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**An Economic Analysis of Electronic Funds Transfer
System: The Theory of Credit Markets**

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**AN ECONOMIC ANALYSIS OF ELECTRONIC FUNDS TRANSFER SYSTEM:
THE THEORY OF CREDIT MARKETS
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Abstract

The basic purpose of this paper is to present a simple theory of credit markets which will help identify the basic issues that should be of concern and perhaps filter out some irrelevant or misdirected concerns. The paper begins with a traditional model of borrowing and ending, noting that consumers are the ultimate borrowers and the ultimate source of funds in the economy. The assumption of no transactions costs and perfect information are dropped, demonstrating the role of the credit intermediary as a more efficient processor and collector of information. The intermediary acts as an agent, bringing together consumers who wish to lend (savers) with those who wish to borrow (firms, other consumers).

Credit intermediaries deal in information. They advertise prices and terms to both savers and borrowers, and use information to attract customers and evaluate risk. Their basic function is to get the parties in the transaction together, and to do this they use information. If Electronic Funds Transfer Systems are to have an impact on credit markets, it will be primarily due to their effect on the supply and cost of information. The regulations proposed will profoundly affect information costs and availability and should be carefully considered in this context.

**AN ECONOMIC ANALYSIS OF
ELECTRONIC FUNDS TRANSFER SYSTEM**

Introduction

The purpose of this study is to use the tools of economics to help predict the impact of an electronic funds transfer (EFT) system on supply and demand, and the intermediaries in the credit market. This market is so incredibly complex, ranging from loan sharks and pawnshops to finance companies and national banks, that a sound theoretical foundation is needed to separate the myriad irrelevant issues from the relevant. This paper deals with the general theory of credit markets. Two others examine the impact of EFT on the actual market institutions with particular emphasis on banks, finance companies, credit unions, savings and loans, direct retail suppliers, and the users of consumer credit.¹

Electronic funds transfer (EFT) implies the electronic transfer of transaction data, or more generally, the electronic transfer of information. As such, it represents the next logical step in the evolution of the payments system, a process that has, over time, reduced the cost of making transactions for the parties involved. A major, if not the most important, effect of EFT will be to change the cost of information exchange. Understanding this, and the importance of information costs to the functioning of financial intermediaries is essential to understanding the potential impact of EFT development on consumer credit markets.

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¹ These papers will be forthcoming Working Papers available at the Credit Research Center, Purdue University.

THE THEORY OF THE CREDIT MARKET

I. The Individual Borrower and Lender²

Very simply stated, an individual will borrow or lend if his desired pattern of consumption spending over time does not match that of his income. To demonstrate this and ultimately to better understand the credit market, we shall employ the basic economic model illustrated in Figure 1. In this graph the horizontal axis measures the quantity of some scarce good that is available now (period 0) and is noted as C_0 . On the vertical axis we will measure the quantity of the same good which is available one year from now, noted by C_1 . Our representative individual is assumed to be endowed with a set of resources such that he can have C_{0a} if he works full time to produce only current goods. Alternatively, if he works full time to produce future goods, he could have a maximum of C_{1a} . The concave line connecting these two points represents the maximum quantities of C_0 and C_1 which this individual can get on his own given his initial endowments and abilities. The line is concave because of the law of increasing costs. The slope of this curve measures the rate at which the individual can transform C_0 into C_1 at the margin. Precisely where on this production possibility curve the individual will choose to be depends on the market prices of C_0 and C_1 .³

We shall use the price of C_0 (P_0) as the numeraire with the assigned value of 1. Because C_1 is the same good only one year removed, its price (P_1) in terms of the numeraire is $1/1+r$, where r is the current rate of interest.⁴ Later we will examine the determinants of r but for now we shall assume that it has been given. The ratio of current price to future price (P_0/P_1) is equal to $1+1/(1+r)$ or simply $1+r$. This is the rate at which our individual can exchange on the market C_0 for C_1 or vice versa. Line AB has a slope equal to this price ratio, $-(1+r)$. In order to maximize the value of the resources which he owns, this individual will produce at point E.⁵ This will include C_{0b} units of C_0 and C_{1b} units of C_1 . At this point, the marginal rate of transformation over time is equal to the ratio of future to present prices and the value of this individual's wealth ($P_0 * C_{0b} + P_1 * C_{1b}$) is at a maximum.

In this simple model, we have given the individual the choice of income streams. He has selected to use his resources in such a way that they generate C_{0b} units now and C_{1b} units in the next year. He could have chosen any other time path of income along his production frontier, but in order to maximize his wealth he chose E. This particular combination of C_0 and C_1 has a present value equal to the horizontal intercept of the price line AB or $P_0 C_{0b} + P_1 C_{1b}$ which is also equal to $C_{0b} + C_{1b}/1+r$. Of all the possible combinations of present and future income, this one has the highest present value.⁶

However, just because he has chosen to produce at E with the associated time stream of income, does not mean that this is where he will choose to consume. The maximization of his wealth and the maximization of his utility or consumption preferences are two different things when there exists a market for exchanging present for future goods.⁷ For example, suppose that this individual has a time preference function characterized by the indifference curve I_1 . In order to maximize the value of this function, given the constraint of the market prices,

² The first two sections of this paper are based largely on Irving Fisher, The Theory of Interest and Jack Hirschliefer, The Theory of Capital.

³ Despite the fact that the individual is confronted with a choice of time dated consumption bundles, this particular model is timeless. The choice is made in time zero (now) and there are no subsequent changes subject to individual discretion.

⁴ In other words, if $r = 10\%$ and $P_0 = \$1.00$, then 91¢ (approx.) today will purchase a unit of C_1 one year from today.

