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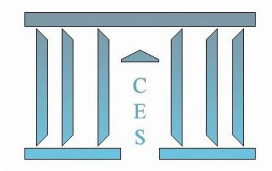

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ECONOMICS OF REGULATION: CREDIT RATIONING AND EXCESS LIQUIDITY

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Abstract: In examining the global imbalance by the excess liquidity level, the argument is whether commercial banks want to hold excess reserves for the precautionary aim or expect to get better return through risky decision. By pictorial representations, risk preference in the Machina's triangle (1982, 1987) encapsulates motivation to hold excess liquidity. This paper introduces an endogenous liquidity model for the financial sector where the imbalance argument comes from credit rationing extended from outside liquidity (Holmstrom and Tirole, 2011). We also conduct a stylistic analysis of excess liquidity in Jordan and Lebanon from 1993 to 2015. As such, the proposed model exemplifies the combination of credit, liquidity and regulation.

Keywords: credit rationing, excess liquidity, inside liquidity, risk preference, machina triangle

JEL: D81; E58; L51

1. Introduction:

The global imbalance [1] as cross-country differences in saving and investment patterns is pervasive and thought provoking, giving good reasons to advocate reduction of imbalance. To be sure, there have been studies concerned specifically with this problem, but the question has also been raised as to whether domestic and international distortions can be a key cause of imbalance regardless of economic development levels or financial externalities. It is diverse to say specific drivers to position imbalance but liquidity reflecting credit of commercial banks in the economic cycle can react to global imbalance with rational expectation.

[1] Blanchard's account (2007)

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The attempt to explain global imbalance which is the macroeconomic broad question on the notion of endogenous liquidity structuring the financial expectation might be further brought into question like killing two birds with one stone. At the outset, what I try to do in this paper is to offer plausible explanations as to why outside liquidity (excess liquidity) can cause inside liquidity [2](surplus liquidity) which is intimately linked with credit rationing [3]. Commercial banks should decide the composition of liquid assets with outside liquidity-currency, reserves, money base. The decision of liquidity might be on whether assets can be melted to make more liquidity in the risky situation or liquid assets as liability is excessively equipped. The concept of excess holds particularly true for reflecting rational expectation in liquidity. Otherwise, excess liquidity without rational expectation should be reduced. Hence, credit rationing to recognize the inside liquidity in open market operations makes reasonable to measure the appropriate outside liquidity to be hold.
Specifically, this study establishes the contour of arguments about financial institutional reasons (appropriate level of holding liquidity) and incentive considerations (outcome uncertainty is endogenous). The meaning of required reserves and net lending in this paper closely parallels the notion of inside liquidity and outside liquidity[4] introduced by Holmstrom and Tirole (2013).
From outside liquidity to inside liquidity, within this context, the classification (Brunnermeier-Pedersen, 2008) of an asset's market liquidity (i.e., the ease with which is traded) and traders' funding liquidity (i.e., the ease with which they can obtain funding) is grounded in those certain rules drawing on financial regulation. When it comes to the funding gap (Cressy, 2000), homogenous funding gap is merely defined as expenditure caused by the gap between alleged debt and equity

[2]Ostensibly, there are three sources of outside liquidity defined by Holmstrom and Tirole (2013): (1) consumers, who can securitize their assets, notably the houses they own; (2) the government, which can issue claims backed by its exclusive right to tax consumers and producers; and (3) international financial markets, which can offer liquidity in the form of claims on international goods and services.

[3]Holmstrom and Tirole, 2013

[4]The explanatory power of the model by Holmstrom and Tirole (2013) has been convincingly structured from the notion of inside and outside money introduced by Gurley and Shaw (1960). For example, Blanchard and Fischer (1989: ch.4) state:
Any money that is on net an asset of the private economy is outside money. Under the gold standard, gold coins were outside money; in modern fiat money systems currency and bank reserves, high-powered money, and the money base constitute outside money. However, most money in modern economics is inside money, which are simultaneously an asset and a liability of the private sector.
Namely, Holmstrom and Tirole (2013) define inside and outside liquidity depending on the source of the pledgeable income. When the pledgeable income is generated by the corporate sector, the claims on it constitute inside liquidity. All claims on goods and services outside the corporate sector constitute outside liquidity.

gaps in national economies within a framework of a balance sheet. Beyond the scale of a balance sheet, heterogeneous funding gap is defined by positive funding gap at an equilibrium, that is, the volume of lending is below the criteria of a competitive capital market perfectly operated by costless and complete contracts and no private information and rational expectations is following. Otherwise, normative funding gap can be from a market failure so the policy responds to which is an increase in the volume of lending.
The normative funding gap might throw light on new intuition escaped from double-booking which should be always balanced in banks' on-balancesheet in imbalance modeling. If a market fails to balance, evidently, rational decision makers try to search for the maximized solution to increase possibility of potential outcome for the future. Much of the decision framework upon the rational expectation is beyond the arrangement of outcomes expected from initial state. To say the least, the aim of this study about excess liquidity is to provide an overview of the financial regulation with rational expectation in economic imbalanced situation.
The financial regulator observes risky outcomes of different choices decided by expectation of a rational decision maker. Potential outcomes in the future can be defined by the expected value of functions. The existence of cardinal utility function related to preferences on random outcomes is proved by Von Neumann-Morgenstern (1947). Due to the interval scale of this measurement, in fact the regulator is not certain until the future outcome is revealed. Hence, the limit between hard regulation and soft regulation are presented in sharp detail as the interval scale of index comes up in the model.
The consequences of rational expectation requirement are quite complex. Even if we limit our analysis to the *financial regulation in excess liquidity*, it would have at least three important effects that should be taken into account:

1. The effect on credit rationing within fixed reserve scale,
2. The effect on excess liquidity in the liquidity composition,
3. The effect on inside liquidity in Machina Triangle by uncertain outcome.

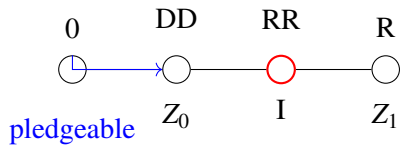
The present paper focuses on the financial sector constructing the imbalance argument. As such, it exemplifies the combination of credit rationing, excess liquidity and regulation.

2. A Model of Credit Rationing applied from (Holmstrom-Tirole, 2013) with Fixed Reserve Scale in the Banking Sector

The premise which underpins a good deal of my subsequent argument is the investment in comparative statics as analogous to required reserves within fixed investment scale. Both motivations of investment and required reserves bear a

striking resemblance to dynamics of comparative statics. Research on investment in comparative statics is still in its early stage, as the brevity of the bibliography attests. It may heighten by filling with two aspects: (1) insured amount and (2) parameterization.
Disputably, the investment is not prominent in satisfaction. As is well known, it is assumed that more consumption is always better for the consumer in the sense of increasing his or her utility. However, it is not a same token for investment. Investors demand high-yielding investments to increase utility. The point is that regulator cannot go to some lengths to establish the utility of investment before revealing the profit. Taking up this issue, insured investment amount can partake of investment in comparative statics. In applying insured investment to move toward the statics, nonpledgeability is closly fetched for being moved of insured investment.

