# MAGICAL BANKING CAPITAL: NEO-ENDOGENOUS MONEY (NEM)

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## Abstract

This research emerges with internal financial constraint. How financial constraint may lead to economic recess or back. This financial constraint is different than external finance constraint, and is not due to lack of gold, etc. It explains the positive relationship between excess return in stock market (ERSM) and non-real funding or riskier credit. The matter comes under imperfect market banking. It includes subsequently banking behavior and failure of central bank policy to control individual banks under these circumstances. In addition, it presents measures to get awareness before default comes, as financial default rare and crisis in financial market comes much before that.

**Keywords:** Endogenous, Banking, Capital, Gambling, Business, Finance, Bank, Central Bank, Depositor Safety, Risk, World, Money, Credit

**Authors' individual contributions:** The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

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## 1. INTRODUCTION

### 1.1. Central point

This research focuses on the emergence of the gambling business and the market from systemic finance binding, and its consequence. It shows how financing bindings could lead to an economic recession. As a result of finance binding, the automatic backtrack of an economy happens before reaching optimum, so financial default would not be a necessity for this. According to these measures has been devised as an early warning. This research also proposes for corporate tax rate due to brand name (CTRB) proportional to corporate ERSM, so that the impact of a brand name could be under control. The development of small business, as well as corporate law, would have a positive impact to reduce such finance constraints.

This research also found one mathematical formulation, the psychology of mathematical induction: "If something could be applied on *'k'*, so the matter should be the same at *'k+1'*". The same could be seen here too, for market players the matter could be the same for financial goods business as if like good in real business. It shows how gambling businesses prosper in an economy from the financing aspect. This research conveys measures on systemic default of financial system, individual banks (RB), and short time-sensitive switching (SSS).

### 1.2. Pseudo/internal financial constraint

This research explains the systemic or trended (Upward) credit-to-money series. It tells about generating automatic negative finance (ANF), on developmental progress on automatic full employment growth/development path. As ANF would pull it back the pseudo financial constraint develops. In general, it tells how the *perfect market banking/financial system* turns into the *imperfect market financial system* through an Illusion of brand name from real sector activities. This leads to imperfect market financing, that even leads to gambling business financing. This must create an obstacle upon other developmental financing or any kind of long-term financing.

The credit is created in this system by exogenous and endogenous capital, where exogenous and endogenous capital may substitute each other, and, money, measured upon exogenous capital, may even move opposite (Downward) way than credit (Upward). As a result, the control of the central bank over bank credit would be very less. In such a situation, though credit is made, the real sector does not get benefit from this.

### 1.3. Endogenous banking capital

It adds the field, systemic banking under imperfect market (SBIM), changing the structure of banking under imperfect market. Under this field, this research adds endogenous banking capital or systemic banking capital (EBC/SBC). This research proposes or introduces non-monotonic banking credit supply function for riskier and non-riskier credit (NMBC under imperfect market); with respect to ERSM ≠ 0 or returns[1]. The implication of endogenous banking capital (EBC) helps in financing financial assets, not to fixed assets financing.

## 2. LITERATURE REVIEW

Earlier research could have directed motivation towards external financial constraints while this study came up with internal financial constraints.

One of the important implications of such a situation raises the possibility that an extreme measure to increase, and as well as decrease credit situation, may ultimately lead to a situation of credit rationing in an economy (Stiglitz & Weiss, 1981).

Figueroa, Leukhina, and Ramírez (2019) reflect information problem between banks and investors and their impact upon the high premium paid. Carletti, Marquez, and Petriconi (2019) work upon the equilibrium model and found that under such situation capital regulation upon banks could be effective.

Buchuk, Larrain, Prem, and Francisco (2019) in their work show that during recession internal capital market increases. According to this work, formal control rights are essential for such a capital market.

Haziza and Kalay (2019) in security market investor underperform on the basis of trust and also past success does not provide a reward in the security market.