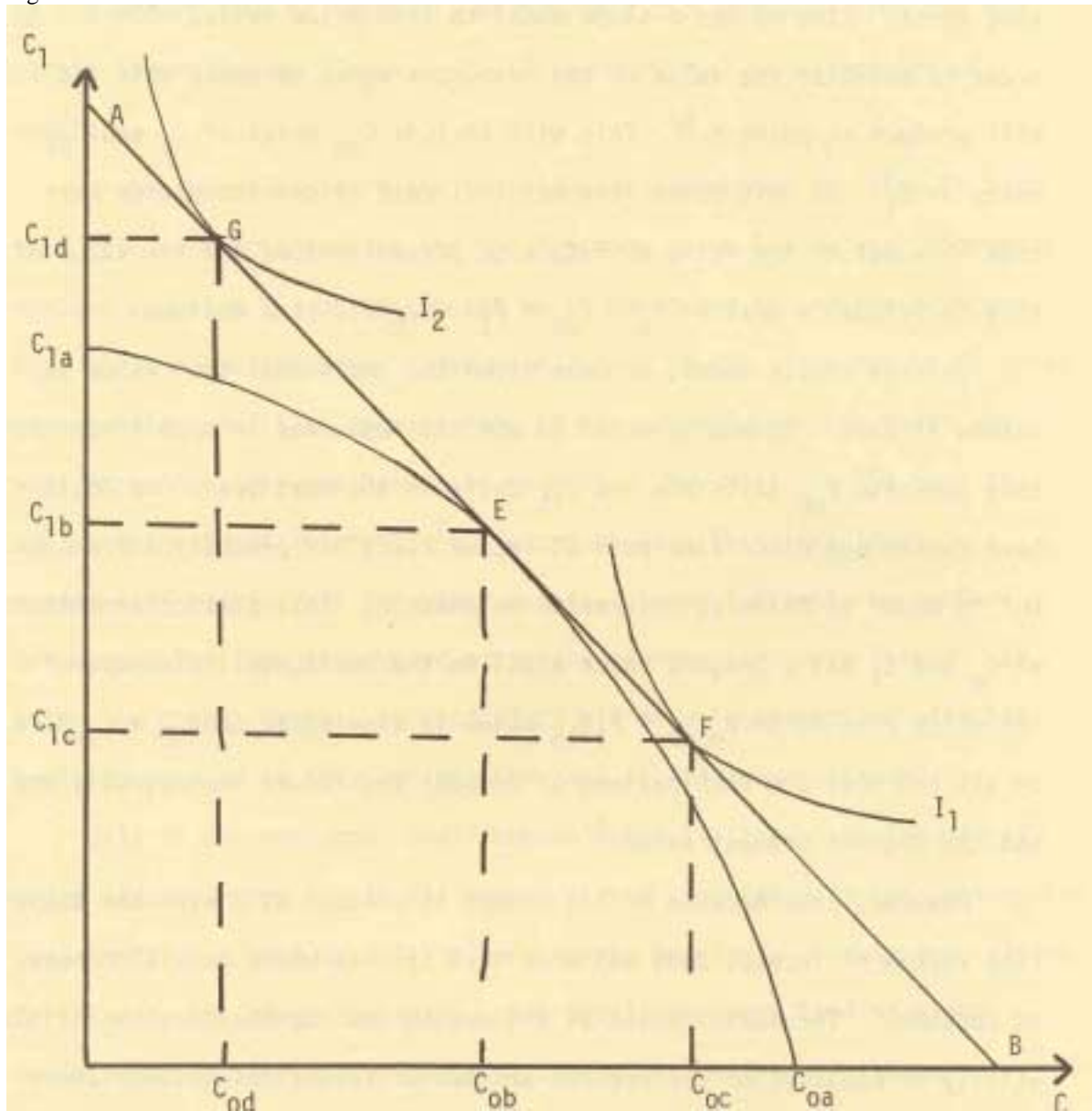
⁵ We are ignoring all problems associated with uncertainty. Information about future events is assumed to be costless.

⁶ There is no other price line which can be drawn tangent to the production frontier that would have a higher horizontal intercept.

⁷ Assuming that wealth through production and utility in consumption are perfectly separable, utility maximization implies wealth maximization; i.e., wealth must be at a maximum in order to maximize utility.

he will choose point F. In other words, he will trade some of his future income for some additional present income. In equilibrium he will consume C_{oc} units C_0 and C_{1c} units of C_1 . Since he is consuming more present units than he is producing himself, he must borrow the difference $(C_{oc} - C_{ob})$. At the market rate of interest, he must pay back one year from now some of his future income $(C_{1b} - C_{1c})$. This individual is a demander of credit.

Figure 1



On the other hand, if the individual's preference function is such that it is characterized by the indifference curve I_2 , he will choose to consume at point G. At this point he is consuming less current income than he is producing himself and more future income. How can he do this? By extending credit or loaning some of his current goods to those who want more than they now have. In exchange, they must pay him back at the market rate of interest with future goods. This individual is a supplier of credit. At the going market rate of interest, he prefers to consume less now than he is currently earning (and more later). By using the credit market, he can adjust his actual consumption with his preferences even if they are not the same as his income stream.

Only if the consumer's indifference curve is tangent to the market price line at point E will his income stream coincide with his consumption preference such that he will neither borrow nor lend. Furthermore, as the market rate of interest changes, some people who were lending might now borrow and vice versa depending upon the direction of change in r . Next, we shall examine the variables which together determine the rate of interest.

