owned by more than 198 banks by the end of 2008, close to 30% of which were subject to international capital(National Bank of Ukraine 2013). The number of banks has decreased since the Great Recession, nevertheless, not to a dramatically low number - to 177. The period of massive reorganization in the system, when a lot of banks were denied the license from the National Bank was 2012 (26 banks lost their licenses to operate on the territory of Ukraine). According to the statistics of the National Bank of Ukraine, 21 banks are in the process of liquidation as of the 1st of April, 2013(National Bank of Ukraine 2013).

On the one hand, assets of banks have grown monetary wise dramatically since 2008: from roughly 600,000 mln UAH to 1,146,000 mln UAH, despite the fact that the number of commercial banks has shrunk from 198 to 177. On the other hand, liabilities for the same time period have increased accordingly: from circa 530,000 mln UAH to 971,000 mln UAH(National Bank of Ukraine 2013).

Given the above mentioned tendencies in the banking market, it is important to identify the trend of deposits growth in the system as a whole, before analyzing the case study of Ukrainian bank run. For this purpose the data from the year 2007 till 2012 has been taken (see Figure 4).



Figure 4 - Deposit Growth in Ukrainian Banking System, 2007-2012, annual % change

Source: data taken from NBU: http://www.bank.gov.ua/control/uk/publish/category?cat\_id=40863

One can see a rather sharp decrease in the year 2009 and partial recovery of deposit growth in 2010, however, the level of 2007 has still not been reached. In this research I will argue that such a situation cannot be solely interpreted from the perspective of declining household income and overall unfavorable economic situation in the country and worldwide. Moreover, political issues as well as lack of public trust in state institutions, including but not limited to NBU and DGF, will most likely further exacerbate the current situation. The problem is considered to be of current importance, since sustainable economic growth is unlikely to be generated without adequate level of savings on the national level, ideally, in the local currency.

Lack of trust in the banking sector and state institutions that ensure macroeconomic stability can be clearly drawn from various sources that conduct sociological and marketing research. To name one of the most influential, Kiev International Institute of Sociology that released its latest report in August, 2012, the level of trust of Ukrainian population to public institutions is rather low. When it comes to NBU, only 32% of the population considers it being trustworthy. The reasons of mistrust are mostly corruption (54%), absence of visible results from the activity of state agencies (38%), bureaucracy (29%), inadequacy of state servants to communicate with the population (22%), and that strikingly 11% of people simply have no information about further development plans of state institutions, and, thus, do not trust them(Kiev International Institute of Sociology 2012). These figures reveal concerns presented by Ukrainian scholars that investment savings behavior of the population cannot be formed in the direction of achieving overall economic growth in the country without building trust to Ukrainian banking sector(Filonova 2012). First and foremost, one of the major cornerstones of investment-savings adjustment policies should be channeled towards restoring trust to DGF. Thus, it is worth mentioning some basic characteristics of the current DGF arrangements in the country in order to be able to conduct analysis of bank runs in Ukraine and make a number of preventive policy advices.

The establishment of deposit insurance scheme itself and the DGF in Ukraine was introduced in a clear-cut manner in 1998 by the Decree "On Measures to Protect the Rights of Physical Persons as Depositors of Commercial Banks in Ukraine" (Verkhovna Rada 1998). Since then it has been changed twice. The last amendment was done in 2012. The initial Decree guaranteed the reimbursement of 500 UAH (circa 62 USD in present value) to individual depositors, which can be regarded as a mostly symbolic amount. According to this Decree, DGF was supposed to guarantee the funds to the broadest number of depositors possible, however, there existed six categories of depositors, who were not subject to the Decree, such as, but not limited to independent audit companies that dealt with the bank in question and bank's stakeholders (whose share exceeds 5% of the regulatory capital of the bank). One of the major drawbacks should be referred to the fact that the public communication link was rather weak, since previously DGF was obliged to publish its activity report in the media for the general

public only twice a year. Under these conditions the activity of the DGF clearly lacked transparency and the degree of accountability was rather low. Given the general distrust in public authorities' actions and lack of confidence in the local currency, such arrangements were not able to create a credible LOLR and a prudent safety net out of the newly established DGF. In addition to that, deposits denominated in foreign currency were to be paid out in local currency only. The amount that was to be paid by commercial banks that participated in the scheme annually was 0,5% from the total value of deposits in a bank including both principal and interest.

The legislation was upgraded in 2001and the changes mostly touched upon the increase of the guaranteed payouts in case of banking collapse to the amount of 1,200 UAH (circa 150 USD in present value). The value of deposits being under guarantee, however, could be changed depending on the market trends. Those changes were done accordingly a number of times before the present legislation took place. The way the amount of the guaranteed sum was progressing can be observed from Table 1.

Date	Amount
09/1998	500 UAH
10/2001	1,200 UAH
01/2003	1,500 UAH
10/2003	2,000 UAH
03/2004	3,000 UAH
04/2004	5,000 UAH
02/2006	8,000 UAH
06/2006	15,000 UAH
02/2007	25,000 UAH
09/2007	50,000 UAH
10/2008	150,000 UAH
08/2012	200,000 UAH

Table 1- Changes in Value of Guaranteed Deposits, per individual depositor

Source: data taken from DGF: http://www.fg.gov.ua/

Apart from the low amount of deposit coverage, one of the major drawbacks was the fact that past legislation operated with the concept of the "temporary Fund member" (Deposit Guarantee Fund 2013). The last piece of legislation states the membership in the DGF as compulsory with the only exception for the State Savings Bank of Ukraine, which is 100% state owned while in this case implicit full coverage of deposits is guaranteed by law(Deloitte Consulting, LLP 2011). Thus, there is no need for the entity to participate in the DGF arrangement. Apart from that, the membership in the DGF can be void in the case of a bank's poor functioning and operation. Last but not least, the mandate of the DGF was extended to the point where bank resolution, including provisional administration and bank liquidation in case of insolvency, can be carried out by the Fund (Verkhovna Rada 2012). The new Law ensures timely and frequent communication of DGF with other state agencies, such as NBU and Ukrainian Parliament. Despite this fact, it fails to address more frequent communication with the general public, which is one of the most relevant parts for the purpose of the given research.

