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A Theory of the Banking Firm

I. Introduction*

IN SPITE OF THE IMPORTANCE of commercial banking both as a major financial intermediary and as an important link in the monetary transmission process, there is little consensus as to what constitutes a workable and productive theory of the banking firm. Neoclassical microeconomic analysis is rarely invoked to explain bank behavior, primarily because there is so little agreement even as concerns fundamental concepts.[1] For example, do stock or flow variables measure the relevant concepts of bank output and input? If neither input nor output can be appropriately defined it becomes presumptuous to speak of a production function relating the two.

In the face of conceptual difficulties in drawing the analogy between a bank and the typical firm of neoclassical analysis, most treatments of the bank at the microlevel have concentrated on one specific problem; the allocation of a bank's funds among competing stocks of assets.[2] That is, a bank has been treated, not primarily as a firm but as a rational investor in an environment characterized by risk or uncertainty. The neoclassical analysis of the firm has yielded to portfolio theory.

If there is relatively little microanalysis of the banking firm, there is a plethora of literature relating the impact of bank market structure on per-

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[1] Two exceptions are John Karaken [8] and F. W. Bell and N. B. Murphy [1].

[2] Perhaps the best example is Richard Porter [11].

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formance.[3] Whatever the merits of such studies it does seem premature to ask how bank behavior is affected by variations in market structure when we have no theory to describe that behavior under *any* specific set of assumptions about the external and competitive environment in which the bank operates. Such an environment, in turn, is largely determined by bank regulation. It follows that, in order to come to some tentative evaluation of the impact of such regulation, a theory of the banking firm is required.

The purpose of this paper is to set forth such a theory in a manner which specifically allows for the role of market structure and competition within the structural relations which the bank confronts. Thus, the model should provide an analytical framework for applied research. The next section sets forth the general nature of the model. In Section III, the detailed structure of the model is laid out and a solution for the bank decision variables is found. Section IV applies the preceding analysis to the problem of interest rate regulation. Finally, the last section summarizes the study and presents some suggestions for future research.

II. Some General Considerations

Any model of the banking firm must, due to the complexity of the institution, be relatively abstract. The nature and degree of the abstraction will be determined by the author's conception of what is particularly important about a commercial bank. Unfortunately, arguments over such matters often seem to approach the metaphysical with the result that little of value emerges. Nevertheless, it is important at the outset to set forth the general way in which this paper will view a commercial bank.

A bank is, firstly, a subset of financial intermediaries in general. That is, it secures funds from surplus spending units and transmits them to deficit spending units. Although the specific assets purchased by banks may differ from those of other intermediaries, this is of secondary importance. Banks are distinguished from other intermediaries because the former can attract one source of funds, demand deposits, without the payment of explicit interest. This is so because demand deposits are a generally acceptable medium of exchange which is superior to currency (which also bears no explicit yield) in a wide variety of transactions.

The issuance of demand deposits means that banks are the administrators of the nation's payments mechanism. Such administration constitutes a service provided by the banking system to the non-bank public. Two points should be noted. First, scarce resources are utilized in the provision of this service. That is, there is a social cost to the utilization of the payments mechanism.

[3] See, for example, T. G. Flechsig [5] and Franklin R. Edwards [3] and the literature cited herein.

Secondly, banks must determine the minimum price necessary to induce them to provide that service. It follows that an economic theory of the banking firm must explain the process which determines the price charged for these services. Specifically, is there a relationship between such pricing policy and the rate of interest offered by banks on a stock of demand deposits? If so, what is the impact of the legal prohibition of explicit interest on demand deposits on the price of this unique commercial banking service? Subsequent analysis will attempt to elucidate the answers to these important questions.

Funds secured by banks in the form of time deposits, demand deposits, and ownership claims are invested in a wide variety of earning assets, the revenue from which constitutes the main source of bank income. These assets differ widely in terms of their expected returns, market and/or default risk characteristics, liquidity, and so forth. One characteristic distinguishing assets which is rarely recognized will here play a central role. We refer to the elasticity of asset supply to the individual bank. Assets such as government securities can be said to be in perfectly elastic supply to the individual bank since the expected return and risk characteristics of such securities are unaffected by individual bank decisions as to whether or how much of these securities are to be purchased. Private securities (loans), on the other hand, are in imperfectly elastic supply to the individual bank. Ceteris paribus, if a bank wishes to increase its loan/asset ratio it must accept a reduction in the marginal return on loans. The author has argued elsewhere that failure to recognize this distinction constitutes a major weakness in traditional portfolio theoretic models and is responsible for the almost nonexistent use of such models in applied banking research [9].