II. The Theory of Interest

Since interest rates are prices for earlier availability, they, like all other prices, are determined by the interaction of supply and demand. To illustrate the way these forces affect the rate of interest and, in turn, the rate of borrowing and lending, let us assume that there are two individuals, A and B, each of whom has been endowed with some amount of C_0 and C_1 . Figure 2 is the familiar Edgeworth exchange box. The axes have the same interpretation as in Figure 1. For convenience, individual A, represented in the lower left hand corner, has been endowed with all of the C_1 and has no C_0 . Individual B, represented in the upper right hand corner, has been endowed with all C_0 and no C_1 . By construction, their endowment points coincide at point E.⁸ Through this point we can draw their indifference curves I_{A1} for A and I_{B1} for B. Because of the different values they place on marginal units of C_0 and C_1 , there exists potential gains from exchange. Under the assumption that these two individuals are so insignificant relative to the market that they perceive themselves as price takers, we can derive their offer curves, O_A and O_B . These two curves show for each rate of interest the maximum quantities that each individual would be willing to exchange on the market. Where these two curves intersect, at point H, is the only place where the market will clear. The price line, which passes from point E through point H, has a slope of $-(1+r)$ where r is the market rate which equates the amount A wishes to borrow with the amount B wishes to lend. At this r , A ends up borrowing C_{oA} units of C_0 from B, leaving B with C_{oB} . In exchange, A must give up his claim to C_{1B} units of C_1 to B, leaving himself with C_{1A} . Notice that A borrows exactly the same amount as B is willing to lend and his payment of future income will equal precisely the amount B will receive; i.e., the quantity of credit supplied is exactly equal to the quantity demanded. It is this interaction which determines the rate of interest on the market. Notice too, that both traders have moved to higher indifference curves, I_{A2} and I_{B2} . This will always be the case when exchange is voluntary regardless of whatever else may be assumed. Of course, this equilibrium satisfies the condition of Pareto optimality such that there is no other rate of borrowing or lending which can move both parties to a higher level of preference.

Before leaving this simple model of the credit market, there is one additional point which must be made. In fact this point is so important in understanding subsequent analysis that it is the major reason we have dwelled so long on these basic analytics. **IN THIS THEORY THERE IS ABSOLUTELY NO PLACE FOR CREDIT INTERMEDIARIES.** A demonstration of this follows.

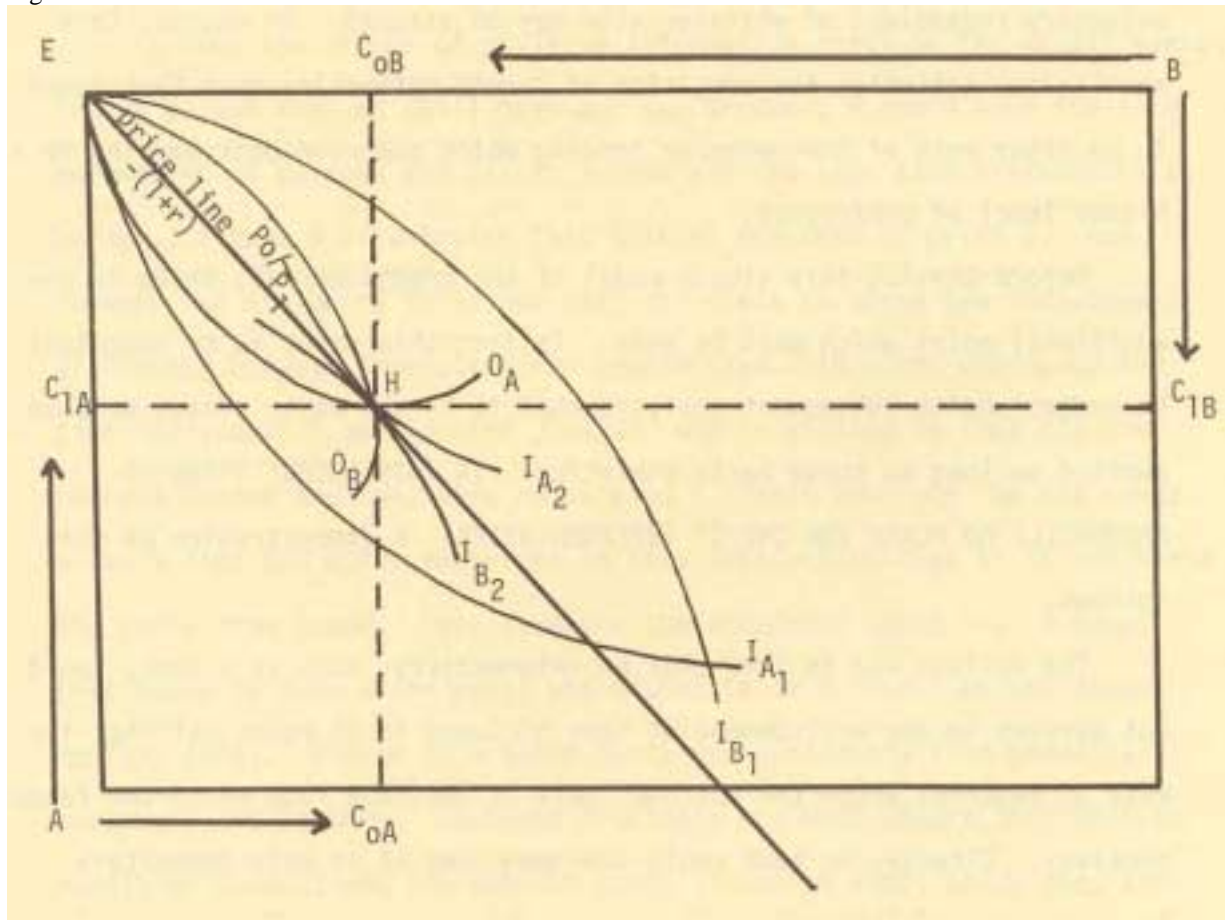
The easiest way to show that an intermediary, such as a bank, could not survive in the environment we have pictured is to point out that the rate of interest which the borrower pays is the same rate which the lender receives. Clearly, no bank could last very long if it paid depositors the same rate of interest as it charged its borrowers. This state of affairs has arisen out of a seemingly innocent assumption implicit in most economic theories, and that is the assumption of zero information costs.⁹ In this model, individuals A and B were allowed

⁸ The assumptions about endowment have been made only to simplify the construction of the graph. Relaxation of these assumptions will not alter the implications.