While it is also stated in the Law that state actors shall not interfere in the Funds' activities, the Administrative Board consists of the representatives of the Cabinet of Ministers of Ukraine, NBU delegates and a member from Bankers Association. In addition, the Fund is accountable to the Cabinet of Ministers and NBU, which clearly raises the concern of political pressure from the government side under certain circumstances.

The issues of the present legislation described above undermine the credibility of the whole arrangement. More importantly, it does not contribute to the trustworthiness of the relationship between depositors and the government. Even despite the fact that the banking membership in DGF became mandatory and the value of guaranteed deposits has increased dramatically, this new arrangement is not likely to be very effective in terms of bank panics prevention. The empirical evidence for this was mainly presented in the previous chapter. The research presented in the following subsection will make this argument even stronger.

#### 2.3. How the Crisis Happened in Ukraine: tendencies and consequences

The current crisis hit Ukrainian economy in 2008. It was accompanied by the decrease in the real GDP growth by almost 6% mostly due to the unfavorable conditions on the export markets (National Bank of Ukraine 2008). In addition, demand from investors' and regular consumers' side also declined considerably. As stated in the Annual Report of the NBU (2008) all the sectors were heavily hit by the crisis events, except for the agricultural sector. Figure 5 illustrates this point via comparison of the gross added value of the main economic activities in 2008 compared to the preceding year. Recession in the major Ukrainian industries is depicted in Figure 6.

#### Figure 5- Gross added value by principal economic activities, 2007-2008, %



Source: Annual Report (National Bank of Ukraine 2008), p. 14

#### Figure 6 - Growth/Decline of major industries, 2007-2008, %



Source: Annual Report (National Bank of Ukraine 2008), p. 18

Furthermore, the year was also characterized by the burst of the real estate asset bubble, which inevitably affected not only consumer demand, but also financial and namely banking sector via creating non-performing mortgage loans in Ukrainian sector as elsewhere worldwide.

The beginning of the year, however, was rather promising, since the world prices on Ukrainian export goods such as metal and grain went up and banking system was still experiencing a lending boom. From August on the situation became the opposite: external economic and mainly export conditions deteriorated, consumers and investors demand fell as well as the real estate bubble burst happened.

By the year 2008 Ukrainian banking system appeared to be rather vulnerable to external shocks, aggravated by internal problems in the system. Local banks situation was characterized by massive exposure to foreign loans, balance sheet maturity mismatches and, as a consequence, lack of liquidity(IMF External Relations Department 2008).

Furthermore, in November 2008 the IMF approved a 16,4billion USD stand-by agreement (SBA) for the country (IMF External Relations Department 2008). One of the major purposes was to stabilize the stance of Ukrainian financial sector and banking sector in particular. The purpose of the SBA was clearly announced both by the IMF and the Ukrainian authorities to the general public in various IMF documents, press-releases, as well as by the Ukrainian authorities in the local media.

Nevertheless, in the following subsections of this chapter I will argue that even such a public announcement did not save the Ukrainian banking system from the future wave of bank runs, despite the fact that the theoretical models with the ILOLR presence predict the opposite outcome. Even though the information attack on the sixth major bank – Prominvestbank, that triggered further bank runs in the country, was conducted in September 2008 (before the signing of the SBA), nevertheless the IMF guarantees should have theoretically prevented further bank runs in the system.

One of the major reasons, why the SBA did not prevent the panic was the non-compliance of the Ukrainian authorities with the IMF conditionality as well as only partial crisis resolution measures. As stated in the IMF Country Report of 2012, the authorities failed to provide effective bank resolution in line with the failure of conducting the necessary policies to resolve the issues of non-performing loans (IMF 2012). The worst part is that the situation continues to remain the same up till the present moment. The country failed to receive another IMF bailout after the visit of the international organization and negotiations in April, 2013(D. Krasnolutska, K. Choursina 2013).

# CHAPTER 3. MACRO-PRUDENTIAL POLICYMAKING IN THEORY AND PRACTICE 3.1 Macro- and Micro-prudential Policies

After the summary of the major economic events preceded by the case study of the bank run being under analysis, I will start the next chapter with a detailed analysis of the theory and empirics of macro-prudential regulation, followed by the baseline models on bank runs that will help to draw conclusions for the case of Ukraine and give a number of policy recommendations.

The current recession has played a major role in terms of rethinking the already existing economic approaches that were the basis of the previously made economic policies that proved to be inefficient. Currently we are coming to the point, where the role of major national financial institutions, as well as the supranational economic bodies, has to be redefined, and their structure itself has to be reformed. However, the question of how this should be done in order to secure national financial stability and, what is more - global financial security– still remains open.

One must take into account the role that different state agencies as well as the Central Banks (CB) of the countries play in terms of resolution of financial issues that are arising in the banking and financial system as a whole on a regular basis, in order to prevent crises like the one that we are facing right now. Financial stability issues should be reconsidered on both micro and macro levels and their interconnectedness should be taken into account.