The model to be set out in the next section seeks to explain the following: (1) the equilibrium scale of the bank, (2) the composition of the bank's asset portfolio, (3) the composition of the bank's liabilities, (4) the rate of interest on bank loans, (5) the yield the bank offers on its time and demand deposit accounts.

III. The Model

A. The Basic Setup

The bank is assumed to have a preference ordering over P, the rate of return on equity, which can be represented by a utility function linear in P. His decision rule is to maximize expected utility or, equivalently, the rate of return on equity.[4] It is necessary at the outset to provide a general formulation of that

[4] A quadratic utility function would have been more general. However, the increased complexity of the algebra was felt to outweigh the benefits of increased generality. Michael Klein [9] deals with the problem of imperfect asset elasticities utilizing a quadratic utility function.

rule. The bank has two primary sources of funds; the equity originally invested in the firm, denoted as W, and borrowed funds secured through the issuance of various types of deposits, denoted as B. Assume the bank issues m types of deposits B_i ($i = 1 \cdots m$) at rates of interest denoted as R_i. It follows that $\sum_i B_i = B$. Let α_i denote the proportion of total funds F obtained through the issuance of the ith deposit type. Then,

$$F = W + \sum_i B_i \tag{1}$$

But

$$B_i = \alpha_i F \tag{2}$$

Therefore,

$$F = W + F \sum \alpha_i \quad \text{or} \quad W = F[1 - \sum_i \alpha_i] \tag{3}$$

Funds secured from equity and the issuance of deposits are allocated among n asset classes. Let X_j denote the proportion of total funds allocated to the ith asset type ($j = 1 \cdots n$) and let E_j denote the expected rate of return on that asset. By the balance sheet constraint,

$$\sum_j X_j = 1 \tag{4}$$

The expected rate of return on total funds, E_F, is given by

$$E_F = \sum_j X_j E_j - \sum_i \alpha_i R_i \tag{5}$$

Finally, the expected rate of return on equity, E_W, is given by equation (6).

$$E_W = \frac{E_F}{1 - \sum_i \alpha_i} = \frac{\sum_j X_j E_j - \sum_i \alpha_i R_i}{1 - \sum_i \alpha_i} \tag{6}$$

We now turn to an explicit statement of the returns on bank assets and the costs of bank borrowing.

B. The Return on Bank Assets

The asset universe confronting the banker is assumed to consist of cash, a homogeneous government security (a consol), and private securities (loans).

Reserve requirements and other restrictions on asset choice are ignored. Let us begin with private securities.[5]

We assume that the bank confronts a demand curve for loans which is a function of the contract rate of interest r and a vector of exogenous variables which influence the state of loan demand confronted by a particular bank. It is further assumed that borrowers are viewed as a homogeneous group by the bank and that all noninterest loan terms are fixed and identical to all borrowers. Let X_L denote the proportion of funds allocated to private securities. Then,

$$r = f(X_L), \qquad f'(X_L) < 0 \tag{8}$$

Equation (8) is the analogue of a demand curve for loans.

Unless the bank assigns a zero probability to the events of partial or complete default on the private security, the expected return on loans E_L must be less than the contract rate of interest since the latter represents the *maximum* return the bank can receive. Generally,

$$E_L < r \quad \text{if} \quad \sigma_L > 0 \tag{9}$$

where σ_L is a measure of default risk, the standard deviation of the probability distribution of loan payments. Since borrowers are assumed to be identical and since the noninterest terms of the loan are assumed exogenous and the same for all loans, we have $\sigma_L = \bar{\sigma}_L$. That is, default risk is exogenous to the bank.[6] From (8) and the above discussion we get

$$E_L = h(X_L), \qquad h'(X_L) < 0 \tag{10}$$

Unlike private securities, government securities are free of default risk and are in perfectly elastic supply to the individual bank. Such assets constitute a secondary reserve which can be liquidated rapidly should an unexpected deposit loss exhaust the bank's cash holdings. Under such circumstances the resale price of the securities can be viewed as a random variable which, in turn, means that the holding period rate of return, denoted as g, is also a random variable with density function $\phi(g)$. The expected rate of return on government securities E_g is, therefore

$$E_g = \int_{-1}^{\infty} g\phi(g)\, dg \tag{11}$$

The bank decision variable is denoted as X_g, the proportion of government securities to total assets.