⁹ The assumption, when not made explicitly, is usually buried in the "price takers" or "competitive" model. To get this model we assume an auctioneer, a la Walras, who costlessly gathers all information about quantities supplied and demanded at every price and selects the one price which clears the market. Notice, in this model that traders can costlessly transact. There are no costs to them of acquiring information about other traders and no costs of negotiating terms of trade.

to transact with each other without spending any scarce resources acquiring information about each other's location or their time preferences, and negotiating and enforcing a credit agreement. In such a world, traders do not require market intermediaries: they can costlessly find other individuals who are willing to borrow or lend current goods in exchange for future payments. For the credit intermediary to have any economic role in the market there must exist positive information costs.

Figure 2



III. The Demand for Credit Market Intermediaries

To show the effect of positive information costs on the credit market, let us assume that we still have our two traders, A and B with the same endowments of current and future income and the same time preferences as before. Figure 3 illustrates this initial position at point E. Now, however, we are going to assume that the costs to these two individuals of trading between themselves are prohibitive. In other words, by the time individual A has located someone who is willing to loan him some current income and they have negotiated a credit contract, he has spent so much time and other resources in this transaction that it is not worth the gains from trade. This is where the middleman comes in. Assume that there is some third party who wishes to be a credit market intermediary (CMI). Assume this third party can costlessly find potential borrowers and lenders. He knows precisely how much credit they wish to supply or demand, and the maximum price (interest rate) which they are willing to accept. Furthermore, we shall assume for the moment that this third party has no other competition; an assumption which we shall relax shortly.

Figure 3 & 4

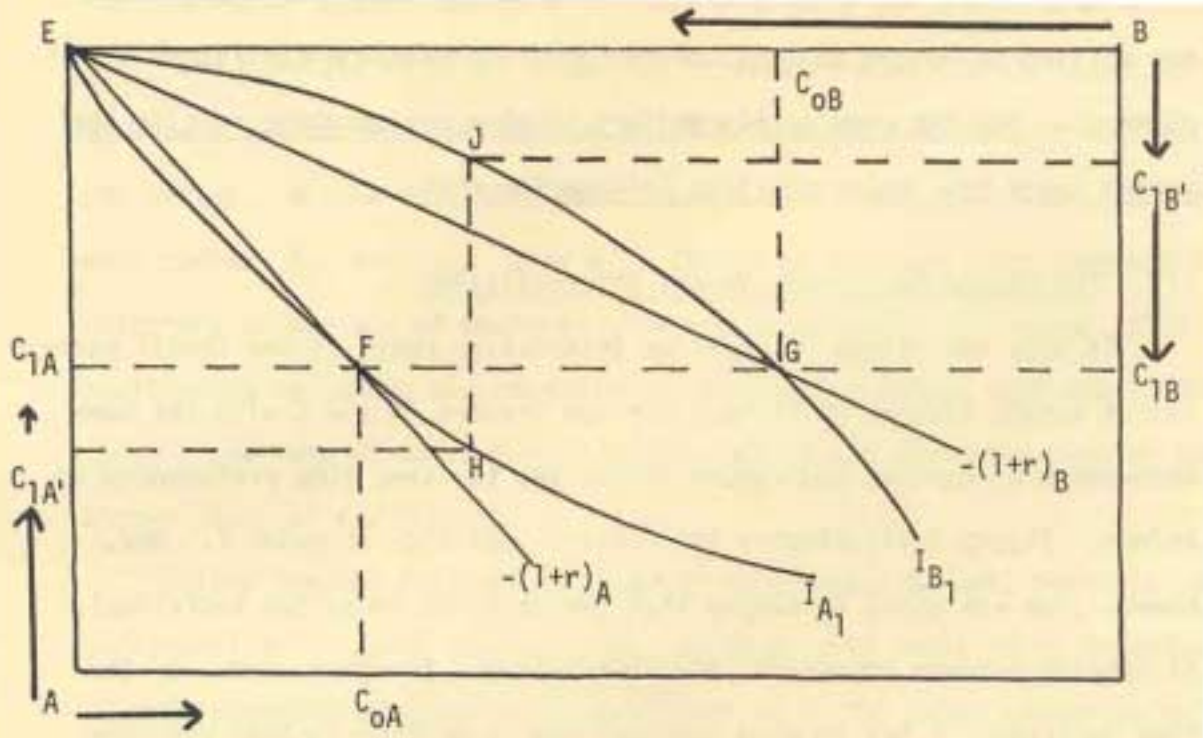
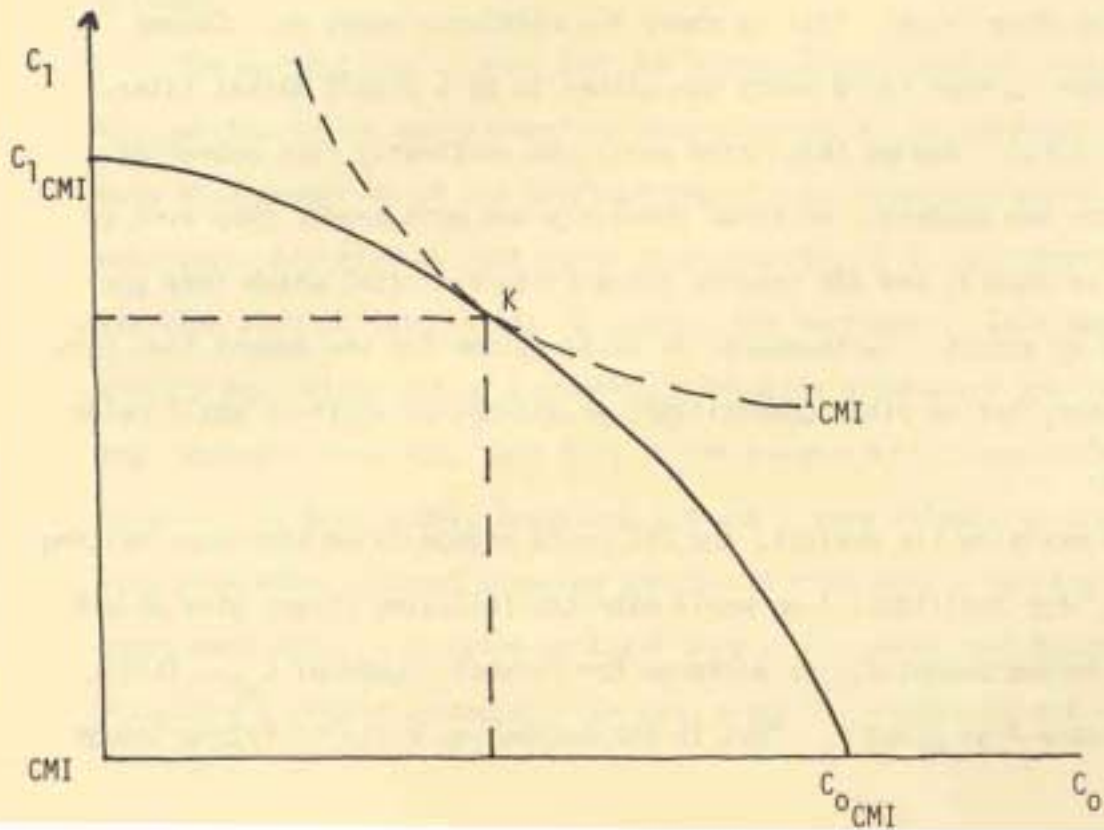