Figure 1. Pledgeable Demand Deposit (DD) and a Positive Wedge $Z_1 - Z_0$ (rent).



identification symbols: DD (Demand Deposit), RR (Required Reserves), R (Reserve), Z_0 (opportunity value in positive wedge $Z_1 - Z_0$), Z_1 (positive net present value in positive wedge $Z_1 - Z_0$).

Supposedly, parameterization in comparative statics might be put involved parts. It bases categories on the juxtaposition of a series of contrasts of exogenous constraints on payouts and another based on endogenous constraints. Here, for example, exogenous liquidity backs up the amount relevant to a precautionary aim as a maximized whole that only the central bank can enjoy, such as the potentiality of lending on a future loan project or increased loan position status. In the second category, the endogenous of excess should be feasible to pay out to projects having profitability. It reduces the excess of central banks and the reduced portion is distributed to consumers and producers by commercial banks.
Seen from this point of view, required reserves are tantamount to insured investment as being fixed but also casting itself in the role of nonpledgeability in case of bankruptcy. Consider a commercial bank with a precautionary reserve which is bigger than demand deposit can be claimed by depositors in commercial banks. Here by, the required reserve has a positive precautionary value but it is not *independent liquidity*. Capital adequacy can require illiquidity more than demand deposit. The shortfall, difference between demand deposit and required reserves, must be secured by deposit insurance to prevent the bank run (or covered by claims

on the market value of domestic assets in commercial banks).
There are various reasons why commercial banks cannot have larger demand deposits than reserves, that is, why there is a *positive wedge* (commercial banks' *precautionary reserves*) $R - DD > 0$. By borrowing the concept of optimal rent, $Z_1 - Z_0 > 0$ which can be interval to sustain the trajectory of investment, we can put explanation into two general categories: one based on *exogenous* constraints on required reserves and another based on endogenous constraints. The prime example of exogenous constraints is an insurance cost on deposits that commercial banks should pay, such as certain amount of demand deposits per household should be secured by insurance. Likewise, accumulation of reserves is potential benefits to deviate from solvency risk by showing the high level of solvency. A related intangible benefit is derived from risk aversion when it comes to continue on-going banking business.
However, depositors do not value the precautionary reserve. It might be in a sense of financial regulation. There is possibility that banks drive business fully taking the risky situation, such as asset-liability mismatch that a bank might borrow money by issuing floating interest rate bonds, but lend money with fixed-rate mortgages. If interest rates rise, the bank must increase the interest it pays to its bondholders, even though the interest it earns on its mortgages has not increased. If source of liquidity in liabilities is riskier than one in assets, evidently, demand deposit is excessive than reserve.

2.1. Excess Liquidity

In what follows, the question about meaning of excess amount reserves ultimately hinges on the shift from the risk aversion by certain outcome (required reserve) to the risk taking by uncertain outcome (excess liquidity). By applying this challenging conceptual approach to the subject, Saxegaard (2016) illustrates about holdings of *precautionary reserves* in the country having a contraction in the supply of credit by banks because of poorly developed interbank market.

More to the immediate point, *excess liquidity* (Saxegaard, 2016) is equated to the quantity of reserves deposited with the central bank by commercial banks plus cash in vaults in excess of the required statutory level. Hence, an increase of deposits in the private sector increases commercial banks' holdings of excess liquidity as banks act to insure themselves against shortfalls in liquidity in the case of Sub-Saharan Africa on a quarterly basis of IMF data from 1990:Q1 to 2004:Q4.

Excess Liquidity (EL)=	Excess Cash	+ Excess Reserves (ER)

Table 1. Excess Liquidity (EL) and Excess Reserve (ER)

In the light of above equations, the *excess liquidity* (EL) is the holding loss which should be liquid to maximize satisfactions of consumers and profits of producers. Moreover, we can assume the monetary status of consolidated commercial banks (except for the central bank) in three assumptions. Firstly, consolidated commercial banks hold excess reserves which are not inserted into the required reserve. Secondly, the reserve requirement can be between 1% and 10%. Thirdly, the borrowed money is deposited into a checking account at another bank that is not any of the previous banks. Within *precautionary reserves* such as Reserves (R) > Demand Deposit (DD), following equations sum up those three assumptions.

- Reserves (R) = Excess Reserves (ER) + Required Reserves (RR),
- Required Reserves (RR) = m × Demand Deposit (DD), $m = [1\%, 10\%]$,
- $\triangle$ in money supply = $\frac{1}{m}\times$ Excess Reserves (ER), where m is a ratio related to change ($\triangle$).

In defining excess reserve, attention to the categorization by the 11^{th} level of *demand deposit to reserves* reveals an index of required reserves from 1 (smallest) to 11 (Largest) as below:

Reserves (R) < Demand Deposit (DD),

- Demand Deposits (DD) - Reserves (R),
- Excess Reserves (ER) = $\underbrace{(DemandDeposits(DD) - Reserves(R)}_{Level 11^{th}} + \underbrace{(Reserves(R) - RequiredReserves(RR)}_{Level 1^{st} to 10^{th}}$,

Conversely, Reserves (R) > Demand Deposit (DD) (precautionary reserves),

- Excess Reserves (ER) = Reserves (R) - Required Reserves (RR),
- Required Reserves (RR) ÷ Demand Deposits (DD) (Level 1^{st} to 10^{th}, according to Required Reserves (RR) ÷ Demand Deposits (DD) ÷ 10),
- Reserves (R) > Demand Deposit (DD), $RR/DD > 1$ (excess liquidity).

This framework using reserves (R) and demand deposit (DD) is consistently linked to liquidity analyses of (Patinkin 1965 chap.5; Tobin 1965; Niehans 1978; Diamond and Dybvig 1983). Especially interesting from their points of demand deposit in two regards, it can be "demand for liquidity" and "transformation" service provided by commercial banks. The analysis of Bank Runs, Deposit Insurance

and Liquidity (Diamond and Dybvig, 1983) embodies uninsured demand deposit contracts are able to provide liquidity but leave banks vulnerable to runs. *Liquidity* is intimated linked with possibility of liquidity that the bank knows how many withdrawals will occur in demand deposit when confidence is maintained.
The juxtaposition between excess reserve and demand deposit has strong association which underlines the connection between excess liquidity and uninsured liquidity. The vulnerability of bank runs (Diamond and Dybvig, 1983) occurs because there are multiple equilibria with differing levels of confidence.
Liquidity role stands to reason that is differ from the Diamond and Dybvig model (1983). Apparently, for investors, asset liquidity is linked to the market operation (Jacklin, 1987; Haubrich and King, 1990; von Thadden, 1997; Hellwig, 1994). On the other hand, it should be added by transaciton between banks and markets. Uncertainty about amount of liquidity (Diamond, 1997) is useful concept that the liquid probability of cardinal utility(Diamond, 1997) of consumptions of firms is started to be argued. However, banks are merely objects having assets should be melted to be liquid because banks want to be inserted in the market operations. Nature of the banking industries exists in two sides of assets and liabilities, furthermore, in on balancesheet factors and off balancesheet factors in open market operations.
Liquidity creation is in two sides of a coin about riskinesses. It can be argued for liquidity creating riskless and causing the problem in risky asset markets (Gorton and Pennacchi, 1990). Otherwise, borrowing and lending are permitted but constrained (Kehoe and Levine, 2001).

	certain outcome	uncertain outcome
DD index	$\frac{DD-R}{R}$	$\frac{DD-R}{DD}$
DD (Demand Deposit)	R (Reserves)	
RR index	$\frac{R-RR}{RR}$	$\frac{R-RR}{R}$
RR (Required Reserve)		

Table 2. DD Index and RR Index in uncertainty

As above, using two different indexes stands to reason that for certain outcome in demand deposit (DD) index, how far demand deposit is bigger than reserves, for uncertain outcome, within the scale of demand deposit, where reserves are located. Otherwise, for certain outcome in required reserve (RR) index, how far reserves are bigger than required reserves, for uncertain outcome, within the scale of reserves, where required reserves are located.

