

BANK BEHAVIOUR IN SMALL OPEN ECONOMIES

by

DeLisle Worrell

October 1996

Bank Behaviour in Small Open Economies

The last two decades have seen intensive research on bank behaviour, mostly for industrial countries. This research provides evidence on economies of scale and scope, the exercise of monopoly power, market segmentation and bank efficiency. However there remain many puzzles about what motivates bank behaviour. In small open economies we observe wide spreads between deposit and loan interest rates, interest rates that tend to be sticky and banks often hold non-earning assets in excess of the requirements of monetary authorities. We may improve our understanding of such phenomena by drawing insight from the existing literature.

We need to understand bank behaviour in order to properly anticipate the outcome of monetary policy. For example, suppose the monetary authority attempts to tighten money supply through an increase in the central bank discount rate. Will deposit and loan rates increase as well, and by equal amounts? Will banks adjust their asset and liability portfolios, and in what way? Typically it is said the banker wishes to maximise the expected utility he gets from income accumulated over a time horizon. His ability to earn income is constrained by his balance sheet: to get more income earning assets he must acquire more costly liabilities. The modern banker offers a variety of services: chequeing accounts, loans, foreign exchange conversion, risk management etc. and incurs a range of costs, including labour and capital costs and interest costs. Modelers derive equations for bank behaviour by maximising profits subject to a balance sheet identity or by finding a minimum cost combination of services under assumptions about how banks use their inputs (the production technology).

Recent models of this kind have given evidence of economies of scale in the banking industry (that is, that larger banks have lower average and marginal costs than smaller banks, for the same service): for the U.S., Clark (1996), Clark and Speaker (1994) McAllister & McManus (1993), and Ferrier and Lovell (1990), for Japan Fukuyama (1993) and for Italy, Tavero and Papi (1995). (However, Streb & D'Amato (1995) argue that what appears to be decreasing costs may be short term deviations from capacity utilisation, using Argentine experience to illustrate.) Widespread economies of scale help to explain the universal trend towards market concentration. For example, in Barbados, the four largest banks account for about 80% of total financial assets. The existence of economies of scale also leads us to expect consolidation of banking business and an on-going tendency to further concentration, trends observed in Jamaica and Trinidad and Tobago.

There is less evidence of economies of scope - that is, that the unit cost of providing a bundle of banking services together is lower than the average or marginal cost of any one of those services provided singly. Clark and Speaker failed to detect global economies of scope in U.S. banks. They found economies of joint production for some pairs of products and diseconomies for others. In the absence of economies of scope it is difficult to find motivation for the widening range of financial services and the tendency to blur distinctions between different types of financial instrument and between financial and non-financial instruments. However, this area is under-researched and the results cited probably reflect the limited range of services analysed. They do not include insurance products, leases and other services into which financial institutions in the Caribbean have recently ventured.

Where there are economies of scale there are opportunities for large banks to exercise a degree of control over the market. Hess (1995), Berger (1995) and Berger and Hannan (1989) found evidence of the exercise of market power in the U.S. although Berger concluded that it did not make a significant contribution to bank profit. Souminen (1994) uncovered evidence of the exercise of monopoly power in Finland. Ironically, there financial reform in the mid-1980s appears to have cleared the way for non-competitive behaviour. Souminen's results suggest that the market for financial services was more competitive before the reforms. The result is of special interest because Finland is a small open economy. Shaffer's (1993) study of Canadian banks is the only one I have encountered which finds a competitive financial market. There have been no economies of scale and scope or of the exercise of market power for small developing countries. Observation of Caribbean financial markets does suggest some monopoly power available to the largest financial institutions through their dominant market share and established relationships with the non-financial private sector.