Figure 3



To maximize his profits, the CMI could engage in an ingenious pricing scheme. For individual A he would make the following offer; give up all future income except C_{1A} in exchange for current income of C_{0A} . This would leave A at point F. This is the maximum quantity of future income that A would be willing to pay in order to borrow C_{0A} units of current income. In effect, this trade would leave A on the same indifference curve at which he began at point E. He would be paying an average rate of interest equal to r_A as represented by the slope of the price line $-(1+r)_A$ from E through point F.¹⁰ To individual B the CMI would offer to give him future income equal to C_{1B} in exchange for all of his current income except C_{0B} . This would leave B at point G, which is on the same indifference curve as he began at E. B would be receiving an average rate of interest equal to that implied in the slope of the price line from E through point G or $-(1+r)_B$. This is the very lowest rate of interest at which B would willingly lend out that quantity of current income.

By utilizing this pricing scheme, the CMI can keep for himself as profits the amount of C_0 lying between points F and G. This is the maximum amount of current income which he can extract from the two traders by charging a higher rate of interest to borrowers than he pays to lenders. This quantity is shown in Figure 4 as the point C_{0CMI} on the horizontal axis. If our middleman so desired he could take his profits in future income instead of current income. To maximize his profits in terms of C_1 he would offer A an exchange rate that would place him at point H in Figure 3. To B he would offer point J. This would leave our CMI with profits equal to the vertical distance between J and H. This profit is plotted in Figure 4 at C_{1CMI} on the vertical axis. Of course, our middleman need not limit himself to taking his profits entirely in current or future income. Instead he could choose some combination of C_0 and C_1 which would lie along the concave curve drawn in Figure 4 between the two extreme points. (This curve is concave because the traders indifference curves are convex.) Precisely which combination the CMI would choose for himself will depend upon his own preferences between future and current income. If these preferences are represented by indifference curve I_{CMI} then our middleman will select that combination of C_0 and C_1 at point K.

The purpose of going through this relatively complex analysis is not to impress the reader with the subtleties of economic graphics but to instill upon him the very important point that the credit intermediary can exist only if the individual borrowers and lenders can not get together costlessly. Actually this statement should be made even more restrictive. The credit intermediary cannot operate profitably unless it can bring borrowers and lenders together at a lower cost than the traders could do it themselves. This can be seen in our previous example. If the CMI tried to take his profits in current income of C_{0CMI} but the traders, A and B, could negotiate themselves the credit contract by expending some current income less than C_{0CMI} then they would not use the intermediary; at least not at his current prices. In fact, this analysis reveals another even more basic characteristic of credit market intermediaries. They are suppliers not of credit but of information.¹¹ It is a very common misunderstanding among observers of the credit market that intermediaries actually supply credit. They do not. They merely bring together potential lenders and borrowers, as our model has already shown. The demand for intermediaries' services is not a demand for credit but rather derives from the existence of nonzero information costs. The spread between the borrowing and the lending rate of interest will be determined, in a competitive market, by the magnitude of these information costs. This will be elaborated on in the next section. From this point on, the terms "lender" and "borrower" will both refer to consumers, and not to an institution.

