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Conflict of Interest between Borrowers and Lenders in Credit Cooperatives: The Case of German Co-operative Banks

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Abstract

Over the last few decades, the co-operative banking sector in Germany has steadily increased its market share at the expense of other types of banks. This outcome is surprising from the standpoint of traditional economic thinking about co-operatives, which suggests that they are most appropriate for "backward" economies. We develop a model of co-operative banks that highlights the dual role of members as borrowers and lenders. We show that a shift in the median (hence pivotal) member of the co-operative from predominantly a borrower orientation toward a lender orientation causes the co-operative bank to shift its policy from underpricing credit toward the provision of competitively priced credit and deposit services. Together with a nationwide supporting infrastructure to capture scale and scope economies (the *Verbund*), the market-oriented policy of German co-operative banks today allows them to compete successfully with other banking groups.

Keywords: co-operative banks, German banking sector

JEL Classification: G21, G32, L22

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It is widely recognized that co-operative financial institutions can play a key role in developing countries and in economically disadvantaged regions of advanced countries today (Srinivasan, 1994). Co-operative financial institutions are typically seen as filling a market niche consisting of low-income entrepreneurs, small businesspeople, or farmers who need credit but who have essentially no collateral with which to secure a loan. In other words, co-operative financial institutions may be particularly well-suited to bringing banking services to the otherwise "unbankable." Besley, Coate, and Loury (1993) describe credit co-operatives as "rotating savings and credit associations" and show how they rely on mutual screening and monitoring of their members to enforce contracts. Co-operative financial institutions effectively substitute "reputational capital" for traditional physical or financial capital.

Implicit or explicit in much of the literature on financial co-operatives is the notion that they are "appropriate technology" for relatively backward economies, but should fade away or disappear altogether as economic development proceeds.[1] Co-operative financial institutions did, in fact, play an important historical role in Germany beginning in 1778; they had appeared by 1831 in the United States and in many other industrializing countries at about the same time (Shay, 1992, p. 833). However, co-operative financial institutions did not disappear with economic development in industrialized countries. In fact, they are among the fastest growing groups of financial institutions in some advanced nations today.[2]

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[1] For example, Besley, Coate, and Loury (1993, p. 805) state unequivocally that "Roscas [rotating savings and credit associations] become less important in the process of economic development, however, since as individuals' market opportunities expand, the value of social sanctions declines, and the sustainability of Roscas becomes more problematic."

[2] In several countries, such as the U.S., co-operative banks may enjoy tax advantages (credit unions). In other countries, such as Germany, there are no differences in tax treatment among different types of banks.

We argue in this paper that the conventional view of co-operative financial institutions is incomplete because they are, in fact, adaptable to various sorts of economic environments. We illustrate this point by examining Germany's co-operative banking sector, the continued viability of which appears anomalous from the conventional point of view. In Germany, where all types of banks engage in *Allfinanz* (including universal (*i.e.*, commercial and investment) banking, insurance, and related financial activities), the co-operative banking sector competes directly with all other types of banks. The range of financial services provided and the terms offered are virtually indistinguishable among the various types of banks (Ringle, 1989, p. 134). In addition, there are very few clear demographic characteristics unique to the customers of co-operatives or any other type of bank in Germany today (Selbach, 1991, p. 106).

In fact, co-operative banks have done much more than merely survive the economic maturation of post-war Germany. Starting with about nine percent of the West German banking market in the 1950s (measured by total "volume of business," which is total assets plus certain off-balance sheet items), the co-operative banking sector has steadily increased its market share to almost 15% today (Deutsche Bundesbank, 1961, 1971, 1974, 1978, 1989, 1996). During the same period, the prototypical universal banks-- the privately owned "Big Three"-- have seen their domestic market share fall from 12-14% during the 1950s to only nine percent by 1996.[3] Despite their not-for-profit nature, co-operative banks have earned returns on assets comparable to those of the big private banks, as Figure 1 indicates.

[3] The remainder of the German banking market is accounted for by other privately owned commercial banks (15% of the market as of October 1996), the state-owned savings-bank sector (38%), public and private mortgage banks (14%), and public banks with special functions (10%) (Deutsche Bundesbank, 1996, p. A20). Some of the private mortgage banks are owned by members of other banking groups, a fact not reflected in this unconsolidated sectoral breakdown. The mortgage banks owned by the co-operative-bank and savings-bank sectors dominate the market, however, so a fully consolidated sectoral breakdown would increase the apparent prominence of the co-operative banks in Germany.

This clear shift of market share away from shareholder-owned universal banks and toward co-operative institutions is remarkable for at least two reasons. First, German co-operative banks expanded their balance sheets faster than the banking sector as a whole even though the market niche they were founded to serve-- small businesspeople and farmers-- has shrunk continually as a proportion of the population. Not surprisingly, the growth of co-operative banks in Germany has come from non-traditional customers, namely creditworthy businesses as borrowers and salary and wage earners as depositors and share owners (Klein-Hessling, 1992). A growing proportion of these newer customers are not even members of the co-operative banks from which they obtain financial services.

Their post-war movement into the mainstream of German economic life points out the second remarkable feature of German co-operative banks that would not be predicted on the basis of standard analyses of co-operative financial institutions. Despite their seemingly inflexible and potentially inefficient ownership structure characterized by "one person, one vote" (Schmid, 1996, p. 28), German co-operative banks successfully undertook major structural reforms in the 1960s and 1970s in order to compete with other banking groups in the field of *Allfinanz*. In addition to consolidating many small co-operative banks into larger, more efficient units, competitiveness was enhanced by creating and formalizing (in 1972) a *de facto* financial conglomerate in the form of a sectoral *Verbund*, or mutual association, that provides central clearing and refinancing facilities, as well as real estate, insurance, securities, and other financial services. Organizationally, some services are provided to the many remaining small primary co-operative banks by one or more of the jointly owned "central banks" (of which three are regional and one is national) or by specialized financial subsidiaries owned by the sector as a whole.

Other financial services are provided by independent firms that have agreed to co-operate exclusively with the primary banks in marketing and product delivery.

In order to provide an explanation for the adaptability of German co-operative banks to changing economic circumstances, we adapt the simple model of a financial co-operative contained in Hart and Moore (1996). Their model stresses diversity of interests among the owners of mutual institutions as the key to understanding the institutions' behavior. As in Hart and Moore, we abstract from agency problems between the owners and the managers. To be sure, there are agency problems in co-operative banks but this is also true of shareholder-owned banks. Instead, we focus on the diversity of interests between members of co-operative banks. There are members whose primary interest in the association is to obtain credit; this corresponds to the "unbankable" small businesspeople and farmers described in most accounts of credit co-operatives. Our model highlights the effect of the steadily increasing number of members who are most interested in receiving a high rate of return on their financial investment (deposits and shares). This pits them against other members, who prefer low borrowing rates (hence low returns on deposits and shares). Since co-operative financial institutions are democratic organizations, the median owner's preferences are pivotal.

