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REGULATION AND THE PUBLIC INTEREST IN BANKING

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The rules that should govern competition and conduct in banking are currently the topics of spirited debate. This paper proposes a rigorous welfare-theoretic methodology which can provide a unifying focus for a wide range of regulatory and market structure issues in banking. The methodology is then applied in an empirical study of recent FDIC bank merger decisions. Evidence is found that potential welfare losses to borrowers and welfare gains to bank owners do influence the decisions taken, and that borrowers and bank owners receive roughly equal treatment by the regulator. The potential welfare losses to depositors, however, appear to be generally ignored.

1. Introduction

The banking industry is one of the most important and highly regulated industries in the United States. Today profound changes in banking technology and the structure of the financial industry are occurring rapidly, and the challenges to bank regulators and policy analysts are great. Though the microeconomic theory of regulation applicable to ordinary goods and service industries has recently witnessed considerable development, parallel developments in banking regulation have lagged behind. The purpose of this paper is to address that deficiency.

Ever since Chandler (1938) and Alhadeff (1954) first applied Chamberlinian models of monopolistic competition to problems of the banking industry, theoretical and empirical studies of banking regulation and market structure have been guided by a 'public interest' point of view. Specific notions of what constitutes the public interest have been many and varied. The classic indicators in such studies, however, have been some limited aspect of bank 'performance', such as bank costs, interest rates, or profitability [e.g., Bell and Murphy (1968), Benston (1965, 1972), Flechsig (1965), Meyer (1967)]. The relationship of the public interest to these measures of bank performance has usually been understood by implicit analogies drawn between banking markets and ordinary goods and service markets where such cost and price

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performance measures can be rigorously linked to well-defined notions of productive efficiency and individual and social welfare.

The shortcomings of this approach to public interest analysis in banking are twofold. First, no such single indicator as cost or price performance can capture more than a limited dimension of overall social welfare. Bank cost performance reveals something about productive efficiency, but is silent on the subject of the welfare of the consumers of banking products. Interest rate performance reveals something about consumers' welfare, but very little about productive efficiency. What is needed is some tractable and empirically usable criteria of social welfare which is capable of embracing all such partial aspects of the social welfare simultaneously.

The second difficulty with public interest analyses of banking markets in the Chamberlinian tradition is the fact that the analogies drawn between banking and other industries are not always entirely legitimate. The characteristic 'products' of banks, credit and debt instruments, or loans and deposits, are intrinsically different from the products of other industries. Agents' behavior in these markets largely summarize and reflect their *intertemporal* allocation of resources between ordinary goods and service markets in different time periods. This qualitative difference in the character and time frame of agents' decision-making in these markets gives rise to important differences between banking markets and other types of markets in the relationship of observed behavior to common notions of welfare.

Recognizing its essentially normative character, the study of banking regulation from a public interest point of view requires, first, the specification of an index of the public interest which is coherent, comprehensive, and yet flexible enough to allow for diverse views on distributional issues. In keeping with the spirit of the Chamberlinian traditions of analysis in banking, this should be some individualistic, utility-based criteria. A broad class of such indicators can be conveniently formalized as Bergsonian-type social welfare functions. Recognizing the unique characteristics of banking products and the decision processes underlying agents' behavior in these markets, the precise theoretical and empirical relationship between traditional market performance measures and familiar notions of individual and social welfare can be established rigorously.

In this paper, one such Bergsonian social welfare function which can legitimately be applied to banking market analyses is proposed, and then applied in an empirical study of the FDIC's decision-making process in recent bank merger cases. Section 2 of the paper provides an overview of the construction and properties of the social welfare function itself. Building from explicit intertemporal models of individual decision-making, a theoretically exact measure of the influence of interest rate and wealth changes on individual welfare can be defined. The relationship of this theoretical measure to observable borrower and depositor surplus measures can then be specified, though the details of this relationship are fully explored elsewhere [Jehle (1984)]. Aggregating over individuals, a comprehensive social welfare criteria analogous to the simple sum of consumer and producer surplus is constructed. Section 3 provides an example of how the welfare methods proposed in section 2 can be applied in practice through an empirical analysis of intergroup welfare tradeoffs in recent FDIC bank merger decisions. It is found that if increased concentration through bank mergers affects traditional market performance variables, then the FDIC's decision-making process generally results in consideration and roughly equal treatment being given to the potential welfare gains to bank owners and welfare losses to borrowers which are likely to follow. Welfare effects of merger on depositors, however, appear generally to be ignored. The sensitivity of these general conclusions to specific assumptions made in the analysis are tested and they are found to be quite robust. Section 4 offers some concluding remarks.

2. A social welfare function for banking

The starting point in the construction of a usable Bergsonian social welfare function applicable to banking market analyses must be a specification of the relationship between market observables and individual welfare. Observable individual demands for loans and deposits can be modelled as the outcome of a standard Fisherian intertemporal utility maximization process, and these can be used to establish the relationship between individual welfare and observable market interest rates and wealth. To establish the essentials of the argument with the least possible clutter, only the simplest two-period, two-instrument case is considered here.

The individual is assumed to possess a non-decreasing, strictly quasiconcave utility function defined over consumption levels in the current and future period, $U(C_0, C_1)$, to be endowed with initial period wealth w, and to expect with certainty future income Y_1. The individual faces fixed single-period interest rates r and d at which he can borrow and lend, respectively. If $L^* \geqq 0$ and $D^* \geqq 0$, denote the *future* values of the amounts borrowed and lent in the initial period, then the present values of borrowing and lending, or the amounts actually borrowed and lent in the current period, are given by $L = (1/1+r)L^*$ and $D = (1/1+d)D^*$, respectively. Future period consumption will then be given by future income plus the future value of net current period lending, $C_1 = Y_1 + D^* - L^*$.