2.2. Credit Rationing

Because of non pledgeability of required reserves (RR) in case of bankruptcy, pledgeable demand deposit (DD) can be marked by $RR-DD > 0$, required reserves (RR) will be required for strict positive net present value in banks. Let A be the *excess liquidity* of capital at the vortex of precautionary aim.

$$A \geq \bar{A} \equiv RR - DD > 0. \tag{1}$$

A lower bound $\bar{A}$ on liabilities and equities of banks invites a reading on several levels of understanding. The negative effect of a lower bound $\bar{A}$ is achieved through increasing of demand deposit (DD) comparably than required reserves (RR), $DD > RR$. Commercial banks need to extend their deposit level paralleled to demand deposit (DD). On the other hand, central banks require the reserve level to commercial banks. Admittedly, A lower bound $\bar{A}$ is *credit-rationed*.

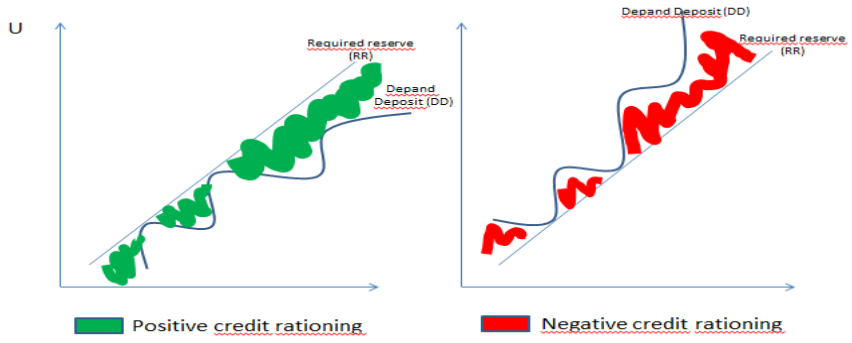


Figure 2. Positive Credit Rationing (left) and Negative Credit Rationing (right)

For example, demand deposits of commercial banks contain loans, excess reserves and required reserves. excess reserves can pay demand deposits incurred by loans. The composition between excess reserves and loans can be arranged. All in all, central banks have commercial bank reserves as liabilities. In some specific cases, required reserve rate is the percentage of deposit in demand deposit. At all events, reserve amount should cover the demand deposit for credit rationing. A commercial bank is *overnight interbank interest player* in a case of

$$A < R - DD. \tag{2}$$

Why would a commercial bank hold excess reserves at the central bank? The motivation to hold excess reserves has relevance to make more networks between small banks and a big bank. For example, a small bank Tiny has lent more money than they intended so some of expected incoming funds did not arrive timely. A

small bank *Tiny* faces the problematic situation of liquidity shortage to meet the required reserve supposed to be sent to the central bank. On the other hand, a big bank *Too Big Too Fail* has excess cash. A big bank *Too Big Too Fail* is supposed to lend to a small bank *Tiny*. An announcement "I lend you" by a big bank *Too Big Too Fail* executes an overnight wire so a small bank *Tiny* can meet the required reserves at the end of day. Indeed, overnight wire isn't a wire of cash between banks. It is a wire of cash to reserves of a central bank paralleled to loans of a small bank *Tiny*. Consequently, commercial banks' excess reserves are involved in reserves of central banks. Generally speaking, bank size is maintained. For an excess reserved bank, a change of excess reserves in the composition of a balance sheet is less risky when it is involved in reserves of central banks.

In spite of rearrangement at the balancesheet composition, excess liquidity has positive value than low bound $\bar{A}$ because excess liquidity contains cash vaults and ATMs beyond excess reserves.

$$R - RR \geq R - RR - A, \tag{3}$$

In spite of easy deduction with excess liquidity A, being able to transfer cash payoffs does not imply that utility is transferable: wealthy and poor players may derive a different utility from the same amount of money. If capital is credit rationed at the low bound $\bar{A}$, the utility payoff U of banks shows satisfaction about funding value to hold excess liquidity A depending upon utility jumps at $A = \bar{A}$.

$$U = \begin{cases} A + R - RR, & \text{if } A \geq \bar{A}\ , \\ A, & \text{if } A < \bar{A}\ . \end{cases} \tag{4}$$

To put it differently, the difference between excess liquidity A and low bound $\bar{A}$ implies tolerance level of excess cash. The candidate to achieve low bound $\bar{A}$ ($=RR - DD$) can be proper amount of cash holdings. Because required reserves are various, I am puzzle on the important scale between the *precautionary reserve* and the decision to hold excess funds for hedging liquidity confronting risky situation like wars and terrors which is different at each country. In case of only A left in the payoff utility if $A < \bar{A}$, that is $DD - RR > 0$, banks want to bet more on *hazardous liquidity* A. Simultaneously, the risk-averse bank turns into the risk-taking investment plan.

The moral hazard problem occurs when the poor status of borrowing banks is negliged by lending banks. Let $A \equiv DD - RR > 0$ be the scale of the *hazardous liquidity*, let ρ_0 be the total expected return of pledgeable $DD - R$, and ρ_1 the return of excess $R - RR$, both measured per unit invested.

Figure 3. Excess Demand Deposit (DD) and a Negative Wedge $Z_1 - Z_0$ (rent)

$$0 \longrightarrow RR \xrightarrow{\rho_1} R(Z_1) \xrightarrow{\rho_0} DD(Z_0)$$

identification symbols: RR (Required Reserves), R (Reserve), DD (Demand Deposit)

Thus, A results in a total payoff $(\rho_0 + \rho_1) \times A$ of which ρ_0 can be pledged to outside investors. The residual $\rho_0 \times A$ is the minimum rent of overnight investment plan to the bank.

$$\begin{cases} \rho_1 &= p_H \times R, \\ \rho_0 &= p_H \times (R - \dfrac{B}{\rho_0}), \end{cases} \tag{5}$$

where p_H is denoted as the probability of success, B as the return of a bad plan and R as return.