We provide evidence that the pivotal owner in the German co-operative banking sector probably shifted from the "borrower" type to the "investor" type sometime during the first few postwar decades. Our conclusion is that, in contrast to the predictions of the previous literature that co-operative financial institutions are inherently inflexible and hence are bound to die out as the original membership group wanes in importance, the democratic nature of these institutions' ownership in fact creates the possibility for adaptation and survival. Co-operative financial

institutions constitute a dense network of financial institutions that is convenient and familiar to a large number of people. Their recent evolution into mainstream financial-services providers was certainly built on this foundation but it also required major internal changes. The success of these changes demonstrates that the co-operative form of organization is, in fact, quite flexible. This, at least, appears to be the lesson of the German co-operative banking sector.

The paper begins with background information on the German co-operative banking sector (Section I). Section II adapts the stock-exchange model of Hart and Moore (1996) to a banking context to illustrate how the governance structure of co-operative banks is driven by the preferences of the median member. We document changes in the membership of co-operative banks in Section III. We also discuss how the threat of member withdrawal is reflected in the strategy of a co-operative bank. Section IV describes the multi-tiered co-operative banking system in German-speaking countries, known as the *Verbund*. We apply our model to illustrate how diversity of interests among co-operative banks may affect the governance of the *Verbund* itself. Section V concludes.

I. The Co-operative Banking Sector in Germany: *Klein aber Fein* ("small but mighty")

The 2,520 "primary" co-operative banks and the four "central institutions" owned jointly by the primary banks together constitute the core of the co-operative banking sector in Germany today (Deutsche Bundesbank, 1996, p. A20). Hermann Schulze-Delitzsch (1803-1883) formed a credit co-operative in 1850 for the purpose of providing low-cost loans from and to other craftsmen (Klein-Hessling, 1992, p. 27). The first agricultural credit co-operative was founded in 1864 by Friedrich Wilhelm Raiffeisen (1818-1888). Wilhelm Haas (1839-1913) was important in developing the supporting institutions that would later form the modern *Verbund* (Bonus and Schmidt, 1990, p. 193; see Section IV below for more discussion of the *Verbund*). The legal basis for modern German credit co-operatives was laid down in a Prussian law of 1867; this statute was incorporated into German law at the time of German political unification in 1870. The *Genossenschaftsgesetz* of 1889 ("Law of Co-operatives") forms the basis of law that still governs the legal status of co-operatives in Germany today.[4]

Savings banks were also founded by local communities and governments in this period to provide universal access to rudimentary financial services. By way of contrast, the membership of credit co-operatives was strictly limited to those with a strong and demonstrable common bond, either vocational or geographic (often both). The reason why credit co-operatives and savings banks emerged at this time in Germany is most likely the increase in credit demand and the lack of credit supply by existing banks. Small businesspeople faced competitive pressures to

[4] Other important dates in the evolution of the German co-operative banking sector include the following (for more discussion, see Bonus and Schmidt, 1990, pp. 186-197). In 1871, deposits from non-members were first accepted. In 1889, limited liability of members became possible; by 1933, all German credit co-operatives had completed the transition to limited liability. The *Genossenschaftsgesetz* (Law of Co-operatives) was altered in 1922 to require all credit co-operatives with at least 10,000 members to adopt a representative assembly (*Vertreterversammlung*); subsequently, this requirement was extended in 1926 to co-operatives with at least 3,000 members. Loans to non-members were first allowed in 1973.

invest in capital equipment but typically had no other collateral than the proposed purchase to offer as security. The only source of credit for many was the local moneylender, who, through a market-sharing cartel among moneylenders in the region, held an exclusive market position in a given local area (Bonus and Schmidt, 1990, p. 187). Clearly, there were strong economic incentives to form mutual credit associations if they could overcome organizational and operational hurdles.

The structure and functioning of credit co-operatives were based on the principles of "one man, one vote" and mutual unlimited liability assumed by all members for the debts of the co-operative. In addition, the share of the ownership that any person could obtain was strictly limited and the shares themselves were non-tradable (except that owners could sell shares back to the co-operative at a predetermined price). The co-operative movement had strong ideological underpinnings. The leaders of the co-operative movement in Germany were either themselves Liberal members of Parliament, as in the cases of Schulze-Delitzsch and Haas, or were, in the case of Raiffeisen, a religious Catholic, following deeply held beliefs (Born, 1976, p. 227).

Joint and unlimited liability made co-operative financial institutions "bankable" even if the individual members were not. Given their role as financial guarantors for all other members, each person had a strong incentive to choose recipients of credit with care and to monitor their use and repayment of the credit vigilantly. The fact that each member of the co-operative knew much about all the other members and could observe new developments relatively easily meant that these arrangements were often feasible and incentive-compatible (Bonus and Schmidt, 1990, p. 188; Schmid, 1996, pp. 7-9).

II. The model

A. Overview of the model. Our model combines elements of the analyses of co-operative financial institutions contained in Besley, Coate, and Loury (1993), Schmid (1996), and Hart and Moore (1996). We consider a multiperiod co-operative association in which the members pool their endowments in order to make acquisition of a capital good possible for at least some members sooner than would be the case under autarky, as in Besley, Coate, and Loury (1993). Unlike the latter authors but like Schmid (1996), we assume that members would like to borrow from the co-operative as often as possible (Besley, Coate, and Loury assume that each member only wants to borrow once). Also following Schmid (1996), we focus on the design of incentives that make a credit co-operative sustainable over time in the face of potentially strong incentives for some members (those served early) to withdraw before all members have been served.

In contrast to Schmid (1996), however, we analyze a model in which the multi-period contracting problem collapses to a single-period pricing decision that is repeated over and over. This is because, unlike Schmid (1996), we assume that (1) both exit from and entry into a co-operative are possible at any time, and (2) property rights to accumulated surplus in a co-operative are not well-defined. The key implication of these two assumptions is that a co-operative rationally chooses not to accumulate any retained earnings (above the minimum level that is required to operate).[5] In general, this may result from inefficient use of resources (expense-preference behavior or other agency costs) or through "overproduction," that is, operating beyond efficient scale. We consider the latter case in which the co-operative uses resources in the right proportions but uses too many of them. By pricing at average cost, no

[5] Co-operative banks are subject to minimum capital requirements as are all other types of banks in Germany. The not-for-profit orientation of co-operative banks was institutionalized in the *Genossenschaftsgesetz* ("Law of Co-operatives") of 1889 (Bonus and Schmidt, 1990, p. 190).

profits are earned. Since there are no retained earnings, the co-operative begins each period from an identical starting point.

There is an important intertemporal link in our model, however. This is because a borrower-dominated co-operative always chooses to set the price of credit at a below-market level.[6] This provides an incentive for members to remain in the co-operative, since it is only through borrowing that they receive any benefits from membership. Conversely, we show in Section III that, in an investor-dominated co-operative, the nature of the intertemporal link changes because the benefit of subsidized credit is less attractive. Profits are earned and paid out each period as a dividend in this case. As before, however, the co-operative begins each period in the identical situation of zero (excess) retained earnings.

