

An Examination of Borrower-Orientation and Scale Effects
in UK Credit Unions

by

Donal McKillop
and
Charles Ferguson

* The authors are respectively Professor of Financial Services Queens University Belfast and Senior Lecturer in Business Organisation in the Ulster Business School at University of Ulster Jordanstown..

Introduction

The fundamental motivation of a credit union is to provide financial services to its membership, in particular a depository for savings and an access to consumer credit. As a practical problem there are, however, a number of reasons why credit unions may achieve a less than perfect balance in the treatment of borrowers and savers. More specifically maintaining low loan rates may reduce the credit union's ability to offer high dividend rates while the maintenance of high dividend rates may require higher loan rates. Consequently, the competing pull of these two objectives may result in the emergence of conflict between those credit union members who on the one hand are net savers and those on the other that are net borrowers. Given that the members of credit unions are in turn the owners, the member group conflict could potentially result in preferential treatment for one particular member group (borrower-orientated or saver-orientated behaviour), rather than balanced or neutral treatment.

In some countries credit unions have open or community-based membership policies. This leads to individual credit unions competing with each other for members with the net effect being that loan and dividend rates will tend to standardise across the industry. In such an environment and assuming that the credit union industry has a significant proportion of the savings and loan market it is also likely that credit union interest rates will be dictated by market rates. The open approach to credit union membership is at odds with the present situation in the UK, where the membership of individual credit unions is defined in terms of a relatively narrow and restrictive common bond. All other things being equal, the restrictive common bond, in that it insulates credit unions from competition from other credit unions, provides a greater latitude for the emergence of preferential treatment in the form of either borrower-orientated or saver-orientated behaviour.

A further factor which is likely to exacerbate the situation vis à vis UK credit unions rests with the regulatory framework within which UK credit unions operate. Currently UK credit unions are subject to a ceiling rate on both dividend payments and loan charges. Credit unions are prohibited from paying a dividend on members' shares which exceeds 8 percent per annum and are restricted from charging in excess of 1 percent per month (12.68 APR) for loans to members. Under such circumstances it is not difficult to envisage how a bias might emerge, although in this instance the bias, if it emerges, will be borrower-orientated in form.

On a more positive fact if it can be shown that the UK credit union industry is characterised by increasing returns to scale this then implies that as credit unions grow the destructive effect on membership cohesiveness of a borrower-orientated, or for that matter a saver-orientated bias, is less likely to manifest. While the membership bias, if it exists, is likely to continue, the decline in per unit costs can be divided between both member groups. Even if there is a further bias in the division of the benefits from the fall in per unit costs, the fact that the non-dominant group also benefits is likely, at least in the short term, to keep membership conflict in check.

The focus of attention in this paper is therefore on membership bias in UK credit unions and on whether the regulatory environment leads to a biased allocation of the benefits of credit union membership. To investigate these issues we adopt the methodology put forward by Walker and Chandler (1977) and Patin and McNiel (1991a; 1991b). These authors developed the concept of the net monetary benefits of credit union membership and established the conditions for the equitable allocation of such benefits.

In terms of the discussion format, the analysis commences with a literature review the theme of which is the potential conflict which arises between the interest of members who are net savers and those who are net borrowers. The methodology employed in both the calculation of the benefits from credit union membership and the identification of biases towards a particular member group is then detailed. An application of this methodology to UK credit unions for the year 1994 is then undertaken. The main body of the analysis concludes with an examination of whether the industry is characterised by size efficiency gains.

Literature Review

Taylor (1971), was one of the first authors to theoretically note the inherent source of conflict between borrowers and savers within cooperative organisations. Taylor demonstrates that when the credit union is saver dominated the objective of the dominant group is the maximisation of average net return (loan demand - average operating costs). Under these circumstances entry by new borrowing members will be regarded by the dominant saver-orientated group as being complementary to their own interests since additional borrowers give the credit union an

enhanced capacity to pay dividends. However, conflict emerges when an output level is reached where any further increase in savings by new members reduces dividend rates for all members, including current savers.

The objective of borrower-orientated credit unions is to minimise the average net cost of securing funds (joint production costs plus long run savings). In this situation it is in the interest of the dominant borrower group to allow all savers within the potential membership access to the savings facility of the credit union since they represent the lowest cost source of borrowed funds. The interest of the borrowing members are complementary with those saving members. However, conflict emerges between current borrowers and new borrowers when additional loan demand by new borrowing members has a detrimental effect on the borrowing charges faced by existing borrowers.