The individual's problem is to maximize utility of consumption subject to the constraint that current period consumption plus the present value of net lending does not exceed current resources. Given the relationship of C_1 to D^* and L^*, this problem can be viewed equivalently as one of choosing C_0, D^* and L^* to maximize utility, subject to the present value constraint. An indirect utility function, relating interest rates and wealth to individual utility, can be defined for this problem as follows:

$$v(r,d,w)=\max_{C_0,D^*,L^*} U(C_0, Y_1+D^*-L^*)$$
$$\text{s.t.} \quad C_0+\left(\frac{1}{1+d}\right)D^*-\left(\frac{1}{1+r}\right)L^*=w. \tag{1}$$

The dual of the indirect utility function, an analog to the usual expenditure function, is defined as

$$e(r,d,v)=\min_{C_0,D^*,L^*} C_0+(1/1+d)D^*-(1/1+r)L^*$$
$$\text{s.t.} \quad U(C_0, Y_1+D^*-L^*)=v. \tag{2}$$

It can easily be shown that $v(r,d,w)$ is decreasing in r, increasing in d and w, and that $e(r,d,v)$ is increasing in r, decreasing in d, and increasing in v. Application of the envelope theorem to the Lagrangian for the maximization problem in (1), together with the definition of the present value demands L and D establishes the following derivative property of the indirect utility function:

$$\frac{-\partial v/\partial r}{\partial v/\partial w}=\left(\frac{1}{1+r}\right)L(r,d,w),$$
$$\frac{-\partial v/\partial d}{\partial v/\partial w}=\left(\frac{-1}{1+d}\right)D(r,d,w). \tag{3}$$

The fundamental tool for the analysis of individual welfare is the wealth-compensation function, μ, analogous to the income-compensation function first introduced by Hurwicz and Uzawa (1971). This will be defined as the minimum wealth necessary at one set of interest rates r and d to achieve the maximum intertemporal utility level achieved at any other arbitrarily chosen set of interest rates and wealth r^0, d^0, and w^0. It is defined implicitly as

$$v(r,d,\mu(r,d\,|\,r^0,d^0,w^0))\equiv v(r^0,d^0,w^0)\equiv v^0. \tag{4}$$

It is clear from the definition that $\mu(r,d\,|\,r,d,w)=w$. Differentiating with respect to each of the interest rates, and using (3),

$$\frac{\partial\mu(r,d\,|\,r^0,d^0,w^0)}{\partial r}=\left(\frac{1}{1+r}\right)L(r,d,\mu(r,d\,|\,r^0,d^0,w^0)),$$

$$\frac{\partial\mu(r,d\,|\,r^0,d^0,w^0)}{\partial d}=\left(\frac{-1}{1+d}\right)D(r,d,\mu(r,d\,|\,r^0,d^0,w^0)). \tag{5}$$

For any arbitrarily chosen, but fixed, interest rates $r^0>r$ and $d^0<d$ it can be shown that there exists a strictly monotonic increasing transformation of the original indirect utility function $v(r,d,w)$, which allows the same ordinal properties of the individual's preferences to be represented by the 'dollar-scaled' indirect utility function $v^*(\cdot)$, where[1]

$$\begin{aligned} v^*(r,d,w)=\mu(r^0,d^0\,|\,r,d,w)=&\int_r^{r^0}\frac{L(\xi,d,\mu(\xi,d\,|\,r,d,w))}{1+\xi}\,\mathrm{d}\xi\\ &+\int_{d^0}^{d}\frac{D(r^0,\xi,\mu(r^0,\xi\,|\,r,d,w))}{1+\xi}\,\mathrm{d}\xi+w. \end{aligned} \tag{6}$$

The integrals in (6) give the compensating variation in wealth for an interest rate change from r and d to r^0 and d^0, or the wealth adjustment necessary when facing rates r^0 and d^0 to achieve the utility level reached when facing r,d and having wealth w. These integrals can be thought of as areas under sequentially shifted 'Hicksian' or compensated demand functions for loans and deposits. While the indirect utility function v^* is measured in terms of observable 'dollar' or wealth units, its level cannot be directly observed since the Hicksian demands cannot be directly observed.

It is possible, however, to define observable surplus measures, analogous to ordinary consumer surplus measures, which approximate the true compensating variation to a high and quantifiable degree of accuracy. Let borrower surplus, BS, and depositor surplus, DS, be defined as the (discounted) areas under sequentially shifted 'Fisherian' or observable individual demands for loans and deposits, and calculated as

$$\begin{aligned} BS&\equiv\int_r^{r^0}\frac{L(\xi,d,w)}{1+\xi}\,\mathrm{d}\xi,\\ DS&\equiv\int_{d^0}^{d}\frac{D(r,\xi,w)}{1+\xi}\,\mathrm{d}\xi. \end{aligned} \tag{7}$$

It is important to notice that the surplus measures BS and DS defined here are not simply the areas under loan and deposit demand functions between two interest rate levels. They are those simple surplus areas 'discounted' over

[1] To verify that (6) generates the same demand behavior as (1), substitute from the l.h.s. of (5) under the integrals in (6), differentiate with respect to r, d, and w, substitute from the r.h.s. of (5), and form the ratios in (3).

the range of integration by the factor $1/(1+\xi)$. This discounting is necessary in order for the observable surplus to conform to the proper ex ante, or beginning of period, compensating variation in wealth. Failure to calculate the observable surpluses in this way can lead to significant measurement errors and result in spurious welfare inferences.

Letting T be the difference between the unobservable compensating variation and the observable BS and DS measures, the individual's indirect utility function can be rewritten as

$$v^*(r,d,w) \equiv BS + DS + w + T. \tag{8}$$

Except for the error term T, (8) gives an index of individual welfare measured in observable units which can be calculated from observable market data. Results analogous to those derived by Willig (1976) on estimating compensating variation in income with ordinary consumer surplus can be obtained on estimating the compensating variation in wealth with BS and DS. As in the usual case, upper and lower bounds on the error T can be obtained from observable market data which show that its size is negligible in most realistic situations likely to be encountered in practice [Jehle (1983, 1984)].

A simple Bergsonian social welfare function capable of serving as a regulatory objective function can easily be constructed using (8).[2] For a society of s individuals, the general Bergsonian social welfare function takes the form $SW = SW(U_1, \ldots, U_s)$, where U_i is the utility level of individual i. SW may be made to depend on interest rates and wealth by substituting the indirect utility functions for the U_i. Letting SW take the simple linear form:

$$SW = \sum_{i=1}^{s} a_i v_i^*(r,d,w_i). \tag{9}$$

The coefficients a_i measure the welfare weight accorded to each individual's utility level in the eyes of the regulator and, if all $a_i > 0$, this welfare function satisfies the 'Pareto property'. If, for the sake of simplicity, it is assumed that the set of s individuals in the regulator's constituency can be partitioned into three disjoint subsets consisting of borrowers, depositors and bank owners, and that the regulator views each group member as indistinguishable from the others in the same group, then, using (8), the social welfare function can be written as the weighted sum of borrower and depositor wealth, aggregate borrower and depositor surplus, aggregate bank profits and an error term. If some regulatory policy act is expected to affect loan and

[2]Bergsonian welfare functions have several well-known limitations which must be kept in mind in any application. However, if wealth redistribution is outside the sphere of policy options for the regulator, Willig (1979) has shown that the Bergsonian approach is an appropriate one.