Hannan (1991) reports results indicating that banks' competition does not extend beyond the locality in which they operate, even in the U.S. where there are no foreign currency costs and exchange rate uncertainties to inhibit financial transactions between localities. Loan markets are found to be local in nature. Approaching the question of market segmentation from a different perspective, Hester and Sdogati (1989) discover significant interest rate differentials for identical financial services between Northern and Southern Italy. However, Osborne (1988) finds that the banking market in the US is integrated nationally, except for the Southeastern Region, and except for very small loans of \$9,000 or less.

There is little challenge to the view that financial markets are defined by national boundaries. In addition to the tendency for localisation of financial markets exchange rate risk and the cost of foreign currency conversion act as barriers to trade in financial services, even where there are no formal exchange controls. Moreover, differences in taxation, legislation and the regulatory framework act to segregate each nation's financial market from those of all others.

Close observation suggests that possibilities are limited for substitution among certain types of bank services. For financial institutions, mortgages are not good substitutes for other loans and lending to households is not a close substitute for lending to firms. For households and businesses, chequeing accounts are not close substitutes for interest bearing accounts. These propositions may be too obvious to attract the widespread interest of econometricians though Hess found that where financial services were close substitutes there was no evidence of interest rate competition whereas interest rates were altered on services where financial institutions determined there were no close substitutes.

The segmentation of markets for financial services by type of service and geographically increases the scope for exercise of market power by dominant financial institutions. The widespread observance of oligopolistic behaviour of financial institutions renders competitive models of bank behaviour inappropriate. Moreover, the removal of restrictions on international financial transfers, the elimination of barriers to the entry of new financial institutions and the provision of financial services from abroad will not fundamentally alter the nature of the localised market in which financial institutions operate.

Monetary policy initiatives depend for their effectiveness on an efficient response by banks. However there is evidence of widespread inefficiency in the banking industry. Berger (1995) Ferrier and Lovell (1990), Miller and Noulas (1994), Berger Hancock and Humphrey (1993), English et al (1993), Pi and Timme (1993) and Grabowski et al (1993) all find US banks to be inefficient to some degree. Fukuyama finds technical inefficiencies in the Japanese banking system. Berg et al (1993) find that a large proportion of Finnish and Norwegian banks and a smaller proportion of Swedish banks do not match the productivity of the most efficient Swedish banks. On the other hand, Miller and Noulas (1996) find low levels of technical inefficiency for US banks and Favero and Papi (1995) conclude that Italian banks are efficient technically and in the allocation of resources.

On balance, the evidence suggests that an assumption of bank efficiency is rather cavalier. The tests are sensitive to the methodology used, to the types of efficiency considered and to the way efficiency is defined. The measures of efficiency - based on Cobb-Douglas and trans log production functions - and the measurement techniques (i.e. the regression procedures) are subject to qualification. Some studies measure the efficiency with which banks allocate their portfolio (allocative efficiency); others minimise the cost of a given bundle of services (technical efficiency). Most studies discuss the efficiency with which banks combine inputs but some also measure the effectiveness in the supply of outputs. As a result of the varied methodologies, procedures and definitions, there is wide variation in the extent of inefficiency reported but very few studies find banks to be efficient.

Recent research on Caribbean commercial banks is reported in Bennett (1995), Bourne (1988), Haynes and Howard (1992), Seepersad (1995) and Shaw (1995). They all report high operating costs, measured against the standards of industrial countries. However, that is not necessarily evidence of inefficiency. It may be the reflection of small scale. The size of Caribbean banking firms is in the range where studies have found increasing returns i.e. most banks have an asset base less than US\$500 million. Caribbean studies also reveal wide spreads between loan and deposit interest rates. The reasons have not been established. Possibilities include:

- (a) small volumes may necessitate a higher mark up because of diseconomies of scale. Small banks may have higher unit costs than their industrial country counterparts;
- (b) dominant firms in small financial markets may exercise monopoly pricing;
- (c) there may be inelasticity in the demand for deposits by households and in the supply of loans by banks because of information costs and asymmetries (see Wood, 1994); and
- (d) the volume of loans is demand-driven, depending on economic activity (see Bourne, 1988).