Quantitative information on the member group breakdown was first presented by Flannery (1974). From an examination of 951 US credit unions, the author found that a plausible categorisation was possible for 589 credit unions - borrower-dominated (143); saver-dominated (233); and neutral (213).

Walker and Chandler (1977) shift the focus somewhat and assess the impact of US regulatory constraints (loan rate and dividend rate ceilings) upon the equitable distribution of the benefits accruing from credit union membership. Walker and Chandler (1977) formalise the potential conflict between member groups and from a theoretical perspective demonstrate that the legal restrictions on dividend rates and loan interest charges result in strong pro-borrower bias.

Walker and Chandler (1978) develop a goal programming model which incorporates regulatory and environmental constraints and has as its objective the equal allocation of net member benefits between member groups. The authors in the course of this study highlight that due to the US legislative ceiling on the dividend rate a balanced distribution of monetary benefits is unattainable, with simulation exercises employed to highlight a pro-borrower bias.

Smith, Cargill and Meyer (1981) combine many of the earlier theoretical perspectives on credit unions into a much more versatile framework. Their main contribution is the construction of a generalised objective function which allows explicit weights to be attached to saver welfare versus borrower welfare. The authors' analysis and policy discussion emphasise the impact of

regulation and taxation on saver dominated credit unions. The authors suggest that a policy of taxing additions to reserves should result in saver-orientated credit unions taking a more neutral or borrower-orientated stance.

Flannery (1981) in a response to this paper questions whether the primary response of a saver-orientated credit union to a dividend rate ceiling would be that of increasing its reserves. He argues that most credit unions, at least in the US, should be able to distribute their earnings via a combination of implicit interest payments and the introduction of higher yielding certificate accounts.

Navratil (1981) constructs a six-equation simultaneous model to estimate aggregate flows within the US credit union industry. Navratil concludes that credit unions are loyal to their historical goal of providing members with low cost consumer credit, even if some potential revenues are sacrificed in the process.

Smith (1984) retraces much of the analysis presented in Walker and Chandler (1977) and Smith et al. (1981). Once again market rate comparisons are utilised in order to gauge the pecuniary gains accruing to members. However, many of the essential features of the previous models are recast in order to accommodate the intertemporal nature of credit union transactions.

Smith (1986) translates his earlier theoretical models into an estimable framework capable of detecting variant objective functions. The idea being that the borrower-saver conflict and the resolution of this conflict could lead to a variety of credit union types, ranging from complete borrower or saver preference at the extremes to some sense of neutrality as the intermediate position. Applying the model to a sample of 951 federally insured credit unions for each of the years 1976 to 1979, Smith (1986) found that 10 percent manifested a borrower preference and 22 percent a saver preference.

Patin and McNiel (1991a) return to the topic of member imbalances and employ a methodology similar in form to that of Walker and Chandler (1977). The authors conduct their analysis for 9,660 US credit unions for the year 1984. By the mid-1980's considerable deregulation had occurred within the US credit union industry. Consequently the equations employed by Walker and Chandler (1977) to estimate monetary benefits to member groups were re-worked by Patin and McNiel (1991a) to reflect the enhanced product freedom on offer to

credit unions. Employing somewhat ad-hoc boundary conditions the authors concluded that 2.7 percent of the sample could be classified as extreme borrower-orientated; 12.9 percent although viewed as unclassifiable were considered to exhibit the characteristics of weak borrower-orientated behaviour; 45.1 percent were categorised as neutral; 29.7 percent although for all intents and purposes unclassifiable were ranked as weakly saver-orientated; and finally 9.6 percent were considered to be saver-dominated.

A subsequent paper by Patin and McNiel (1991b) based on the same data set and utilising the same methodology raises further important points. In particular they found that US credit unions which are orientated towards a particular member group tend to be more concerned with maximising benefits per member, whereas neutral credit unions are more concerned with maximising the total benefits of the group. Patin and McNiel (1991b) suggest that the finding, credit unions subject to member group bias restrict membership size, is consistent with the theoretical model documented by Taylor (1971) which hypothesised that for credit unions subject to membership bias a conflict of interest emerges between existing members and potential new members.

The literature under consideration has been exclusively US based. Many of the papers did, however, adopt a theoretical stance and in consequence have relevance for credit unions located in other countries. As the regulatory environment within which UK credit unions currently operate is similar in form to that in the US pre-deregulation, it is the pre-1980 literature on membership bias which is most pertinent to the movement in the UK. Attention is now turned to the methodological approach to be adopted in the investigation of the member group orientation of UK credit unions.