The rational bank expects the return from overnight investment plan. Hence, we get:

$$0 < \rho_1 < 1 < \rho_0. \tag{6}$$

Consequently, the bank has the minimum illiquidity ratio:

$$1 - \rho_1, \tag{7}$$

Maximum betting level for excess liquidity investment plan is:

$$\frac{A \equiv DD - RR}{1 - \rho_1}. \tag{8}$$

and gross payoff is:

$$U^g = \frac{(\rho_0 - \rho_1) \times A}{1 - \rho_1} = \mu A, \tag{9}$$

where

$$\mu \equiv \frac{\rho_0 - \rho_1}{1 - \rho_1} \tag{10}$$

2.3. Inside liquidity and Contingent Shocks

Consider a three-period economy, $t = 0, 1, 2$ with a single outside liquidity-"gold." Banks are risk taking and value capital according to

$$k_0 + k_1 + k_2.$$

Banks have large endowments of gold in each period but no way of storing gold from one period to next. Equivalently, they have labor endowments that can be used to produce gold that must be balanced in the period it is produced. There is outside liquidity as a gold in the economy for now; all liquidity is embedded in the returns of the financial sector. In particular, banks cannot promise to fund future investments without backing up their promises with claims on pledgeable returns; the banks' future endowments are not pledgeable.

Assumed that required reserves are monotonically increasing. Merit discussion focuses on similar monotonic increasing nonlinear line of endogeneous variables. A further point needs to be made with fixed scaled shocks impacting on the trend line of guided criteria. We shall check whether endoegenous variables are comparably statics following the guided trendline with shocks or not.

The order-theoretic single crossing property of Milgrom and Shannon (1994) in the theory of comparative statics is useful for verifying when the required level in regulation is monotonically increasing. Hereby, endoegenous variable is demand deposit and an exogeneous parameter is shock as below:

DEFINITION (single crossing property) Let endogeneous X (demand deposit) and parameter T (shock) be partially ordered sets. A function $f : X \times T \to \mathbb{R}$ is said to satisfy the single crossing property in $(x; t)$ if for all $x' > x^*$: whenever $f(x', t^*) \geq (>) f(x^*, t^*)$, then $f(x', t') \geq (>) f(x^*, t')$ for all $t' > t^*$.

Simply, the slope which has the flow and following the trendline of guided amount is not moving upward entirely. The example in figure 4 derived from Edlin-Shannon (1998) can be shown as below:

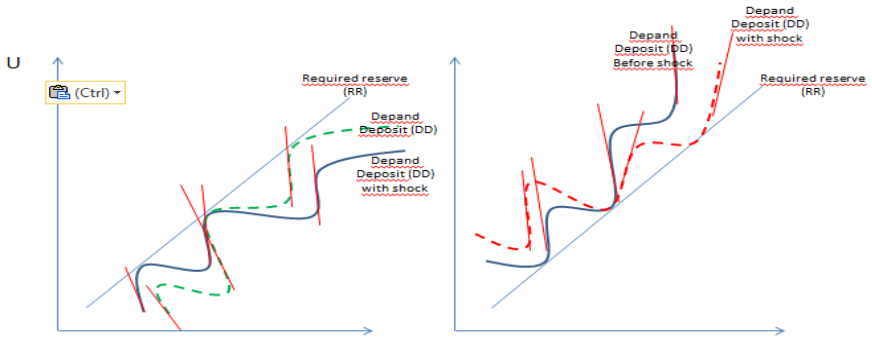


Figure 4. Comparative statics in investment

Comparative statics in investment is the comparison of two different pledgeable portpolios, before and after a change of an exogeneous shock within fixed scale by credit rationing. Here by, credit rationing is specified in the gap between insured amount and parameterized amount: pledgeable demand deposit and required reserves. The excess liquidity composed by excess reserves is a kind of a shock. The exogeneous shock is measured by demand deposit index and required reserve index obtained by credit rationing.

To reach a easier understanding of credit rationing, assume that required reserve (RR) of a bank is monotonically increasing. Certainly, the aim of soft regulation is to check comparatively statics to sufficiently follow the trend of guideline. not a limitation of specific guideline about an amount.

Therefore, when we check the change when the slope is increasing, the change before shock and one with shock increase. However, the change is not beyond the required reserve line. Change is comparably statics but it shows increasing is vigorously continous along monotonic increasing of criteria for regulation. There remains a range of problems to be tackled because shocks in investment have comparativly statics so it can be nonlinear motions but the lending contract has the fixed term which can be seen in the linear approximation.

2.4. Net lending: The case of certainty

At date 1, the liquidity shock $\rho \geq 0$ takes place. Let $i(\rho) \leq RR$ denote the continuation scale and at least shock can cover the worst scenario, $\rho_0 < \rho$. Remark that

$$\begin{cases} \rho_1 &= p_H \times R, \\ \rho_0 &= p_H \times (R - \dfrac{B}{\rho_0}), \end{cases} \tag{11}$$

where p_H is denoted as the probability of success, B as the return of a bad plan, R as return.
We assume the high liquidity shock is $f_L = 1$ and $\rho_H = \rho$. Further, $1 + \rho < \rho_1$, implying that the betting on overnight plan would always be worth undertaking from a net present-value point of view. If there are no liquidity problems, a bank with funds $A \equiv DD - RR$ transfers certain amount to the central bank as follows at date 0: He chooses RR as the initial scale of the project and invests $(\rho - \rho_1) \times RR > 0$ into a liquid asset or a credit line, where RR is set to exhaust the budget, $(1 + \rho - \rho_0) \times RR = A$. With these initial investments the bank is able to cover exactly the deterministic liquidity shock ρ at date 1. He can raise $\rho_1 \times RR$ by making an angel loan against his pledgeable date-2 deposits and add to it his portfolio in liquidity $(\rho - \rho_1) \times RR$.
The plan presumes that there is a liquid assert, or a credit line backed by a liquid asset, that allows the bank to save $(\rho - \rho_1) \times RR$ from date 0 to date 1. However, in the economy just described, the only available assets are claims on the continuation value of banks looking to save. Suppose, hypothetically, that all banks are able to meet the date-1 liquidity need $\rho \times RR$ and therefore to continue at full scale. Then the date-1 continuation value of the financial sector is $\rho_1 \times RR$. But this is less than the liquidity needed, $\rho \times RR$. Since, the net continuation value of the financial sector, $(\rho_1 - \rho) \times RR$, is negative, consequently the financial sector can neither act as a store of value nor provide collateral for future funding by institution.
This is itself emblematic of certain inside liquidity. Lending can be tied to the duration by fixed contract given five years or more. In detail, complete information about returns of portfolio is revealed in the loan contract. By contrast, preference of banks is incomplete information in comparative statics. Suffice it to say that this requires uncertainty methodology which can be better in a pictorial way for easier explanation.

2.5. Selected Liquid Characteristics of Village I and Village II

Having outlined the institutional context dealing with different countries, the discussion now turns to the real economy. In order to provide a framework for more detailed consideration of credit rationing, it will be helpful to compare two villages. There is a marked contrast between a village I holding a small reserve (reserve ratio 7%) and a village II holding an excess reserve (reserve ratio 30%). To a great extent, within the outside liquidity system, both village I and village II are conceived of excess liquidity (7867, 44800) : ≡ currency issued (5886, 400, current USD, million) + excess reserve (1981, 44400, current USD, million).