However the studies have found banks to be quite profitable in all circumstances.

The international comparisons used in Caribbean studies are probably not appropriate. Banks in small Caribbean economies cannot expect to match the operating performance of large financial institutions in industrial countries. More appropriate comparisons with banking systems of similar size might uncover more meaningful norms.

The often puzzling behaviour of deposit and loan interest rates may be the result of discontinuities in the demand and supply functions for loans and deposits. Evidence is emerging of such discontinuities (Fase, 1995). Information costs alone will make it uneconomical to respond to every change in interest rates, no matter how small. The majority of depositors need brokers to advise on the range of interest rates on offer. The depositor gains only if the expected return from a shift to a higher yielding financial asset exceeds the cost of the broker's services. There is a corridor in the immediate neighbourhood of any existing interest rate where changes evoke no response. In addition, there are usually legal and financial fees and penalties in switching between financial assets and liabilities, which serve to widen this corridor. These quasi-fixed costs account for inertia in price responses in financial markets and one should expect significant interest rate elasticity only when they can be fully compensated for.

Research on the nature of the relationship between financial institutions and borrowers has served to enrich understanding of the apparent rigidities in the interest response of demand for banks' financial assets. In order to maximise the expected return on lending, banks must contain the risk that borrowers are unwilling or unable to repay. They are reluctant to increase interest rates on borrowers who have a proven record of reliable payment, especially if a higher interest rate is likely to attract a riskier clientele. Instead, they offer better than market terms and interest rates to customers they know, and the quality of their services improves to customers according to the duration of their relationship with the bank. Loan contracts are not simply a means of increasing profit; they also provide valuable information on the characteristics of clients (Zephirin, 1990).

Most empirical work is designed to measure the extent to which banks distinguish borrowers according to perceived risk and how borrowers are rationed out of the market. Less attention is given to the question addressed by Zephirin (1993) of the implications for interest sensitivity and financial liberalisation. We should not assume that banks are as comfortable lending to high risk clients at high interest rates as to the less risky at lower rates. In a study of Turkish banks Pehlivan (1996) found that although financial reform led to the use of "market oriented techniques" banks continued to ration credit and there was a shift from the financing of investment to short-term advances.

I am unable to find reported research that deals with the norms used by banks for setting interest rates. There is a considerable macro economic literature discussing how market outcomes differ depending whether prices or quantities tend to be more flexible. Analysis of the financial market seems to have neglected this important issue. It is always assumed that banks' response to any change in expected profit is to adjust their assets and or liabilities through interest rate changes. For example, if the discount rate is raised, banks are expected to increase interest rates on their own assets and liabilities. However, in financial markets which are fragmented, localised and subject to influence, bankers set a loan interest rate to achieve a margin over the deposit interest rate which is accepted as the market norm for the time being. This behaviour is analogous to mark-up pricing. It is an empirical question, still to be explored, whether the effect of monetary policy is on deposit and loan interest rates or on the spread between them. Banks may achieve target profitability by widening the spread between deposit and loan rates even when that produces no change on their balance sheet.

The need for plausible explanations of interest rate setting is highlighted by the discrepancy between observed behaviour and what conventional theory predicts. For example, in the Caribbean, interest rates are adjusted discretely even though assets, liabilities and bank liquidity change continuously. There are episodes of interest rate adjustment followed by extended periods where there is no change. This pattern is as characteristic of jurisdictions where the central bank issues no instructions about banks' interest rates (Jamaica and Trinidad and Tobago since the late 1980s) as it is where there is some guidance. Where, as in Barbados, the central bank makes some interest rate stipulation, but banks are allowed freedom to structure interest rates around an indicative rate, that flexibility is seldom exercised.

The neglect of available insight into bank behaviour has contributed to unintended outcomes of financial liberalisation. Because the monetary authorities ignored the presence of increasing returns and market segmentation they did not anticipate the increasing degree of financial concentration and control of markets. To the contrary liberalisation was justified as a means of increasing competition.