Methodology Utilised to Estimate Monetary Benefits to Member Groups .

The methodology followed in this paper follows that detailed in Walker and Chandler (1977) and Patin and McNeil (1991a and 1991b).

The net monetary benefits of credit union membership are the increase in the interest rate earned on savings and the decrease in the interest rate paid on loans that a credit union member receives as a result of dealing with the credit union rather than the next best alternative.

In equation form, the net monetary benefit received by the credit union saver (NMB_S) is defined as

$$(NMB_S) = (D_C - S_O) \cdot TS \dots\dots\dots (1)$$

where,

- (NMB_S) = the net monetary benefits received by credit union savers
- D_C = the dividend rate paid on savings by the credit union
- S_O = the best alternative interest rate on savings available to credit union members
- TS = the total volume of member saving balances

Equation (1) measures the monetary benefits accruing to a credit union's saving members net of the opportunity costs associated with their decisions.

$$(NMB_B) = (L_O - L_C \cdot (1-R)) \cdot TL \dots\dots\dots (2)$$

where,

- (NMB_B) = the net monetary benefits received by credit union borrowers
- L_O = the effective loan interest rate available at the lowest cost non credit union lender
- L_C = the interest rate charged on a credit union loan
- R = the proportion of interest income on loans refunded to credit union borrowers
- TL = the total volume of loans to credit union members

Equation (2) measures the monetary benefits accruing to a credit union's borrowing members net of the opportunity cost of their decision to obtain funds from the credit union rather than their best alternative source of funds. The next step in the process is to compare empirically the benefits received by each member group, consequently the difference (D) between NMB_S and NMB_B is calculated for each credit union, that is,

$$D = NMB_S - NMB_B \dots\dots\dots (3)$$

To adjust for potential size bias the member group benefit imbalances for a particular credit union is weighted by the total asset size of that credit union, that is,

$$DR = (NMB_S - NMB_B) / TA \dots\dots\dots (4)$$

where,

TA = the credit union's total assets

In that a relative measure of member imbalances is more appropriate, an index of benefit imbalances (DI) is computed by standardising DR relative to DR = 0,

$$DI = (DR - 0) / STD_0 \dots\dots\dots (5)$$

where,

STD₀ = the standard deviation of DR about zero.

A particular credit union generates more net monetary benefits for saving members than for borrowing members if DI > 0. In contrast if DI < 0 the credit union generates more net monetary benefits for borrowing members while if DI = 0 the credit union provides equal benefits for both member groups.

An idea of the total monetary benefits (TB) which accrue to the members of a credit union can also be calculated and is given by,

$$TB = NMB_S + NMB_B \dots\dots\dots (6)$$

Data and Results

In that a significant component of UK credit unions are recently formed, spurious results would be likely to emerge if all 597 UK credit unions were included in the analysis of member group orientation. This rests with the fact that a sizeable section of credit unions pay either no dividends or simply a token dividend in the first few years after formation. This fact is highlighted in Table 1 which details the average dividend rate for credit unions based on different asset size categories. Asset size can, in effect, be taken as a proxy for the age of the credit union. Small scale credit unions, those in the asset range £613 - £49,999, are for the most part only two to three years in existence. This contrast with those credit unions in the size category “greater than £1 million”, many of these credit unions have been in existence since the formative years of the UK credit union movement - the early 1960’s.

TABLE 1
AVERAGE DIVIDEND RATE

ASSET RANGE	Number of Credit Unions	Average Dividend Rate (%)
over £1,000,000	59	4.09%
£500,000 - £999,999	49	3.31%
£250,000 - £499,999	42	3.43%
£100,000 - £249,999	59	1.61%
£50,000 - £99,999	49	1.71%
£613 - £49,999	339	0.7%

It is clear from Table 1 that small credit unions pay only a marginal dividend at best. In terms of our analysis these credit unions would automatically be classified as borrower-orientated. Consequently, credit unions which paid a dividend of less than one percent in 1994 were removed from the data set. This resulted in the omission of 314 credit unions from the database, leaving 283 credit unions on which to conduct the analysis.

The next stage in the analysis was the determination of the best alternative market loan rate and savings rate on offer outside the credit union industry. Scrutiny of savings and loan rates available from other financial institutions revealed that the best alternative rates were offered by building societies. A problem which did, however, emerge was that within this financial grouping it was not the large national players which provided the best interest rate package but rather the smaller regional or the local societies. By definition this latter group of building societies do not have a national exposure through a branch network system and hence choosing one of these institutions would be unfair in that the majority of credit union members would not be able to avail of its services. As a second best alternative, the building society offering the best saving rate and the best loan rate in each of the twelve regions of the UK was identified. The best regional rates were then employed to compute an average savings rate and an average loan rate and it was these rates which were used as proxies for the rates on offer outside credit unions.