Before the current financial crisis government authorities would mainly focus on microprudential policy making, thus, targeting individual systemically important institutions. However, in order to ensure the smooth functioning of a financial system as a whole, only micro-prudential approach is not sufficient. Macro-prudential approach has to be directed on preserving financial stability via limiting systemic risks, by addressing both the crosssectional dimension of the financial system (aiming at strengthening its resilience to adverse real or possible financial shocks) and its current dimension (to control the accumulation of risk over the business or financial cycle) (BIS Paper, No. 60 2011).

In order to realize what exactly should be done on both micro and macro levels in terms of organizational structure, I will first point out some key differences between the micro and macro-prudential regulation approaches and aims as such. Table 2 below provides brief, but focused insight on this matter.

	Macro-prudential	Micro-prudential
Proximate Objective	Limit financial system-wide distress	Limit distress of individual institutions
Ultimate Objective	Avoid macroeconomic costs	Consumer (investor/depositor)
	linked to financial stability	protection
Characterization of Risk	"Endogenous" (dependent on collective behavior)	"Exogenous" (independent of individual agents' behavior)
Correlations and common	Important	Irrelevant
exposures across institutions	important	in our func
Calibration of prudential control	In terms of system-wide risk;	In terms of risks of individual
	top-down	institutions; bottom-up

Table 2- Macro- versus Micro-prudential Perspectives

Source: Galati G., Richhild M., Macroprudential Policy – a literature review, BIS Working Papers, No. 337, February, 2011, p. 7

After looking through the main economic perspectives on macro and micro level in the table, one can make the conclusion that even though the policies do overlap and are interconnected to a certain extent; they are still fundamentally different and require individual approach when it comes to the process of implementation. This is despite the fact, that the tools that are being used in the process of policy making sometimes resemble each other. However, in order to enhance strong macro-prudential regulation, one must think of the new tools that can sufficiently decrease the probability of such crises as we are currently facing, and make financial

systems of the countries being strongly protected against exogenous risks that might arise. Such instruments should include: increased regulatory capital requirements dependent on the risk weight of the assets, cyclically-dependent funding liquidity requirements, FOREX lending restrictions, LTV (loan-to-value) ratios, systemic risk insurance schemes and haircut settings(G. Galati, M. Richhild 2011). Most of the above mentioned tools deal with the regulation of banks' capital. Regulations in this sphere are vitally important indeed as the banking system is a so called circulatory system of the economy, thus, the stability of the banking system is the key to the stability of any financial system and any economy in general.

The debates about various aspects of macro-prudential policies and regulations became particularly intense after 2007, when the regulators realized that something has gone fundamentally wrong with the way the financial system has been supervised. Despite the fact that little research has been done so far on the effectiveness of macro-prudential tools with regard to the prevention of bubbles or network effects in the economies, one cannot question the importance of macro-prudential regulation in addition to the micro-prudential supervision.

For instance, some authors(C. Gauthier, A. Lehar, M. Souissi 2009) find that macroprudential capital allocation mechanisms reduce default probabilities of individual banks as well as the probability of a systemic crisis by about 25%. This finding primarily means that macroprudential capital buffers can substantially improve financial stability and reduce vulnerabilities in the system.

Empirical evidence as well as common sense show that it is much easier to manage and control financial stability on the national levels individually, whereas a much harder task appears to be to deal with the issues that might arise in this respect on the international arena. Financial cycles are not synchronized, capital mobility is on a fairly high level, and countries do follow different traditions and culture, even when it comes to policymaking in economic terms. Moreover, various contagious scenarios should also be taken into account in the international financial system environment.

In order to be able to manage financial stability on the micro level, policymakers should set up relevant macro-prudential institutions and deal with various governance issues in this respect, so that the micro-prudential stance of affairs will not be distorted due to the presence of external vulnerabilities.

The organizational issue of macro-prudential policy appears to be very complex. The difficulty of the question is also complicated by the debate on to what extent macro-prudential tools should interact with monetary policy, since one of the corner stones of the organizational setup is about the role of the CB in macro-prudential regulation.

It is clear that both monetary and macro-prudential policies aim at financial stability and, thus, affect the real sector of the economy. In fact, economic outcomes would be superior if monetary and macro-prudential policies were coordinated, however, it is not always possible, due to the purely political issues and the lack of mutual understanding between the bodies that are in charge of both policies implementation. Even though, the more monetary policy is used for stabilization purposes, the less one will use macro-prudential instruments to stabilize the banking sector and especially capital adequacy among the agents in the sector (G. Galati, M. Richhild 2011), ceteris paribus, one still cannot overemphasize the importance of sensible macro-prudential supervision. Both policies are to a certain extent complimentary and overlapping approaches to financial stability, rather than substitutes.

Coming back to the question, whether CB should simultaneously be responsible for both monetary and banking regulatory and supervision functions, one will not find a definite answer from the existing literature. Some authors argue that there is not sufficient empirical evidence to justify the argument that one authority and the centralization of financial supervision under one organizational structure (i.e., CB) is the best and the wisest organizational design (Lastra 2003). Indeed, there has never been a one-size-fits-all policy for any country, especially in economic terms. Even though, it should be a rather individual judgment, to what extent a CB of a certain country should be responsible for conducting macro-prudential regulation and supervision, it is hardly a question whether a Bank should participate in its conduct or not at all.

To justify such a conclusion, I will mention some reasons presented by other authors in this regard (O. Blanchard, G. Dell'Ariccia, P. Mauro 2010). The authors argue that both monetary tools and financial regulation tools contain a lot of cyclical tools that are needed both in monetary and macro-prudential policies. Thus, a high degree of coordination is needed in order to synchronize both monetary and macro-prudential policies. If this goal is not to be achieved, it will cause serious complications to the way that both policies are implemented in a country. Furthermore, it might also bring policymakers to some contradictory results in terms of policies implementation.