deposit interest rates and bank profits then, using (8) and (9), the change in social welfare expected to result from the policy act can be decomposed into the weighted sum

$$\Delta SW = a_1 \Delta BS + a_2 \Delta DS + a_3 \Delta \Pi + T^*, \tag{10}$$

where the a_i measure the regulator's inter-group welfare weights, $\Delta\Pi$ measures the change in bank profits, and ΔBS and ΔDS measure the changes in borrower and depositor surplus calculated from aggregate, market-level demands for loans and deposits. Upper and lower bounds on the error term T^* can be calculated using upper and lower bounds on the wealth elasticities of market demands for loans and deposits, and it can be shown that this error will generally be small.[3]

Much less stringent assumptions than those made here for the sake of expositional clarity are sufficient to justify the general form of the social welfare function given in (10). Though these issues are specifically addressed elsewhere, it bears noting that it is a straightforward and easy matter to allow for the existence of an arbitrarily large number of deposit and loan instruments with different maturities which banks might offer, and to allow for the borrowing and lending of firms in addition to that of individuals. Within this same framework, it is also possible to expand the scope of analysis to include consideration of banking activities other than borrowing and lending, such as the provision of financial and transactional services. The large and highly developed literature on the welfare analysis of firms that produce ordinary goods and services is directly applicable to the analysis of banks' activities in these areas, and is entirely compatible with and integrable into the social welfare function given in (9) and (10).

When borrower and depositor surplus measures are defined and calculated as in (7), indexes of social welfare change such as (10) have several nice properties and can play a useful and important role in the formulation and assessment of banking regulatory policy. First, they strongly resemble in spirit and substance the familiar sum of producer and consumer surplus widely used as an index of social welfare in most theoretical and applied analyses of policy and performance in markets for ordinary goods and services. Second, they provide the regulator or policy analyst with an empirically usable tool with a clear and quantifiable relation to rigorous and commonly accepted notions of individual and social welfare. Finally, and most importantly, like all social welfare functions, (10) offers the analyst a criterion for evaluating policy which simultaneously incorporates the often countervailing considerations of equity and efficiency.

[3]See Jehle (1983) for details of the bounding procedure.

3. Welfare tradeoffs in bank mergers

In the present era of limited branch banking, one of the most important tasks of the bank regulatory authorities is to evaluate and rule on bank merger requests. In ruling on any merger application, the Bank Merger Act requires that '... the Comptroller, The Board, or The Corporation (FDIC) ... take into consideration the effect of the transaction on competition ... and shall not approve the transaction unless ... it finds the transaction to be in the public interest'.

The stipulation in the act to consider the impact of proposed mergers on competition when making the public interest test derives in large part from the structure–performance (S–P) doctrine. This literature, a direct descendant of the post-Chamberlinian industrial organization literature, holds that banking structure – the number and/or size distribution of firms – affects the conduct of those firms and thereby affects market performance. A tremendous amount of empirical work, represented over the years by such well-known studies as those by Schweiger and McGee (1961), Bell and Murphy (1969), and Heggestad and Mingo (1976, 1977), has explored the influence of structure on performance, variously defined, and sought to quantify their relationship.

The debate on these questions has been long-lived and extensive, and will probably never be definitively resolved. Rhoades (1977), for one, argues that the consensus of this literature is that structure does affect performance, and that increased concentration tends to be associated with higher loan rates, lower deposit rates and greater bank profitability. At the same time, there is no shortage of works whose reading of largely the same body of literature seriously questions Rhoades' view.

Regardless of which view may ultimately be judged to be the 'correct' one, there is substantial evidence in the published merger decisions of the FDIC, the Board, and the Comptroller of a serious concern with the possible effects of increased concentration through bank mergers on loan interest rates, deposit interest rates, and bank profitability. The attention paid by bank regulators to these market performance measures reflects an implicit awareness of, and concern with, the welfare impact of changes in those performance measures which might follow from their decision. It is intuitively clear, and easily shown using (8), that these interest rate and profit effects would generally be expected to cause welfare gains to bank owners and welfare losses to borrowers and depositors. Drawing on the findings of the S–P literature, borrower and depositor surplus can be used to make accurate estimates of these welfare changes for any proposed merger. Given an agreed upon set of distributional weights, these surplus calculations could be used to calculate the net effect of the merger on social welfare using (10). If this approach were to be taken, the 'benign' regulator would be expected to approve mergers for which $\Delta SW > 0$ and deny those for which $\Delta SW < 0$.

Clearly, no such *explicit* balancing of gains and losses is a formal part of the actual regulatory decision-making process. However, at least two important questions about that process itself arise. First, if gains to some and losses to others will predictably follow from any decision taken, to what extent does the actual decision-making process take account of them? Second, if such tradeoffs are an inevitable outcome of the process, what can be said about the appropriateness or social desirability of the kind of tradeoffs actually being made?

The purpose of this section is to investigate these two questions by focusing on a sample of recent merger decisions taken by the FDIC. First, bench-mark estimates of market-level demands for loans and deposits will be made in the markets affected by the mergers. These demand functions, together with evidence from the literature relating changes in market concentration to changes in interest rates and bank profits, will be used to calculate the changes in borrower surplus, depositor surplus, and bank profits which could have been anticipated at the time the proposal to merge was made. These calculated welfare effects will then be used as data in a probit analysis designed to determine the role they played in influencing the pattern of decisions taken by the FDIC.

3.1. Data and methods

The analysis was conducted for a sample of merger decisions taken by the FDIC over the ten-year period 1970–1979. The sample contained banks in 12 unit-banking or limited branch banking states, and excluded any cases for which the FDIC's report cited concerns for either bank's solvency as a contributing factor in its decision.[4] For the eventual welfare calculations to be meaningful, they must be made from demand functions which reflect, as well as possible, the conditions in the 'relevant market'. The problems of defining the relevant market in banking are well-known in the literature [e.g. Stolz (1976), Gelder and Budzeika (1970)], and will not be addressed here. For the purposes of this study, the appropriate definition of the relevant market is the one actually used by the FDIC in its analysis of the merger proposal and cited in its published decision. These relevant banking markets were often very small geographic areas, and, at the same time, the smallest geographic area for which relatively reliable bank, economic, and demographic data are available is the county. Therefore, only decisions for which the county, or groups of counties, had been considered by the authorities to be the relevant market were selected for the sample. The principles of market definition, data availability, and exclusion of cases decided on the issue of

[4]The published decisions of the FDIC and the opinions of the Justice Department are given in the FDIC Annual Reports, 1970–1979.

bank solvency which guided the sample selection lead unavoidably to a sample consisting of only 32 decisions over the ten-year period. While the resulting sample contained proportions of approvals and denials which were approximately the same as those in all cases considered by the FDIC over the period, the results to be presented below must be interpreted in the light of the size of the sample from which they were obtained.