(Current USD, million)	Village I	Village II
Outside Liquidity in domestic currency, liabilities		
currency issued	5,886	400
required reserve	2,053	19,200
excess reserve	1,981	44,400
reserve money	9,920	64,000
demand deposit, commercial banks	12,684	3,028
excess liquidity	R < DD	DD < R
Inside Liquidity		
overnight deposit window rate	2.75	2.75
credit rationed A	-10,631	60,972
domestic credit to private sector by banks to GDP (%)	70	99.2
net commercial bank lending and other private credits	250	-43

Table 3. Selected Liquid Characteristics in 2014 [5]

For one thing, excess reserve (64000) and reserve money (44400) in Village II is higher than in Village I (9920, 1981). It can be puzzled how domestic credit to private sector by banks to GDP in Village II (99.2) is higher than Village I (70). It bears the imprint of importance to make an attention on two criteria to understand excess liquidity: R < DD or DD < R. This may in part be due to pledgeability of demand deposit, illiquidity of reserves and more liquidity of demand deposit are emphasized by contrasting two different liquidities. The comparison is partially developed in creditability judged by expectation of investors.

Insofar as credit rationing going to two different lengths is concerned: insured and parametrized in the optimum, an endogenous liquidity model still calls attention to the central problem as to satisfy the goal of investors by insured and parameterized comparative statics of optimal investment values.

The question has been raised in comparative statics as to whether investors increase

[5] source: village I by data in Jordan by Central Bank of Jordan, village II by data in Lebanon by Central Bank of Liban in 2014 and world bank data.

2. complementary economic information about village I and village II, reference: world bank data.

	Village I	Village II
Population (total)	7,416,083	5,612,096
GDP (millions, Current USD)	3,587	4,573
GDP per capita (Current USD)	4,830	8,148
commercial bank branches per 100,000 adults	19. 85	29.84
Domestic credit to private sector (% of GDP)	70	103
Bank nonperforming loans to gross loans (%)	5.6	4
Bank capital to asset (%)	12	8

the amount of investment or not. Our concern is not with the increase of broad investment amount which can be credited but with insured and parametrized amount getting to the optimal value.
A richer analysis of the interdependence between the excess liquidity and credit rationing components in the spread between pledgeable and unpleageable amount for different countries can be carried out by considering the government policy rule changing the mix of assets held by the private sector through open market operations (Kiyotaki-Moore, 2008).
For example, a look at functioning of the economy by the central bank's balance sheet, Garreth (2015) argues on impact of central bank collateral choices in Bank of England caused by the Asset Purchase Facility (APF) reaching 375 billion by late 2012.
Additionally, a clue to changes of asset composition is provided by numerous stylized facts about the asset purchases and the freshly created reserves in Hong Kong (long-standing currency peg regime since 2005 by Hong Kong Monetary Authority (HKMA) and Thailand (inflationary targeted (0.5-3.0%) operational strategy to absorb excess liquidity by market.
There can be little doubt that offset in the same composition is always possible in the changeable composition. The change of positioning in the same frame figurative as the change of a composition carries articulation of flows. By the way, this framework requires heavy emphasis on the proof that the value of investment has single-valued because the value can be representable in the balance sheet. The puzzle on offset among different values obtained by credit rationing sets the tone for investment having multi-dimensional valued regardless of on-balancesheet factors and off-balancesheet factors.

2.6. Composition of Liquidity

At the heart of credit rationing lies the conception of the liquidity composition. In relation to what I have previously said that Village I and Village II are having excess liquidity as far as excess cash and excess reserves concerned. In detail, even though the measurement of excess cash is not easy, Village I are having the excess reserve than required reserves (3340 > 694). Likewise, Village II are having the excess reserves than required reserves as well as Village I (44400 > 19200). By the way, a closer look at the compositon with credit rationing, demand deposit - required reserves (-1764 , 16172) gives a different answer.

Village and Liquidity Composition	Credit Rationing, I : -(DD-R) II: RR-DD	Certainty, excess liquidity I: (R-RR) ÷ R II: (R-RR) ÷ RR	Precautionary Level Index (Lowest 1- Highest 11)	Uncertainty, inside liquidity I: (DD-R) ÷ DD II: (DD-R) ÷ R
Village	Village I, II	Village I, II	Village I, II	Village I , II
currency issued	5886 , 400			
required reserve	694 , 19200			
reserve ratio	7% , 30%			
excess reserve				3340, 44400
reserve money				9920, 64000
demand deposit	12684 , 3028			
credit rationing	-11990 , 16172			
excess reserve				1981 (actu), 44400
(R-RR) ÷ RR		93 % , 233 %		
Level Index			level 11	
(DD-R) ÷ R				22%, -0.0084 %

Table 4. Composition of Village Liquidity in 2014

identification symbols: DD (Demand Deposit), R (Reserve), RR (Required Reserves),

source: village I by data in Jordan by Central Bank of Jordan, village II by data in Lebanon by Central Bank of Liban in 2014 and world bank data.

Seen in the perspective of an asset-liability match, demand deposit exerted a strong influence on reserves. It is not seem to rash to suggest required reserves as a percentage of net demand deposits held in commercial banks by customer. Demand deposit against reserves is total demand deposits less "due from" (Allen, 1956). No single explanation can account for the single driver to describe the change of reserves with credit and demand deposit. However, Several assumptions are worth to be mentioned for the sake of financial regulation.

It is not unreasonable to postulate that credit rationing is differently interpreted as a transaction holding a liability (Henderson, 1960), reserve credit (Allen, 1956) and a monetary instrument (Siegel, 1981). It can be a transaction (Henderson, 1960) for a borrower occupied by the federal funds absorption ratio of a financial liability defined as the amount of federal funds which directly and indirectly support a one-dollar public holding of the liability. As a matter of the fact, a country bank allows a reserve city bank with different reserve requirements by shifting interbank deposits depending upon reserve credit (Allen, 1956) because the total reserve is not changed and only distribution among banks by shifts in interbank balances. Additionally, as a monetary instrument, optimal reserve requirement on demand deposits (Siegel, 1981) controls the value of monetary aggregates.

As a closer look at the composition of Village Liquidity in 2014, credit rationing of Village I ($R < DD = 9920 < 12684$) is negative and on the other hand, Village

II ($R > DD = 64000 > 3028$) is positive. It indeed may be said with safety that motivation to hold liabilities excessively is purely surplus reserves in 1930 without any economic purpose caused by lack of good loan opportunities. After crisis 2007, good loan opportunities hinges on a series of remedies in a bad economic situation up to one country and more.
Passively accumulated excess liquidity is not merely explained by the conservative banking system. At the same time, as a meaning of proper loan commitment, it is no less dubious to connect that the bank behavior in the uncertain situation should be viewed with reservation. It is no wonder the motif to hold excess liquidity is good reason to show credit facility to induce good loan opportunities and obtain safer investment return by overnight interest. This motivation requires a quite logical explanation with small sample of reserves in a vulnerable economy.

3. Inside Liquidity in a Machina's Triangle

A further point needs to be made with regard to inside liquidity. This part will be a step toward a richer and more inclusive understanding of the ease with which investors can obtain funding. With problems to deal with potential outcomes resulting from funding, expected value needs to be calculated with cardinal utility function before revealed preference.
Measurement of cardinal utility function needs to look more closely at the interval scale. Now for an example of three events which the event A and B are uncertain to occur and C is certain to occur:

P(A or B and C) = $P(A \cup C) + P(B \cup C)$

In this discussion, when we say "A or B and C occur" we include three possibilities:
1. A occurs, B does not occur and C does occur,
2. B occurs, A does not occur and C does occur,
3. C occurs, A does not occur and B does not occurs.