[5] A more detailed analysis is given in [9].
[6] This is unlikely to be true. However, we are abstracting from problems connected with loan risk appraisal.

Finally, we turn to the bank's cash holdings. To this point, random elements have entered the analysis only with respect to the rate of return on bank earning assets. The explicit yield of cash, however, is nonrandom and equal to zero. Nevertheless, cash does yield an implicit return. An increase in cash holdings reduces the likelihood of a cash deficiency and, if there is some penalty cost for such a deficiency, the reduction in the expected loss obtained from the holding of cash can be viewed as the implicit yield of this asset.[7]

Thus, it is necessary at this point to introduce explicitly another element of random variation in the external environment confronting the bank. In the next subsection it will be shown how the bank determines the prices it will pay for various types of deposits and how these prices, in conjunction with the deposit supply functions the bank confronts, determine the scale and composition of the bank's deposit liabilities. Such supply functions denote, for each price, the expected value of the deposit liabilities the bank will assume. However, the transactions of the bank's depositors set up a flow of reserves into and out of the bank in question. The possibility that, for a period of time a net outflow of deposit funds will occur, cannot be neglected.

At any given point in time, a bank is receiving reserves from both public flows of currency and drafts drawn on other banks. Its disbursements follow a similar pattern. Net disbursements are defined as disbursements minus receipts and can be viewed as a random variable. Let z denote net disbursements as a fraction of total funds and assume that z has density $k(z)$. The bank is presumed to incur a penalty if its cash holdings are insufficient to meet its disbursements.[8] Viewed in this manner, cash is held for precautionary reasons; it is an asset held in order to meet a liability which is stated in fixed dollars and whose time of repayment is unknown.[9]

Let the penalty cost per dollar of cash deficiency be denoted as n. If the bank held no cash it would expect a loss equal to

$$n\int_{0}^{c} zk(z)\,dz \tag{12}$$

where c is the largest net disbursement to which the bank assigns a nonzero probability. If the bank holds cash as a proportion of total funds equal to X_r, the expected loss on cash management is

$$n\int_{X_r}^{c} (z - X_r)k(z)\,dz < n\int_{0}^{c} zk(z)\,dz \tag{13}$$

[7] The analysis that follows is indebted to the work of George R. Morrison [10].

[8] A bank will liquidate government securities or borrow depending on the costs of each method of adjustment. For simplicity, we assume that the marginal costs of adjustment are identical for both methods.

[9] See Edward L. Whalen [13].

For simplicity assume that $k(z)$ is rectangular and equal to $1/(c - b)$ where b is the lowest conceivable deposit loss (highest possible gain). Then

$$n\int_{X_r}^{c} (z - X_r)k(z)\, dz = n\left[\frac{(X_r - c)^2}{2(c - b)}\right] \tag{14}$$

Equation (14) represents the expected loss, expressed as a weighted rate of return, from the bank's cash management policy.

C. The Deposit Supply Functions: General Formulation

The banks is assumed to issue demand deposits, D_1, and time deposits, D_2. Two characteristics distinguishing these liabilities will be relevant to our later analysis. First, demand deposits are a media of exchange, and depositor transactions utilizing this media impose a cost on the issuing bank. Secondly, law precludes the payment of explicit interest on a stock of demand deposits, but does not preclude such interest on time deposits. At this point, however, it will be advantageous to place these distinctions in the background and proceed, temporarily, with a more general formulation. Then, in the next section, we can utilize the distinguishing structural and regulatory characteristics of demand deposits in an analysis of the impact on bank behavior of the prohibition of interest on these deposits.

We content ourselves with a very general formulation and assume that the supplies of time and demand deposits to the individual bank are increasing functions of the yields, implicit and explicit, which the bank offers on these accounts.[10] Specifically,

$$D_1 = D_1(R_1), \qquad D_1'(R_1) > 0 \tag{15}$$

$$D_2 = D_2(R_2), \qquad D_2'(R_2) > 0 \tag{16}$$

Further, define

$$\alpha_1 = \frac{D_1}{F} \tag{17}$$

$$\alpha_2 = \frac{D_2}{F} \tag{18}$$

That is, α_i denotes the proportion of total funds obtained through the issuance of the ith deposit type.