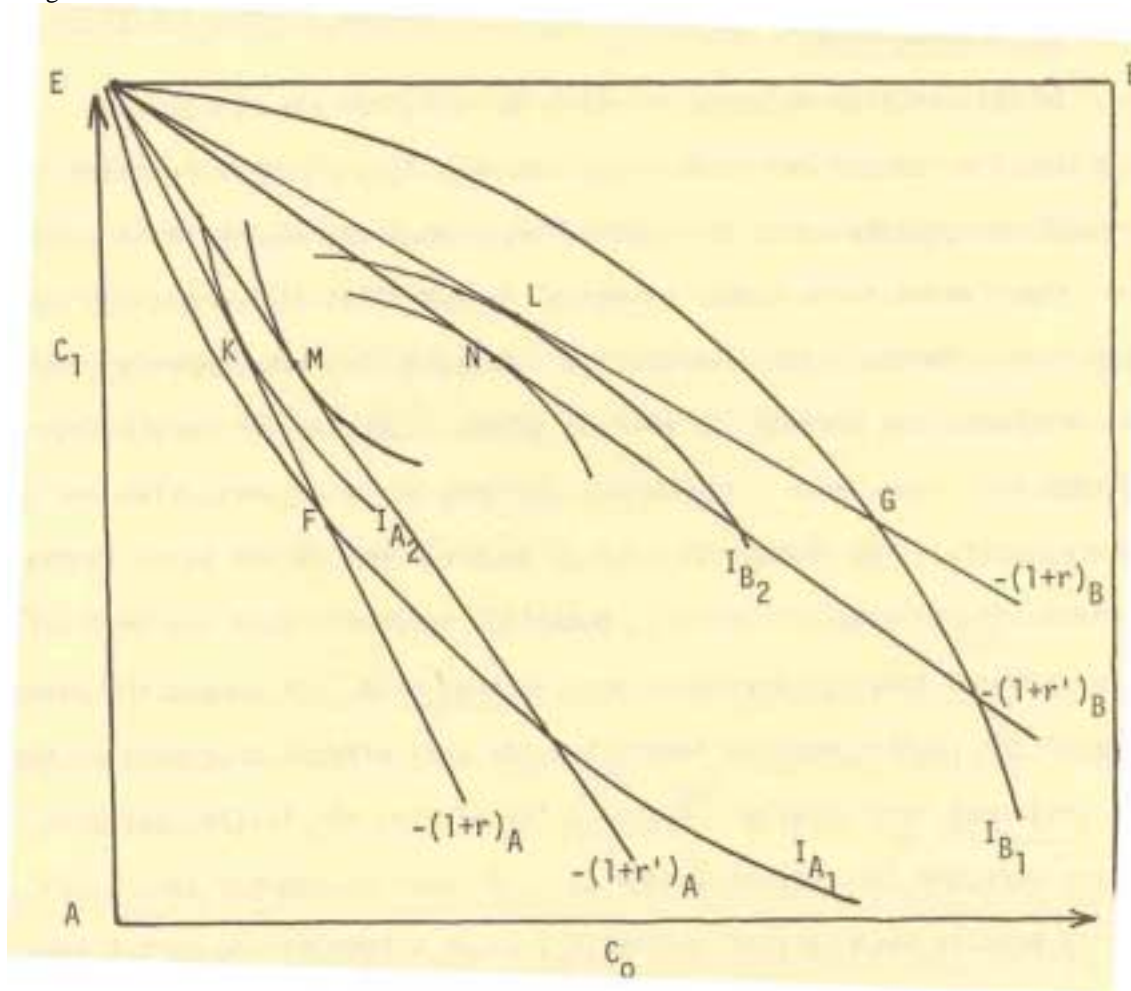
¹⁰ This same pricing tactic could be applied incrementally instead of on an "all-or-nothing" basis. This would move A down his indifference curve in steps until reaching point F. If we were to then average all of the incremental prices it would be equal to r_A .

¹¹ This concept of the intermediary is closely related to an earlier discussion by R. Coase, "The Nature of the Firm." Coase views the reason for being for firms as the existence of positive transaction costs.

IV. Information Costs, Competition, and the Spread Between Borrowing and Lending Rates

In this section we shall maintain our original assumption that individual borrowers and lenders cannot negotiate a credit contract without the assistance of an intermediary. However, now we shall assume that there are a large number of actual or potential intermediaries each competing with the others for profits. Because they are competing, no one middleman can utilize the pricing scheme discussed in the previous section.¹² Now, each intermediary can only offer potential lenders one interest rate. The lender can loan as much current income as he wishes at that offered rate. Similarly, potential borrowers face one interest rate at which they can borrow as much as they wish. Of course the rate offered the lenders must be lower than the rate offered borrowers or the CMI could not long survive. Figure 5 illustrates the initial position of the borrower (A) and the lender (B). Because of competition, A can borrow however much current income (C_0) as he wishes at the market rate he faces, which equals $-(1+r)_A$ as before. Now, instead of having to go to point F which the monopolist dictated, our borrower selects point K, where he equates his marginal rate of time preference with the market rate of interest. Notice that this point is on a higher indifference curve than point F. This is one of the advantages of competition. In a similar fashion, our lender (B) facing a lower interest rate than borrowers, $-(1+r)_B$, selects point L instead of point G as dictated by the monopolist. Again, this point is on a higher indifference curve than point G. The profits accruing to the CMI are equal to the horizontal distance between K and L. This is clearly less than the profits realized by the monopolist.

Figure 5



¹² Implicit in this notion of competition is the assumption that the costs of collusion among intermediaries is prohibitive.