The fact that we are able to analyze a recurring single-period model to describe the dynamic decision problem of the co-operative means that we can apply the single-period model of a co-operative institution with diverse member preferences contained in Hart and Moore (1996). The analysis in Hart and Moore (1996) shows how members' preferences influence the co-operative's actions through the democratic voting structure.

B. The model. We follow Besley, Coate, and Loury (1993) by considering a group of individuals each of whom wishes to purchase an expensive indivisible good. A co-operative savings and credit association can improve the *ex ante* welfare of this group by pooling their individual resources and allocating funds to selected individuals. This allows these individuals to purchase and obtain the benefits of the indivisible good earlier than would be possible under

[6] In adapting Hart and Moore (1996) to our context, we assume that members of a co-operative have differing demands for credit. We refer to members who have a high willingness to pay for credit as "borrowers" and members who have a relatively low willingness to pay for credit as "investors" (because their primary source of benefit from joining the co-operative is the return they receive on their financial investment in it).

autarky. However, the individuals we consider would like to borrow as often as possible. Therefore, a co-operative member still might want to remain in the association after having received credit once. This assumption differs from that of Besley, Coate, and Loury (1993) and gives rise to different types of dynamic incentive schemes to maintain the membership, as discussed in Schmid (1996, pp. 7-9). We discuss these further below.

Adapting the model of a stock exchange in Hart and Moore (1996), we assume that $2N$-1 people form a co-operative bank at date zero in a market currently served by a monopolistic lender. The co-operative association may last indefinitely, as existing members may withdraw but new members may join. The benefit of credit derived by member i at date zero, where i=1,2,...,$2N$-1, is described by the demand curve $D_i(P)$ on the price interval $[v,V]$, where the members are ranked from the lowest to the highest demand for credit at a given minimum price equal to v (see Figure 2). No member demands any credit at a price higher than V and all are satiated by the time the price falls to v. The aggregate demand curve is obtained by summing all the individual demand curves horizontally, giving $D(P) = Q_v(V-P)/(V-v)$ where $Q_v = \sum_{i=1}^{2N-1} q_i$.

The marginal cost of supplying a unit of credit is rising in the amount lent.[7] The idea here is that the funds being lent by the co-operative are subject to increasing returns to scale, so there is an increasing opportunity cost associated with the loanable funds. This might be due to minimum feasible sizes for members' investments or scale barriers to entering capital markets; larger pools of capital earn higher returns. The total cost of lending is $C(Q) = F + cQ^2/2$; this cost function is common to all types of lenders. Thus, the marginal cost of lending is cQ, where Q is the quantity of credit extended by a single lender. The fixed cost includes all items such as

[7] This differs from Hart and Moore's assumption of constant marginal costs and is important for our results.

the minimum physical capital that is necessary to operate. The average cost of lending, Q, is $C(Q)/Q = F/Q + cQ/2 = AC(Q)$. We assume that $v \leq AC(Q) \leq V$; that is, for any feasible level of output Q, there exists a price in the range (v,V) that allows the lender to break even.

The one-period profit earned by any lender at price P is

$$\Pi(P) = \left[\frac{Q_v(V-P)}{V-v}\right](P-cQ) - F \text{ for } v \leq P \leq V. \tag{1}$$

A monopolist would maximize profit by setting price equal to $P_m=(1/2)(cQ+V)$, which is clearly above marginal cost (see the Appendix).

We now adapt the multi-period analysis in Schmid (1996, pp. 7-9) by assuming that (1) both exit and entry into a co-operative are possible at any time, and (2) property rights in a co-operative are not well-defined enough to allow accumulated earnings to be appropriated by individual members. In particular, neither a withdrawing nor a remaining member has any legal claim to any of the co-operative's assets in excess of the nominal face value of the member's share(s), which he can reclaim at any time.

Schmid suggests that a profit-maximizing co-operative is sustainable regardless of its dividend policy. This is because, in his model, it can retain earnings to deter exit by members who have already been allowed to borrow. He argues that, since co-operative membership shares are redeemable only by the co-operative itself at their original face value, withdrawal means relinquishing any control over the bank's retained earnings which could be used to favor the remaining members. This creates an incentive to remain a member even after having borrowed and repaid the loan. Note that the incentive mechanism he describes requires well-defined property rights of the *remaining* members to the accumulated surplus of the co-operative.

Schmid's analysis of the incentive-compatibility of the co-operative bank retaining earnings in order to keep the membership intact does not go through once we assume that new members may enter at any time and that they receive identical shares in the ownership of the co-operative's accumulated earnings. This obviously creates a free-rider problem in the sense that someone previously outside the co-operative can join at any time to claim part of the earnings in the accumulation of which they played no part. But this negates the ability of potentially forfeited profit shares to deter withdrawal, since remaining members have no control over this surplus. Consequently, they have no incentive to earn profits that will be usurped by new members. Why give up current benefits (dividends or low-priced credit) to accumulate profits if they can't be protected from encroachers?

Of course, the lack of well-defined property rights to accumulated surplus doesn't explain why a co-operative wouldn't lend to its members at a profit-maximizing price and then pay out the earnings immediately as dividends to all current members. Our assertion that this will not happen in the initial circumstances we consider derives from the basic insight of the Hart and Moore model of a co-operative. If the median member of the co-operative places a higher value on the chance to borrow than to receive a dividend-- due to increasing returns to scale in this member's business enterprise-- then this member's preference will be to maximize the volume of lending that the co-operative does, rather than the profit it earns. This increases the chance that any given borrower will be allocated credit in a given period.

Thus, the co-operative at date zero sets the price at such a low level that there will be no profit. The greatest feasible amount of credit is the amount defined by the intersection of the demand curve and the average-cost curve. Given increasing marginal costs, this implies a price

below marginal cost. This is an inefficient use of resources, but it is incentive-compatible for the current members, who cannot appropriate the profit that an efficient use of resources would generate (since dividends are not highly valued).

C. The dual roles of borrower and lender in a co-operative bank. Now we examine the incentives and behavior of a credit co-operative in more detail. Each member receives two types of reward, namely, some consumer surplus in the form of benefits from borrowing and some producer surplus in the form of a return on investment in the co-operative itself.[8] In contrast, a profit-maximizing owner would only take producer surplus into account, while ignoring the implications any decision might have on consumer surplus.

The consumer surplus enjoyed by a co-operative member is depicted in the left-hand panel of Figure 3, where member i's demand curve for credit is shown. The right-hand panel of Figure 3, which shows the member's supply curve of investment, depicts the member's producer surplus. For tractability, we take the member's investment in the co-operative as fixed at his entire endowment, I_i.[9] This endowment need not be liquid or even curently available. In fact, the assumption of joint and unlimited liability by all the members of the credit co-operative allows the co-operative to obtain liquid funds from a bank on the basis of the membership's total assets and earnings prospects. It is in this sense that the liability structure of the co-operative allows the members to liquify their "reputational capital."

