BANK SERVICES: THE INFLUENCE OF LEARNING

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Extended Abstract

This paper argues that banks can reduce their uncertainty about client characteristics and improve bank performance by learning about clients in the course of the depositor relationship. The information acquired from deposit account performance allows them to tailor services to fit the characteristics and capabilities of their customers. The conditions under which such information implies an increase in service quality over time are derived.

The model considers the development of service offered by one bank to a pool of depositors. Initially, individual depositors cannot be identified by type but there is common knowledge about the distribution of types. The

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revenue generated by a deposit account depends randomly on the characteristics of the depositor and the type of service offered. Revenue probabilities, conditional on service level and depositor type, are known. To keep notation simple, two service and depositor types and three service- and type-dependent levels of revenue are assumed. Providing type-specific service to each depositor increases the bank's expected profits. Service is considered here as all the utility- or income-enhancing facilities extended by a bank to a client. Service is costly to the bank in dollar terms and can be viewed as generating a proportional dollar return to the depositor. Inappropriate service does not benefit the client. It is assumed that the conditions for self-selection do not exist.

In the first period, the two types of service are allocated randomly to new depositors. A depositor receiving appropriate service has a more than even chance of producing the best level of account revenue expected from that service. However, their account may also produce a lower level of revenue with the same probability as would an inappropriately allocated service level. On the other hand the account with inappropriately assigned service has a high probability of generating the lower level of revenue.

At the end of the first period the bank is able to observe the revenue that each class of service-receiving deposit account has produced and updates its priors about type using Bayes rule. In the second period it extends service, s_{i2}, to the depositors receiving s_{i1} whose deposit accounts have produced revenue R_{i1} where the first subscript refers to type and the second to time period. The risk-neutral bank maximizes conditional expected (discounted) profits over the two periods subject to the participation constraints on expected utility of the two types of risk-averse depositors.

Consider a depositor with an ATM card in first period. A depositor who has a high time preference and saves little is more likely to make frequent withdrawals, with higher operating costs (lower revenue) for the bank. On the other hand, the saver is more likely to economize on withdrawals, with higher, more stable balances which the bank can onlend. The deposit account of a spender with a cash card service is therefore likely to generate less net revenue for a bank. If a bank has isolated two depositor types, it can then infer type conditional on revenue observed. The second type of account performance is more likely to encourage a bank to provide a credit card.

This framework is intended to generate a profit-maximizing increase in depositor service to capture the simple observation that new depositors do not usually receive the same facilities as established depositors. In English banks, for example, service cards (a card which provides cheque guarantee, cash access and direct debit facilities) is not given on demand - the bank will explicitly inform a new depositor that it has to observe deposit account performance for six or more months. A cash, or ATM, card is easier to obtain. Similarly, a request for a credit card by a new and unknown customer is unlikely to be granted. In this scenario a loan is also a bank service — one that is an improvement over a cash card and over a credit card. The argument is that a bank extends this enhanced service only when it has learnt the characteristics of the client.

The model is loosely based on Rogerson's 1985 paper (*Econometrica* 53(1)) which examines a repeated principal-agent relationship with moral hazard in the labour market. Here, while there is no hidden action and

action-contingent payment, learning about unobserved characteristics and revenue-contingent service are usefully modelled in a similar framework.

Using the first order conditions for the bank's maximization problem, the paper finds the conditions under which service in the second period exceeds service in the first. In an earlier paper, (Zephirin, 1994, *The Economic Journal*, 104) the author derived endogenous switching costs for depositors who establish good reputations with banks who provide relationship-specific service which improves over time. But that paper did not consider the conditions under which bank service quality would improve. The present paper argues that a bank's learning about customer type over time and its consequent ability to provide service valued by the particular type will result in increasing expected service over time.

There are many papers examining bank acquisition of information about consumers in credit markets with hidden information. In addition to the several well-known papers with signalling, Sharpe (1990, *Journal of Finance*, 45(4)) looks at the informational advantage which banks obtain over rivals by learning about their borrowing clients and Broecker (1990, *Econometrica*, 58(2)) considers credit-worthiness tests used by banks to assess a borrower's repayment capability. Besanko and Thakor (1993) [1] also model borrower-specific information acquired by banks in relationship banking, where relationship banking is described as repeated bilateral transactions between banks and borrowers. The idea in the present paper — that banks' acquisition of client information begins in the deposit market, rather than with the borrower — is similar to that in Vale (1993, *Scandinavian Journal of Economics*, 95(1)) where banks infer a borrower's risk aversion from the conduct of his demand deposit account. Vale is, however, concerned with how banks gain an advantage over non-bank intermediaries in the credit market by providing deposits with a certain return. The concern here is with how even depositors can gain by developing an information-based relationship with their bank. The paper contributes to the extensive literature on banks' informational role by arguing that banks' valuable functions may include the ability to provide customer-tailored transactions services, which may, but need not, include credit.

[1] Chapter 10 in Mayer, C. and X. Vives *Capital Markets and Financial Intermediation*, Cambridge University Press