Finally, the high degree of aggregation in the publicly available data even at the county level made it impossible to distinguish between loan and deposit instruments of different maturities. It will be assumed therefore that agents possess a single-period planning horizon and that there is only one loan instrument and one deposit instrument, time and savings deposits.

A very simple approach was adopted to estimate the market level demand functions for loans and deposits. The observed values of the loan interest rate and loan volumes were taken to be determined by the market level demand and supply of loans. Similarly, the deposit interest rate and deposit volumes were viewed as determined by a separate two-equation market model of supply and demand for deposits. The simple supply and demand framework was deemed satisfactory since all that were hoped for in the initial stages of the analysis, given the nature of the available data, were bench-mark estimates of the structural demand functions.

Market level bank data for each of the markets were prepared and supplied by the Federal Reserve from the *Reports of Condition* and *Reports of Income* of all banks operating in the different markets over the period 1970–1979. Economic and demographic data for the same markets were prepared and supplied by the Bureau of Labor Statistics. Cross-sectional and time series data on all markets were pooled and per-capita estimates of the structural demand for loans and demand for deposits were made using two-stage least squares. This method was used to estimate only the demand-side of the loan and deposit market models, with the supply-sides providing instruments.

Several forms for the respective demand equations were tested. All dollar quantities were measured in 1972 prices using the GNP deflator, and the following variables were used:

L = per capita loans,
D = per capita time and savings deposits,
LIR = interest income/total loans,
DIR = interest on deposits/time and savings deposits,
INC = per capita income, and
UR = unemployment rate.

The log linear form for the loan equation and linear form for the deposit equation yielded the best results. The results of these regressions are reported in table 1.

Table 1

Bench-mark estimates of loan and deposit demand in FDIC bank merger cases, 1970–1979[a]

	R^2	Durbin–Watson
$\log(L_{it})=3.67 \; -0.857\log(LIR_{it})+1.09\log(INC_{it})+0.225\log(UR_{it})$ (5.11)(−2.10) (4.68) (2.97)	0.68	1.94
$D_{it}=2.85+135.41\,DIR_{it}+186.75\,INC_{it}$ (0.987) (2.60) (2.64)	0.73	1.82
$i=1,\ldots,32,\; t=1,\ldots,10$		

[a]Instrumental variables used in the estimation of the loan equation were, in logarithms: per-capita income and total deposits, unemployment rate, three-month Treasury Bill rate and one period lags of the income, unemployment rate, loan interest rate, and per-capita loan variables. For the deposit equations: per-capita income and total loans, three-month Treasury Bill rate, and one period lags of the income, deposit rate, and time and savings deposit variables. By treating deposit market variables as exogenous to the loan market system, and loan market variables as exogenous to the deposit market system, the two-stage least squares estimates of the interest rate coefficients in both models may be biased. The sensitivity of the subsequent analysis to the specific coefficient estimates here will be examined in section 4.

Numbers in parentheses are t-statistics.

Given the high level of aggregation in the data, the estimated equations perform reasonably well. Both equations show estimated coefficients for the income, unemployment rate, and respective interest rate variables which are large relative to their standard errors and which have the expected signs. The demand for loans is inversely related to the loan interest rate, and the demand for deposits is positively related to the deposit interest rate. Both loans and deposits are 'normal', with demands increasing as income increases.[5] The coefficient on the unemployment rate variable in the loan demand equation, intended to capture cyclical effects, is positive, and may reflect counter-cyclical borrowing behavior of firms to finance inventories and of individuals to maintain standards of living over the cycle.

By treating deposit market variables as exogenous to the loan market system, and loan market variables as exogenous to the deposit market system, the two-stage least squares estimates of the interest rate coefficients in both models may be biased. However, since these results generally conform to those obtained in other studies, and since all that is hoped for at this stage are reasonable bench-mark estimates of the relevant parameters, these equations serve satisfactorily as the basis for the initial surplus calculations. The sensitivity of the subsequent analysis to the specific coefficient estimates here will be examined in subsection 3.3.

[5]Income data was used as a proxy for wealth. No serious problem should arise from this substitution since income and wealth tend to be highly and positively correlated. See Projector (1966).

The welfare effect of a merger on borrowers is directly due to the change in loan interest rates and is measured by the change in borrower surplus. The effect on depositors is due to the change in deposit rates and is measured by the change in depositor surplus. The change in loan rates and deposit rates, in turn, are due to the structure-conduct relationship assumed to characterize banks' behavior as concentration changes. The welfare effect on bank owners may be thought of as due to these changes in loan and deposit rates, plus any cost savings achieved through consolidation, and is measured by the change in bank profits.

Estimates of these expected welfare effects were made using a simple method. Expected surplus changes depend on pre-merger and expected post-merger deposit and loan interest rate levels. The expected profit changes depend on pre-merger and expected post-merger profits. The pre-merger interest rates and profits are known – they are the ones prevailing at the time of the application to merge. The expected post-merger interest rate and profit levels may be calculated by drawing on the considerable body of work that has been done in the S–P literature estimating the relationship of market interest rate levels and bank profit levels to the level of market concentration.

The range of choice from among the large number of such studies is, fortunately, restricted by the fact that most have employed the n-firm concentration ratio, for $n=1$, 2 or 3, as the index of market concentration. These studies will not be useful since most mergers in general, as well as in the sample, are between banks that are not among the market's two or three largest. A smaller subset of more recent S–P studies employ the Herfindhal index, $H=\sum_i s_i^2$, where $0 \leqq s_i \leqq 1$ is the ith firm's market share, and i runs over all firms in the market. The H measure permits interest rate and profit effects to be computed for mergers between banks of any size in the same market.

The procedure for these calculations is straightforward. Let $r=r(H)$ be the estimated relationship between the average market loan interest rate and the Herfindhal. A merger between banks 1 and 2 having market shares s_1 and s_2 will cause a change in the Herfindhal of $\Delta H=2s_1s_2>0$, and a change in the market loan rates of $\Delta r=(\partial r(H)/\partial H)\cdot 2s_1s_2$. For the relation $d=d(H)$ between market deposite rates and the Herfindhal, the same merger gives rise to a change in deposit rates of $\Delta d=(\partial d(H)/\partial H)\cdot 2s_1s_2$. Similarly, S–P studies which regress net income over total assets on the Herfindhal can be used to compute the expected change in bank profits. Letting $ROR(H)$ denote this relationship, and letting TA denote total assets, the total expected change in bank profits in the affected market is $\Delta \Pi=(\partial ROR(H)/\partial H)\cdot TA\cdot 2s_2s_2$. The S–P hypothesis predicts that $\Delta r \geqq 0$, $\Delta d \leqq 0$, and $\Delta \Pi \geqq 0$.