If credit is made available by the co-operative at price P_m in Figure 3, the member's consumer surplus is equal to the area A. Suppose that the member's return on alternative

[8] We term the benefits of borrowing "consumer surplus" because it will be measured as the area under the members' demand curve for credit. Similarly, returns on investment are termed "producer surplus" because this quantity will be measured as the area above the opportunity cost of funds.

[9] We consider the incentives of a member to reduce his investment in the co-operative-- *i.e.,* exit-- in Section III below.

investment is as shown in the supply curve of the right-hand panel, $S_i(P)$. The amount of producer surplus a co-operative member receives is given by the area C+D at this price. For ease of illustration in the figures, we assume that the lending rate and the return on deposits (investment in the co-operative) are equal; in other words, there are no fixed or administrative costs and no retention of surplus. We take all costs into account in the formal model below.

If the co-operative offers credit at a price P_c, then consumer surplus rises to A+B while producer surplus becomes D-E. Note that the co-operative member's producer surplus is reduced by any investment beyond I_c. Clearly, a profit-maximizing lender would prefer the higher price, since he faces no trade-off between consumer and producer surplus.

Formally, member i's payoff from his membership in the co-operative is

$$(2) \qquad U_i(P) = \frac{q_i(V-P)^2}{2(V-v)} + \left[\frac{1}{(2N-1)}\right]\left\{\left[\frac{Q_v(V-P)}{V-v}(P-cQ)\right] - F\right\} \text{ for } v \le P \le V$$

where the first term of the sum represents consumer (borrower) surplus and the second term represents producer (investor) surplus.[10] In contrast to the simplified illustration in Figure 3, all costs in addition to the cost of funds are taken into account in (2).

Since the only decision the co-operative must make in our simple model is what price for credit to charge in the current period, and since the median voter is crucial in every democratic institution, there is a single member whose preferences are pivotal. In terms of our model, this member is the one whose demand for credit falls at the median of the distribution of all members; call this person member N. That is, N -1 members have demand curves lower and steeper than member N while the other N -1 members have demand curves higher and flatter than that of member N (recall Figure 2).

[10] See Hart and Moore (1996, p. 64) for a detailed derivation of a similar expression.

Co-operative members whose willingness to pay for credit is higher than N's (higher and flatter demand curves) are precisely the "borrowers" to which we referred earlier. They prefer a lower price for credit since a given decrease in the price translates into a relatively large increase in their consumer surplus. Conversely, members with demand curves lower and steeper than the median member's demand curve prefer a higher price; these are the "investors." This group puts relatively more weight on producer surplus. A growing representation in the membership of this group can shift the pricing of co-operatives toward that of private lenders, as we show below.

Figure 4 portrays a typical co-operative member from each group. Member i, an investor, has a demand curve lower and steeper than the median member's demand curve (not shown), while member j, a borrower, has a demand curve that is higher and flatter than the median. Each member has invested the amount I_i. All members face the same opportunity cost of funds; the source of the differing demands for credit is instead the members' attitudes and preferences (*e.g.*, attitudes toward risk, willingness to work hard, etc.)

A decision to reduce the co-operative's price of credit from P_m to P_c will unambiguously increase the amount of consumer surplus available and decrease the amount of producer surplus available. At P_m, a borrower (member j in Figure 4) enjoys consumer surplus of A+F and producer surplus of C+D. At the lower price of P_c, the borrower's consumer and producer surpluses are A+B+F+G and D-E, respectively. Thus, the borrower prefers the lower to the higher price if and only if B+G > C+E. An investor, on the other hand (member i), enjoys consumer surplus of A and producer surplus of C+D if the price of credit is set at P_m. At the lower price of P_c, the investor's consumer and producer surpluses are A+B and D-E,

respectively. Thus, the investor prefers the lower to the higher price if and only if B > C+E. In general, the investor prefers a higher price for credit, while the borrower prefers a lower price.

For concreteness, consider a credit co-operative with three members. Member 1 is an investor, the demand curve of which corresponds to member i in Figure 4. We assume that B<C+E in Figure 4, and member 1 prefers the high price, P_m. Member 3 is a borrower, the demand curve of which corresponds to member j in Figure 4. We assume that B+G > C+E in Figure 4, so member 3 prefers the low price, P_c. We now consider three possibilities for the location of the median member's demand curve (member 2).

First, we assume that the median member's demand curve is identical to that of member 3. This is the case of a borrower-dominated credit co-operative. The co-operative's policy will be to set the lowest price possible for credit. What is the lowest feasible price for the co-operative to charge? Figure 5 shows that this lowest feasible price is P_c , which occurs where the co-operative's average cost curve intersects its aggregate demand curve. The amount of credit extended is then Q_c. Taken as a whole, the co-operative generates consumer surplus in amount A+B+C+D+E+F+G and yields producer surplus of H-F-G-K, as shown in Figure 5. Thus, total surplus is A+B+C+D+E+H-K.

The second case we consider is an investor-dominated co-operative. To illustrate this case, assume that member 2's demand curve is identical to that of member 1. The co-operative's policy in this case is to set the price of credit as high as possible. There are two factors that constrain the co-operative's ability to set a high price, however. First, price competition between the credit co-operative and other lenders would drive each toward the competitive price and quantity, P_e and Q_e in Figure 5. If collusion were feasible at the monopoly price, consumer

surplus would be only A, while producer surplus would total B+C+H. The second constraint on the co-operative's freedom to set its price at a high level is the threat of member withdrawal, to which we turn in Section III. Clearly, member 3 would not be willing to remain a member if the co-operative's price for credit exceeded that available from other sources.[11]

Finally, consider the case in which member 2's demand curve is intermediate to those of members 1 and 3. Suppose further that member 2's preferences are a perfectly weighted average of those of the other two members. This situation-- perhaps unlikely but certainly possible-- would lead the co-operative to offer credit at the level Q_e and at a price P_e in Figure 5 (see Hart and Moore, 1996, p. 66). When the median member has *average* preferences for the co-operative, borrowers' and investors' oppositely skewed preferences are perfectly offsetting; the distortions introduced by each type of member are cancelled out.

To see this razor's-edge situation of a balanced co-operative in the general case, assume that the median co-operative member, N, has average preferences; that is, $q_i = [1/(2N-1)]Q_v$. Replacing this expression in (2) yields the payoff faced by the median member when he is also the average member:

$$(3) \qquad U_N(P) = \left[\frac{Q_v}{(2N-1)}\right]\left[\frac{(V-P)^2}{2(V-v)}\right] + \left[\frac{Q_v}{(2N-1)}\right]\left\{\left[\frac{(V-P)}{(V-v)}(P-cQ)\right] - \frac{F}{Q_v}\right\}.$$

Differentiating (3) with respect to P gives us the balanced credit co-operative's first-order condition:

$$(4) \qquad U'_N(P) = \left[\frac{Q_v}{(2N-1)(V-v)}\right](cQ-P) = 0.$$

[11] Recall, however, that it was precisely the sparsity of borrowing alternatives that drove the original co-operative members to form the association. The threat of withdrawal may not be credible in some circumstances.