What happens if these profits are in excess of the costs of operating a CMI? Competition will be attracted into the credit market and more individuals will act as intermediaries between borrowers and lenders. However, the only way in which a newcomer can attract traders away from already established CMIs is to offer better interest rates.¹³ For the borrower this means lower rates, for the lender it means higher rates. This is illustrated in Figure 5. The price line facing A pivots counter clockwise and becomes flatter as his borrowing rate falls to $-(1+r')_A$. The price line facing our lender B will pivot clockwise and become steeper as his lending rate of interest rises to $-(1+r')_B$. Facing this new rate of interest, A now selects to borrow more current income at point M on a higher level of indifference. B chooses to lend more current income at point N which is also on a higher level of indifference. The profits to the middleman have declined to the horizontal distance between M and N.¹⁴ This process continues as long as the returns to the middleman are greater than their costs. Incoming competition will raise the lending rate and lower the borrowing rate of interest until the spread between the two rates just generates enough income to cover the costs of intermediation.

Equilibrium in a credit market with positive information costs is characterized by a number of interesting features. First, given the constraints, the rate of interest paid to lenders is the highest possible. Second, the rate of interest paid by the borrowers, while higher than that paid to lenders, is the lowest possible. From this it follows that the spread between the two rates must be at a minimum. This is true because if any other intermediary could offer better interest rates to our trading parties and still operate at a profit he would do so. Third, each consumer, whether borrower or lender, will be on the highest indifference curve possible, given the magnitude of the information cost. Fourth, and most important to us, competition has forced intermediaries to provide their services at the lowest possible cost. Only those who have a comparative advantage as CMIs will survive. In other words, the production and utilization of information concerning the possibilities for reallocating income streams through time will have been accomplished at the lowest possible cost to society.

This last point requires some elaboration. Note that in Figure 5 our individuals have moved from points F and G respectively to point M and N on higher indifference curves. This move was made possible by introducing competition into the CMI market. However, it would still be possible for A and B to reach even higher levels of indifference if only there were no information costs. The existence of these costs makes it impossible to further increase the utility of all traders. Given the state of technology relating to the generation and transmission of information and the nature of the required information for credit contracts, competition has forced CMIS to produce and utilize information at the lowest possible costs. If they did not, other individuals could enter the market and provide intermediary services cheaper, thus depriving the others of their market shares. If there is an innovation in technology which would permit the production and utilization of relevant information at a lower cost, competition will force its introduction into the market. Those CMIs which can best use this new technique will be able to lower their costs and bid away customers from other CMIs through lower prices, forcing changes in market shares. These lower prices will be reflected in Figure 5 by a reduction in the spread between borrowing and lending rates of interest which, in turn, will allow the traders to move to a higher level of preference. Again, the spread between the two rates will be bid down until it is exactly equal to the costs of providing information at the equilibrium volume of exchange.

So far, the analysis has dealt with credit markets and their associated information costs in a very general fashion. While it is very important, perhaps crucial, to the understanding of the role of credit intermediaries, the assumption of nonzero information costs by itself can only lead to very general implications of the sort already

¹³ Of course, better services or new services could be offered without changing the price or the rate of interest. This is actually a price decrease when adjusted for quality differences. We are assuming through this paper that the price (r) is the only margin at which adjustments will take place.

¹⁴ As we mentioned before, this profit need not be taken entirely in current income (C_0) but may be taken all or in part in future income (C_1).

derived. In order to predict more specific effects on the credit market of changing information costs it is necessary to examine these costs in more detail. This is what will concern us in the next section.

V. The Nature of Information Costs

We have seen, thus far, that the credit market is characterized by traders who wish to reallocate their income stream in such a way that it more closely conforms to their desired spending pattern over time. In order to do this, the individual must find another trader(s) who wishes to adjust his income stream in a similar but opposite fashion. The exchange which occurs involves one party giving up his rights to current income for the rights to future income while the other party purchases the rights to additional current income and pays by foregoing the rights to future spending. Of course the exchange must be preceded by an agreement between the traders in which the terms of the transaction are specified, including the quantities to be traded, the price or, in this case, the rate of interest, and the timing of the payments. Finally, after this contract is formed, some provision must be made for enforcement of the agreement as there is some likelihood that one or more of the parties will not behave according to specifications.¹⁵

In general, the formation of any contract involves the expenditure of some scarce resources. These costs, which are usually labeled transactions costs, are directly related to the generation and utilization of information. For example, an individual who wishes to borrow some current income must locate another person who desires to make a loan. This information is not free. Depending upon the physical distance separating the traders, language barriers, institutional constraints and legal restrictions, the costs of merely locating a potential trading partner may be significant. Once the identification of a trader has been made, information must be transmitted between them relating to their relative preferences. The borrower may wish to obtain X amount of current income in exchange for Y amount of future income, while the lender may be willing to give up X amount of current income for Z future income. In this case more information is required through the negotiation process in the hope that a mutually advantageous agreement can be reached. As before, the costs associated with this process will depend upon a number of variables, including physical distance, language, legal and institutional constraints.

Perhaps of greatest significance to the credit contract is the cost of enforcing the agreement. Because the lender has given up some of his current income on the borrowers promise to repay out of future earnings, there is considerable risk of contract violation. While these risks are present in nearly every transaction, the length of time between purchase and payment in the credit contract makes them of greater significance. For example, if I sell a new car to someone for cash, there is some possibility that he will get in and drive away without paying me. This probability can be reduced by giving him the ignition keys at the same instant that he gives me the cash. This also reduces the likelihood that I will take his cash and drive away in the car myself. However, as soon as I agree to give the car keys to him in exchange for payment one year from now, there is a much greater chance that I will never see the money. It is this time lag between purchase and payment which makes the enforcement of the credit contract somewhat unique compared to many other types of transactions.