The expected surplus changes are obtained by integrating the demand equations in table 1 between the pre-merger and expected post-merger interest rates, and evaluating the integrals at the income level and unemployment rate prevailing in market i at the time t of application to merge. For pre-merger rates r^0 and d^0, and post-merger rates $r'=r^0+\Delta r$ and $d'=d^0+\Delta d$, the effects of merger on the three groups' welfare can be summarized as follows:

$$\Delta BS=-\int_{r^0}^{r'}\frac{L(\xi,INC_{i,t},UR_{i,t})}{1+\xi}\mathrm{d}\xi\leqq 0,$$

$$\Delta DS=-\int_{d'}^{d^0}\frac{D(\xi,INC_{i,t})}{1+\xi}\mathrm{d}\xi\leqq 0,$$

$$\Delta \Pi=\frac{\partial ROR}{\partial H}TA_{i,t}\cdot 2s_1s_2\geqq 0. \tag{11}$$

While it may be fair to say there is some agreement on the qualitative aspects of the S–P relation, there is much less agreement on the nature and empirical magnitude of the relationships. From among the many available studies, several were chosen as representative. The most common specification of the relationship is a simple linear one. Heggestad and Mingo (H–M) (1976) give estimates for the linear relationship between H and the loan interest rate, $\partial r(H)/\partial H$, and the deposit interest rate, $\partial d(H)/\partial H$. Yeats (1974) also gives linear estimates of the interest rate effects as well as a linear estimate of the profitability effects, $\partial ROR(H)/\partial H$. Yeats finds a larger effect than Heggestad and Mingo on deposit rates, and a smaller effect on loan rates. Yeats also finds a larger effect on profitability than Rhoades (1980). Non-linear and dichotomous relationships between H and the interest rate variables have been investigated by Heggestad and Mingo (1976, 1977). Their results suggest that increases in concentration have relatively large effects when concentration is low, and less effect when markets become more concentrated. In the extreme dichotomous approach, increases in concentration have no effect on loan rates once concentration reaches a rather low critical level. The results of these studies are summarized in table 2.

Each entry in table 2 gives the estimated number of basis points of change in loan rates, deposit rates, or *ROR* for every one hundred basis points of change in the Herfindhal. For example, if two banks with market shares of 20 percent each merge, the change in the Herfindhal would be 0.08, or 800 basis points. According to the H–M linear estimates, this would cause an increase of 16 basis points in the average loan rate in the affected market.

For any choice of study made from table 2, the expected changes in borrower surplus, depositor surplus, and bank profits can be calculated using (11). Recalling the linear social welfare function presented in (9), and normalizing it to a per-capita basis, the regulator can expect the proposed

Table 2
Bank performance measures and the Herfindhal (H) index.

Author (type of relationship)	$\frac{\partial r}{\partial H}$	$\frac{\partial d}{\partial H}$	$\frac{\partial ROR}{\partial H}$
H–M (linear)	1.98	−0.27	–
Yeats (linear)	0.90	−4.7	1.70
Rhoades (linear)	–	–	0.40
H–M (non-linear)	$\frac{0.06}{H^2}$	$\frac{-0.01}{H^2}$	
H–M (dichotomous):			
for $H \leqq 0.144$	11.10	–	–
for $H > 0.144$	0.00	–	–

merger to cause a change in the welfare of a 'representative individual' in a given market equal to the weighted sum in (10). The regulator is assumed to approve the merger if $\Delta SW_i > 0$, and to deny it if $\Delta SW_i < 0$. Since the left-hand side of (10) is unobserved, it is impossible to directly estimate the inter-group weights a_j. The approach will therefore have to be somewhat indirect.

Letting Y be a binary variable, where $Y=1$ if the merger is approved and $Y=0$ if denied, the model to be estimated will take the form:

$$Y_i = \beta_0 + \beta_1 \Delta BS_i + \beta_2 \Delta DS_i + \beta_3 \Delta \Pi_i + U. \tag{12}$$

The stochastic error term $U \sim N(0, \sigma^2)$ captures the non-systematic or capricious elements in the regulator's decision-making process. In models with binary dependent variables, ordinary least squares estimates of the parameters are unbiased, but not efficient, due to heteroskedasticity. Several methods exist to deal with this problem, all involving a transformation of the linear index on the right-hand side of (12) such that the dependent variable is constrained to take values between zero and one [McFadden (1976)]. Probit analysis is the one such technique which will be employed here.

Letting βX_i stand for the right-hand side of (12), probit analysis employs a cumulative standard normal transform of the linear index βX_i. From among the several methods which can be used to estimate the parameters of the probit model, Goldfeld and Quandt (1972) have shown the maximum likelihood method to produce reasonable estimates of the parameters in small samples. The interpretation of the estimated coefficients in the probit model is somewhat eccentric and so bears some discussion before turning to consider the results. The dependent variable in the model is the conditional probability of approval of the merger, given particular values for the welfare variables. The index βX_i, the probit of the probability of approval, is defined as the abscissa corresponding to the probability of approval in a standard normal distribution. The estimated probability of the merger being approved, given values X_i for the surplus and profit changes, is

$$P(A\,|\,X_i)=\frac{1}{(2\pi)^{1/2}}\int_{-\infty}^{\beta X_i} e^{-\xi^2/2}\,\mathrm{d}\xi. \tag{13}$$

The coefficients β_j, $j=1,3$, can be interpreted, therefore, as the number of standard deviations of change in $P(A\,|\,X_i)$ for every one dollar change in borrower surplus, depositor surplus, or bank profits. The constant term, β_0, gives the number of standard deviations worth of area under the standard normal distribution which must be added to or subtracted from 0.5 (equal probability of approval and denial) to obtain the probability of the merger being approved when all expected welfare changes are zero [Watson (1974)]. For a merger expected to result in the vector X_i of welfare changes, a measure of the responsiveness of the probability of approval to one dollar changes in the welfare of each of the three groups can be obtained by differentiating (13) with respect to elements of X_i. The change in the probability of a merger being approved per unit change in the expected welfare gain to group j is given by

$$\frac{\partial P(A\,|\,X_i)}{\partial X_{i,j}}=\beta_j\frac{1}{(2\pi)^{1/2}}\mathrm{e}^{-(\beta X_i)^2/2}. \tag{14}$$

The sign of the estimated coefficient, therefore, does provide qualitative information on the direction of influence exerted on the probability of approval by changes in the welfare of the different groups.

In addition to discovering such qualitative information, another objective is to assess whether the three groups' welfare are considered 'equally' by the regulator, or whether the regulatory decision making process tends to be 'biased' in favor of welfare gains for particular groups. One measure of this bias is the relative sensitivity of the probability of approval to changes in the welfare of the different groups. By (14), this reduces to a simple comparison of the two estimated coefficients:

$$\frac{\partial P/\partial X_{i,j}}{\partial P/\partial X_{i,k}}=\frac{\beta_j}{\beta_k}. \tag{15}$$

In the next section, the results of estimating the model under different assumptions about the nature and magnitude of the mergers' effects on interest rates and profits are reported.