Brunnermeier and Pedersen (2009) work upon the linkage between asset market liquidity and traders' market liquidity. They find both are reinforcing and lead to spiral. Cappelletti and Guazzarotti (2019) discussed the interbank market under some asymmetric information, like under the debt crisis, and found that the result impact exists.

Giannone, Lenza, and Reichlin (December, 2019) study the relationship between the business cycle and financial intermediation in the euro area. It says the long-run, short-run loans, and deposits may not show abnormal dynamics. Mian, Sufi, and Verner (2019) find that credit expansion only should raise the business cycle and lead to more recession through expansion in the non-tradable sector, hardly impact upon the tradable sector.

Benoit, Colliard, Hurlin, and Pérignon (2016) by means of the survey found that a significant difference between the on-going debate on theory on regulation and systemic risk, so more applied theory and data disclosure may be needed.

Russo, Lagasio, Brogi, and Fabozzi (2020) estimate the probability of a financial institution breaching the Common Equity Tier 1 capital under Basel III rules. They found that higher Common Equity Tier 1 capital ratios do not necessarily imply lower probabilities of breaching capital requirements and vice versa.

Jalles (2020) evaluates empirically the effect of financial crises on several types of pollutant emissions. Finally, in countries under fiscal retrenchment, a financial crisis leads to a negative response to $CO_2$ emissions. Dai and Zhu (2020) mixing existing forecasting models can significantly improve the prediction

[1] (Im)perfect market reflects (non)unique valuation at equilibrium for single object. Imperfect market could be seen as the segmented market in terms of valuation of credit from point of view of lender/banks and borrowers/firms in financial market = excess-return in stock-market. As valuation = return and for long term credit, a lender/bank should expect return as much as stock market, as like perfect market; and a borrower/firm the return from as much as fixed asset return. The cash requirement associated negative number, -θ, instead of '0', due to long, and short term, and other fixed differences between financial and fixed assets.

performance of stock returns, which should be useful for the financial market too.

Yang, Liu, and Chou (2019) work upon the controversy of diversification is that it may not be necessarily beneficial to the banks as it leads to more severe systemic risk. It supports the idea that bank diversification plays a crucial role to influence systemic risk.

Machokoto and Areneke (2020) find that the propensity to corporate save is higher in this context due to the limited access to external finance.

Yen and Cheng (2020) investigate the relationship between the Economic Policy Uncertainty Index (EPU) and cryptocurrency volatility. They find that a change in EPU of China predicts cryptocurrency volatility, but a change in the EPU of the U.S., Japan, or Korea has no such effect, such would have an impact upon the financial market.

Shen, Lee, and Fang (2020) examine how excessive growth in credit, housing, and international capital flows, referred to as credit, housing and capital booms can serve as an early warning signal (EWS) for an impending banking crisis. Capital booms occur 1 year ahead of a crisis, but credit and housing booms occur 2 years ahead. Talukdar (2014) discussed the impact of the excess return of the stock market upon commodity price, so credit also rises.

## 3. RESEARCH METHODOLOGY

### 3.1. The emergence of brand name

The origin of goodwill or brand names in the financial market should have earned from some business in the real sector. Under imperfect market information problem, it would not be possible to know the exact amount of net asset holds by the financial firm, so outsiders believe in this brand name. Even if the financial firm would have gold, and if the central bank or banking sector would be needed gold for banking deposit and lending purpose when an economy grows, then demand for gold and its' price should have gone up and the firm should have sold such things.

So, financial firms also would not have such an amount of valuable on the first step, so a firm also would have to advertize or sell its brand name. In this case, brand name could be a better guess to have the faith of outsiders on such firms and accept their circulated papers as a substitute for money. As these money moves and generated within the system, it comes under the concept of Endogenous money[2]. This research also adds (may be system) brand name against or substitute gold or banking reserve (BNG) used in financial assets. Otherwise, without BNG, nobody should have bought financial assets under the information problem to outsiders (everybody cannot sell financial assets).