Therefore, the balanced co-operative would set its price, P_e, equal to marginal cost. In particular, the price chosen by the balanced co-operative would be

$$P_e = \frac{cQ_v V}{cQ_v + V - v} \tag{5}$$

where Q_v is the quantity demanded when $P=v$ (see the Appendix for the derivation). Referring to Figure 5, consumer surplus would be A+B+D and producer surplus would be C+E+H. Therefore, the perfectly balanced co-operative, just like a perfectly competitive market, would be more efficient than the borrower-dominated co-operative by the amount K and would be more efficient than a monopoly lender by the amount D+E. These conclusions correspond to Hart and Moore's Claim 1, namely, that co-operatives become less efficient relative to a perfectly competitive market populated by profit-maximizing firms as their membership becomes skewed in either direction (Hart and Moore, 1996, p. 56).

To complete the description of possibilities in the three-member case, note that any deviation that exists in the median member's preferences from the average in the direction of member 1 (an investor) tips the co-operative's pricing policy toward that of an investor-dominated co-operative. Conversely, if the median member's preferences are closer to those of member 3 (a borrower) than to those of member 1, the co-operative becomes effectively borrower-dominated. Notice, however, that the investor-dominated co-operative bank faces potential credit-market competition while the borrower-dominated co-operative does not.

III. The impact of changing member characteristics on German co-operative banks

German co-operative banks were founded in the mid-19th century by members whose primary interest was in obtaining low-cost credit (Bonus and Schmidt, 1990, p. 190). That is, the co-operatives were borrower-dominated. The typical member was a small farmer or a craftsman without sufficient collateral to borrow from a bank. As shown above, this membership orientation results in the credit co-operative setting the price of credit at a below-competitive level, or P_c in Figure 5. As noted above, the not-for-profit orientation of credit co-operatives was considered so fundamental to their nature that this business objective was incorporated into the nineteenth-century law that governed their legal status and operations.[12]

A volume-maximizing objective is not efficient from the standpoint of resource allocation because there is deadweight loss (area K in Figure 5). However, there exist no external (*i.e.*, credit-market) forces to raise the price of credit because the co-operative bank undercuts all other actual or potential lenders in the market. Nor were there strong internal pressures to change in the early days, since the median member valued consumer surplus (access to credit) relatively more highly than producer surplus (return on invested funds), and since the threat of withdrawal by a disgruntled member with an investor orientation was not very credible.

Changes in the structure of the industrializing German economy of the nineteenth and twentieth centuries foreshadowed dramatic changes in the population at large that would eventually alter the strategic outlook of co-operative banks. Whereas only 4.8% of the German

[12] "Thus, it became part of the co-operative movement's self-esteem to dissociate itself from the idea of profit-seeking. It was even written into law that the purpose of a co-operative was to *promote its members' business affairs*, and that a co-operative that aimed for nothing more than improved dividends should be dissolved through the courts" (Bonus and Schmidt, 1990, p. 190; italics in original). The promotion of members' business affairs-- the so-called *Foerderauftrag*, or "assistance obligation"-- remains the professed business objective of all German co-operative banks to this day.

population lived in urban areas in 1871, this proportion had risen to 21.3% by 1910, to 77% by 1960, 85% by 1980, and 86% in 1994 (Born, 1976, p. 197; World Bank, 1980, p. 149; World Bank, 1996, p. 205). This trend was mirrored by an increase in the proportion of employed persons, those whose livelihood consisted of wages and salaries as opposed to self-employment income. This fundamental transformation of German society had the effect of incresing the number of potential "investors" in the population while decreasing the number of potential "borrowers."

Figure 6 shows that the characteristics of the membership of co-operative banks in Germany has changed dramatically in the last half-century, in large part because the population as a whole has changed so dramatically over this period. Self-employed people in the agricultural sector constituted about 35% of the membership of co-operative banks in 1950, while their share had fallen to only 4% by 1990; during the same period, the proportion of the membership made up of employed persons-- who presumably have much less demand for business credit-- rose from 45% to 86%. Reflecting the lower demand for credit on the part of employed persons, the share of co-operative banks' lending to this group is only about 50% of the total, far less than their share in the membership (Aschoff and Henningsen, 1995, p. 61).

The model developed in the previous section can provide insights into the effect of this dramatic shift in the membership characteristics of co-operative banks. Recalling the example presented above of a credit co-operative with three members, we can think of the transformation of German society over the last century in terms of a shift in member 2's preferences from those of a borrower to those of an investor. As noted above, the effect of this change in the preferences of the pivotal member of the co-operative is to push for an increase in the price of credit above

P_c, the low price that favors borrowers. As noted above, the situation in Germany today is indeed that the terms and offerings of credit co-operatives are virtually indistinguishable from those of the other banking groups (Ringle, 1989, p. 134).

What happens to the members of co-operative banks who retain a traditional orientation; that is, what becomes of member 3, the borrower? Clearly, the members with a high demand for business credit might leave the co-operative if the price is raised too high and viable alternatives exist. Could exit by members who feel unrepresented affect the bank's policy?

An important aspect of the dual roles of credit co-operative members as both lenders and (sometimes) borrowers is the direct effect that withdrawal plays on the association. Considering the three-person co-operative bank, a decision by member 3 to withdraw from the co-operative is similar in effect to a bank run. In other words, exit by a minority member (or group of members) serves as a very powerful disciplining mechanism on the co-operative bank. To see this, assume that the now investor-dominated co-operative bank seeks to charge an above-market price for credit. Further, assume that the bank's assets consist of a loan to member 3-- the member with a high demand for credit-- funded by ownership shares provided by members 1, 2, and 3, where each member is assumed to own a one-third share of the co-operative's assets. Withdrawal by member 3 in effect forces the liquidation of the bank unless the other members agree to take on a credit commitment with the funds obtained from member 3 when he pays off his loan. Other options would be to attract new borrowing members or to offer credit to non-members. At the above-market price assumed in this scenario, however, there would not be any other source of loan demand available to the co-operative bank.

Therefore, the co-operative's pricing is constrained by the threat of withdrawal by members whose preferences are not represented by the median member. To avoid member withdrawals, the co-operative must price its services no higher than the alternatives available to members. In fact, market-oriented pricing appears to be the norm for co-operative banks today. This allows the co-operatives to retain borrowing members and also attract non-members as customers. Non-member business is, in fact, a fast-growing part of total co-operative-bank business in Germany, with non-members outnumbering members in the client list by a ratio of perhaps 4:1 (Klein-Hessling, 1992, p. 33). Co-operative bank shares (deposits) provide competitive returns, which can be paid out of the earnings generated from loans to members and non-members alike (recall Figure 1). Thus, it is evident that German co-operative banks have adapted to the changing characteristics of their membership, an outcome that is not foreseen by most analyses of credit co-operatives.

IV. The Role of the *Verbund* (sectoral co-operation agreement)

The basic units of the multi-tiered co-operative banking system in Germany are the primary co-operative banks, which are owned co-operatively by their individual members. The primary banks, in turn, jointly own the central institutions, including both regional banks and a central bank for the entire co-operative banking sector-- the DG Bank (*Deutsche Genossenschaftsbank*), which is itself the fourth largest bank in Germany (Bonus, 1992, p. 455). In some parts of the country, there is a three-tiered structure in which the primary banks collectively own a regional bank, which owns a share of the DG Bank. In other parts of the country, there is a two-tiered structure, where the primary banks own shares in DG Bank directly.