3.2. Results

Table 2 showed that there is considerable disagreement over the extent of the movement in interest rates and profits as concentration changes. To account for a broad range of possible structure-performance relationships which may be operative, eq. (12) was estimated over surplus and profit changes calculated on the basis of several different combinations of the possible relationships reflected in table 2. Table 3 summarizes the results of estimating the probit model when four different loan rate, three deposit rate, and two profitability relations are assumed.

The low χ^2-statistics for eqs. (V)–(VIII), which assume non-linear and dichotomous relationships between concentration and market performance variables, show that the null hypothesis that all coefficients other than the constant are equal to zero cannot be rejected. This suggests that if the structure–performance relationship is non-linear or dichotomous, then the evidence in the sample does not support the conclusion that borrowers', depositors' and bank owners' welfare are of any consequence to the decision reached. Eqs. (I)–(IV), however, which assume the kind of linear relationship between structure and performance which is most common in the S–P literature, do permit the conclusion that at least two of the three groups' welfare are implicitly being taken into consideration by the FDIC in its decision-making. Consequently, further discussion will be restricted to eqs. (I)–(IV).

Eqs. (I)–(IV) yield basically similar qualitative conclusions. Under both linear versions of the structure–performance relationship, regardless of the linear profitability relation considered, the estimated coefficients on borrower surplus and profit changes are positive and significantly different from zero at the 90 percent level. In none of the equations is the estimated coefficient on depositor surplus changes significantly different from zero. These results suggest that, ceteris paribus, larger expected welfare gains (smaller welfare losses) to borrowers tend to increase the probability of the merger being approved. Larger expected welfare gains accruing to bank owners also tend to increase the probability of approval. At the same time, the results consistently show that the level of expected welfare losses to depositors has no effect on the probability of any given merger being approved.

The estimated coefficients may, in principle, be used to make inferences about the quantitative relationship between the welfare effects of a proposed merger and the probability of the merger's approval. Eqs. (13) and (14) show that the probability of a merger's approval and the responsiveness of that probability to changes in expected welfare depend importantly on the precise magnitudes of the expected welfare effects. For the sake of illustration, consider the case of an 'average' merger, where the expected welfare losses to borrowers and the expected welfare gains to owners are assumed to be equal to the average values of the variables over the sample. For the structure–

Table 3

Welfare and the estimated probit of merger approval.[a]

Eq.	Assumption on $\frac{\partial r}{\partial \Pi}$	Assumption on $\frac{\partial d}{\partial \Pi}$	Assumption on $\frac{\partial ROR}{\partial \Pi}$	Estimated coefficient on Constant $\hat{\beta}_0$	Estimated coefficient on ΔBS $\hat{\beta}_1$	Estimated coefficient on ΔDS $\hat{\beta}_2$	Estimated coefficient on $\Delta \Pi$ $\hat{\beta}_3$	χ^2	R^2 (max.=0.71)
(I)	H–M (linear)		Rhoades	1.0906	0.0509	−0.1180	0.0500	9.97	0.27
				(2.80)	(1.89)	(−0.78)	(1.63)		
(II)			Yeats	–	–	–	0.0117	–	–
							(1.63)		
(III)	Yeats (linear)		Rhoades	1.0790	0.1107	−0.0067	0.0505	9.88	0.27
				(2.79)	(1.84)	(−0.74)	(1.65)		
(IV)			Yeats	–	–	–	0.0118	–	–
							(1.65)		
(V)	H–M (non-linear)		Rhoades	*0.8044*	*−0.0014*	*0.0664*	*−0.0050*	*3.18*	*0.09*
				(2.14)	(−0.31)	(0.55)	(−0.58)		
(VI)			Yeats	–	–	–	−0.0012	–	–
							(−0.58)		
(VII)	H–M (Dichotomous)	H–M (linear)	Rhoades	0.8352	0.0019	0.1290	0.0403	5.41	0.16
				(2.48)	(0.81)	(1.50)	(1.28)		
(VIII)			Yeats	–	–	–	0.0094	–	–
							(1.28)		

[a]Numbers in parentheses are t-statistics.
Critical t for 90 percent significance level is 1.31.
Critical χ^2 for 95 percent significance level is 9.49.
'–' denotes same as in the previous equation. In general, even-numbered equations differ from odd-numbered equations only in the size of the estimated coefficient on the profit change variable. All other coefficients, t-statistics, χ^2 and R^2 are the same.

performance assumption on interest rates underlying eqs. (I) and (II), the mean per capita expected loss in borrower surplus is $-\$5.61$, and the mean expected loss in depositor surplus is $-\$0.89$. For eqs. (III) and (IV), mean borrower surplus loss is $-\$2.56$ and mean depositor surplus loss is $-\$15.35$. For eqs. (I) and (III), mean expected gain in bank profits is \$2.18, and for eqs. (II) and (IV) is \$9.35. Letting X denote the vector of expected welfare changes from this hypothetical merger, an estimate of the probability that this merger would be approved can be obtained by evaluating (13) at X.

Calculations of $P(A|X)$ for all combinations of structure–performance relations represented in eqs. (I)–(IV) yielded virtually identical results. In all cases, the estimated probability of an average merger being approved was approximately 0.65, which, of course, is approximately equal to the sample fraction of approvals. This contrasts with an estimate of the probability of a merger being approved when expected welfare changes for all groups are equal to zero, $P(A|X=0)$, which can be obtained from the constant term. That figure, for all equations, is roughtly 0.86. The difference between these two figures clearly supports the conclusion that the adverse welfare impact of mergers on depositors tends not to be a major consideration to decision-makers, but that the adverse effect on borrowers is an important consideration. That is, any merger, insofar as it is expected, through increased concentration, to adversely affect the welfare of borrowers, tends to have a lower probability of being approved than a merger which is not expected to adversely affect borrowers.

Estimates of the degree to which the probability of approval is affected by changes in welfare incidence can be obtained using eq. (14). Again for the case of the average merger, estimates of $\partial P(A|X)/\partial X_{i,j}$ for the two factors exerting a significant influence (borrower surplus and profits) were calculated for all four equations. A one dollar per-capita reduction in the expected loss in borrower surplus under eq. (I) tends to increase $P(A|X)$ by approximately 0.019. Under eq. (III), that figure is roughly twice as high, 0.041. The marginal increase in probability for increases in bank profits in both eqs. (I) and (III) was approximately 0.019. For eqs. (II) and (IV), those figures were considerably lower; both approximately 0.004. The rankings of relative sensitivity across equations in this example are directly due to the estimated relationships between concentration and interest rates and profitability in table 2. The relatively large effect of concentration on loan rates in the H–M study compared to the Yeats study in table 2 means that relatively larger losses in borrower surplus would be expected. Given the observed pattern of decisions made, this leads to a relatively lower marginal (and absolute) weight being given to the welfare of borrowers in eq. (I) compared with (III). Similarly, the greater sensitivity of bank profitability to concentration in the Yeats study compared with Rhoades' leads to the lower marginal (and absolute) weights accorded owners' welfare in eqs. (II) and (IV), compared with (I) and (III).