### 3.2. Neo-endogenous money

Endogenous money is an alternative or substitute for money. Here alternative money is financial assets, primarily for speculative income or gambling purpose, also may be used for simple transaction purpose. On assumption, as its' value may arise in the future (relative to the simple interest rate) so maybe lucrative more than money. However, in this research, financial assets may act as a substitute for money for transaction at the financial market, but for speculative purpose or income, where everybody earns from risk, so risk accumulated, everything on imperfect information for short time.

### 3.3. Endogenous banking capital

*'λ1'*, the central bank minimum rule for holding capital for banks may depend upon various things and various things may substitute it, like extra money of depositors, the part which is out of safety net of the central bank.

$$W^* = W + D_1 \quad (1)$$

where,

*W*, W* is endogenous banking capital. The safety net of the depositor is the part that is assured to be returned by the central bank to depositors in case the bank defaults. The net endogenous banking capital could grow, in the short run, with the increase in grows up of ERSM.

$$W^* - \lambda_1 = (W + D_1) - \lambda_1 \quad (2)$$

[2] Endogenous money (extra/additional aspect). Given limitation of credit capacity, another type of monetary theory is endogenous money, where given credit constraint (for real sector or fixed assets) situation, endogenous money, for real assets/goods transaction purpose, may be generated within system, for longer time, and as a result, money to GDP ratio would go down with higher growth of income (under closed economy, may be no foreign capital, perfect market; should have information about source of alternative money to have faith, even every alternative money should have own cost of production used for transaction of real assets etc.). However, that mostly applicable for very under-developed money market, because an economy may have international borrowings, the 'basis of money' in presence of higher return of market, however banking capital remains the same.

### 3.4. Consequence

(1) With the increase in ERSM (> 0), a bank would be more interested to invest owners' capital into a bank as it would earn more than outside the real sector. So, '*W'* should grow. (2) Similarly, even a bank would have any problem in raising *'W'*, a bank could attract more deposits by increasing the interest rate for deposited money so that '$D_1$' may be higher.

### 3.5. Risk and return, and bank decision

When risk content would be higher, the bank would try to shift it to depositors, depositors would be at dark because of the information problem about higher risk. On the other hand, when return content would be higher, the bank should try to increase the owner's wealth invested in banks or the *'W'*. The outcome, in terms of 'impact on the cost of fund', would be the same.

### 3.6. Multiplier process in banking capital

For the speculative purpose, the base could be enlarged as speculative money transform into financial assets, and these financial assets act as a capital base to produce more financial assets for further speculation, though the risk keeps on to accumulate (see Figure 1). So, risk or uncertainty is accumulated during the process of a multiplier.

Financial assets — Banking capital — Credit for financial assets — Financial assets[3].

### 3.7. Brand name/goodwill illusion

Exogenous money is created on the basis of valuable real asset reserve which could be exchanged at the international market very easily or very liquid and measures are stable, not erasable, depreciation near zero.

This research adds how financial assets may act as a substitute for cash and associated items for transaction purposes, substitute for exogenous money. In place of gold, a brand name of financial institutes, firm or manufacturing firm, goodwill/brand name illusion, because good in one dimension, should be good in other dimension, that replaces gold reserve. So, the risk is accumulated in this process.

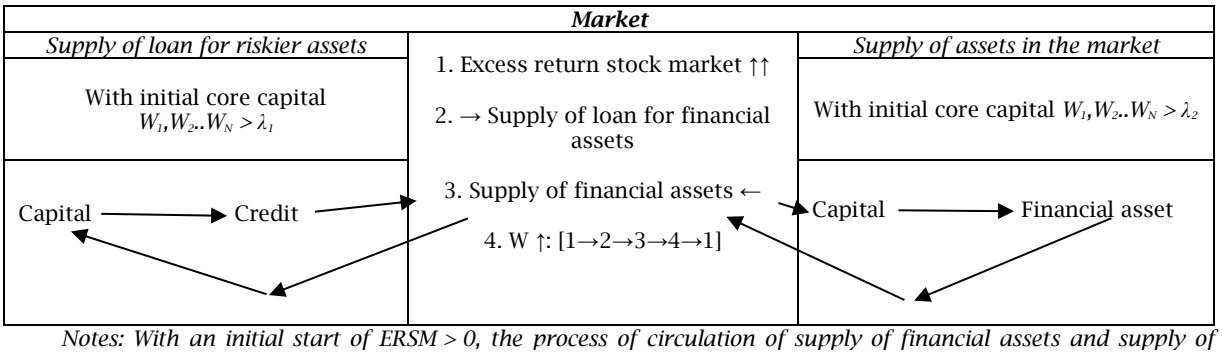
### 3.8. Upper bound of cost of fund and foreign direct investment (FDI)/Foreign capital gold borrowing