[10] They are, of course, affected by other variables. This will be discussed in Section IV.

D. The Solution of the Model

Substituting the preceding structural relations into the framework provided by equations (1)–(6), we have

$$E_w = \left[\frac{1}{1 - \alpha_1 - \alpha_2}\right]\left[X_L h(X_L) + X_g E_g - n\left[\frac{(X_r - c)^2}{2(c - b)}\right] - \alpha_1 R_1 - \alpha_2 R_2 \quad (19)$$

Now

$$\frac{1}{1 - \alpha_1 - \alpha_2} = \frac{F}{W} = 1 + \frac{D_1(R_1) + D_2(R_2)}{W} \quad (20)$$

Similarly,

$$\frac{\alpha_1}{1 - \alpha_1 - \alpha_2} = \frac{D_1(R_1)}{W} \quad (21)$$

and

$$\frac{\alpha_2}{1 - \alpha_1 - \alpha_2} = \frac{D_2(R_2)}{W} \quad (22)$$

Substituting the above into (19) yields

$$E_W = \left[1 + \frac{D_1(R_1) + D_2(R_2)}{W}\right]\left[X_L h(X_L) + X_g E_g - n\frac{(X_r - c)^2}{2(c - b)}\right] - \frac{1}{W}[R_1 D_1(R_1) + R_2 D_2(R_2)] \quad (23)$$

(23) is to be maximized subject to $\sum X_j = 1$.

The method of undetermined multipliers yields the following first order conditions for a profit maximum, where Γ is the Lagrangean multiplier:

$$\frac{\partial E_W}{\partial R_1} = \frac{D_1'(R_1)}{W} E_a - \frac{1}{W}(R_1 D_1'(R_1) + D_1(R_1)) = 0 \quad (24)$$

$$\frac{\partial E_W}{\partial R_2} = \frac{D_2'(R_2)}{W} E_a - \frac{1}{W}(R_2 D_2'(R_2) + D_2(R_2)) = 0 \quad (25)$$

$$\frac{\partial E_W}{\partial X_L} = \left[1 + \frac{D_1(R_1) + D_2(R_2)}{W}\right](X_L h'(X_L) + h(X_L)) - \Gamma = 0 \quad (26)$$

$$\frac{\partial E_W}{\partial X_g} = \left[1 + \frac{D_1(R_1) + D_2(R_2)}{W}\right] E_g - \Gamma = 0 \tag{27}$$

$$\frac{\partial E_W}{\partial X_r} = \left[1 + \frac{D_1(R_1) + D_2(R_2)}{W}\right]\left[-n\left(\frac{X_r - c}{c - b}\right)\right] - \Gamma = 0 \tag{28}$$

$$\frac{\partial E_W}{\partial \Gamma} = X_L + X_g + X_r - 1 = 0 \tag{29}$$

where

$$E_a = X_L h(X_L) + X_g E_g - n\left[\frac{(X_r - c)^2}{2(c - b)}\right]$$

The solution for the bank decision variables is relatively easy. From (26)–(28), we have

$$X_L h'(X_L) + h(X_L) = E_g = -n\left[\frac{X_r - c}{c - b}\right] \tag{30}$$

Now the expression on the left is simply the marginal return on loans. Thus, X_L is chosen at the point at which the marginal return on loans is equal to the average (and marginal) expected return on government securities.

A similar result holds for the bank's cash holdings. Let us call the reduction in the expected cost imposed by a cash deficiency from holding X_r of assets as reserves, the total expected return on cash holdings, E_r. That is,

$$E_r = n\int_0^c zk(z)dz - n\int_{X_r}^c (z - X_r)k(z)\,dz \tag{31}$$

Performing the indicated operations,

$$E_r = \frac{nX_r}{2(c - b)}(2c - X_r) \tag{32}$$

The marginal return from an increment in cash holdings is given by equation (33).

$$\frac{dE_r}{dX_r} = \frac{n}{c - b}(c - X_r) \tag{33}$$

If we multiply both n and $(c - X_r)$ by minus unity, it is seen that the expression is identical with the right hand side of (30). Thus, cash is held until its marginal (implicit) return is equal to the expected return on government securities. This completes the solution for the asset selection decision variables.

