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Operationalizing and Measuring Competition: Determinants of Competition in Private Banking Industry in India

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Abstract

Using an appropriate theoretical framework and econometric methodology, the study has sought to measure and model competition in private banking industry in India in an attempt to analyse the process of market dynamics in the industry. The changing scenario of private banking consequent to deregulation provided the motivation behind the study. It used the concept of competition proposed by Stigler (1961) and measured it by Bodenhorn's (1990) measure of mobility. The study provides a critique of the mechanism of inducing competition, which is implicit in the Narasimham Committee (1991). It then provides the theoretical background of an alternative mechanism based on Structure-Conduct-Performance paradigm, which incorporates basic conditions and strategic groups, apart from including entry, economies of scale, product differentiation and price cost margin, One basic contention of the study is that competition goes beyond "conduct" and encompasses all the four components of S-C-P paradigm: basic conditions, structure, conduct and performance.

Accordingly, a three equation simultaneous equation model is used to ultimately estimate the equation of competition through Tobit technique. The result demonstrates that variables related to basic conditions, structure, and conduct and performance influence competition. The study has found evidence against the simplistic relationship between concentration and competition, which remained implicit in the literature. The study also developed a methodology to arrive at market form from an analysis of three aspects of a market and concludes that private banking industry in India is characterized by monopolistic competition.

Keywords: Competition, Structure-Conduct-Performance, Banking reform.

Jel Codes: D4, D21, E5, E42, 44.

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I.0 Introduction

Growth can be financed by government investment through fiscal policy or by private investment through monetary policy. While a State-led strategy relies on fiscal development finance a market-led one would rely on banks. Ideally speaking, there should be competition between these two strategies. Apparently, there is not much possibility of competition between institutions providing funds for public investment. The State and banks are therefore, are in this sense competing entities. While a State-led strategy relies on fiscal development finance a market-led one would rely on banks. However, competition can exist between different banks which provide funds for private investment. The study attempts to contribute in the direction of providing a framework and methodology for analyzing competition in banking industry.

It is necessary to go into the history of banking for understanding the changing role of fiscal and monetary policy. The failure of the private banking industry in the pre-nationalization era had led to nationalization. The main reasons were:

1. Industrial policy – concentration of economic power.

2. Undermining the strategic developmental interests – priority sector lending.

3. Siphoning-off funds into own businesses.

All of the above was anti-developmental. Firstly, this mistrust led to the need for regulation of banking industry. Post-nationalization banking industry became regulated. The role of the banking industry and its potential for financing growth became controlled and restricted. Secondly, on account of losses of public sector

banks the burden on fiscal funding increased. There was a constant need for re-capitalization. Over a period from 1985-86 to 2000-02, the government has contributed Rs 20,046 crores towards recapitalization of public sector banks[1]. Since banks were not doing so well, and their growth was controlled, the burden of financing growth shifted onto fiscal policy. Monetary policy had to become more restrictive. This points to the changing role of fiscal and monetary policy in financing growth.

Hence, in terms of strategy, there was a choice between stifling the banking industry to meet long term developmental goals and freeing the banking industry so as to allow private initiative and finance to facilitate growth and development. In the process it is expected that a more competitive banking industry would lead to a more efficient financing of growth.

The recent financial sector reform, especially, the Narasimham Committee initiative resolves this dilemma. It frees banking industry in terms of allowing entry which has led to growth of private banking industry. Parallely, the deregulation of interest rates provides the conditions for private banks to manage themselves more efficiently. With the removal of restrictions, it is expected that banking industry would become more competitive

Clearly, operations of both public sector banks and foreign banks[2] are relatively more restricted in the deregulatory phase of the banking industry. Hence, we have chosen to concentrate on (domestic) private banking alone for studying competition. Although private banking is not the major component of the banking sector, its importance is

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1 Mathur, K.B.L.(2002)
2 Deb, A.T. (2006)

progressively increasing[3]. Today it would be no exaggeration to treat this segment of banking industry as the most dynamic segment. It no longer plays a residual role in the banking industry. Of the three components, private banks operate in the most open environment. Therefore, they are likely to be closest to competitive markets. It is also the segment that has seen the greatest growth and entry of new banks making it prone to competition.