This use of the word "or" is technically called exclusive because it does not include the case in which both or more events occur at the same time.
Here are two worlds in antithesis. By and large, probabilities of various outcomes arising from any chosen alternative are *objectively known*. Conversely, a *lottery* representing risky alternatives might be monetary gambles on the spin of an unbiased roulette wheel. Furthermore, *compound lotteries* $(L_1, ..., L_k; \alpha_1, ..., \alpha_k)$ (MWG, session 6.B) is the risky alternative that yields the simple lottery ℓ_k with probability α_k for $k = 1, ..., K$, given K simple lotteries $\ell_k = (p_1^k, ..., p_N^k)$, $k =$

1, ..., K, and probabilities $r_k > 0$ with $\sum_k \alpha_k = 1$. We can specify compound probabilities with two uncertain events and a certain event in the following example.

P(A), P(B), P(C)	P(A)+ P(B)+ P(C)	P(r_1), P(r_2), P(r_3)	P(r_1)+ P(r_2)+ P(r_3)	P(r_1)×P(A) + P(r_2)×P(B) + P(r_3)×P(C)	1-(P(r_1)×P(A) + P(r_2)×P(B) + P(r_3)×P(C))
1/2, 1/3, 1/6	1	1/10		1	0
1/2, 1/3, 1/6	1	2/10, 3/10, 5/10	1	17/60	43/60
1/10, 2/10, 2/10	1/2	1/10, 2/10, 2/10	1/2	9/100	91/100

Table 5. compound probabilities with heterogeneous valued weighted measure

EXAMPLE : The agent can carry fruits on the plate within three fruits. Letting event A be an apple, event B be a banana and event C be a coconut on a plate. The agent prefers three choices: an apple (a) to a banana (b) to a coconut (c). Three events by each choice are: $A \succ B \succ C$. However, if the preference has the cardinal value which can be numerical interpretation, then ordinal interpretation can be challenged because it can have the homogeneity like:

$$P(r) \times P(A) + P(r) \times P(B) + P(r) \times P(C) = 1$$

However, whether the weighted measure $P(r)$ is homogenous or not, the probability measure space $\omega = P(r) \times P(A) + P(r) \times P(B) + P(r) \times P(C)$ is different. In case of homogenous valued weighted measure $P(r) = 1/10$ and each $\{P(A) = 1/2, P(B) = 1/3, P(C) = 1/6\}$ has combined measure space 1. In case of heterogeneous valued weighted measure at P(r), combined measure space is not 1. How we can intepret risk preference when compound measure space is not 1. The lottery at the origin can be assumed that $\frac{86}{100}$ is certain.

We shall start by an attempt to define *independence axiom* (Von Neumann and Morgenstern, 1944) and *preferential consequentialism* (Vergopoulos, 2011) from certain probability methodology to uncertainty. for the risk preference $A \succ B \succ C$, the origin point has less riskier and certain value, C. The lottery point C in the y-axis is more riskier and uncertain value than B in the x-axis. Binary choice B or C is described in the half space of rectangular shaped space which is like a triangle because compound probabilities are not jointed but weighted. If we imagine the game tree, several subgame trees exist independently:

1) The preference relation $\succeq$ on the space of simple lotteries ℓ satisfies the in the *independence axiom* if for all $L, L', L" \in \ell$ and $\alpha \in (0, 1)$, we have $L \succeq L'$ if and only if $\alpha L + (1 - \alpha)L" \succeq \alpha L' + (1 - \alpha)L"$

2) *Preferential consequentialism* is that the agent firstly recognizes the endogenous event (E), regardless of the preferred act g in the exogenous event (E^c), he will choose the preferred act f in the endogenous event (E): $f_E g \sim_E f$.
3) Savage's Sure Thing Principle (STP) (Savage 1954; Aumann, Hart): For any event $E \subset \Omega$ and any acts $f, g, h, k \in B(\Omega)$, $f_E h \preceq_0 g_E h \leftrightarrow f_E k \preceq_0 g_E k$ where $\preceq_0$ is an optimal *ex ante* choice in the backward induction.
4) Dynamic Consistency: For any information structure $(E_i)_{1 \leq i \leq n}$ and any acts $f, g \in B(\Omega)$, $\forall i \in [1, n]$, $f \preceq_{E_i} g \Rightarrow f \preceq_0 g$. Additionally, if $f \prec_{E_i} g$ for some i such that E_i is not null, then $f \prec_0 g$.

By the independence axiom, the agent should choose the first lottery (L) than the second lottery (L') regardless of the third one (L"). Excess liquidity is not as compelling to be needed for the analysis in the presence of certainty as it is under uncertainty. Machina's paradox (1987) is an interesting technique to demonstrate the influence of "what might have been." on consequences which is the *violation of the independence axiom*. The independence axiom sets out examine the more obscure and puzzling aspect of the third lottery. The order of two lotteries by certain preference does not depend on (is independent of) the appearance of the particular third lottery. Significantly, particular certain event has increasing importance by the preference indifference in the preferential consequentialism. In that, any event E is the subset of a finite set of information structure Ω. Among any atomic act set f, g in the information structure Ω, the act $f_E g$ is conditionally defined by "$(f_E g)(\omega) = f(\omega)$ if state $\omega \in E$" and "$(f_E g)(\omega) = g(\omega)$ if $\omega \in E^c$."

EXAMPLE (independence axiom): There are three outcomes: "a trip to New-york," "eating a New-york styled bagel," and "staying in the office. " Suppose that you prefer the first lottery to the second one and the second one to third one. The choice to select the second lottery is rational if you anticipate that you cannot travel to New-york. However, the independence axiom forces you to prefer the first lottery to the second one (*Machina Paradox* in section 6.B, MWG).

EXAMPLE (Preferential consequentialism) : You are invited for a dinner (E). You were supposed to drink a Beer (g) in case of staying at home (E^c). However, you decide to carry a Wine (f) for an invitation of dinner(E).

A prospect is a point (A, B, C, D in a certain year) in a triangle. Consider the four prospects A, B, C and D. Note that the slope of the line CD is $(1 - a)(1 - b)/a(1 - b) = (1 - a)/a$. This is also the slope of the line AB. We assume that the independence axiom implies that indifference curves are parallel lines. Thus, if $D \succ C$, then expected utility must be rising along the line AB in the direction of B.

Conversely, if $D \prec C$, then expected utility must be decreasing along the line AB. Supposed by the 45 degree slope and the point value in a specific year, $a = 0.5$, $b = 0.43$ are contributed to calculate four prospects are as follows:

A = (0, 1, 0)
B = (1/2, 0, 1/2)
C = (0, 0.43, 0.57)
D = (0.285, 0, 0.715)

As we can see at B (1/2, 0, 1/2) and D (0.285, 0, 0.715), if the point is the remotest from the origin point A, then the probability is 0 at the state 2 of certain outcome x_2.

