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Talk about the "Bank Run"

-- Making Northern Rock as Example

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Abstract

Bank runs are one of the challenges faced by the banking industry. Poor management or insufficient liquidity, or even rumors about the bank may lead to bank runs. Similarly, in 2007, the neglect of northern Rock's asset and liability management led to a serious bank run, leading to the nationalization and even bankruptcy of the bank. Taking history as a mirror, this paper takes Northern Rock as an example. The D-D model is used to study the mechanism of bank runs, explain the necessity of innovation of deposit insurance system, crisis communication strategy and financial supervision system of banks, and analyze the disposal measures and prevention system to deal with bank runs, so as to realize the steady development of bank operations and maintain the good reputation of banks.

Keywords

Bank run; Northern Rock; Deposit Insurance System; Crisis Communication.

1. Introduction

1.1. Concepts Related to Bank Runs

A bank run is when a large number of customers of a bank withdraw all their money in a short period of time. Because the bank in a short period of time to store liquidity is less than the value of outstanding deposits, unable to meet the needs of withdrawals. As a result, bank runs quickly depletes banks' ability to pay, bankrupting previously healthy banks. Because of its abruptness and violent consequence, the traditional economic theory used to describe it as people's irrational behavior. When you have a lot of bank runs, you get panics and even banking crises.

As for the definition of banking emergency, there is no exact regulation in our country. Silver in China insurance regulatory commission about print and distribute "banking insurance measures for emergency information report pointed out that" the banking industry of sudden incidents "specific standards include banking financial institutions for large-scale illegal theft, illegal robbery, illegal banking financial services and banking financial institutions, inspection found significant violations caused by financial emergencies, such as sudden withdrawals and other events which may have a significant impact on the normal operation and provision of normal financial services of bank financial institutions. Although this definition summarizes the contents of banking emergencies in detail, it is mainly from the perspective of banking supervision. According to the unique characteristics of the banking industry and the particularity of the work, this paper considers that the banking emergency refers to "the emergency that occurs suddenly, may cause or cause significant unexpected losses of bank assets, seriously interferes with the normal operation of the bank, or may cause significant damage to the reputation of the bank.

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1.2. The Mechanism of Bank Run

The introduction of a bank run mechanism (Dimond & Dybvi, 1983) in the published papers about bank run "Bank Runs, Deposit Insurance and Liquidity", the establishment of a bank run D-D model, analyzes the mechanism of bank runs and proposed the preventive measure, Including deposit insurance system and suspension of deposit realization.

As a three-stage model, the business cycle can be divided into three segments, namely t=0, T=1 and T=2.Suppose there is a production technique where every unit of input at t=0 produces R units of output at t=2 (R>1).If production is interrupted at t=1, the value saved is only the original investment value.

Therefore, the production technology is expressed as follows:

Table 1. Production of New Technology.

T period	T=0	T=1	T=2
Uninterrupted	-1	0	R
Interrupted		1	0

Source: Statistics from Zhang (2014)

So the depositors are exactly the same at t=0, facing either type 1 (impatient) or type 2 (patient) uninsured risks. Only when t=1 does the depositor know its own type. Suppose at time 0 each depositor is given 1 unit of deposit to invest in production technology.

If the depositor discovers that he is type 1 when t=1, he can only get the original investment for consumption, i.e., C_1^I=1 (C_I^K=1 is the consumption of a depositor of type I at period K). If the depositor is type 2, he can wait until the completion of the investment cycle to obtain R's investment for consumption. C_2^2=R .However, since the depositors in advance do not know what type they are (or whether the liquidity will be impacted when t=1), so the depositors at t=0 face the risk of only getting the original value for consumption.

Compared with the above results without the existence of banks, the introduction of banks provides depositors in the model with a product with insurance significance -- demand deposit contract. The insurance significance of demand deposits is reflected in that the consumption range of 1< R' <R. Such income arrangement establishes a rule of benefit sharing and risk sharing among depositors. Admittedly, depositors are risk-averse, so everyone wants to enter into such a contractual relationship with the bank.