In addition to the primary and central banking institutions, the co-operative banking sector today consists of associated financial institutions including the country's largest home-loan bank (*Schwaebisch Hall*) and the fourth largest group of insurance companies (*R+V Versicherungen*). Investment and leasing corporations, a capital-management firm and several other corporations also work together to provide financial services to the ultimate owners of the co-operative sector, the individual members (Bonus, 1992, p. 455). The co-operative banking sector also maintains its own auditing association and deposit-insurance fund.

Historically, German agricultural credit co-operatives were members of regional and national alliances beginning in 1872; the urban co-operatives followed in 1883 (Aschhoff and Henningsen, 1995, p. 63). At the regional level, the co-operative banks founded central institutions for clearing, refinancing, and other purposes. Auditing associations ensured that adequate management and risk-control procedures were being followed at member institutions. At the national level, a single sectoral "central bank" provided another level of clearing and

refinancing support to the individual regional institutions, which retained control over the central institution. The entire sector was built on a bottom-up, one-member, one-vote model.

Building on decades of informal co-operation and responding to competitive pressures from other banking groups, the co-operative banking sector formalized the sector's structure in a *Verbund* (sectoral co-operation agreement) in 1972. In principle, this agreement allows the primary banks to resist any undue increase in their size and scope through growth or consolidation. This is particularly important for the co-operative banks because, although operating economies are important in order to provide competitively priced financial services, the essence of the banks is their local contact and member control.[13] The existence of the *Verbund* justifies our assumption throughout the foregoing analysis that co-operative banks operate with no cost disadvantage relative to private-sector competitors.

The *Verbund* is essentially an institutional framework within which all of the products and services associated with full-fledged German *Allfinanz* (universal banking plus insurance, real-estate, travel, and other services) can be offered by the local primary banks operating on a relatively small scale. The functioning of the *Verbund* can be compared to outsourcing of non-core financial services. Outsourcing has been increasingly adopted by small banks in the U.S. as a viable competitive strategy, as well (Kapoor, 1997). The important difference in the context of the German co-operative banking sector is that the primary banks-- and ultimately the members of these banks-- themselves control the firms to which the non-core financial services and activities are outsourced.

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[13] At the same time (1972), the previously separate urban and rural co-operative organizations joined to form a nationally unifed co-operative banking trade association, or *Verband* (*Bundesverband deutscher Volksbanken und Raiffeisenbanken,* or BVR). This body plays an important role in representing the interests of the co-operative banking sector in national and international forums.

Another important component of the *Verbund* that protects the primary banks' continued viability is a "non-compete clause" that prevents primary co-operative banks from other localities from entering any other co-operative bank's area of operation. In addition, all *Verbund* institutions are required to obtain permission from the relevant primary bank before approaching any of the latter's clients (BVR, 1989).

An interesting application of the model of co-operative decision-making presented above is to the *Verbund* itself, since the "members," the primary banks, jointly own and control the central institutions.[14] Shifts in the characteristics of the members of the *Verbund* could also affect the strategic direction of this larger association. We now argue that such a change has, in fact, occurred.

Figure 7 shows that the average size of primary co-operative banks has increased from 334 in 1960 to 5,154 in 1995, due both to an increasing number of co-operative members overall and consolidation of smaller banks within the sector. However, the increase in the average size of primary co-operative banks disguises an increasing skewness in the size distribution among the banks (see Figures 8 and 9). In terms of our model of co-operative decision-making, the skewness of the membership in the co-operative *Verbund* implies that the median member is much smaller than the average member. In other words, a bank with business volume in the range 100-250 DM million would be the *median*, and hence pivotal, member of the association if only the primary banks had votes. However, the *average* bank is in the 500-1,000 DM million range. Since many of the votes in the Board of Administration that governs DG Bank are in the

[14] The primary banks are not fully enfranchised, however, as the DG Bank, most notably, is a public-law corporation. The Federal Government and the Federal States retain some votes in the Board of Administration that governs DG Bank. This situation dates back to 1895, when DG Bank's predecessor institution was founded (Bonus and Schmidt, 1990, pp. 184, 193-194).

hands of government bodies, which may favor further consolidation or other kinds of restructuring of the sector, the median voter in the *Verbund* may be different from the median voter among the banks themselves.

The large primary banks, like the borrowers in our earlier discussion, might prefer to receive financial services and products from the *Verbund* institutions at a low price, since they are likely to be comparatively heavy users. These banks might value the consumer surplus they receive from the *Verbund* relatively more than the producer surplus (dividends) they get. The smaller banks, on the other hand, like the investors in our earlier discussion, would probably prefer a higher price of services in order to maximize the value of their ownership stakes in the associated enterprises.

According to some, conflicts such as these arising in the *Verbund* in recent years require changes in the structure of the co-operative banking sector (Bonus and Schmidt, 1990, p. 186). In principle, the democratic nature of the *Verbund* should allow diverse interests to be accommodated. The median member's preferences are pivotal, so extreme views are ruled out. Minority interests are protected by the threat of withdrawing from the organization. The cost of exit may be high for a small primary bank, however, so this channel of influence may be slight. It remains to be seen if the *Verbund* of the co-operative banking sector will prove to be as flexible as the co-operative banks themselves have been.

V. Conclusions

In the early period of co-operative banking in Germany the orientation of most members was overwhelmingly that of a borrower. That is, these members valued the availability of credit much more highly than the possibility of earning a small dividend. Given the democratic voting structure of a co-operative, the fact that the median member of most co-operatives was just such a person meant that these institutions lent at a break-even (below-marginal cost) level. The banks earned no profit, but this in itself provided incentives for the members to remain in the co-operative so that they would have a chance to borrow at this below-market price. The inefficiency engendered by this overproduction of credit services effectively served as a bonding mechanism for the members of the group.

As the characteristics of the membership of credit co-operatives changed, so did the business policies of the co-operative banks. When the median member of a given co-operative turned out to be more interested in earning a good return on his or her investment than in the possibility of borrowing at a below-market rate of interest, the democratic voting structure allowed the policy of the co-operative to shift. By raising the price of credit toward the efficient level, the co-operative was able to earn a profit and pay a competitive dividend. This allowed the co-operative bank to retain its investment-oriented membership although the previous core membership-- the borrowers-- were less well-served than before. The threat of withdrawal by borrowing members served as a powerful disciplining device, however, so the price of credit could rise no higher than the level available elsewhere in the market.

The nationwide networks of small urban and rural co-operative banks formed larger groupings in order to exploit economies of scale in payments, administration, and investment

very early in their development. This *Verbund* (sectoral association) of banking and other financial organizations allowed the co-operative banking sector to attain efficiency levels comparable to other more consolidated banking groups in Germany.