There were, however, a number of further complications in the calculation of the monetary benefits to the member groups. Most members who save with a credit union in the UK are able to access their savings on demand and for the vast majority their savings are somewhere between £500 and £1000. There are a wide variety of savings products on offer at building societies. To match the characteristics of savings in credit unions we opted for a building society instant access account with the interest rate on offer that for an account with a minimum balance of £500. The alternative savings rate was calculated at an average rate of 2.374 percent for 1994.

A second problem relates to the fact that on the loan side of the balance sheet credit unions make secured and unsecured loans. Approximately 78 percent of credit unions loans are unsecured with the residual 22 percent secured. While UK credit unions charge a standardised loan rate irrespective of whether the loan is secured or unsecured this is not the case with other UK financial institutions, including building societies. It was therefore necessary to compute a weighted loan rate. In this instance the hypothetical loan portfolio was viewed to consist of a personal loan for between £500 and £5,000 of which 78 percent was unsecured. The average annual percentage loan rate (APR) for 1994 was calculated to be 19.971 percent.

The final complicating factor is that while all credit unions in the UK charge a standardised 1 percent per month (APR 12.68 percent) which is the maximum allowable under the 1979 Credit Union Act a number of credit unions in 1994 provided loan rebates to their members. The Board of a credit union may recommend a rebate of interest provided that the credit union pays a dividend to its members of not less than 3 percent. Of the 283 credit unions under scrutiny, 35 provided an interest rebate in 1994. For the 35 credit unions providing loan rebates the effective loan interest rate was reduced, on average, by marginally in excess of one percent.

Member Group Orientation of Credit Unions

The member group orientation of credit unions is determined by the sign of DI. When DI values for UK credit unions were calculated it transpired that the degree of member group benefit imbalances ranged on a continuum from extreme borrower-orientation (minimum value of DI = -3.4083) to marginal saver-orientated behaviour (maximum value of DI = +0.2991). For the sample set the mean value of DI was estimated to be -0.8927. This value indicates that for 1994

the average UK credit union was characterised as borrower-dominated. Indeed in that only three credit unions had a positive value of DI the vast majority of UK credit unions could, at least nominally, be classified as being subject to borrower-orientated behaviour.

Patin and McNiel (1991a and 1991b) while arguing that boundary lines between saver-orientated, neutral and borrower-orientated credit unions cannot be drawn with any great precision nevertheless adopt the following classification scheme. Credit unions with a DI value < -1.5 are categorised as extreme borrower-dominated while credit unions with a $-1.5 \leq DI \leq -0.5$ are viewed as borrower-orientated but in all probability unclassifiable. Those credit unions with $-0.5 \leq DI \leq +0.5$ are considered to be neutral in their behaviour. To be characterised as saver-orientated, although again probably unclassifiable, $+0.5 \leq DI \leq +1.5$ while to be ranked as extreme saver-dominated, $DI > +1.5$. On the basis of this classification scheme no UK credit unions were classified as exhibiting either weak or extreme saver-orientated behaviour, 40 were classed as neutral in the treatment of their members, 223 were viewed to be weakly borrower-orientated with the remaining 20 classed as extreme borrower-dominated.

It is possible to calculate the excess allocation of benefits to borrowers on an individual credit union basis. As an example, if the DI value for the average credit union ($DI = -0.8927$) is taken in conjunction with the computed standard deviation of DR about zero (2.69 pence per £ of total assets), the excess allocation of benefits to borrowers by the average credit union was 24 pence (-0.8927×2.69) per £ of assets. With 47.5 percent of credit unions having a value of $DI > -0.8927$, it is evident that an excess allocation of benefit to borrowers permeates the UK credit union industry at this point in time.

Should we be surprised at the strength of the pro-borrower stance of UK credit unions? The answer must clearly be in the negative. The regulatory environment, manifested in terms of dividend and borrowing rate ceilings, almost dictates that UK credit unions adopt a bias in favour of borrowers. This point can be highlighted by returning to the early work of Walker and Chandler (1977) and re-casting it in terms of the behavioural characteristics of UK credit unions.