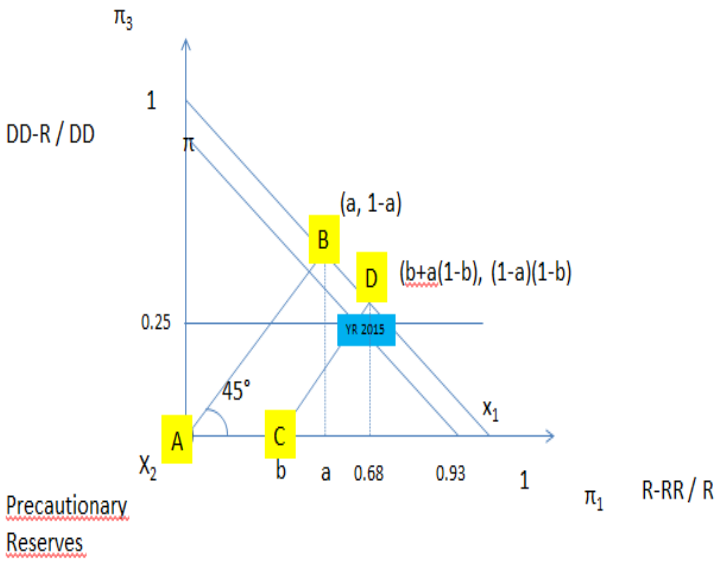


Figure 5. Remoted prospects from the origin point

Dynamic consistency is to maintain dynamics of *ex post* preference to select acts in case of the event (E), then the optimal *ex ante* preference by backward induction also follows same dynamics. Under preferential consequentialism, standard arguments of non-consequential theories (e.g. Machina 1989; Epstein and Le Breton 1993; Hanany and Klibanoff 2007; Vergopoulos, 2011, proposition 1) allows us to assume that violation of Sure Thing Principle implies dynamic inconsistency. The slopes of indifference curves indicate the individual's relative sensitivity

to changes in p_1 versus changes in p_3, are given by $\text{MRS}(x_2 \rightarrow x_3, x_2 \rightarrow x_1) = (U(x_2; F_{p_1,p_3}) - U(x_1; F_{p_1,p_3} / U(x_3; F_{p_1,p_3} - U(x_2; F_{p_1,p_3}))$. A steeper slope indicates a higher level of risk aversion. More risk averse of the local utility function raises the slope of the indifference curves. The indifference curves will appear "fanned out" (Machina, 1982) so that the relatively steeper slopes in the (p_1, p_3) plane near the vertical axis than in the one near the horizontal axis illustrates the individual's greater sensitivity to changes in p_1 relative to p_3 when p_1 is small relative to p_3, and vice versa.

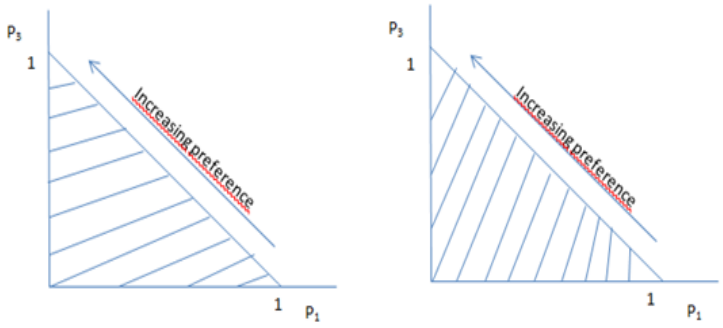


Figure 6. risk preference and steeper slopes by fanned out

The precautionary reserve locates on the origin point which is not an argument in uncertain outcome framework. Here by the argument is steeper slopes in the (p_1, p_3) plane near the vertical axis which represents risk preference. Because the logic of risk preference is outcome might be happened riskier so that the return of riskier choices is expected greater than the choice in the origin point. Remarked with two index, DD index (DD-R)/DD and RR index (R-RR)/R, the point of the demand deposit (DD) index at the vertical axis than one of the required reserve (RR) index at the horizontal axis raises the slope of the indifference curves.

4. Empirical founding in the case of Jordan and Lebanon during the period 1993-2015

This part takes a systemic and comprehensive approach from excess liquidity to surplus liquidity with the case of Jordan and Lebanon during the period 1993-2015. The MENA (Middle East and North Africa) region has passed political and economic conflicts since the Gulf war in 1990 and 1991 located on Iraq, Kuwait, Saudi Arabia and Israel. It affects Jordan as a small open oil-importing country who is geographically in Southwest Asia, south of Syria, west of Iraq, northwest

of Saudi Arabia and east of Israel and the West Bank. As time goes by, conflict areas neighbored with Jordan are seemed to have higher risk in finance. Especially, liquid asset is spotlighted to be sent to a safer country Jordan and Lebanon by residents in conflict areas.

Net lending in conflict areas is higher for restoration from the war. Ostensibly, the confusion among net lending, grant and excess liquidity is bolded than before 1993. In case of Jordan, the holdings rate which is the exchange rate of a currency against the special drawing right (SDR) derived from the currency's representative exchange rate reported by the central bank, is consistently about 1 from 1991 up to 2016, radically decreasing from 2.5 in 1985. In detail, remoted from the impact from the war, for the period (2009 – 2015), basic spread in financial sectors in jordan: deposit interest rate, lending rate are consistently maintained from 4% to 5% regarding to the bank lending-deposit spread. The deposit interest rate decreases from 4.8% in 2013 to 3.49% in 2015. In addition, the lending interest rate decreases from 9.01% in 2013 to 8.47% in 2015 as well.

Real interest rate fluctuates even though there is stability of deposit interest rate, lending rate and interest spread during 2003-2015. For economic financial stability, in all probability, understanding liquidity in financial sector and remittance and transaction in external sector is important than ever to analyze imbalanced part in Jordan.

According to S.Gray (2006), excess reserves are described the position of most developed country central banks: the Bank of England, the US Federal Reserve Bank, the European (System of) Central Banks and the Bank of Japan. In addition, it could be the case that the surplus is represented by excess cash in circulation (supply is greater than demand) rather than by commercial bank balances at the central bank; this is unlikely although it can be observed in a few countries. In case of Jordan, this is the case of excess cash. On the other hand, cash is on deficit as the percentage of GDP Regarding reserve money which contains currency and reserves in central bank of Jordan, issued currency composed the major part of reserve money during the period (2013-2015) and approximated 60% on average. Issued currency increased from 3559 Jordanian million dinars in 2012 to 4336 Jordanian million dinars in 2015 and reserve money as well increased from 5229 Jordanian dinars in 2013 to 7505 Jordanian dinars in 2015.

Middle East and North Africa (MENA) after the Gulf war from 1990 and 1991 can access to get good loan opportunities: debt forgiveness. It is of course not needed to say laziness of conflict countries to be vulnerable by external shocks in their economies. To put it differently, the exact probabilities to indicate the bank behavior in spite of short time series data which cannot be shocked durably and sequentially up to future, better put, the worst situation is happened and should be recovered by net lending, should be noted.