We have argued that conflicts of interest are important elements in the structure and functioning of the German co-operative banking sector. It may be surprising to some that this sector has been able to survive and adapt to modern financial-services competition. We believe our paper demonstrates that the co-operative form of corporate governance can be, in fact, quite flexible and successful even in the presence of changing membership characteristics.

Appendix

Derivation of a monopolist's lending price. The one-period profit of any lender is given by

$$\Pi(P) = \left[\frac{Q_v(V-P)}{V-v}\right](P-cQ) - F \text{ for } v \le P \le V. \tag{1}$$

Differentiating (1), we have

$$\frac{Q_v}{V-v}\left[(V-P_m)-(P_m-cQ)\right] = 0$$

which implies that $P_m = \frac{cQ+V}{2}$, as asserted in the text.

Derivation of a balanced co-operative's lending price. To find an expression for the price set by a balanced co-operative, P_e, we set aggregate quantity demanded equal to the supply curve (which is $Q=P/c$) and solve for the price:

$$\frac{Q_v(V-P_e)}{(V-v)} = \frac{P_e}{c} \text{ or } P_e = \frac{cVQ_v}{cQ_v + V - v}$$

as stated in the text.

FIGURE 1

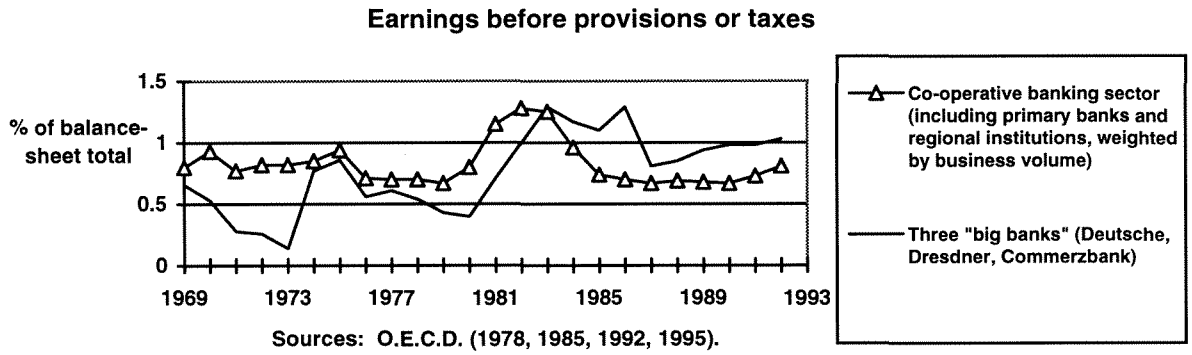


FIGURE 2

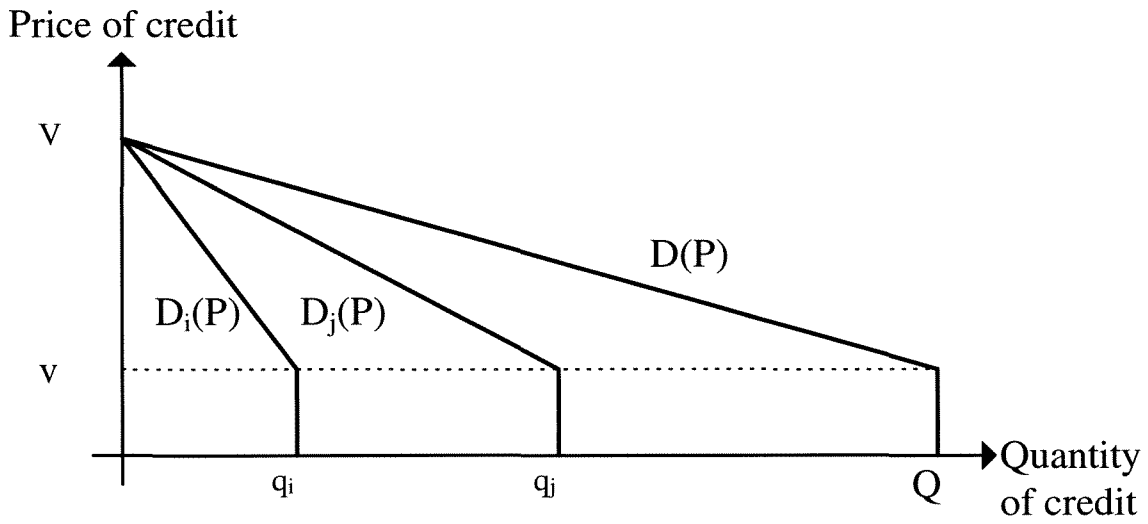


FIGURE 3

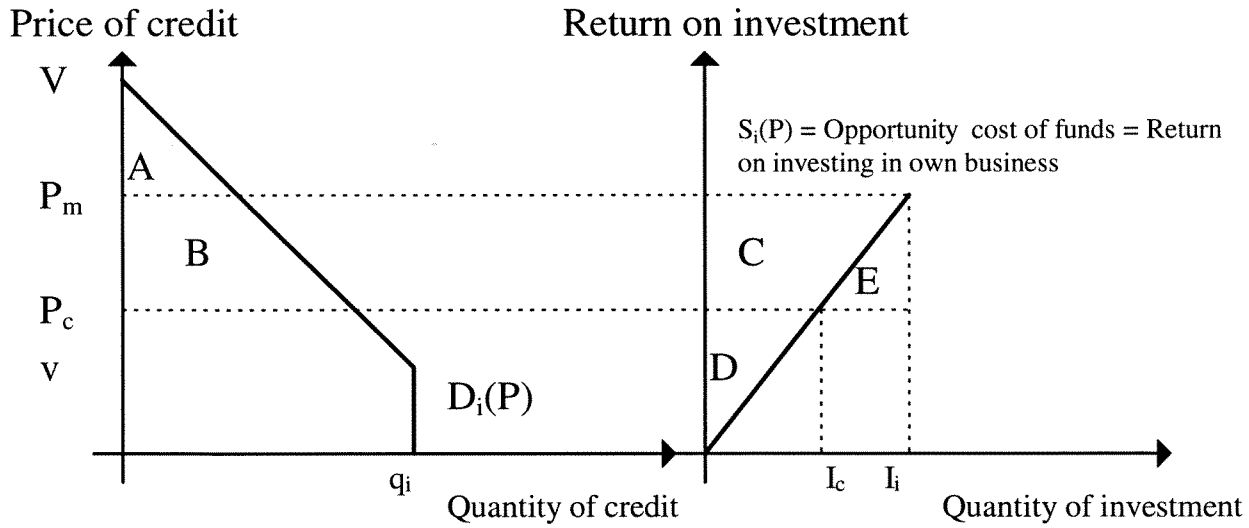


FIGURE 4

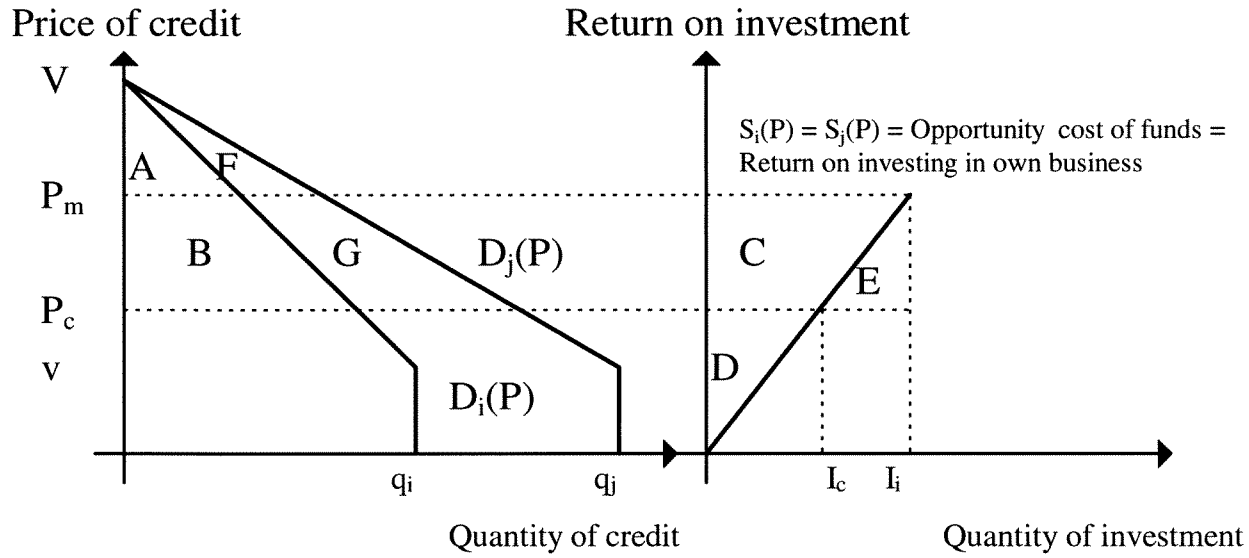


FIGURE 5

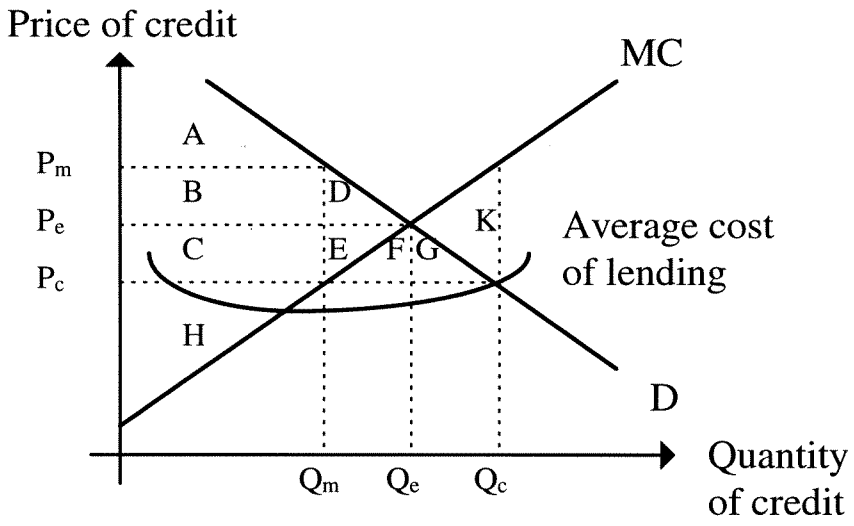
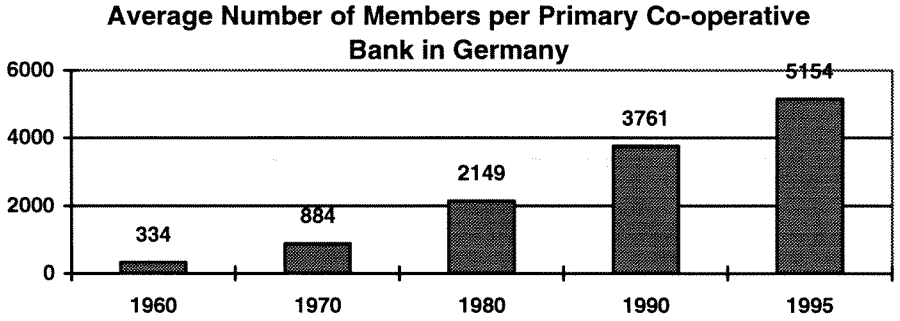


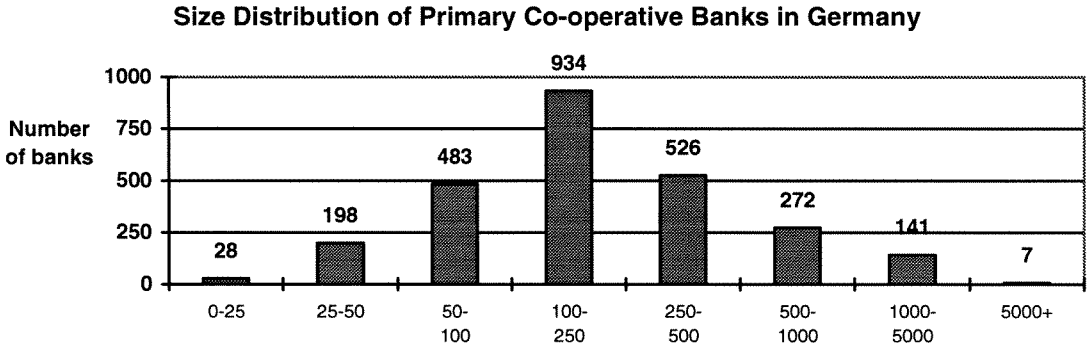
FIGURE 6

FIGURE 7



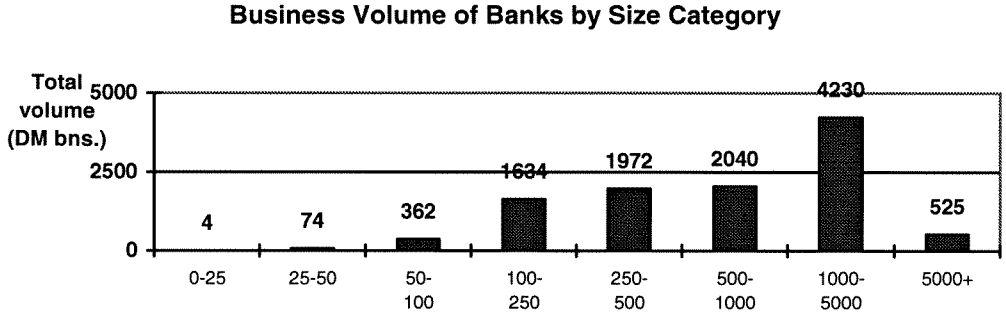
Sources: Ringle, 1993, p. 11; DG Bank, 1996.

FIGURE 8



Size category of bank (Business volume in DM millions)
Source: DG Bank, 1996.

FIGURE 9



Size category of bank (Business volume in DM millions)
Source: DG Bank, 1996.

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