Coordination is the key in this issue, which raises the question of whether the CBs should also have mandates to focus their activity on macro-prudential regulation in line with the monetary policy. There are two main options when it comes to the debate about whether independent macro-prudential bodies are needed and how are they supposed to be organized. The first one refers to the notion that CBs can perform both monetary and macro-prudential regulation functions; the second one just requires a sufficient amount of coordination between the CBs and independent macro-prudential authorities. In most cases there exists no doubt that CBs should play a sufficient role in the macro-prudential regulation as they are "ideally positioned to monitor macroeconomic developments" (O. Blanchard, G. Dell'Ariccia, P. Mauro 2010, 12) and it will eliminate the problem of coordination in case the policies are done by separate institutions. In addition, monetary policy decisions made by monetary authorities can affect and overlap upon the decisions of bodies that mitigate financial risks in the system. Given the above presented reasons one might draw a conclusion that a CB alone can perfectly perform all the macro-prudential responsibilities on its own. However, this is not always the case.

Blanchard et al. (2010) give some counter reasons towards making the CB solely responsible for macro-prudential matters. The very first reason is that the CB might start to take a milder stance on inflation targeting as interest rate hikes affect banks' balance sheets. Another reason refers to the notion that in such a case a CB will have a more complex mandate and will become less accountable to other governmental institutions concerning its decisions; such a situation will clearly require a higher level of transparency from the CB's side.

Let me now present the theoretical basis for the evaluation of the run on Prominvestbank and the flaws of the current DGF arrangement in Ukraine, in order to justify the policy recommendations and the possibility of application of the Diamond-Dybvig model for the Ukrainian case, which will be presented in the last chapter.

#### 3.2. Diamond-Dybvig Model on Bank Runs: Setting-up the Model

In the light of the topic of this thesis there is a need to show how macro-prudential policymaking (including safety net issues and LOLR considerations) affects the banking system and under which circumstances the situation in the Ukrainian banking sector can be changed for the better in the future.

In order to do this, I will take the Diamond-Dybvig Model and its extensions as the core framework to connect economic theory with empirical situation in the country being under observation and show that the core model fails to deliver the expected results. I will also suggest the alternative of the core model (G. Corsetti, B. Guimaraes, N. Roubini 2003) being more appropriate in the case of the recent Ukrainian bank runs during the current crisis. Such analysis will enable conclusions on the recent stance of Ukrainian banking sector to be drawn and further policy implications to be suggested. Diamond- Dybvig Model (D. W. Douglas, P. H. Dybvig 1983) remains to be one of the most influential banking models up till now, even though there have been created numerous extensions to it by various scholars, which I will discuss later in the following chapter. Every model has its own limitations and assumptions that are to be challenged in real life; however, the core model still remains to be the basis for current empirical research and observations.

The model shows that such measures as suspension of convertibility cannot be optimal to prevent a bank run in case of massive deposit withdrawal. Instead, a prudent safety net (deposit insurance arrangement) should be carried out by the government representing domestic LOLR. The model also serves as an explanation of the emergency of the "bank" category as such and presents the possibility of an equilibrium, which happens under a bank run condition. For the purpose of this research the main interest is represented by the very first statement, where the authors prove that state-induced deposit insurance is superior to market arrangements of deposit contracts when it comes to the bank run equilibrium.

The general set-up of the model is based upon three time periods. Banking sector consumers are represented by two types: those, who are to withdraw the money in period one and those, who are to wait till the second period, while both types make deposits in the initial period zero. If consumers withdraw their money in the first period, they will get the provision they deposited initially. In contrast, if consumers wait till the second period, they get the initial provision plus the premium. Thus, the initial set-up represents a trade-off between consumption now and consumption tomorrow. In most cases the way consumers will make their decision when to withdraw is chaotic and unpredictable, thus, the type is not determined ex ante. Any of the consumers might experience unpredictable or emergency expenses.

In order to show risk pooling and justify the fact that the first type of consumers will still get more than the initial value deposited, the authors introduce bank as a financial intermediary. Such an arrangement is meant to meet the needs of consumers of both types in areas such as liquidity mismatch elimination and risk aversion.

If the number of consumers that are willing to withdraw at the first period does not correspond to the resources available at the bank in order to cover the demand for liquidity in period one and there exist no deposit insurance, but the only thing that will give them the opportunity to recover their initial deposit is waiting for their turn to withdraw, then the equilibrium will emerge under a bank run condition. In this case consumers of the second type will also not wait till the last period to withdraw, since under the assumptions given, they will not recover their initial deposits in the last period as they will assume that all the type two depositors are to stick to the optimal behavior and to withdraw in the first period, without waiting for the last moment. The optimality of such a behavioral pattern from the consumers' side is justified merely by the fact that resources in the second period might not be sufficient to repay their deposit when their order comes. Thus, since the fraction of the money that the bank got in the zero period from both types of consumers has already been invested (because the massive withdrawal at period one is not presupposed ex ante), the bank will not be able to cover the entire liquidity demand for both types of the consumers at the period one. Hence, the banking sector faces the bank run equilibrium situation due to the optimality of the herd behavior for the depositors.

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Under the conditions described above it becomes evident that the plausible solution to prevent the 'unfavorable' equilibrium is to design a prudent safety net, which will make the herd behavior of withdrawing in the first period not optimal. The solution presented by Diamond and Dybvig (1983) is to introduce deposit insurance. This solves the problem of a bank run being an optimal outcome from the depositors' side; however, it does create the problem of the moral hazard from the banking side, which is fully acknowledged by the authors. If deposits' reimbursement is guaranteed by the government or any other institution, the probability of banks, taking excessive risks and not caring about the consequences is rather high and probable (since commercial financial institutions are profit-oriented, not unlike the bank in the model presented above).