Zhu (2021) points out that the bank also assumes that the bank's deposit contracts promise a fixed income for each category 1 consumer r_1(r_1=1). Since the bank operates on a first-come, first-served basis, the bank's reward to depositors also depends on the position in the queue where the person stands at the time of withdrawal. Let V_1 be the return on each unit of deposit

that the depositor withdraws at t=1. The amount of return paid depends on the order of the depositor in the queue at t=1.V2 is the return paid at t=2 for each unit of deposit that the depositor does not withdraw before t=1, and V_2 (f, r_1)=max{R(1- r_1 f)/(1-f),0}whereV1

represents the ratio of deposit that depositor I has withdrawn before to total deposits. F is the percentage of demand deposits that are withdrawn at t=1.The formula is as follows:

$$V_1(f_1,\ r_1)=\begin{cases} r_1\ , if\ f_1<r_1^{-1} \\ 0\ \ if, f_1\geq r_1^{-1} \end{cases}$$

Zhu (2021) states that banks are given contracts with two equilibrium: a good one and a bad one. The equilibrium of the first type of depositors withdrawing money when t=1 and the second type of depositors withdrawing money when t=2. This good balance achieves the

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optimal dispersion of risks, which not only improves the welfare of depositors, but also enables the reasonable and effective allocation of social resources. On the other hand, a bad equilibrium may occur in the deposit contract in banking business, that is a bank run. Once the second type of depositors have the expectation that other depositors will withdraw money in advance and panic, all depositors will rush to try to withdraw money when t=1, and a bank run will inevitably occur. Under d-D model, bank run is actually a process of self-realization of depositors' belief, and the dominant reason of bank run is depositors' subjective expectation and depositors' confidence in the steady operation of the bank. Therefore, to ensure depositors' confidence in the bank and ensure that depositors' expectations do not deviate is the key to prevent bank runs.

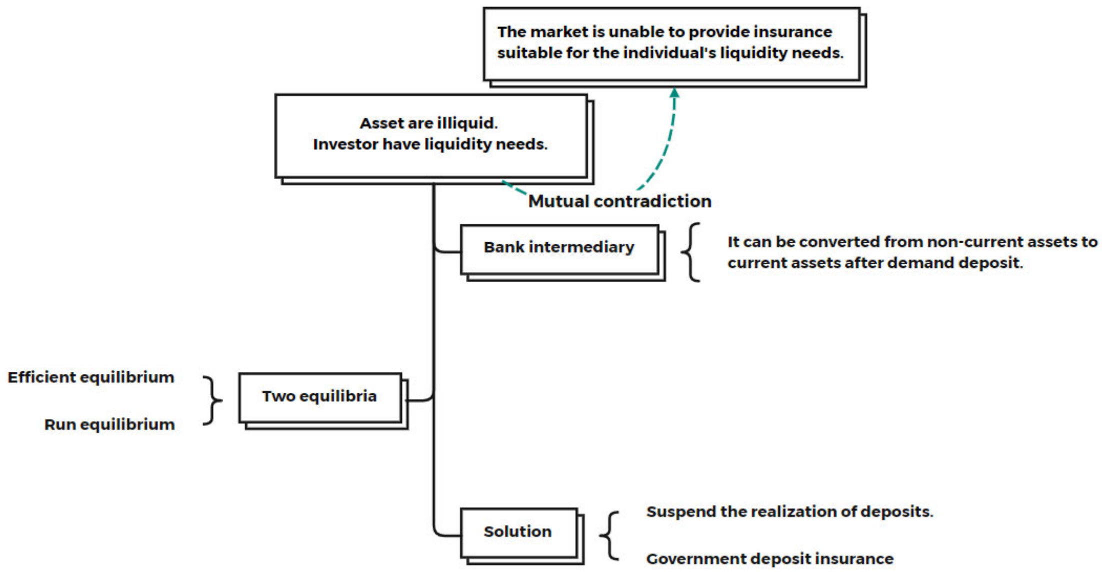

Figure 1. D-D Model
Source: Statistics from Zhu(2021)