Our interest is in studying the new liberalised (de-regulated) environment for banking and for this purpose. The question is why it is important to study competition. Firstly, there is not adequate discussion about private sector banks in the Narasimham Committee report, even when they have been visualised as dynamic agents, which would improve the functioning of the banking industry through competition. Secondly, there is hardly a study of competition in Indian industry, let alone one in Indian banking industry[4]. Finally, the need to study competition in banking industry has been stressed in the literature[5]. This study chooses to use the Structure-Conduct-Performance (S-C-P) approach to analyse competition in private banking industry in India.

Plan of the paper: Section II is devoted to the review of literature. Section III relates to conceptual issues. The hypotheses are given in Section IV. The measure of competition used is discussed in Section V. Section VI has the preliminary analysis of data. Section VII is about methodology. The determinants of competition are given in Section VIII. Section IX contains results. The concluding section is Section X.

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3 Deb, A.T. (2006)

[4] To our knowledge there is only one such study. Ghosh, Saibal and Prasad, A. (2005), Competition in Indian Banking, IMF Working Paper, July, paper 05/141.

[5] Santomero (1984) stressed the importance of studying the degree of competitiveness in the financial market that surround the banking firm.

II.0 REVIEW OF LITERATURE[6]

Theory purports limited price competition in a situation when a market is characterised by a high degree of concentration and a small number of firms. Moreover, the possibility of collusion arises with a reduction in the number of firms. Such a situation should result in conduct that causes relatively little mobility and turnover among the dominant firms. Shepherd observed that successful cooperation would - while it lasts-usually holds firm shares virtually constant. Such constancy may be used to infer cooperation, even when direct evidence is lacking. Constancy may also result from vigorous but stalemated competition, in a situation, where all firms succeed equally. But such a running stand off is relatively improbable. The greater the stability, the higher is the probability that overt or covert cooperation exits. If on the other hand, the market is characterised by low concentration and large number of firms, competition is more likely to be relatively intense for two reasons. First, presence of larger of number of firms makes the possibility of collusion remote. Second, presence of large number of firms makes it difficult to obtain information necessary to assess the action and possible counter action of rivals. Such uncertain environment is likely to lead to relatively intense competition for fear of outmanoeuvred by the rivals. When intense rivalry prevails in a market, the element of chance will result in some big winners and some big losers. It is apparent that a competitive market structure should force a kind of conduct or rivalry among firms that would be reflected in a relatively large amount of mobility and turnover.

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6 For a detailed discussion on a theoretical notion of competition see: Bhanumurthy, K.V. and A.T. Deb (2007) 'Theoretical Framework of Competition as Applied to Banking Industry', Working Paper, www.papers.ssrn.com.

There have been two types of attempts to quantify the phenomenon of competitive rivalry. They focus on different phenomenon in an attempt to understand competition in a market. They relied on changes in the firm's rank or the changes in their respective market shares. In their attempts to develop suitable indicators of competitive conduct, Heggestad and Rhoades (1976), Rhoades (1980), Rhoades and Rutz (1981) and Bodenhorn (1990) argue in favour of the former while Hymer and Pashigian (1962) argue in favour of the later[7].

In terms of the traditional industrial organization paradigm of S-C-P, extant studies like, Joskow (1960) argue that firm rank stability measures like mobility and turnover are complementary to measures of concentration as indicators of structure. Heggestad and Rhoades (1976) argued that mobility and turnover aspects are not elements of industry structure but rather reflect conduct. While mobility was defined as churning in rank position of the leading firms, the measure of turnover was defined as the number of firms below the leading group that replace the firms belonging to the leading group. Bodenhorn (1990) pointed out the problems with both measures. He argued that Heggestad and Rhoades's measure of mobility takes a value zero, if two firms in the leading group change positions, while others maintain their positions. The problem with turnover measure is that it will take value 1, whether moves from rank 6 to rank 5 or from rank 16 to rank 5. These problems led Bodenhorn to construct his own measure as a sum of rank changes among the top firms. It is important to observe that while Bodenhorn calls his measure mobility, it captures both the aspects of change in rank in the leading firms as well as entry of firms below the leading group into the leading group. It thus captures both the aspects of mobility and turnover, but is termed as "mobility" alone instead of mobility and turnover. Like

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7 Further discussion can be had from Deb, A.T. (2004)

Denizer (1997) our study uses Bodenhorn's measure. We calculated Bodenhorn measure in table VII.2 and following him called it mobility but the discussion based on the measure refers to both mobility and turnover.