If the cost fund would have adjusted, then the return of fixed assets should have come down, the theory of foreign investments should not even have started. So, there must be an upper bound of the cost of fund. And, the cost of fund cannot move with the return of fixed assets, even if the return of fixed assets may go up, the cost of fund cannot go accordingly[4].

[3] For speculative purpose the base could be enlarged as speculative money transform into financial assets for further speculation. Or money substitute as financial assets as excess return in financial assets rises. EMF used in purchase/sale of financial assets further, creates multiplier.

[4] The cash requirement associated with credit has been ignored, as if cash are required, a bank may borrow cash from central bank as return in the market is higher or even a central bank may borrow gold from outside when return is higher relative to international level.

**Figure 1.** Multiplier process: Circulation of credit and supply of riskier assets (Tier 2 capital and partially Tier 1 capital)




*Notes: With an initial start of ERSM > 0, the process of circulation of supply of financial assets and supply of credit goes on and excess return rises (Equation 1) with stock market gambling process. It is a multiplier process.*

### 3.9. Non-monotonic monetary policy

This research presents banking behavior under the imperfect stock market. The particular questions of this research are: *Is excess return in the stock market* (ERSM)[5], *and riskier credit (loan) positively correlated or not?* Or, *Whether stock price growth and riskier credit positively correlated (hence, co-trended) or not?,* Or, *Whether credit-to-money series has got zero slope or not?* (The ERSM ≠ 0 should only be feasible under imperfect information market; and, financial assets consist of credit instruments including shares or stocks).

### 3.10. ERSM and the state of an economy

ERSM > or < 0, has nothing to do with supply or demand constraint situation. For example, most likely, ERSM < 0 is a very less possible case, even if there, should adjust as the stock market should respond to this higher return of profit very shortly as stocks become costly. ERSM > 0 should be the very possible case under recessing situation and under near supply constraint situation when earning from real sectors becomes a constraint, alternatively to earn or get liquid funds from the stock market. ERSM = 0 is a perfect market case, should be feasible when there no so much constraint or a medium healthy economy.

### 3.11. International banking

The importance, with respect to international banking, lies in the fact that now banks all over the world are inter-connected and operate under certain international rules under Basel, to facilitate and channelize their liquid fund. Once the uncertain policy and defaults start, it may spread all over the world with the float of the fund to default countries.

### 3.12. Default

This endogenous banking capital is a theory, how banking capital could become flexible under excessive stock market return, and jeopardize central banks' policies based upon negligible or no risk/uncertainty situation. If a government can (in absence of a proper audit) issue currency without base, or issue of public debt under, information disguise public debt (IDP) from the public. This would increase public debt every day, then the government could go to default after some time as people would exchange stock of currency to be paid back in kind from government, in short, such things are not sustainable for a longer period. And if this information goes out then people would deny accepting currency and would convert currency into an asset, so the asset price and hence all price should rise. So, such things do not work.

### 3.13. Use of ERSM for real/liquid asset

When there would be a higher demand for the liquid asset then ERSM > 0, and when demand for the real asset would be higher then ERSM < 0. However, the chance or existing time for ERSM < 0 should be very less possibility. ERSM may be considered with some negative number, – θ, instead of '0', due to the long and short term, and other fixed differences between financial and fixed assets.