5. Summary

Credit rationing is rationing of excess liquidity by risk preference on comparable statics of liquid investment. This study addressed two research questions: First, the key question to be asked is how a subject of excess reserves in excess liquidity after the banking crisis of the early 1930s or 1970 can be re-identified in 2016. And second, needs of new technique about risk preference provides a useful ground to test the cross-sectional data between economics and finance by applying theories about uncertainty which is hereby the Machina's triangle (1982, 1987). For one thing, *Excess liquidity* has simply deduced itself from required reserves in banks. By the way, if *Increasing credit rationing* at the precautionary level stand out from the gap of required reserves and pledgeable demand deposit, $RR - DD > 0$. Not the least of these is its mixture of styles, increasing credit rationing at the aim of investment is within fixed reserve scale, Reserves (R) - Demand Deposit (DD). Most obviously, *risk preference* in the triangle distinguishes between risky loving behavior inside of a triangle and risk aversion behavior at the origin. As has been noted earlier, comparative statics in investment is a richly detailed study of the nature of monotonic required regulation criteria. Especially important is hard regulation on increasing the precautionary level is impossible to quibble with increasing every level set above required level. Consequently, the aim of soft regulation is to check comparatively statics to sufficiently follow the trend of guideline. not a limitation of specific guideline about an amount. This technical result of my study point to several promising applications for regulatory issues.

6. (Annex)

6.1. Village I (Jordan)

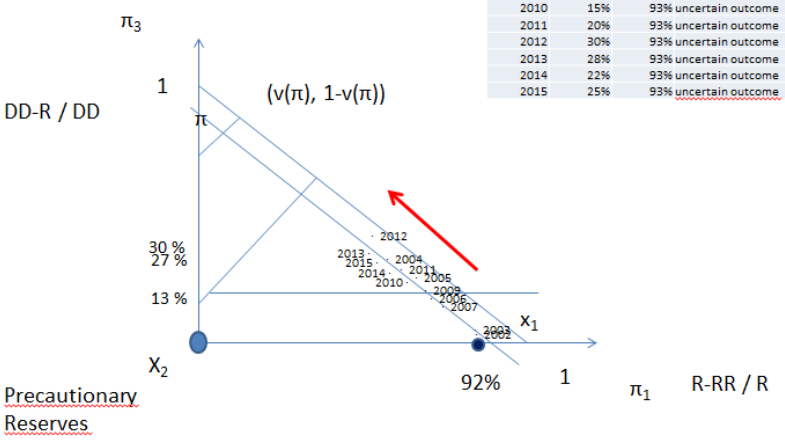
identification symbols: DD (Demand Deposit), RR (Required Reserves), R (Reserve), EL=Excess Liquidity

Year	DD-RR/R	R-RR/RR, Precautionary Reserves	RR/DD, RR index (1-11th)
1993	-35%	567%,certain outcome	23%,3th(below 30%)
1994	-37%	567%,certain outcome	24%,3th(below 30%)
1995	-38%	567%,certain outcome	24%,3th(below 30%)
1996	-36%	567%,certain outcome	24%,3th(below 30%)
1997	-41%	614%,certain outcome	24%,3th(below 30%)
1998	-33%	614%,certain outcome	21%,3th(below 30%)
1999	-38%	614%,certain outcome	23%,3th(below 30%)
2000	-29%	900%,certain outcome	14%,2th(below 20%)
2001	-15%	1150%,certain outcome	9%,1th(below 10%)
2002	1%	92%,uncertain outcome	11th(over 100%)
2003	2%	92%,uncertain outcome	11th(over 100%)
2004	27%	92%,uncertain outcome	11th(over 100%)
2005	23%	92%,uncertain outcome	11th(over 100%)
2006	12%	92%,uncertain outcome	11th(over 100%)
2007	9%	92%,uncertain outcome	11th(over 100%)
2008	0%	91%,certain outcome	1th(below 10%)
2009	12%	93%,uncertain outcome	11th(over 100%)
2010	15%	93%,uncertain outcome	11th(over 100%)
2011	20%	93%,uncertain outcome	11th(over 100%)
2012	30%	93%,uncertain outcome	11th(over 100%)
2013	28%	93%,uncertain outcome	11th(over 100%)
2014	22%	93%,uncertain outcome	11th(over 100%)
2015	25%	93%,uncertain outcome	11th(over 100%)

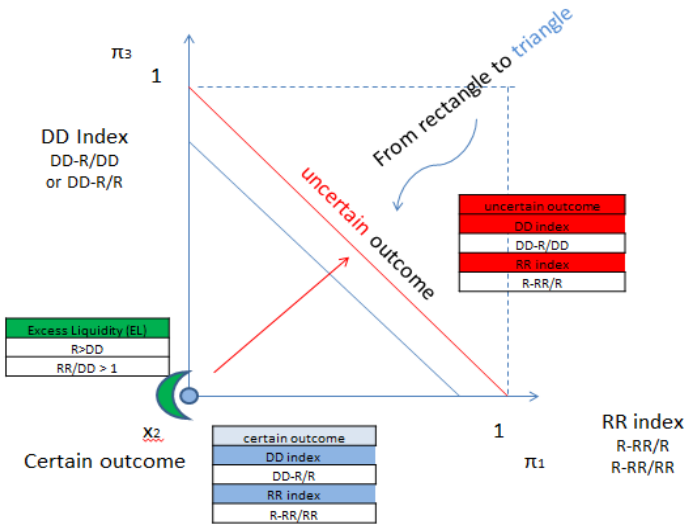
6.2. Risk preference description in the Machina Triangle

Village I (Jordan)

Year	DD-R / DD	R-RR / R	
2002	1%	92%	uncertain outcome
2003	2%	92%	uncertain outcome
2004	27%	92%	uncertain outcome
2005	23%	92%	uncertain outcome
2006	12%	92%	uncertain outcome
2007	9%	92%	uncertain outcome
2008	0%	91%	uncertain outcome
2009	12%	93%	uncertain outcome
2010	15%	93%	uncertain outcome
2011	20%	93%	uncertain outcome
2012	30%	93%	uncertain outcome
2013	28%	93%	uncertain outcome
2014	22%	93%	uncertain outcome
2015	25%	93%	uncertain outcome



Framework of risk preference in the Machina Triangle



6.3. Village II (Lebanon)

identification symbols: DD (Demand Deposit), RR (Required Reserves), R (Reserve), EL=Excess Liquidity

Year	DD-R/R	R-RR/RR, Precautionary Reserves	RR/DD, RR index (1-11th)
1993	-70%	233%,certain outcome	98%,10th(below 100%)
1994	-82%	233%,certain outcome	166,11th
1995	-85%	233%,certain outcome	204,11th
1996	-87%	233%,certain outcome	226,11th
1997	-89%	233%,certain outcome	267,11th
1998	-88%	233%,certain outcome	253,11th
1999	-87%	233%,certain outcome	237,11th
2000	-88%	233%,certain outcome	248,11th
2001	-92%	233%,certain outcome	354,11th
2002	-91%	233%,certain outcome	323,11th
2003	-95%	233%,certain outcome	661,11th
2004	-95%	233%,certain outcome	641,11th
2005	-96%	233%,certain outcome	678,11th
2006	-95%	233%,certain outcome	603,11th
2007	-95%	233%,certain outcome	554,11th
2008	-95%	233%,certain outcome	566,11th
2009	-95%	233%,certain outcome	663,11th
2010	-95%	233%,certain outcome	618,11th
2011	-96%	233%,certain outcome	667,11th
2012	-95%	233%,certain outcome	624,11th
2013	-95%	233%,certain outcome	593,11th
2014	-95%	233%,certain outcome	629,11th
2015	-95%	233%,certain outcome	650,11th

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