The condition for the equitable distribution of the benefits from credit union membership is given as

$$\text{NMB}_S = \text{NMB}_B \dots\dots\dots (7)$$

which in terms of equations (1) and (2) may be rewritten as

$$(D_C - S_0).TS = (L_0 - L_C.(1-R)).TL \dots\dots\dots (8)$$

For all intents and purposes the credit union has only direct control over D_C , L_C and R . To some extent, through the setting of D_C and L_C it exercises a degree of control over TS and TL , the remaining variables, S_0 and L_0 are, however, determined outside the system and must be treated as exogenous by the credit union.

In the analysis of UK credit unions for 1994 the best alternative savings rate, S_0 , was 2.374 percent and the best alternative loan rate, L_0 , was 19.971 percent. For 1994 share capital, TS , was some 1.132 times as large as loans to members, TL , for the average UK credit union. Importantly for attempts to establish equity in the distribution of the net monetary benefits of credit union membership this ratio of 1.132 is relatively stable across all credit unions, not only during 1994 but also in each of the years from 1991 onwards. Under these conditions even a credit union that levies the maximum loan interest rate (12.68 APR) on its members, and in addition offers no interest loan rebates will necessarily be characterised as adopting a pro-borrower stance. This becomes clear on substituting the above noted values into equation (8) with the additional assumption made that loan rebates are not paid. Equation (8) becomes

$$(D_C - 2.374).1.132 = (19.971 - 12.68.(1-0))$$

Solving for D_C yields a value of 8.81 percent. In the context of UK credit unions such a solution is not possible as credit unions may not pay a dividend on members' shares which exceeds 8 percent per annum. Therefore at present, credit unions are locked into borrower-orientated behaviour. It should also be noted that loan interest rates in the UK in 1994 were at their lowest level since October 1977. Consequently, in each of the last seventeen years the UK credit union industry must also have been characterised as borrower-dominated.

At present in the UK the situation persists where the net monetary benefits to savers is less than the net monetary benefits which accrue to borrowers, that is,

$$NMB_S < NMB_B \dots\dots\dots$$

(9)

which may be rewritten as

$$(D_C - S_O).TS < (L_O - L_C.(1-R)).TL \dots\dots\dots$$

(10)

which can in turn be written as

$$(D_C .(TS/TL)) + (L_C.(1-R)) < L_O + (S_O.(TS/TL)) \dots\dots\dots$$

(11)

Again assume that savings continue to run at 1.132 times loans to members and that credit unions do not offer interest rebates. In addition assume that credit unions adopt a policy of paying the maximum dividend rate possible, 8 percent. Under such circumstances the right hand of the inequality in equation (11), $L_O + (S_O.(TS/TL))$, would need to fall to 21.736 percent before the pro-borrower bias is eliminated and there is equity in the treatment of borrowers and savers. On the assumption that the savings to loan ratio remains constant the fall in $L_O + (S_O.(TS/TL))$ must occur through a fall in either L_O or S_O . A change in the former would lower the monetary benefits to credit union savers while a fall in the latter would cause the benefits to borrowers to decline. If credit unions were to operate at their loan and dividend rate ceilings, equity in the treatment of membership groups could be achieved with a net fall in $L_O + (S_O.(TS/TL))$ of only 0.922 percent. While this net fall is relatively small it must be remembered that nominal interest rates are at present extremely low, and in fact have not been this low, on a consistent basis, since the mid 1960's. It must therefore be concluded that if the dividend and interest rate ceilings continue in place there is little prospect of credit unions achieving a balanced treatment of member groups.

Assuming that an equal distribution of net monetary benefits is desirable, what are the necessary steps which must be taken to reduce the biases in the distribution of benefits? There are in fact two steps which could be taken. One is to raise or eliminate the maximum dividend rate while the second is to raise or eliminate the maximum loan rate. It is of course also possible to opt for some combination of the two steps. In the analysis by Walker and Chandler (1977) a similar dilemma was faced by US credit unions. Walker and Chandler made the point that if the maxims of welfare economics are followed then the choice must be to raise the dividend rate, (the interest

rate ceiling on credit union share accounts in the US was removed in 1976, see Reichert and Rubens (1994)). Such a measure would seek to reduce the pro-borrower bias without reducing the welfare of either group. The problem for UK credit unions in adopting this proposal is that the loan rate ceiling at 12.68 APR is relatively low and as the dividend rates would need to exceed 8 percent to generate equity of treatment of member groups this may result in too narrow a margin to permit the credit union to operate efficiently. This is likely to be particularly the case when the credit union achieves a size where it becomes necessary to employ full-time staff.