Competition in liberalised financial markets in the Caribbean was expected to come, to a large extent, from foreign sources. That has proved unrealistic. There is little incentive for foreign financial institutions to incur establishment costs to enter markets where they would need to engage in vigorous competition with locally dominant institutions in order to achieve a significant presence. Because of the localisation of financial markets it is not possible to compete effectively from off-shore. Foreign credit is offered only to a handful of companies

which are very large by Caribbean standards and then only by banks that have resident subsidiaries. These companies are the only clients whose credit worthiness can be established in a cost effective manner. No offshore credit facilities are offered to the private sector by financial institutions which compete with those already established locally. Although foreign deposit facilities are more widely available they are more costly to maintain than domestic accounts. Households, who hold the majority of deposits, do not hold foreign currency accounts except where there is apprehension about the future value of the domestic currency.

Implications for Monetary Policy

Monetary policy initiatives assume a banking system that is competitive and efficient, which adjusts smoothly to changes in interest rates and benefits from no economies of scale for year to year changes in financial assets. It is assumed that interest rates will be determined by the equivalent of a market auction rather than by agreed norms. Under such circumstances, one may make plausible forecasts of expectations about the effects of monetary policy. For example, an increase in the central bank discount rate or an increase in the reserve requirement would lead to an increase in deposit and loan interest rates to attract deposits and reduce credit sufficiently to prevent any deterioration in commercial bank profits.

However, if there are increasing returns to scale banks may respond by widening the spread between the deposit and loan interest rates; in some circumstances the deposit rate might be reduced as the loan rate is increased. If there are increasing returns to scope, banks may be inclined to substitute leases for some of their lost credit or to offer fund management services

instead of deposits. The tendency to widen the gap between deposit and loan rates is greater if banks have significant monopoly power. If markets are very strongly segmented banks might be inclined to alter the interest rate structure. For example, mortgage rates might be unchanged when interest rates on consumer lending are increased because mortgages are more sensitive to interest rate changes than consumer lending. The prime rate might be unchanged so as not to penalize the banks' best borrowers but the margins above prime may be larger for less favoured customers. If a tightening of monetary policy acts as an incentive to increased efficiency levels there may be no change in interest rates whatsoever.

Changes such as widening of interest rate spreads or increases in margins over prime may not be sufficiently great to provoke any change in credit or deposits where there are discontinuities in the demand functions. Such inertia is more likely if there are perceived to be large costs in switching from one bank to another or between local and foreign banks. If banks manage their interest rates by applying some norm to a basic indicator rate, any monetary policy initiative is likely to have only a one-time effect on the interest rate no matter how long the time taken for deposit and credit reactions to play themselves out.

These features of the market obviate the need for monetary policy in some circumstances. For example, an exogenous increase in money supply may cause an increase in the monetary base and in holdings of excess reserves rather than increase in credit if there are discontinuities in the credit demand function. Even if banks were to lower their interest rates there would be no additional demand for credit. The additional money supply does not result in additional spending

but is sterilised in the form of excess reserve holdings by the banking system. There is therefore no need for the monetary authority to take corrective action.

The effects of monetary initiatives depend on the magnitude of switching costs, the width of the corridor of interest rate inertia and the significance of scale and scope economies. Furthermore the outcome of monetary policy is contingent on the strategy chosen by financial institutions with significant market power.

We face a long research agenda to establish the existence and quantitative significance of factors which invalidate the competitive model of financial markets. Empirical work should focus on returns to scale and scope, evidence of the exercise of market power, the extent of market segmentation, bank efficiency, the relationship between the interest elasticity of demand and credit and the size of interest rate changes, the magnitude of switching costs and the mechanics of interest rate setting in the banking system. We may use available methodologies to begin this exploration.