We turn now to the rates of interest the bank will offer on its deposits. From (24) we get

$$R_1 = E_a - \frac{D_1(R_1)}{D_1'(R_1)} \tag{34}$$

and from (25) we get

$$R_2 = E_a - \frac{D_2(R_2)}{D_2'(R_2)} \tag{35}$$

This completes the solution for the bank decision variables.

IV. Application and Interpretation of the Model

A detailed examination of the content of current regulatory policy and its impact on bank market structure and behavior is beyond the scope of the present paper. Nevertheless, the preceding model has a number of implications respecting the desirability and likely impact of diverse forms of regulatory policy. In addition, such an analysis has implications for future research in the banking area and for this reason it is important to make a preliminary attempt at providing a framework for the implementation of such analysis.

A. The Regulation of Interest Rates on Demand Deposits

Interest rate regulation is probably the single most conspicuous facet of the limitations on competitive behavior imposed by the regulatory authorities. All federally insured commercial banks are prohibited from paying explicit interest on demand deposits and are subject to restrictions on the maximum rate payable on time and savings deposits. For member banks, these restrictions are imposed by the Federal Reserve. Nonmember federally insured banks are subject to identical restrictions imposed by the F.D.I.C. The above model has a number of implications for such regulation. We shall concentrate on the zero interest ceiling for demand deposits since the generalization to other interest ceilings is straightforward.

One of the initial justifications for interest rate regulation was that competition for deposits between banks would lead to 'unsound' portfolio policies. Driven by higher interest rates on its sources of funds, a bank was presumed to seek out high yield (and high risk) uses of funds. George Benston [2], among others, has found little empirical evidence to substantiate this claim. An appropriate question at this point is whether or not such behavior should be expected on a priori grounds. The answer is given by the optimization condition (30) for the bank asset selection variables. Neither the cost ot deposits nor the parameters of the deposit supply functions appear in the optimization condition and therefore, cannot affect asset selection.[11] On the other hand, the portfolio yield E_a does affect the interest rate banks are willing to pay for deposits as is seen by examination of (34) and (35).

Turning to the effects of a zero interest ceiling on demand deposits, equation (34) provides us with the implicit yield which a profit-maximizing bank would provide in order to induce depositors to hold its demand liabilities. It now behooves us to define the yield on demand deposits with some care. If banks are prohibited by law from paying a positive price directly for a productive input, competition insures that individual banks will induce depositors through other forms of price concessions. Thus, depositors may be given preferential price or queuing treatment on loans, or they may be provided with 'free" ancillary services, etc.[12] Still another possibility is to reduce the charge a bank imposes on administering the transactions mechanism below the cost of providing these services. An interesting problem concerns the extent to which these different methods of adjustment are utilized by individual banks in order to attract and keep demand deposit accounts. In what follows we shall assume that the only outlet for such price competition is in the setting of service charges on demand deposit account activity.

Transactions services provided by banks utilize scarce labor and capital resources. Let us denote bank output in this activity as A, where A is the number of transactions per account per time period.[13] Further assume that A is related to the inputs of capital and labor according to a Cobb-Douglas production function exhibiting constant returns to scale. Then, if the prices of the services of capital and labor are assumed exogenous to the bank and invariant to the level of bank utilization, the cost of providing these services can be expressed by an equation such as

$$C = eA, \qquad e > 0 \tag{36}$$

where C denotes the total cost per account per time period of providing the services of the payment mechanism.

Further we specify that the total service charge per account per time period, S, bears a linear and proportional relationship to the degree of account activity. Thus,

$$S = dA, \qquad d \geq 0 \tag{37}$$

where d is the basic bank decision variable, the service charge per transaction.

[11] If the parameters of the net disbursements function are affected by the demand deposit-time deposit mix, this conclusion would have to be modified. I am indebted to Alfred Broaddus for this point.

[12] Donald Hodgman [6] and E. Kane and B. Malkiel [7] take up this issue.

[13] A is assumed to be unaffected by bank service charge policy.

The dollar value of demand deposits accounts can be expressed as a product of the number of accounts, M, and the average size of an account, N. If activity per account is identical across accounts, we can define R_1 as

$$R_1 = \frac{(e-d)AM}{MN} = \frac{(e-d)A}{N} \tag{38}$$

That is, the implicit yield which a bank offers on demand deposit accounts is defined as its operating loss per time period in providing payments services expressed as a fraction of total demand deposits.