Increasing the maximum loan rate for credit unions thus becomes a more viable alternative, although such an action will reduce the welfare of borrowers. Of course, raising the maximum loan rate does not automatically force the credit union to charge higher loan rates. What it will do, however, is to create the potential for equality in the treatment of borrowers and savers. It is then a decision for the membership of individual credit unions whether a balanced or unbalanced treatment of member groups should be pursued.

Member Benefits and Group Orientation

The implicit assumption throughout the discussion has been that neutrality in the treatment of members should be a credit union's preferred objective. This is to some extent confirmed by an examination of average total benefits per credit union and total benefits per credit union member for the earlier member group classifications. For the 40 credit unions classed as neutral in the treatment of their members average total benefits (benefits per member) were £71,000 (£42.86); for the 223 credit unions viewed to be weakly borrower-orientated the average total benefits value (benefits per member) was £66,685 (£40.33); while for the remaining 20 credit unions classed as extreme borrower-dominated the mean total benefits value (benefits per member) was £10,326 (£33.57). While nominally the calculated values could be considered to provide strong support for the theoretical argument that neutral behaviour maximises total benefits and indeed benefits per member, it should be noted that the respective values had high associated standard deviations and hence a difference between means analysis did not yield significant results.

A credit union's affiliation could also be a determining factor in both the member group orientation of the credit union and in the benefits which accrue as a consequence of membership.

In the UK, credit unions are affiliated to one of three main groupings. The Irish League of Credit Unions (ILCU) whose UK members are all located in Northern Ireland. The Association of British Credit Unions Limited (ABCUL) whose membership is based in Great Britain and the National Federation of Credit Unions (NFCU) whose members are spread across the UK. The larger credit unions are affiliated to the ILCU and ABCUL and these two trade bodies may be viewed as sister organisations in that both are linked to the World Council of Credit Unions. Although the membership of the NFCU stretches across the UK most member unions tend to be of a relatively small asset size. (More details on the respective trade bodies can be found in Ferguson and McKillop (1997)).

The degree of pro-borrower bias for ILCU affiliated credit unions was calculated at -0.7074. Comparable values for ABCUL and NFCU affiliated credit unions were respectively -1.0512 and -0.9319. The inference to be taken is that ILCU credit unions have a lower degree of pro-borrower emphasis than credit unions affiliated to the other two trade organisations. In this instance the differential has little to do with differences in the ethos of the trade organisations. Rather it is a function of the fact that the ILCU represents a more mature, longer established group of credit unions with this longevity and greater maturity manifesting itself in the form of higher dividend rates to savers relative to those paid by credit unions more recently formed. This automatically results in longer established credit unions generating higher monetary benefits for savers leading to a reduced borrower-orientated bias. Credit unions in their formative years, such as many of those affiliated to the NFCU and ABCUL, traditionally pay only a token dividend. This is due to the fact that any surplus generated through operations is initially reinvested in premises, equipment and staff training. Only after credit unions have been in existence for a number of years does the dividend rate begin to creep up towards the notional average for the industry. This contrasts with rates charged on loans, where credit unions immediately levy a rate close to or at the loan rate ceiling.

Consequently it is likely to be the case that the present differential in the index of borrower-orientation between ILCU credit unions and those affiliated to the NFCU and ABCUL is in all probability transitory. This is also true for the mean total benefit value per member which for ILCU members was calculated at £70.13, compared with £52.28 for ABCUL members and

£31.56 for NFCU members. What, however, should be stressed is that while maturity will reduce the degree of borrower imbalance and raise benefits per member for both NFCU and ABCUL credit unions, the regulatory environment, if it remains, will ensure that borrowers are the dominant member group.

Scale Efficiency

In the introduction to this paper it was suggested that if the UK credit union industry was characterised by increasing returns to scale this may dampen any potential for membership conflict. A cost function approach is the most accepted methodology to examine for the existence or otherwise of scale economies. Unfortunately, for a number of reasons, it is not possible to pursue a cost function methodology in this study of UK credit unions. First, a significant proportion of UK credit unions depend totally upon donated capital and labour and consequently their input costs relate solely to "other expenses" - printing and stationary, loan and share insurance etc. Secondly, for those credit unions which report capital and labour expenditure in their annual accounts the problem still remains as to the determination of appropriate input prices. With respect to the labour input the problem rests with the fact that individual credit unions do not publish statistics on employee numbers making it impossible to compute an input price. With regard to the capital input price, varied theoretical and practical problems make it difficult to compute a representative input price irrespective of the form of the financial organisation, (see for example, Glass and McKillop (1992) for an analysis of capital input price problems, while Karafolas and Mantakas (1996) provide a more recent analysis vis à vis Greek banking).