### 3.14. Alternative monetary policy

This research also discusses alternative monetary policy (AMP): control over the spread of the interest rate. A relative grading on control over mean and variance of the interest rate. The particular objective of this research is

[5] Excess return in stock market (ERSM) = Return from financial assets in stock market – Return from fixed assets in real sector = Growth in stock market – (Profit from sales/Real capital).

how banking capital could transform itself from exogenous elements to an endogenous element and subsequently changes the banking behavior under imperfect stock market: banking capital is endogenous, because it moves (is generated) within the system, and here it is ERSM. As could be fund in Figure 1, with the increase of ERSM, more financial assets come in the market and used as capital to create more credit base.

### 3.15. Cost of fund and riskier fixed asset project

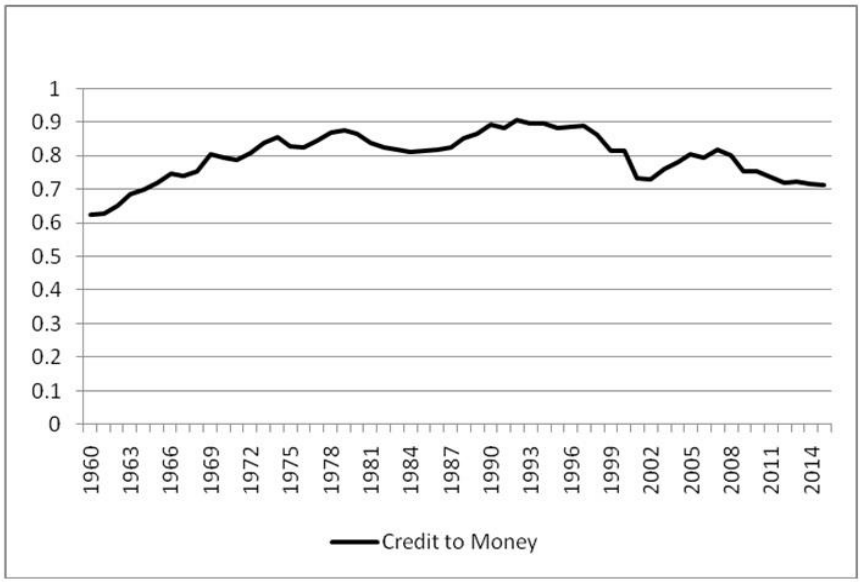
In this system, as the cost of fund increases, fixed assets projects are applied towards riskier projects where less working capital or liquid assets would be applied or works are done with high risk, so there is a high chance of break down of these capital goods. Even for financial investment, people may invest in less known/non-historical financial assets.

## 4. RESULTS

### 4.1. Trend (systemic) discussion

This research finds a positive relationship between excess return in the stock market and credit to GDP (a proxy of the riskier loan). As a result, the 'credit to the private sector by banks, to broad money ratio' for the world, also can be seen from the Figure 2, is not stable, and quite having upward biases, reflects the finding of endogenous banking capital in the economy, or base of credit should be related with the stock market.