Equation (34) determines the yield on demand deposits and (38) provides the level of d which is necessary in order to obtain that yield at an individual bank. From (34) it can be seen that

$$R_1 > 0 \quad \text{if} \quad E_a > \frac{D_1(R_1)}{D_1'(R_1)} .$$

Therefore,

$$d < e \quad \text{if} \quad E_a > \frac{D_1(R_1)}{D_1'(R_1)} .$$

Even if R_1 is the same for two different banks, the service charge, d, may be different due to variations in A, N, and e across banks.

In this connection it should be noted that the practice of viewing the ratio of bank service charges to the stock of demand deposits as a negative rate of return on demand deposit holdings is conceptually incorrect. Much use has been made of this statistic by Edgar Feige [4] and others. The model shows that, in fact, banks may induce depositors to hold demand deposits by providing a positive, albeit implicit return on these holdings. A rough measure of this rate of return can be found by taking the difference between a bank's costs of administering the payments mechanism and bank service charge revenue and then dividing this difference by the stock of demand deposits.

As an illustration, we utilize data from the Federal Reserve Functional Cost Analysis Program for 769 banks with total deposits less than $50 million. In 1967, the average bank had approximately $8 million in regular checking account funds. These funds generated transactions costs of $177,000 while service charge income was only $53,000. Thus, the implicit rate of return on these deposits was approximately 1.6 percent. We conclude that the prohibition of interest on demand deposits is at least partially offset in the above manner.

B. Role of Structure and Competition in the Model

According to the preceding analysis, the offering rates on bank deposits are functions of the profitability of bank lending and the parameters of the deposit supply functions. These parameters could be expected to differ cross-sectionally for two reasons. First, those economic variables (such as per capita income) which affect the demand for financial assets differ cross-sectionally. Secondly, market structure and the degree of bank competition exhibit rather large degrees of cross-section variation. These three types of variables, then, play an integral part in the analysis of bank offering rates on deposits.

The fact that external economic and market structure variables are an integral part of the model means that the model's empirical implications are rather extensive. Two examples will be cited. Let us first look at the asset selection process. Since the model makes allowances for imperfect asset elasticities, differences in loan demand across banks will lead to different asset selection choices. Traditional portfolio theory is silent on this problem.[14] Since market structure and competition can be expected to affect the shape and position of the h function, these variables are also relevant to the asset selection process.

On the liability side, if the D_1 and D_2 functions were identical, the implicit rate on demand deposits would be set equal to the explicit rate on time deposits by an individual bank. In this connection the following problem emerges: demand deposits appear to be considerably more profitable for banks than are time deposits. As pointed out earlier, Functional Cost analysis data puts the average cost of demand deposits for the bank sample discussed at approximately 1.6 percent. The corresponding figure for time deposits is in excess of 4.3 percent. The obvious explanation that time deposits carry an explicit interest expense whereas demand deposits do not is clearly inadequate. If demand deposits are more profitable than time deposits, why don't individual banks cut service charges further in order to capture the accounts of other banks?

A plausible hypothesis would start from differences in the competitive forces a bank confronts in securing the two types of accounts. In a recent study for the Federal Reserve Board, Bernard Shull [12] concludes that nonlocal competition for time and savings deposits forces banks in isolated one and two bank towns to raise their offering rates on these types of deposits. Specifically, his findings seem to indicate that local market structure is of lessening importance in understanding the functioning of time and savings deposit markets.

It seems reasonable to suppose that since demand deposits are used primarily for transactions, the proximity of the depositor to the bank is of prime importance. Competition by banks within the local area may lead the depositor to substitute one bank for the other, but it is unlikely that nonlocal competition can have a similar effect. This is not to say that there is no compensation which can induce a depositor to shift his checking account to a nonlocal bank, only that within the relevant range (remembering that explicit payments are illegal) such substitution is likely to be minor. This is an area in which future research could be highly beneficial.

[14] See Klein [9].

V. Concluding Comments

Most of the questions raised in this paper cannot be resolved by a priori theorizing; basically, they are empirical issues. It has been the purpose of this paper to demonstrate that the development of a simple microeconomic model of the banking firm is an important first step both in discerning what are the problems of interest in applied research and in suggesting plausible and testable hypotheses connected with them.

The neoclassical analysis of the firm first developed individual behavior under a specified set of assumptions about the external and competitive environment within which the firm operated. Only then did it ask how firm behavior is affected by various in these conditions. The literature on banking appears to be attempting to answer the second problem without dealing with the first.

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