The second best alternative, as in the work of Cox and Whigham (1984), Kohers and Mullis (1988) and McKillop et al. (1995) is to examine the operational efficiency of credit unions. The income statement measure, operating costs to operating income is employed as the key measure of operational efficiency.

To test for the existence of scale economies, credit unions were paired on the basis of size differences. Credit unions in each size category were compared to credit unions in the other size categories which allowed, in total, for 15 size category comparisons. The mean difference in the operational efficiency measure employed was then tested for statistical significance. The null hypothesis for a test of the comparison of sample means with paired observations is $d = 0$ where d is the population mean difference in the efficiency measure between paired observations. The test statistic is distributed as student's t and may be expressed as follows:

$$t = \bar{d} / S_{\bar{d}} \text{ Error! Switch argument not specified.}$$

where

$$\bar{d} = \sum_{i=1}^n (x_{1j} - x_{2j}) / n = \text{sample mean difference Error! Switch argument not}$$

specified.

$$x_{1j} = \text{Error! Switch argument not specified. the measure of efficiency for the } j\text{th credit}$$

union

in the first category, e.g. small credit unions.

$$x_{2j} = \text{Error! Switch argument not specified. the measure of efficiency for the } j\text{th credit}$$

union

in the second category, e.g. large credit unions.

$$n = \text{Error! Switch argument not specified. the total number of pairs, and}$$

$$S_{\bar{d}} = \sqrt{\frac{\sum_{j=1}^n (x_{1j} - x_{2j})^2 \left[\sum_{j=1}^n (x_{1j} - x_{2j}) \right]^{2/n}}{n(n-1)}} \text{ Error! Switch argument not specified.}$$

The paired difference methodology in that it is based on the efficiency ratios suffers from the fact that smaller credit unions rely more heavily upon donated inputs and in particular donated labour. The implication of this is that operating costs are distorted with a bias introduced against finding scale economies. This in turn implies that any scale economies that survive this bias should be treated all the more seriously.

Documented in Table 2 are the size category comparisons; the number of paired observations per category compared; and the computed mean differences and associated

standard errors for the efficiency measures, operating costs / operating income and (operating costs - staff remuneration) / operating income.

TABLE 2
SIZE ECONOMIES IN CREDIT UNIONS

Credit Union Size Category Comparison ¹	Pairs of Observations	Operating Costs/ Operating Income Mean Difference ²	(Operating Costs - remuneration) / Operating Income Mean Difference ²
C6 with C5	49	0.1677* (0.0627)	0.1930* (0.0603)
C6 with C4	59	0.2805* (0.0555)	0.2889* (0.0578)
C6 with C3	42	0.3609* (0.0755)	0.3996* (0.0789)
C6 with C2	49	0.4487* (0.0865)	0.5682* (0.1011)
C6 with C1	59	0.4018* (0.0586)	0.5526* (0.0771)
C5 with C4	49	0.1388* (0.0488)	0.1513* (0.0489)
C5 with C3	42	0.1261* (0.0598)	0.1597* (0.0518)
C5 with C2	49	0.2312* (0.0537)	0.3098* (0.0543)
C5 with C1	49	0.1835* (0.0511)	0.3084* (0.0577)
C4 with C3	42	0.1595* (0.0497)	0.1521* (0.0370)
C4 with C2	49	0.0679* (0.0276)	0.1428* (0.0335)
C4 with C1	59	0.1047* (0.025)	0.2121* (0.0331)
C3 with C2	42	-0.0102 (0.0600)	0.0111 (0.0218)
C3 with C1	42	0.1030** (0.0539)	0.1280* (0.0272)
C2 with C1	49	0.0648* (0.0240)	0.0853* (0.0146)

¹C1=£1m or more; C2=£0.5m to £999,999; C3=£0.25m to £499,999; C4=£100,000 to £249,999; C5=£50,000 to £99,999; C6=£613 to £49,999.

²Standard errors are in parentheses.

* statistically significant at the 5% level of significance.