While suggestive, a certain amount of caution is called for in interpreting the results of these illustrative calculations. Eqs. (13) and (14) show the dependence of the estimated absolute and marginal probabilities of approval on the magnitudes of the expected welfare effects of particular mergers. One cannot, therefore, infer from these results that every merger has a 0.65 probability of being approved. It depends on the magnitudes of the expected welfare effects. Moreover, the insignificance of the depositor surplus variable in all of the estimated equations suggests that a different specification of the relation in eq. (12), which did not include depositor surplus as a consideration to the decision-makers, would lead to different estimated coefficients on borrowers' and owners' welfare variables and so, therefore, lead to different quantitative estimates of conditional absolute and marginal probabilities of approval for a given merger. If one were interested in prediction, therefore, a different specification of the relation in (12) would be called for.[6]

The purposes here, however, are more qualitative than quantitative. The estimated eqs. (I)–(IV) and the illustrative calculations suggest, first, that depositors' welfare is not an important consideration. Second, they suggest that borrowers' and owners' welfare are important considerations, but that inferences about the relative implicit weight attached to the two groups' welfare may be highly dependent on the particular structure–performance mechanism assumed to be operative. For any given mechanism assumed, eq. (14) shows that a measure of the relative bias displayed between the two groups can be obtained by considering the ratio of the estimated coefficients from table 3. Table 4 gives the relative preference shown borrowers' welfare over owners' welfare implied by eqs. (I)–(IV). It is clear from these calculations that the extent of the relative bias in favor of borrowers' welfare varies considerably according to the structure–performance mechanism assumed. However, the more limited conclusion that the FDIC's behavior displays *some* bias in favor of borrowers appears to be robust to very large differences in the particular structure–performance mechanism assumed.[7] In only one case out of the four is there any reason to infer that close to equal treatment of the two groups results from the FDIC's decision-making process.

It seems on the basis of these calculations that there is little support for 'capture theoretic' explanations of the regulatory process in the case of FDIC

[6]Estimates of the probit coefficients were calculated when the depositor surplus variable was dropped from the specification in (12). In all cases, the size of the constant term remained virtually the same, reflecting no significant difference in the probability of approval when surplus and profit changes are zero from that reported in the text. The size of the coefficient on borrower surplus generally decreased and that on profit change generally increased, reflecting somewhat lower and higher marginal probabilities, respectively, than those reported in the text. None of these results, however, alters the qualitative conclusion drawn in the text, nor do they lead to significantly different predictions of the probability of approval of an average merger.

[7]The same general pattern of relative preference persists when depositor surplus is dropped from the version (I)–(IV) equations.

Table 4

Relative preference shown borrowers by structure–performance relation assumed.[a]

Interest rate relation	Profitability relation			
	Rhoades		Yeats	
H–M (linear)	(I)	1.02	(II)	4.36
Yeats (linear)	(III)	2.19	(IV)	9.41

[a]Numbers reported are $\hat{\beta}_1/\hat{\beta}_3$.
Numerals in parentheses are corresponding equations in table 3.

merger decisions over the sample period. If anything, relatively greater consideration appears to be given to the interests of at least one group which stands to be adversely affected, borrowers, over the interest of the regulated firms themselves. Caution is again in order, however, in trying to infer too much from these results. No degree of statistical certainty can be attached to these general conclusions because of the impossibility of constructing the appropriate tests of hypotheses concerning the estimates of the relevant absolute and marginal probabilities.[8]

3.3 Sensitivity analysis

The results just considered appear to support the argument that the effects of mergers on depositors are generally ignored. There is also the suggestion that the welfare of borrowers tends to be more of a concern to the FDIC than that of bank owners. However, in view of some of the limitations of the empirical analysis, it is worthwhile considering the sensitivity of these general conclusions to some of the particular assumptions that have been made.

One possibly crucial assumption that has been maintained throughout is that the loan and deposit demand equations in table 1 serve satisfactorily as the basis for the borrower and depositor surplus calculations used in the probit analysis. At least two objections might be raised to this. One is that the underlying assumption that individuals are identical in their demand behavior across markets is not justified. It could be argued that demand equations for each individual market should be used as the basis for the

[8]One- and two-tailed tests of the hypothesis that the two coefficients themselves are equal can be made using standard t-tests or χ^2-tests, since the estimators are normally distributed with known means and the variance and covariance can be estimated. From eq. (14), however, the difference in the marginal changes in the probability of approval between any two groups does not have such a simple distribution.

surplus calculations. This objection, though entirely legitimate, cannot, however, be addressed here. Investigating the sensitivity of the general conclusions to this assumption must be left to more refined analyses.

If this assumption is accepted, however, there is still the question of how the general results depend on the particular estimates of the parameters of the loan and deposit demand equations. As noted earlier, because of the small size of the available sample and the simple approach that was taken in estimating these demand equations, they can, at best, only be expected to have produced reasonable bench-mark estimates of the demand relationships. More or less elastic demands for loans or deposits could, for a given change in the interest rate expected to result from the merger, lead to possibly significant differences in the estimated surplus losses in the sample of cases considered. The regulator may, for example, be viewing deposit demands as more elastic than assumed in eq. (4). In such a case, the expected loss in depositor surplus would be smaller. The pattern of decisions taken, therefore, might reflect a greater weight given depositors' welfare than was revealed in the previous analysis.

To investigate this possibility, a pseudo comparative statics, or sensitivity analysis, was performed on the results of eqs. (I)–(IV). The coefficient on the interest rate variable in the deposit equation was increased and decreased by one and two standard deviations of its estimate, with appropriate adjustments of the constant term being made to the mean of the dependent variable. Depositor surplus losses for all decisions in the sample were recomputed for these four versions of the deposit demand equation, and versions I–IV of the probit equations were re-estimated. The results of these estimations are summarized in table 5.