To deal with the moral hazard issue, while simultaneously caring about bank run prevention, policy makers have to ensure that in line with the prudent deposit scheme they also exercise other aspects of macro-prudential regulation, namely prudent banking supervision with the explicit mandate of risk assessment and stress-tasting, especially when it comes to the institutions that are too-big-too-fail (due to the fact that the latter are the most probable suspects to cause the domino effect in the entire banking sector of a given country and sometimes even contributing to the worldwide financial distress).

The question is, however, whether the presence of the safety net alone can fully prevent the bank run phenomena without even leading to the need for deposit reimbursement. In other words, is the presence of the safety net alone sufficient to make depositors feel fully safe and not to become engaged in the creation of the 'unfavorable' equilibrium?

To answer this question I will present the limitations of the model and assumptions that are not always justified in real life in the following subsection. I will also touch upon some important extensions of the core model that represent the most relevant pieces for the purpose of conducting a further research on the case of Ukrainian bank runs.

#### 3.3. Limitations and Extensions of the Core Model

Some scholars (E.J. Green, P. Lin 2000) present a number of limitations of the core model that are likely to contribute to the fact that even prudent safety net arrangements in some countries do not necessarily prevent system wide bank runs.

The first limitation refers to the fact that the type of deposit contract that is used by the authors in the 1983 model is not the only one that can take place in the banking system. Under

alternative arrangements, banking sector might also have access to much broader information regarding the type of consumers they deal with. In other words, the preferences of depositors could also be known by the bankers. In this case, the allocation of resources made by the bankers can be done in a way that liquidity mismatch will not aggravate the problem to the extent of a bank run equilibrium.

Another possible limitation can refer to the fact that in the core model the number of depositors is infinite, whereas in reality bankers can to a certain extent be informed about deposits growth/drop in the whole system and the trend of those regarding their particular bank within a particular macroeconomic environment.

For the purpose of this research, however, the most important limitation is considered to be the fact that the authors of the core model operate in a closed economy environment. This assumption does not allow for the opportunity to evaluate the possibility of a bank run equilibrium in the case of the presence of the international lender of last resort (ILOLR). There exist a number of extensions and modifications of the core model in this regard. For instance, some models (R. Chang, A. Velasco 2001) describe the situation of financial crisis caused by the illiquidity of local banks within international dimension. In general, the situation, when domestic banks occur in parallel with panics of foreign creditors, constitutes a more common real life situation for a bank run to become equilibrium in a given country rather than a local bank run alone.

In addition, the core model does not account for other important external factors that will lead to a higher probability of a bank run. Those factors include, but are not limited to increased financial globalization, considerable asset prices fluctuations, bad government policies, lack of credible commitments to repay foreign debts in order to receive extended support from a potential ILOLR to fight further illiquidity concerns. The Model of Financial Crises in Emerging Markets (R. Chang, A. Velasco 2001) differs from the core model in a few important aspects. Those include small open economy assumption as well as the assumption that domestic banks always follow a commitment to repay their external debt. The latter can be viewed as a rather fragile assumption with respect to the real life situation, the most prominent examples are PIIGS and Cyprus, where countries did not have access to foreign credit facilities after the first bailouts or the conditions of getting new loans were so harsh, that the future burden of repayments will lead to even greater instability and worse consequences.

In addition, the authors explicitly point out the role of foreign credit, the size of capital inflows, financial liberalization phenomenon, asset prices fluctuations, bad governmental policies and exogenous shocks as important parameters that might be responsible for banking crises and bank runs in particular. I will briefly discuss their findings with regard to the aforementioned factors, since those are going to play crucial role for the case of Ukrainian bank runs that are to be analyzed in the following chapter.

From recent and past financial crises all around the global it is evident that if a bank cannot repay its foreign obligations not only local depositors are going to be about to panic, but also foreign creditors themselves. The authors argue (R. Chang, A. Velasco 2001) that both the size and the kind of foreign lending affect the probability of banking system instability, and, consequently, the probability of a bank run performed by local depositors. Here sustainability of banking system is highly dependent on the possibility to extend the credit line from foreign lenders and the willingness of other foreign agents to provide resources to an economically damaged bank. In addition, the maturity of the foreign debt plays a vital role, which has already been briefly discussed above. Needless to mention, if foreign agents are not willing to extend lending, the bank is more prone to the possibility of a bank run. Thus, the behavioral patterns of foreign agents in this story might lead to a self-fulfilling prophecy of a bank run. In the case if creditors demanding the repayment of the short-term debt on the bank's liabilities side and when the funds invested are temporally illiquid, then other foreign agents might demand repayment due to the fear of not obtaining their funds back. Such a scenario is purely a result of individual degree of economic optimality and rationality. However, again, as in the previous case, there exist a high degree of probability that it will lead to panic among other creditors and domestic depositors.

The second factor of the size of capital inflows works quite intuitively as well. Larger capital inflows on average increase the incline of banks to run. Nevertheless, this statement is a subject to certain conditions, since capital inflows do not represent a threat or disadvantage per se. However, taking the previously presented analysis into account, the larger the number of foreign creditors involved in the bank funding procedure, the higher is the probability that if one lender panics, then the others will follow. This brings it to the point, where the bank run might occur even earlier than anticipated otherwise due to the increased speed of the information flow, networking among creditors, bigger fear that you as a particular creditor will not be "on time" to take out the money, etc. Clearly, such a situation is more likely to occur when an adequate governmental policy response is absent. Prudent macro-prudential policies and sometimes even protectionist measures, such as capital controls will be a must to eliminate or at least to mitigate such a situation.