** statistically significant at the 10% level of significance.

It is clear from Table 2 that, for the most part, smaller credit unions have significantly higher operating costs to operating income ratios. Indeed a pronounced pattern emerges when the C6 group of credit unions, those with an asset base between £613 and £49,999, are compared with the other credit union classifications. The pattern is one of a staged increase in the mean difference of the efficiency variable as the size difference compared increases. The inefficiency of the C5 group of credit unions, those with assets between £50,000 and £99,999, relative to the other larger asset size groupings is also apparent from Table 2, as indeed is the inefficiency of the C4 group, those with assets between £100,000 and £249,999, relative to larger scale credit unions.

The uniform picture of increasing operational efficiency then appears to break down somewhat when the C3 credit union group is employed as the control in the pairing process. The problem in the main relates to the pairing of C3 credit unions, (assets between £250,000 and £499,999) with the C2 credit union group, (assets between £500,000 and £999,999). The paired mean difference estimate suggests greater operational efficiency for the smaller scale credit union group. This apparent dichotomy in the findings relates to the broader and more comprehensive range of input costs faced by the C2 group which are not offset as a consequence of achieving increased operational efficiency through scale. Only when credit unions enter the C1 category, assets greater than £1m, does the scale effect outweigh the broader portfolio of input costs and causes a further significant upward movement in operational efficiency. This point is highlighted by the fact that the paired mean difference values between C1 credit unions and the other groups, C2 through to C6, are indicative of C1 credit unions having, in each case, a significantly lower operating costs to operating income ratio.

Also reported in Table 2 are mean difference values for the ratio, operating costs minus staff remuneration divided by operating income. These reported figures and their associated standard errors add little new information. The trends identified mirror completely those identified in the mean difference analysis based on the unadjusted measure of operational efficiency. The only difference of any real substance relates to the magnitude of the reported values. As would be expected, excluding remuneration expenses results in an increase in the reported mean difference values. This relates to the fact that credit unions in the larger asset size categories are more liable

to pay salary expenses hence its removal from operating expenditure widens the cost ratio gap with credit unions of a smaller asset size.

From this aspect of the analysis it can thus be argued that this finding of increasing returns to scale is likely to dampen any potential for membership conflict. Increasing returns to scale can translate into higher returns for shareholding members and lower loan costs for borrowing members.

Concluding Comments

The results documented in this paper indicate that almost all credit unions in 1994 exhibited borrower-dominated behaviour. It was also stressed, based on an examination of market rates of interest, that the UK credit union industry was likely to have been characterised as pro-borrower in each of the prior 17 years. This result was in part almost a foregone conclusion given that the 1979 Credit Union Act requires credit unions not to pay dividends above a stipulated maximum of 8 percent per annum nor charge loan interest rates in excess of 1 percent per month.

It was also argued that further falls in market interest rates would aid in the reduction of the pro-borrower bias. However it is our view that irrespective of the degree of further interest rate falls credit unions will not be able to achieve a neutral treatment of their members. Given the present dividend and loan rate ceilings the achievement of a balanced treatment of borrowers and savers would require that credit unions operate off relatively narrow margins, with the required interest rate spread probably too narrow even for financial institutions which pay only a fraction of their true operating costs.

On a more positive front the analysis also highlighted that ILCU affiliated credit unions were less borrower orientated than those affiliated to either the NFCU or ABCUL. This finding was taken to suggest that as credit unions become longer established the average dividend paid tends to rise which reduces the degree of borrower orientation. If this finding is coupled with the fact that the UK credit union industry has been shown to be characterised by increasing returns to scale then the long run "equilibrium" position of UK credit unions being weakly borrower orientated may not lead to membership conflict and hence a threatening of the cooperative principles on which credit unions are based. Indeed, one can proceed a step further and argue

that membership conflict may not emerge because individual members, over time, are likely to enjoy some periods as net savers and other periods as net borrowers.

The theoretical debate has always centred on the first best position being that of a neutral treatment of borrowers and savers. In this discussion we have shown that the achievement of this objective in the context of the regulatory environment under which UK credit unions operate is impossible. In the body of the analysis it was suggested that if credit unions were to achieve a balanced treatment of their membership then it was necessary to remove the interest and dividend rate ceilings to which they must adhere. However, if we abstract from the theoretical debate and refocus on the fact that credit unions are invariably based in low income communities where access to cheap loan funds alleviates a degree of the hardship faced by many families then it may in fact be a retrograde step to create an environment where there was not an upper loan rate ceiling. Indeed, it may be the case that the UK situation of weakly borrower orientated credit unions while not theoretically optimal is nevertheless socially optimal. Given the unique and positive role played by credit unions in low income communities it is therefore our view that weak borrower domination is an insufficient reason for a revision of the dividend and loan rate ceilings.

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