1.3. Perspective of the Run on Northern Rock

As the fifth largest housing mortgage bank in Britain, liquidity crisis occurred due to the impact of the SUBPRIME mortgage crisis in the United States, which reduced the bank's earnings in the operation process. However, when the Bank of England came to the rescue of Northern Rock and injected liquidity into the domestic financial market, Libor continued to reach a new high for three consecutive months, reaching a maximum of 6.85%, at which time The Liquidity of Northern Rock was already insufficient. The Bank of England had to prop it up again to ease its liquidity problems. The further expansion of the run event is due to the loss of confidence of the stakeholders of the bank due to the liquidity problem and the damage to the reputation of the bank. Moreover, with the spread of the news to the entire financial system, coupled with the global economic downturn caused by the sub-prime mortgage crisis in the United States, market panic is inevitable. In the wake of the run, Northern Rock's reputation was so discredited that it had to be temporarily nationalized and bought by Virgin Financial on 18 November 2011.

The impact of the US subprime mortgage crisis on the run on Northern Rock has been emphasized above, but it also has its own reasons, which are considered in this paper as follows:

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1.3.1. Excessive Reliance on Short-term Funds of Peers

Northern Rock made its profits by taking money from its peers and lending it out on mortgages. Northern Rock's liquidity management was able to raise enough funds to meet liquidity requirements within five working days without tapping the peer market. Under this standard, it was extremely risky for Northern Rock to secure 46% of its liabilities with 13% of liquid assets, as the table below shows. Especially in the emergence of market liquidity problems, capital shortage, resulting in a variety of concurrent risks.

1.3.2. Ignoring Financial Security

Before the run on the bank, Northern Rock made use of its good credit to finance and obtained a huge capital flow, but in the issuance of housing loans, it also crowded a large number of housing mortgage loans in the balance sheet, occupying the liquidity of funds. At the same time, Northern Rock set up a special purpose vehicle called Grantie, which it used to securitize mortgage-backed assets, boosting liquidity and growing rapidly during the housing boom. In 2003, however, house price growth slowed, housing demand remained flat, the property boom faded and interest income growth slowed. At the same time, the UK inter-bank offered rate rose, which seriously affected northern Rock's financing model by relying on inter-bank business.

The double whammy of property and peer businesses has hit the debt side of the bank badly, with shareholder returns underperforming the FTSE 100.Then Northern Rock began to focus on residential mortgage-backed bonds, which on the one hand increased the size of the debt, on the other hand, guaranteed bonds have a longer average maturity, more stable funding, enhance liquidity. Unfortunately, northern Rock's mortgage-backed securities did not grow on a large and sustained basis. Throughout the expansion process of Northern Rock, it never stopped to reflect on the fact that profit is the goal of bank operation and lack of social responsibility, which is also an important reason why depositors no longer trust Northern Rock.

2. Literature Review

DouglasW.Diamond and Philip Dybig(1983) create the classic operation model of commercial banks D- D model. By analyzing the three-stage economic model, the author describes the causes of bank runs and their negative effects on the economy. The introduction of "government deposit insurance" and "suspension of deposit liquidation" as an effective solution to the run on commercial banks shows that commercial banks still have a great development space during the crisis. Jackin and Bhattacharya(1998) establish an information-based bank run model. They believe that banks cannot know the actual liquidity needs of depositors, but depositors can get information about the asset quality of banks, which forms information asymmetry between banks and depositors. Especially in the absence of alternative value stored on bank overall outlook of bad news will not completely capital outflows led to the banking system, however, if the bad news from the bank spread rapidly in the banking system, it will cause a bank run, and depositors from spread bad information bank withdrawals, And put cash in banks that don't spread bad information.