**Figure 2.** The trend of credit-to-money ratio: World

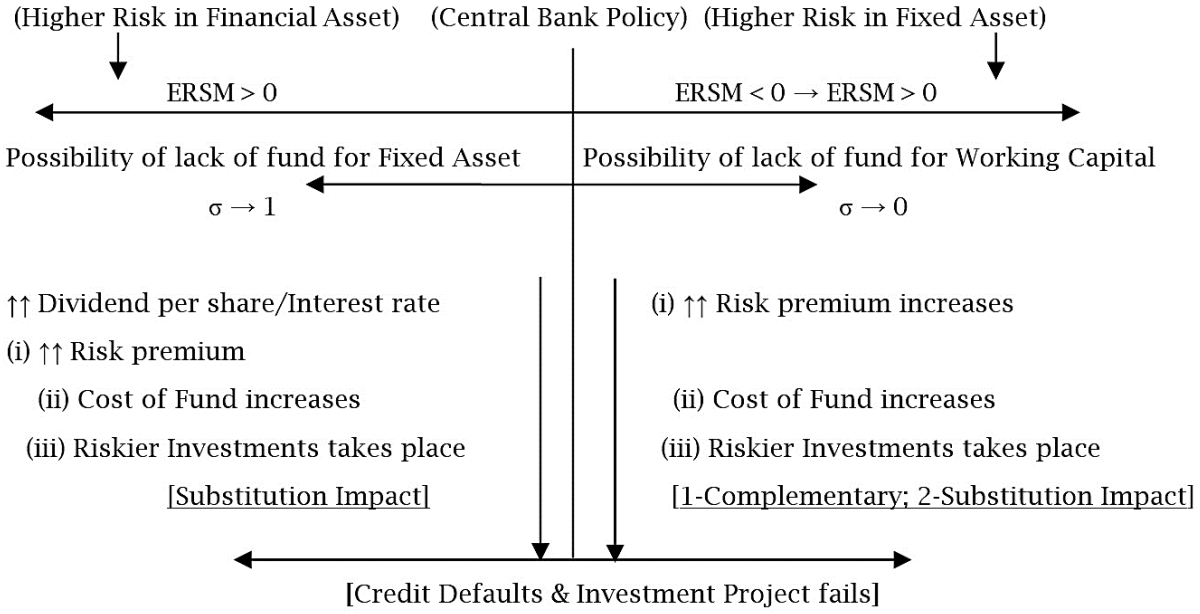



### 4.2. Discussion on the objective of the central bank

The basic objective of the central bank is to maintain ERSM = 0 or the perfect capital market. Assuming exogenous banking capital from the viewpoint of the central bank, where 'σ = Capital/Credit'; $\sigma \to 1$ would be preferable, if ERSM > 0 is positive then riskier investments could substitute the non-riskier investments, it could be reducing real sector. However, $\sigma \to 0$ would be needed if ERSM < 0 is negative then constraint in getting liquid asset or working capital for firms could arise. As the market value of banking capital changes with the stock market, the central bank adjusts its' rule over capital holding ratio of individual banks, according to growth in the stock market. As the banking rule changes, the individual banks also sequentially change their behavior or decision about sources of profit: whether to earn from higher interest rate ($\sigma \to 0$) or higher risk premium ($\sigma \to 1$).

### 4.3. Instability of equilibrium

**Figure 3**. Central bank policy to Smooth fixed asset investment (Banking under imperfect market)




Though central bank would increase 'σ' to reduce ERSM > 0, however, this situation should lead to the increase of ERSM, it should increase the existing capital value of the individual bank, and also some real capital could be used to generate more financial assets as the capital as the return would be higher, by the individual bank. Such a situation should lead to be bounded solution where the cost of the fund would not grow, however, should be unstable equilibrium.

So, the fact that the central bank attempts to establish more stability may enhance instability in the financial market.