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The third factor of increased financial liberalization implies a certain degree of financial deregulation, which is again, not necessarily bad per se. However, in line with the possible increase in welfare and financial development pattern, banking sector of the country that embraced financial openness, will also become more prone to the probability of a bank run, following the same logic as before. Thus, prudent macro-prudential oversight by the local authorities appears to be a must.

The fourth factor of asset prices booms and crashes has clearly been illustrated by the recent crisis. For instance, a boom in asset prices (such as real estate boom and rapid crash afterwards) can easily lead to the panic in financial sphere. The run leads prices of assets to go down to its real value, which inevitably leads to disruption of financial intermediation and sudden lack of liquidity.

The last factors of bad state policies and unfavorable external shocks are even more country-dependent than the previously discussed aspects. It cannot be argued, however, that these two factors make a potential bank run more probable. The latter factors appear to be particularly relevant for the purpose of this research on the case of Ukraine.

One of the most important limitations of this model (R. Chang, A. Velasco 2001) is that the authors abstracted from the issue of moral hazard, while still taking into the account the role that the ILOLR could play in the cases of bank runs. In the light of this limitation I will continue the following section with the model of Corsetti, Roubini, and Guimaraes that explicitly deals with the ILOLR role and the moral hazard concern.

The model deals with the same three-period time horizon as in the core model, however, extends to the point, where agents can borrow from foreign actors and the ILOLR (the IMF). Such an arrangement immediately raises the issues of moral hazard and the need of foreign entities to decide what should be the size of resources provided for lending to the agents in trouble. The latter will heavily depend on such factors as the public information available and market signals.

The question of moral hazard due to the possibility of lending from the ILOLR was explicitly raised in the International Financial Institution Advisory Commission Report by Metzer (Meltzer 2000). Thus, foreign participation in liquidity provision should be limited in its size and frequency, in order to eliminate moral hazard and prevent possible 'encouragements' of risk taking reckless behavior for future. The conditionality of the IMF loans can decrease the risk of moral hazard occurrence; nevertheless, this effect is subject to several conditions. For instance, whether the local government will commit to stick to their implementation and whether the government possesses the necessary tools and authority within the banking sector to adequately monitor and control to a certain extent their financial activity. Another concern is whether such partial IMF's bailout will help in bank runs prevention or not and whether the policies prescribed by the ILOLR are going to be carried out in a manner that will restore favorable macroeconomic fundamentals in the borrower-country. The model drives to the conclusion that partial bailouts performed by the ILOLR are beneficial and serve its preventive role if the initial macroeconomic fundamentals are not "too weak" on the first place.

The liquidity support – moral hazard trade-off can be solved via prudent deposit insurance and strong local macro-prudential regulation and control. Some authors (M. Dooley, S. Verma 2001) argue that explicit sanctions possibilities for misbehaving countries-borrowers might serve as a good moral hazard prevention mechanism. As practice shows, even though the ILOLR might not extend the credit line further due to the misbehavior, countries will still stick to the risk averse policies and the liquidity situation will worsen even further, creating problems for the foreign agents, who have already provided external financing prior. This raises the question of whether the ILOLR should provide the liquidity in the first place to eliminate the risk of simply "wasting" money. In my empirical section I would argue that the information that foreign creditors possess cannot always be credible and the discretion of local authorities' policies cannot be taken with a high probability of certainty (especially when it comes to emerging economies). Another interesting fact that is mostly related to consumers psychology and behavioral patterns is that the liquidity provision announcement per se might be enough to send a signal to local agents and other foreign creditors to calm down and not to engage in a bank run activities. In other cases, this announcement might also turn out to be irrelevant for the situation of a bank run that is about to occur.

For the purpose of this research it is also beneficial to mention the extensions of this model. These touch upon the optimal size of liquidity provision by the ILOLR, seniority of the ILOLR's loans and the so called sequential games, where the ILOLR moves first to signal the markets. The optimal size will be the one, which can provide sufficient liquidity support balancing the "help" with the moral hazard issue. Seniority of the ILOLR's loan might create confidence among private agents not to engage in a bank run equilibrium and serve as an ex ante measure. Finally, in the case of sequential games, ILOLR's intervention will again serve as an ex ante measure to bring stability to the banking system and discourage private agents from a bank run equilibrium. However, all three extensions are subject to various country-specific factors and the stance of the world economy.

To conclude, liquidity insufficiency and associated bank runs can be tackled both domestically and via foreign aid, however, the combination of both is more likely to appear efficient under conditions of adequate macroeconomic fundamentals and prudent macroprudential regulation locally. Thus, ILOLR's additional liquidity provision might contribute to the fact that local governments will undertake adequate policies and strengthen their economic fundamentals to prevent bank runs at present and in future, or it might create additional moral hazard and still allow for a bank run to occur.

For empirical evidence on that matter, examples of Mexico and Brazil can be drawn as those countries represented stories of successful intervention of the ILOLR (N. Roubini, B. Setser 2004, 212-213). Unsuccessful stories mainly refer to Russia and Argentina (N. Roubini, B. Setser 2004, 213).