Damnd and Dybvig (1983) propose that the government should provide deposit insurance to deal with the crisis of bank run while establishing D-D model of bank run. Deposit insurance system is similar to establishing a firewall between the national economy and financial crisis. It can effectively supervise financial institutions while enhancing the sense of security of depositors and protect the national economy from the impact of financial crisis. Yehning(1999) points out that moral hazard can be weakened by strengthening market supervision by establishing deposit insurance mechanism to weaken bank run panic and guide depositors to pay attention to real information, which requires deposit insurance system to ensure depositors to wait patiently for real information.(zhang, 2021)

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CoombsWT(2007) discuss the development of situational crisis communication theory (SCCT) and presented its crisis communication guidelines. It shows that communication affects people's perception in crisis, and the words and deeds of management will affect people's view of the organization and crisis. In turn, these perceptions shape the public's assessment of the reputation of the target organization, as well as stakeholders' emotional reactions to and future interactions with the organization. It is pointed out that crisis managers can learn how to protect reputation assets by crisis communication during crisis through sctt.(zhu,2021)

Zhang et al. (2017) believe that in the context of an uncertain crisis, due to the information asymmetry between investors and company management, investors have to look for persuasive signals to re-evaluate the target focus enterprises. As an information intermediary, the media provides investors with effective signals of company quality. They believe that due to the correlation between the attributes of investors during corporate crisis and the economic potential of enterprises, corporate reputation disseminated by media will be directly linked with investors' evaluation of enterprises in crisis.

3. Main Points

3.1. The Construction of Deposit Insurance System is Helpful to Deal with Bank Runs.

There are two equilibrium decisions in D-D model: one is the optimal risk-sharing equilibrium with complete information; The other is the equilibrium of bank runs, and a conclusion is drawn in this model: the emergence of the above two equilibrium depends on the expectations of depositors. When depositors expect bank runs to occur, depositors choose to withdraw money in advance, which leads to bank runs. When depositors do not expect a bank run in the future, they choose to defer withdrawals. The emergence of bank runs has caused harm to the real economy to a certain extent. Preventing the crisis in advance requires even reliable information maintenance measures. The analysis of D-D model shows that in some cases, such as when the government provides deposit insurance, confidence problems will not occur.

Deposit insurance system is a kind of guarantee mechanism, which can make depositors form the expectation of deposit safety. It is also a supervision mechanism, through the supervision of the insured institutions, to prevent problems caused by excessive risk operation, to restrict them in time and order correction, so as to reduce the moral hazard of banks, prevent bank runs, protect the interests of depositors, and maintain the image of the bank in the public.

Depositor's expectations of Banks is the key to the outbreak of a bank run or not, corresponding to a run on the Banks of the prevention and treatment measures should ensure depositors to produce good prospects, ensure that the disclosure of information, throughout the whole evolution process of bank runs, deposit insurance system has the prominent role, can effectively protect the safety of depositors deposit. To prevent depositors from suffering serious property losses during the crisis, thus enhancing depositors' confidence in the banking industry and maintaining the long-term stability of the financial system.

3.2. Crisis Communication is Helpful in Dealing with Bank Runs

Northern rock senior management used a variety of masking strategies and rituals to try to construct a crisis interpretation framework during the crisis, as shown in the figure below.

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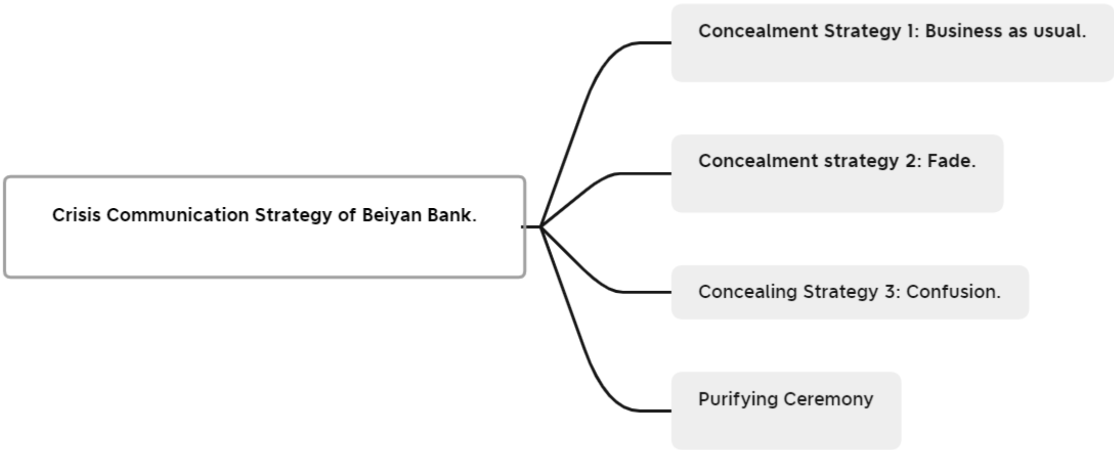