That the risks associated with the credit contract arise because of positive information costs can be most easily seen by assuming that all information about the present and the future is available at a zero price. Now, the lender knows exactly what the borrower is going to do at any point in time. If the borrower is going to violate the terms of the contract, the lender has this information at no cost to him and, of course, will not make

¹⁵ The assumption that each individual is a utility maximizer implies that if the gains from breaking an agreement exceed the costs at the margin, anyone would cheat on the contract.

the loan. The loan will only be made to those potential borrowers who will repay as agreed. Because the lenders know who these individuals are at the time of the negotiation, enforcement problems will never arise.

Clearly, this abstraction is too extreme to be of any use other than to reveal the nature of the enforcement problem. Information about the future is costly and never certain. Lenders cannot know who is going to repay and who is not. However, by gathering certain types of information they can reduce the probability of making a bad loan. Information which might reduce the likelihood of bad loans could include data on the potential borrower's current job and the prospect of continued employment; the current state of health and any history of health problems; past credit experiences and the percent of debt to current income now outstanding. The number of variables, which may be useful here, is quite large.¹⁶ The important thing here is that as information costs go down, more information can be economically gathered by the trading parties, reducing the probability of future enforcement problems. In the limit, if information costs are zero in a nonrandom world, there would be no enforcement problems.

VI. The Minimization of Information Costs

It should be obvious from the preceding discussion that wealth-maximizing individuals will try to minimize their costs of acquiring the information necessary for the formation of a successful credit contract. By so doing, they can better readjust their income streams to more closely conform to their time preferences and move to a higher level of utility. Some of the methods used by individuals to reduce these costs are so commonplace and so numerous that their purpose has often been ignored and their importance underestimated. For example, the organization of one geographical location in which potential buyers and sellers repeatedly get together is a simple way to lower the search costs involved in trading. Within this location, often called a market, it may also be advantageous to adopt a common medium of exchange. By getting all the traders in a given market area to accept this common medium, the costs of negotiating prices can be reduced. Notice that this medium, which we generally define as money, will only be created if the costs of transacting are not zero.¹⁷ Advertising is another method by which search costs and negotiation costs can be reduced. By advertising, a seller or buyer may be able to contact a large number of potential traders, inform them of his location, the nature of his product, and the price at which he would willingly buy or sell. Notice that this advertised price has the effect of reducing negotiation costs between other traders of a similar product because the bargaining range is now limited by the advertised prices of their competitors. Advertising should also reduce the differences between prices on similar or identical products, thus reducing the consumers incentive to spend additional time searching for lower prices and saving the associated costs of search.

It is in their ability to reduce information costs that credit intermediaries find their economic niche in society. As we have already demonstrated, these CMI's can only operate profitably if they can bring potential borrowers and lenders together in a successful credit contract at a lower cost to the traders than if the traders did it themselves. The intermediary can reduce the costs associated with transactions in a wide variety of ways. They can locate themselves within a well-organized market area where there already exist a large number of traders. They can use large-scale advertising media which will reach relatively large numbers of potential traders and they can specialize in the bearing of risk which stems from the nonzero information costs associated with the credit contract enforcement. This last point deserves some further elaboration.

¹⁶ Of course, in a world where this information is costly, not all variables will be considered. Information will be gathered only as long as the expected marginal gain exceeds the expected marginal cost.

¹⁷ Actually, money is merely a unit of account which serves to convey information about an individual's ability to purchase real goods through exchange.

Risk, as we have seen, arises out of the fact that there is not perfect information available at zero price about future events. The fact that there is, by definition of credit, a time lag between the receipt of current borrowed income and the payment of the debt with future income means that risk is going to be present in any credit contract. The credit intermediary can serve to reduce this risk in two different ways. First, by specializing in the acquisition of information relating to the likelihood of default, the CMI can reduce the probability of a bad debt. Second, by spreading the risk over a wide variety of loans and a larger volume of total debt, they can stabilize the percentage losses relative to the total loan portfolio.

Finally, credit market intermediaries can reduce the costs associated with the formation of credit contracts by actually reducing the total number of transactions. This can be seen most easily with the aid of the following example. Suppose that there are ten individuals who wish to loan out some of their current income at the market rate of interest. So as not to put all their "eggs in one basket," they wish to lend their income to more than one borrower. To keep the example simple, assume that there are only two individuals who wish to borrow current income. Between them, however, they wish to borrow exactly the amount that the ten lenders are willing to loan. If each lender loans one-half his loanable income to each borrower there will have to be 20 credit contracts. If, on the other hand, the CMI is used, the ten lenders will give their loanable income to the intermediary in exchange for the lenders rate of interest. The two borrowers will borrow from the CMI at their rate of interest, and the total number of credit contracts will have been reduced to 12. By so reducing the number of contracts, the CMI can eliminate or significantly reduce the costs associated with credit contract formation. This enables them to offer the traders better rates of interest than the traders could net without CMIs and at the same time generate some additional profits for themselves.

VII. Conclusions

In this paper we have laid down some basic principles necessary to the understanding of credit markets and Actually, money is merely a unit of account which serves to convey information about an individual's ability to purchase real goods through exchange shown that (1) CMIs can only exist if there are positive information costs; (2) they can only survive (make profits) if they can produce and utilize relevant information more cheaply than the individual borrowers and lenders themselves; (3) CMIs are, in a fundamental sense, suppliers of information, not credit.

Because of the key role which information costs play in the credit market, some time was spent in this paper elaborating on the general nature of these costs. It was demonstrated that CMIs can reduce these costs through (1) location, which reduces search costs; (2) advertising, which reduces search and negotiation costs; (3) specializing in the acquisition of information related to potential default; (4) the diversification of risk and (5) the actual reduction of required transactions.