Yet, a number of works that point out some significant potential "failures" of the core Diamond-Dybvig model have also been written. Such authors as Wallace et.al (1978), McCulloch and Yu (J. H. McCulloch, M-T. Yu 1998), showed the limitations that drew the core model further from the real world situations and the possibility of its implementation by practitioners. Their main arguments rest upon the notions that "sequential service constraint" used in the core model can be in fact substituted by any other type of contract, such as "contingent bonus contract" (those are extremely helpful when the time preferences of the parties differ, exactly as in this case), which implies no tax payers assistance needed. This might lead to disintermediation in the core model. In his work Wallace (N. Wallace, J. H. Kareken 1978) also showed that if the type of contract that is used in the core model is applied to both banks and government, the deposit insurance scheme will not be of that much help to prevent bank runs.

I will finish the chapter with mentioning a model, which has actually been published before the core model that represents the theoretical cornerstone of the following research. In the aftermath of the research undertaken by the authors they come to the conclusion that a Central Bank as any other LOLR should not bear the "insurance" responsibility for a fraction or the total amount of bank liabilities. Instead, bank examination and regulation should be put in place.

I will argue, however, that the combination of both is necessary. Moreover, deposit insurance scheme represents a component of any adequate and effective macro-prudential regulation. The existence of well-designed deposit insurance scheme does not guarantee stability of banking sector and the impossibility of bank runs per se as it has already been pointed out by various extensions of the core model as well as by empirical evidence.

Let me now continue with the forth chapter, where I will show the implications of the model and its extensions to the case of Ukrainian banking system and to the case of the run on Prominvestbank in particular. In addition, some policy advices will be also suggested after this analysis.

## CHAPTER 4. DIAMOND- DYBVIG MODEL APPLICATION IN THE CASE OF UKRAINE: POLICIES TO MAKE IT WORK

#### 4.1. Diamond-Dybvig Model in the Case of Ukrainian Bank Run

In the case of Ukraine, the application of the core model does not work. The presence of a safety net – Ukrainian DGF is clearly not enough to prevent massive deposit withdrawals and bank runs. In fact, the problems with Prominvestbank in 2008 accompanied by the reform procedures with regard to the DGF provision facilitated further mistrust from depositors' side. The stand-by agreement signed with the IMF in 2008 and the respected announcement of the authorities to initially use the borrowed money as a back-up for the future 'rainy days' and insuring market trust did not work for the country's banking sector either.

The Ukrainian DGF legislation is considered to be one of the most advanced in the Southeast European and Eurasian countries (Deloitte Consulting, LLP 2011). Nevertheless, it does not ensure the presence of the situation, where depositors fully trust the system and are not afraid to deposit in the future. The relevant question is whether there exist a way to reform the current system even further in order to improve the situation and make Ukrainian banking sector less prone to potential bank runs.

The main flaws of the current deposit insurance arrangement mainly include issues connected with insufficient level of information publicity as well as with the lack of accountability. I would also argue that the issue of the moral hazard is not addressed properly in the DGF's arrangement. Namely, the 'misbehavior' of banking institution when taking excessive risks is punishable via excluding those from the DGF. Such a measure will only contribute to the aggravation of the panic tendencies, rather than calming those down. However, if an "irresponsible" bank is excluded from the "back up" arrangement, the probability of it serving as a bank run trigger shall increase dramatically, since depositors will no longer have the right to obtain respected reimbursements. The assumption that the bank's fear to be excluded from the arrangement will lead to a more responsible behavior in the first place remains rather shaky in the case of Ukraine.

The fact, that the presence of the ILOLR (the IMF stand-by agreement of 2008) in Ukraine does not contribute to the situation and does not help to prevent the bank runs starting from 2008 and onwards, points out to some other reasons that are responsible for such behavior from the depositors' side. Thus, the case of Ukraine is unique in the sense that neither the core model, nor the majority of its extensions explain the bank run equilibrium in the sector.

#### 4.2. Policy Recommendations

Let me elaborate on what can be done to further improve Ukrainian regulatory system as well as the DGF in particular and, thus, decrease the probability of bank runs. The following major areas should be reformed in this respect:

• The new framework should allow for the room for other non-banking depository institutions to become members of the DGF, but conditional upon them meeting the same regulatory requirements imposed on bank financial institutions. This aspect remains very country-specific since during this recession Ukrainian credit unions were literally falling apart following the Ponzi-scheme scenario;

• All the arrangements and the mechanism of depository insurance functioning should become more transparent and well-defined in order to ensure high degree of publicity and trust, otherwise, the system will not be able to perform its preventive measures concerning bank run possibilities;

• Risk adjusted premiums of DGF members should be designed to prevent excessive risk taking of those and ensure fair burden of responsibility in case of the reimbursement procedure initiation;

• DGF's administration should not consist exclusively of the NBU members and members of the government; such stance of affairs contributes to even bigger distrust of depositors in the Fund. The governance of the DGF in the case of Ukraine is the one of

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the major factors that cannot prevent bank runs, even when the coverage of reimbursed deposits is being raised;

• Closer cooperation with private sector, DGFs from other countries and international supervisory bodies should be put in place. Cooperation with private sector and business agents will restore confidence among general public and correct for wrong signals on the market. Since Ukrainian deposit insurance practice is relatively young, learning by doing and best practices can be extracted when cooperating with international financial bodies on a regular basis;

• Macroeconomic stability is a key to prevent bank runs. From the models presented before in the thesis and from general economic practice, it is evident that any deposit insurance arrangement should not be the only remedy to succeed in preventing bank runs *ex ante*; bad government policies will also countervail credibility of *de jure* 'ideal' safety net arrangement;

• The authorities should maintain financial stability in the country on a regular basis, rather than try to intervene when the crisis has already evolved or the bank panic among depositors has already started. Thus, referring to the analysis of macro-prudential policies presented in the thesis before, it is evident that Ukrainian financial system lacks adequate macro-prudential framework and especially the system of early warning signals. Preventive measures have always been a superior option as opposed to the situation of dealing with the unfavorable consequences post-factum. To put it in other words: "The best national response to crisis is not to have one"(L.H.Summers 2000).