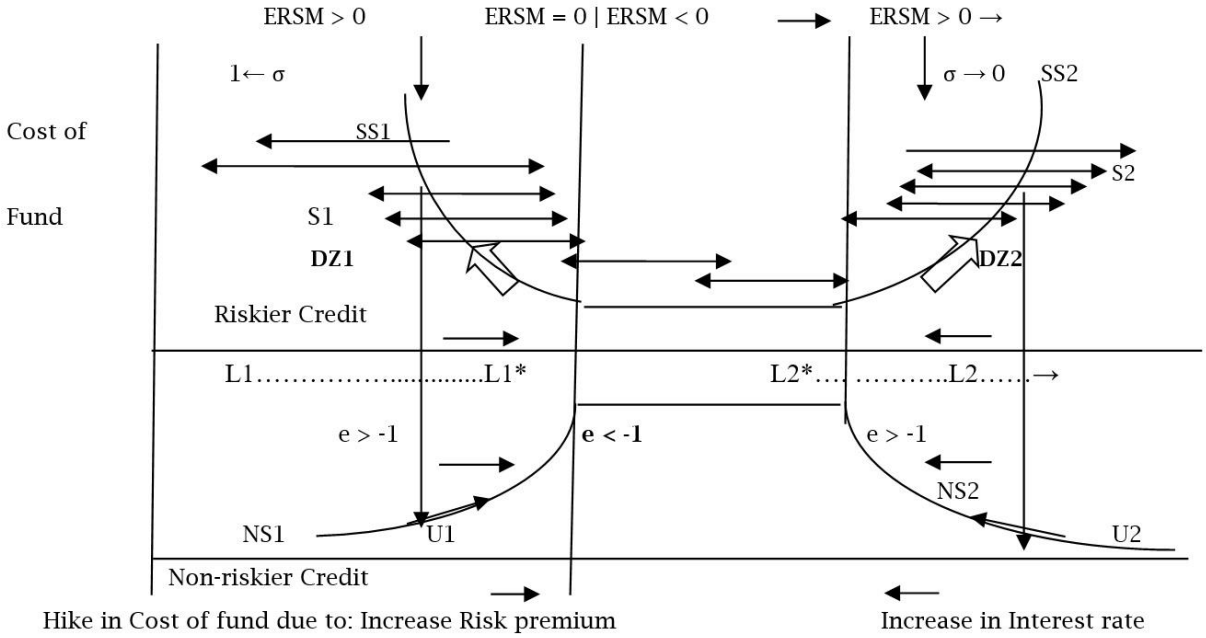
### 4.4. Central bank vs Individual bank

Suppose also if a bank would have extended 1 unit of loan or credit it should have σ unit of capital ('*W**' as mentioned above), for riskier investments, where $0 < \sigma < 1$ for the group of riskier assets.

Under uncertainty, (1) when a brand name is there, gambling business growing, ERSM > 0, σ is needed to 1, the risk premium should be higher as more capital would be needed, so to attract capital, dividend per share of banking stock would be higher too and the higher would be *W**, according to above-mentioned paragraph, or wealth invested in banks should be higher. So, approximately, as $\sigma \rightarrow 1 \Rightarrow L < L1, (< L2)$.

(2) When ERSM < 0, σ is needed to 0, the basic interest rate should be higher to cover the risk of default as there no capital to cover risk; so as $\sigma \rightarrow 0 \Rightarrow$ so capital attached with per unit of credit should be lower by law, $L > L2 (> L1)$. As the brand name develops in the real sector, the firm would be attached to the gambling business which leads to ERSM > 0. So, as towards both as σ to move to either 0 or 1, the cost of the fund would grow.

**Figure 4.** The bounded solution in the banking sector: Situation under imperfect market




*Notes: ERSM – Excess return in Stock Market*

## 5. CONCLUSION

This research put forth possibilities that if demand for credit is very high, it could create a "pseudo credit constraint situation" (PCC). Once the brand name develops, it should lead to ERSM > 0, the brand name should be, 'must be needed' for ERSM > 0, this leads to continuous gambling business and the real sector cannot grow to a higher level. As the real sector cannot grow, demand for commodity also cannot grow, investment plans kept down and recess situation emerges as an economy cannot reach to the optimum point as by resources.

This research proposes measure on 'Sensitivity or Riskier Banking (Systemic Default)' in terms of non-real basic money, C = Credit, M = Money/Money having real asset base (legally assured with the real asset), $RB = (\Delta C/\Delta M)-1$, if RB > 0, otherwise RB = 0, where $RB_2$ (sum) could be assumed to have $\chi^2$ (Chi-Square) distribution to measure possibility of default of financial market (the same thing can be applied for individual banks, *M* may be replaced with deposits or real assets in backing).

The sensitive switching can be measured by tSSS = tL. $tL = [(ERSM_t/C_t) - (ERSM_{t-1}/C_{t-1})]$. $C = C_t/Y_{t-1}$, C = Credit allocated per unit of previous income. One could test whether SSS significantly different from zero, otherwise, it should be normal distribution at the normal situation.

Corporate tax rate due to brand name (CTRB) could be made proportional to corporate ERSM or individual level ERSM so that the impact of brand name could be under control. The government should try to promote small business to reduce the impact of brand names and internal financial constraint.

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