Figure 2. Crisis Communication Strategy of Beiyan Bank.
Source: Statistics from Zhang(2021)

Northern Rock supported this self-presentation with various cleansing rituals and dissembling, with the following communication strategy:

A statement that business was normal. After the crisis Northern Rock sent the message that banks were becoming more capital efficient and paying higher dividends. The collapse of the switchboard and the gridlock of its branches made it clear that Northern Rock was hiding the fact that it was facing a serious credit crunch.

Played down the seriousness of the problem. By covering up the facts and denying the possibility of depositors losing their money, the bank played down the seriousness of the situation, thereby avoiding publicly playing down northern Rock's funding problems.

Use obfuscation strategies. When global liquidity markets froze up, the world's most liquid markets were effectively closed. Northern Rock has also been shut out of interbank lending and it is only a matter of time before a bank without capital fails. But northern Rock executives, for the sake of confusion, insist they can still raise money. Although northern Rock was operating under capital constraints, its previous statements implied that it was able to raise funds from the market, and its subsequent statements implied that it was unable to do so, a clear confusion.

Purification ceremony. The ritual of purification is a public demonstration of the proper procedures one has taken during a crisis to signal the possibility of returning to normalcy. (Zhu,2021) Northern Rock adopted a purification ceremony during the crisis. It finally admitted that it had problems in both interest rate rise and capital, and said that it solved the problem through interest rate swap and learned lessons from it.

Crisis management is a preventive system established in advance to cope with sudden crisis events, resist sudden disaster events and minimize damage. According to the D-D model mentioned above, although deposit contract can achieve optimal allocation of resources, deposit contract is faced with multiple equilibrium. Once patient consumers lose confidence in the steady operation of banks and bank runs are expected, bank runs will actually occur. (Zhu,2021) It can be seen that good bank reputation and depositors' trust in the bank are crucial to the steady operation of a commercial bank. In order to prevent the expansion of the crisis, it is necessary for commercial banks to adopt timely and effective communication strategies, strengthen contact with the outside world, avoid the fermentation of crisis events, ensure the stable operation of banks, and maintain the good reputation of banks.

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3.3. The Innovation of Banking Financial Supervision System Helps to Deal with Bank Runs

The Northern Rock case shows that delays, unclear functional responsibilities and political conflicts of interest in dealing with banking crises are often the main reasons for deepening the crisis and leading to serious bank runs.

This paper argues that, in addition to the daily supervision and maintenance of financial market stability, the laws of various countries should clarify the goal of financial stability and the tools and means to maintain stability, and strengthen operability. However, as international environmental and financial risks are frequently exposed, it is also necessary to establish a financial stability coordination mechanism including relevant parties in the form of regulations as soon as possible, clarify the framework of regulatory cooperation mechanism, and establish an appropriate power and responsibility structure, so as to cope with increasingly realistic systemic risks.

4. Conclusion

Northern Rock bank run crisis is a landmark event since the Subprime mortgage crisis in the United States. As one of the five major mortgage banks in Britain, the run and eventual nationalization of Northern Rock Bank had a profound impact on the financial industry in Britain and even the whole world (zhu,2021).From the analysis of this paper, we point out that the expectation of depositors on banks is the key to the outbreak of bank runs, and analyze the importance of emergency communication strategy to maintain good reputation of banks and ensure the steady operation of banks, and put forward suggestions for further innovation of financial market supervision system to the government authorities.

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