In the meantime, observations on bank behaviour in the Caribbean give reason for healthy skepticism about the effects of monetary policy. Because the economies are so small even the largest financial institutions are unable to reap full economies of scale but they do have a cost advantage over smaller banks. There is a strong incentive towards mergers and consolidations and the largest institutions are able to exercise monopoly power. However numerous their smaller rivals, small size makes their services expensive and they can offer no competitive

challenge. Facilitating the entry of new financial institutions and giving locals access to foreign financial services does nothing to inhibit the monopoly powers of domestic financial institutions because of the universal fragmentation of financial markets into distinct local entities.

In these circumstances policy makers have little notion what the outcome of monetary initiatives will be. If they assume, implicitly or explicitly, that the results will resemble those produced by a competitive system, they will be surprised and disappointed. However, they have no basis for any other assumption since they would need to know in advance what strategy leading financial institutions will adopt in response to any initiative. The possibilities are numerous; financial institutions themselves may not be sure in advance what course will finally be decided upon. Economists have tried to get around this problem by speculating how reasonable, well informed agents might respond. Results from research of this kind are unconvincing, involving presumptions about the amount of information available to agents, how they interpret that information, how costly it is to acquire additional information, how willing they are to take risks, what their time horizon is and whether all agents are identical. In addition to all this, we need systematic information on bank efficiency and the interest rate setting mechanisms.

In the present state of knowledge the best monetary policy may be the least ambitious. Empirical research cited, mainly for the U.S., should serve to qualify expectations about the outcome of monetary policy in that country. Skepticism about the impact of monetary policy in small open economies must surely be much greater. Precisely because of their openness, monetary policy is known to be less efficacious. Now we observe that evidence of non-

competitive behaviour is widespread in small open economies and that small size and the characteristics of the market in financial services make this an abiding feature. Incentives should be offered to increase the efficiency of the provision of financial services to benefit firms and households but monetary authorities delude themselves if they anticipate any increase in their leverage over economic outcomes.

References

- Bennett, Karl, "An Analysis of the Performance of the Financial Sector in Barbados, Jamaica and Trinidad and Tobago", Social and Economic Studies, 44: Special Issue 1995, 69-86.
- Berg, S.A. et al, "Banking Efficiency in the Nordic Countries", Journal of Banking and Finance, 17:2-3, April 1993, 371-88.
- Berger, Allen, "The Profit Structure Relationship in Banking: Tests of Market Power and Efficient Structure Hypothesis", Journal of Money Credit and Banking, 27:2, May 1995, 404-31.
- Berger, Allen and Timothy Hannan, "The Price Concentration Relationship in Banking", Review of Economics and Statistics, LXXI:2, May 1989, 291-9.
- Berger, Allen, D Hancock and D Humphrey, "Bank Efficiency Derived from the Profit Function", Journal of Banking and Finance, 17:2-3, April 1993, 317-47.
- Berger, Allen, W.C. Hunter and S.G. Timme, "The Efficiency of Financial Institutions: A Review and Preview of Research Past, Present and Future", Journal of Banking and Finance, 17:2-3, April 1993, 221-50.
- Bourne, Compton, "Structure and Performance of Commercial Banking in Trinidad and Tobago", in Bourne and Ramsaran, Money and Finance in Trinidad and Tobago, ISER, Mona, Jamaica, 1988
- Clark, Jeffrey, "Economic Cost, Scale Efficiency and Competitive Viability in Banking", Journal of Money, Credit and Banking, 28:3, August 1996 Part 1, 342-64.
- Clark, J. and P. Speaker, "Economics of Scale and Scope in Banking", Quarterly Journal of Business and Economics, 33:2, Spring 1994, 3-25.
- English, M. et al, "Output Allocative and Technical Efficiency of Banks", Journal of Banking and Finance, 17:2-3, April 1993, 349-66.
- Fase, M, "The Demand for Commercial Bank Loans and the Lending Rate", European Economic Review, 39:1, January 1995.
- Favero, Carlo and Luca Papi, "Technical Efficiency and Scale Efficiency in the Italian Banking Sector", Applied Economics, 27:4, April 1995, 385-95.
- Ferrier, Gary and C.A.K. Lovell, "Measuring Cost Efficiency in Banking: Econometric and Linear Programming Evidence", Journal of Econometrics, 46:1,2, Oct/Nov 1990, 229-45.
- Fixler, Dennis and Kimberly Zieschang, "An Index Number Approach to Measuring Bank Efficiency: An Application to Mergers", Journal of Banking and Finance, 17:2-3, April 1993, 437-50.
- Fukuyama, H., "Technical and Scale Efficiency of Japanese Commercial Banks: a Nonparametric Approach" Applied Economics, 25:8, Aug 1993, 1102-12.
- Grabowski, R, N.Rangan and R. Reznian, "Organisational Forms in Banking: An Empirical Investigation of Cost Efficiency", Journal of Banking and Finance, 17:2-3, April 1993, 531-8.