In all equations, there is no dramatic divergence from the previous body of results. In all cases, borrowers' and owners' welfare are shown to be significant contributing factors in the decision made. In no case is the coefficient on depositor surplus ever significantly different from zero. The earlier finding that the FDIC tends to ignore the welfare effects of its decisions on depositors, seems, therefore, to be quite robust over a broad range of possible deposit demand elasticities that the decision maker may perceive.[9]

The measure of relative preference towards borrowers is somewhat more sensitive to the estimates of the deposit demand equation parameters. While the structure–performance versions II–IV consistently suggest some pre-

[9]Further tests were made to test the sensitivity of this conclusion to differences in the perceived loan demand elasticities as well. The slope of the loan demand equation in table 1 was adjusted up and down by one and two standard deviations of its estimate, and the probit equations were estimated with surpluses calculated for all possible combinations of loan and deposite rate elasticities. None of these showed estimated coefficients on the depositor surplus variable significantly different from zero.

Table 5

Sensitivity of probit estimates to the interest coefficient of deposit demand.[a]

Version	Adjustment of deposit rate coefficient	Constant	ΔBS	ΔDS	$\Delta \Pi$	χ^2	R^2 Max=0.72	Relative preference $\hat{\beta}_1/\hat{\beta}_3$
I	−2	1.0990	0.0615	−0.1746*	0.0520	10.43	0.28	1.2
II					0.0121			5.1
	−1	1.0963	0.0560	−0.1460*	0.0505	10.20	0.27	1.1
					0.0120			4.7
	+1	1.0836	0.0466	−0.0930*	0.0503	9.97	0.27	1.02
					0.0117			4.4
	+2	1.0765	0.0432	−0.0716*	0.0510	9.66	0.27	0.8
					0.0119			3.6
III	−2	1.0925	0.1350	−0.0101*	0.0520	10.38	0.28	2.6
IV					0.0121			11.2
	−1	1.0870	0.1224	−0.0084*	0.0507	10.11	0.27	2.4
					0.0118			10.4
	+1	1.0704	0.1006	−0.0051*	0.0510	9.69	0.27	2.0
					0.0119			8.5
	+2	1.0625	0.0924	−0.0037*	0.0521	9.54	0.26	1.8
					0.0121			7.6

[a]*Denotes not significant at 90 percent level.
All other reported coefficients significant at 90 percent level or above.
Even-numbered equations are, again, identical to the preceding odd-numbered one, except for the size of the profit change coefficient.

ference shown to borrowers, this conflicts sharply with the conclusion drawn when it is assumed that version I is the operative structure–performance relationship. A one standard deviation increase in the size of the deposit demand slope estimate is sufficient to reduce the ratio of estimated coefficients on borrowers' and owners' welfare effects to 0.9, reflecting a slight bias in favor of owners' welfare. Unless there is reason to rule out the possibility that the version I structure–performance relationship underlies the FDIC decision making, the results of this analysis must be interpreted as leaving unresolved the question of whether or not any regulatory bias exists.

4. Conclusion

This paper has shown how, with proper recognition of the unique character of banking products, the traditional public interest point of view in banking regulation and market structure analysis can be formalized in terms of a flexible Bergsonian social welfare function. Given a proper definition of observable borrower and depositor surplus measures, one convenient and applicable form which the social welfare function may take is the sum of borrower surplus, depositor surplus and bank profits; a form similar in spirit and substance to the familiar sum of consumer and producer surplus. Using such a social welfare function as an index of the public interest has clear conceptual and analytical advantages over traditional measures of banking market performance such as interest rates, costs, and profitability. In addition to having a rigorous and unambiguous relation to familiar notions of individual and social welfare, the social welfare function offers an empirically usable method of summarizing and integrating the often countervailing aspects of performance, such as efficiency and equity.

Section 3 demonstrated how the social welfare methods might be applied to study regulatory decision-making in the important area of bank mergers. If the FDIC is presumed to be benign when considering merger applications, it may be assumed to approve those mergers which are expected to increase social welfare, and to deny those which are expected to reduce social welfare. The published decisions of the FDIC show a clear awareness of the structure–performance literature and its predictions concerning movements of loan rates, deposit rates and bank profitability in response to changes in concentration, and at least an implicit awareness of the welfare effects of those movements. The probit analysis of the FDIC's merger decisions has led to several general conclusions about the nature of that decision-making process. However, caution is called for in interpreting the empirical results. The results reported cannot be interpreted as having 'revealed' the true regulatory preference of the FDIC. An entirely different approach would be required in order to attempt that task. Nor can it legitimately be inferred from the explanatory power of the surplus and profit variables that one or another of the various S–P versions considered is the 'correct' one, or that it underlies the regulator's decision-making. Rather, the legitimate inferences from the empirical results obtained are of the following, more hypothetical nature.

If the structure–performance relationship is of the more controversial dichotomous or non-linear forms found in the literature, then the pattern of decisions taken by the FDIC shows that predictable welfare effects on borrowers, depositors, and bank owners are not reflected in their decision-making. If, however, the structure–performance relationship is of the more common linear form found in the literature, then the evidence strongly suggests that the welfare effects on borrowers and bank owners are reflected in the pattern of decisions taken in a way which is justifiable from a social welfare point of view.

At the same time, the analysis strongly suggests that if there are adverse effects on depositors of increased concentration through bank mergers, then they tend generally to be ignored. This conclusion persists under considerable variation in the assumed magnitude of the relationship of concentration to deposit rates, and under wide variation in the estimated responsiveness of deposit demands to deposit rate changes. There is one possible explanation for this this which would tend to vindicate the FDIC from charges that it was insensitive to depositors' welfare. If, as seems plausible over the sample period, Regulation Q deposit interest ceilings were known to be binding on the banks in the relevant markets, then it seems reasonable for the FDIC to have expected market deposit rates to be unaffected by the mergers. If this were true, the calculated changes in depositor surplus used in the analysis here would exaggerate the welfare effects on depositors which the FDIC had reason to expect. If this were the case, however, it is surprising that the structure–performance studies done over roughly the same time period continued to find reason to expect some decline in deposit rates to accompany increases in concentration.

On the question of regulatory bias towards borrowers or bank owners, the results of the analysis are suggestive, yet largely inconclusive. For three out of four versions of the structure–performance relationship considered, it would appear that some bias in favor of borrowers' welfare exists. This conflicts, however, with the results of the fourth case which, if anything, tend to suggest some bias in favor of bank owners. More detailed, less aggregated studies would be needed to resolve the question of regulatory bias.

In spite of the level of aggregation and the size of the sample of decisions considered, the analysis here has served to draw attention to the distributional implications of banking regulatory policy. Since there are, inevitably, redistributive effects of the administrative decisions taken by regulatory agencies such as the FDIC, the appropriateness to society's distributional goals of the actual or implicit way in which the welfare of one group is weighed against that of another in the decision-making process, and the adequacy of the process itself in achieving the authorities' intended distributional effects, are subjects worthy of social concern and further research.

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