• NBU should monitor and regulate commercial banks' activities more closely, thus, insuring that the banks' balance sheets are kept in order and the enormous amount of non-performing loans and bad assets are not going to be generated by the whole

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banking system in the future. The phenomena of bank runs and panics occurs not only because of rumors and non-credible information on the market, but in fact in a lot of the cases it sources from weak balance sheets of the banks that could have been prevented beforehand if only prudent monitoring and supervision were put in place. In this regard, additional macro-prudential body could be created in order to perform the sole function of banking supervision and regulation in Ukraine.

• The last, but probably the most crucial factor in the case of Ukraine corresponds to political stability condition. As it has already been mentioned before, the level of trust to governmental bodies is extremely low and the tendency appears to be rather pessimistic as well. In the case of the country in question, financial stability and even the credibility of commercial financial institutions cannot be built without reliable political climate. Even despite the predictions of the abovementioned model with the ILOLR in place, the IMF's support could not prevent further bank runs since people simply do not believe that the money borrowed will be spent on reimbursements in case of massive bank bankruptcies. Thus, the authorities should communicate more efficiently with the general public and, for instance, provide information on how the IMF's tranches are actually being used (this element of transparency is clearly missing in the case of Ukraine).

Given the set of policy recommendations presented above, the major conclusion can be drawn: Diamond- Dybvig model as well as related extensions and models are not applicable in the case of Ukraine, since they lack such broad parameters as overall macroeconomic stability, political stability and general public loyalty to the authorities. Thus, even with the support of the ILOLR, the bank run equilibrium tendencies are likely to remain if the situation, especially with regard to the authorities' credibility is not going to be improved.

#### **CHAPTER 5. CONCLUSIONS**

The objective of the thesis was to apply the framework of the Diamond-Dybvig model on bank runs as well as its extensions to the case of 2008 Ukrainian bank run and show that the presence of the DGF in the country is irrelevant to bank run preventions, since the safety net arrangement is subject to important flaws and inconsistencies.

The given research argues that various theoretical models on bank runs are not applicable in the case of the country in question, mainly due to their substantial limitations when it comes to the country-specific environment. These factors include macroeconomic and political conditionality and lack of trust from the general public towards local authorities.

Even though *de jure* the deposit insurance system is meant to function in a rather efficient way, *de facto* the safety net does not perform its preventive functions. On the basis of these major findings, a set of crucial policy recommendations for the Ukrainian authorities is given.

The measures that should be undertaken in order to ensure that Ukrainian DGF performs its bank run preventive role and, consequently, ensures stability in the Ukrainian banking sector, include both economic and political features.

Firstly, the DGF arrangement itself should be reformed in such a way that allows non-banking financial institutions to participate in the scheme. Secondly, DGF members should pay risk-adjusted premium to allow for the fairness of the system. In addition, an adequate degree of transparency and accountability should be formed within the DGF in order to restore depositors' trust, which remains to be the key to financial stability. Furthermore, the actions of the DGF should be announced to the general public in a timely and explicit manner. Finally, macroeconomic and political stability has to be created in order to ensure adequate operational climate for financial institutions as well as for local and foreign economic agents. Despite the fact that the analysis of Ukrainian DGF from the perspective of bank runs models and related

recent case studies has not been published before, the work has some limitations and scope for further research.

In order to draw a more general conclusion on the case of Ukrainian banking sector, earlier bank runs could be analyzed within the past DGF's arrangements in the country. Such analysis would give an opportunity to track the development and the scope of changes with time. Furthermore, the most significant changes could be distinguished in order to understand which policy action would contribute to the improvement of the situation the most. In this case the policy evaluation technique would appear a rather beneficial tool to use. Finally, the research could be extended to a cross-country comparison, and on this basis a general trend for some of the post-soviet economies could be determined.

Nevertheless, the given research can be used by policymakers to shape their future decisions with regard to their actions towards further DGF's reform process. The research can also serve as a blueprint for accessing the success of safety net arrangements in terms of bank run prevention in the economies alike.

## APPENDICES

Reimbursed Deposits			
Date	Number of Banks with Reimbursed Deposits	Number of Reimbursed Depositors	Reimbursement, mln UAH
01.01.2010	5	36,116	1,312.5
04.01.2010	13	93,004	3,390.9
10.01.2010 01.01.2011	16 16	97,152 101,118	3,509.2 3,606.2
04.01.2011	16	102,179	3,623.3
07.01.2011 10.01.2011	16	89,082 90,049	3,370.8
01.01.2012	17	92,023	3,532.8
04.01.2012	18	92,762	3,566.7
01.01.2012	22	120,548	4,329.6

Table 1. Volume of Reimbursed Deposits, 2010-2012, mln UAH

Source: adopted from DGF Statistics Database: http://www.fg.gov.ua/eng/statistics/

Date	Financial Resources, mln UAH
01.01.2010	4,302.7
04.01.2010	3,843.4
07.01.2010	2,873.9
10.01.2010	3,076.1
01.01.2011	3,390.3
04.01.2011	3,778.7
07.01.2011	4,038.0
10.01.2011	4,493.4
01.01.2012	4,827.3
04.01.2012	5,312.0
10.01.2012	6,194.4
01.01.2013	6,092.1

Table 2. DGF Financial Resources, 2010-2012, mln UAH

Source: adopted from DGF Statistics Database: http://www.fg.gov.ua/eng/statistics/

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