Hannon, T.H., "Bank Commercial Loan Markets and the Role of Market Structure: Evidence from Surveys of Commercial Banking", Journal of Banking and Finance, 15:1, February 1991, 133-50.

Hess, Alan, "Portfolio Theory, Transactions Costs and the Demand for time Deposits", Journal of Money Credit and Banking, 27:4, November 1995 Part 1, 1015-32.

Hester, D. and F Sdogati, "European Financial Integration: Some Lessons from Italy" Banco Nazionale del Lavoro Quarterly Review, 170, September 1989.

Kaparakis, E.S. Miller and A Noulas, "Short Term Cost Inefficiency of Commercial Banks: a Flexible Stochastic Frontier Approach", Journal of Money Credit and Banking, 26:4, November 1994.

McAllister P.H. and D. McManus, "Resolving the Scale Efficiency Puzzle in Banking", Journal of Banking and Finance, 17:2-3, April 1993, 389-406.

Miller, S and A Noulas, "The Technical Efficiency of Large Bank Production", Journal of Banking and Finance, 20:3, April 1996, 495-509.

Osborne, D.K., "Competition and Geographical Integration in Commercial Banking", Journal of Banking and Finance, 12:1, March 1995, 85-103.

Pehlivan, Hatice, "Financial Liberalisation and Bank Lending Behaviour in Turkey", Savings and Development, 20:2, 1996, 167-84.

Pi, L. and S.G. Timme, "Corporate Control and Bank Efficiency", Journal of Banking and Finance, 17:2-3, April 1993, 515-30.

Seepersad, Suzanne, "The Commercial Banking Industry in Trinidad and Tobago, 1986-92", Social and Economic Studies 44, 1995 Special Issue, 41-68.

Shaffer, Sherrill, "A Test of Competition in Canadian Banking" Journal of Money Credit and Banking, 25:1, February 1993, 49-61.

Shaw, E.A., "Operational Results of Commercial Banks in Jamaica, 1991-3", Social and Economic Studies, 44:Special Issue, 1995, 23-40.

Souminen, Matti, "Measuring Competition in Banking: a 2-product Model", Scandinavian Journal of Economics, 96:1, 1994, 95-110.

Streb, Jorge and Laura D'Amato, "Economies of Scale and Utilization of Installed Capacity: Empirical Evidence from Retail Banks in Argentina", Money Affairs, 8:1, Jan-June 1995.

Wood, Anthony, "Bank Lending to Firms and the Nature of Credit Rationing in Barbados", Money Affairs, 7:2, Jul-Dec. 1994.

Zephirin, M.G., "Financial Liberalisation: A Theoretical Perspective", Money Affairs, VI:2, Jul-Dec. 1993.

Zephirin, Mary, "Imperfect Information and Financial Liberalisation in LDCs", PhD thesis, University of Warwick, 1990.

DeLisle Worrell
October 15, 1996