As distinct from the above studies, which attempted to empiricize competition rigorously, there are two groups of studies. The first group consist of a few theoretical works on the relationship between entry, number of firms and competition. They include, Shubik (1990) and Fama and Laffer (1962). The other group consist of few empirical studies, which come somewhat close to the questions examined by the present study. They include Bresnahan and Reiss (1991), which suggests that competitive conduct changes quickly as the number of incumbents increase. Another study due to Bikker and Half (2002) provided support for the conventional view that concentration impairs competitiveness. A number of studies apply S-C-P hypothesis particularly in the context of banking industry. Gilbert (1984) provides a detailed survey of such studies. These studies attempt to test the hypothesis that degree of concentration influences the degree of competition. They estimate measures of bank performance as functions of concentration of deposits among banks in local market areas. The measures of performance used as indicators of the degree of competition among banks include bank profit rates, interest rates charged on loans and paid on deposits. However, results of the bank market structure do not consistently support or reject the hypothesis that market concentration influences bank performance.

III.0 CONCEPTUAL ISSUES

Concentration is taken to be a summary measure of the market structure. In fact, it is often taken to be a summary measure of the market form as a whole (which

consist of S-C-P). For instance, often tight and loose oligopoly[8] has been defined in terms of concentration ratio. In fact, it is degree of competition, which defines the nature of market form and not the degree of concentration[9]. The impact of concentration on competition works through a number of factors that affect competition, consisting of S-C-P factors and basic conditions. Concentration exerts only a partial effect[10]. Therefore, the relationship between entry and market form is not determinate as well. The notion of competition in Narasimham committee makes it appear as though entry is sufficient for generating competition. Deb (2004) pointed out that such an argument consists of the followings steps, which are worth examining.

- Entry will reduce concentration.

- Reduction in Concentration will reduce monopoly power[11].

- Reduction in monopoly power is synonymous with rise in competition.

  (Nickell, 1996)

Impact of entry on concentration has received some attention in the literature on industrial economics. Bodenhorn (1990), Denizer (1997) and Davies and Lyons (1991) argued that entry might as well increase concentration ratio. Deb (2004) to use some algebra to specify the precise conditions in which entry would have positive and negative impact on concentration. Clearly then, entry does not always reduce concentration. As for the second part of the argument, assumptions have been already

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[8] A tight oligopoly is defined in terms of four-firm concentration ratio of above 60%, and a loose oligopoly in terms of below 40% four-firm concentration ratio.
9 For a detailed discussion see: Deb, A.T. (2004).
[10] Such argument is fallaciously used by Shiraj and Rajsehkaran (2001). It states that with falling concentration, competition rises.
[11] Monopoly power is the ability to alter prices away from competitive levels to earn economic profit for long periods, without attracting new competitors and without improving their product or reducing their production cost (Mas-Collel, Whinston and Green, 1995).

worked out by Saving (1970) under which there will be a systematic relationship between concentration ratio and monopoly power. Using the above contentions, Deb (2004) concluded that there exists no general relationship between entry and concentration, or between concentration ratio and monopoly power.

The notion of entry and competition in S-C-P paradigm is associated with the following problems. Traditional theory discuses the concept of entry barrier, which gives an advantage to the existing, firms. In terms of the S-C-P paradigm, competition has been classified as a conduct variable (Bodenhorn, 1990). Secondly, the traditional S-C-P does not take account of the influence of basic conditions, conduct and performance on competition. Thirdly, the underlying construct in S-C-P paradigm to understand competition is price cost margin.

A framework to study such a notion of competition is developed in the following sections. It assimilates traditional elements of S-C-P paradigm including entry, economies of scale, product differentiation and price cost margin as well as other elements including basic conditions and strategic groups.

IV.0 AN ANALYTICAL FRAMEWORK TO ANALYSE COMPETITION

In the light of the above discussion, we are developing an analytical framework to understand competition. Such a framework includes the following elements. Firstly, it is believed that competition is an overall state that describes the nature of the market form. Hence, it encompasses all the aspects of an industry, namely basic conditions, structure, conduct and performance. Secondly, there is a phenomenon of entry facilitators as opposed to entry barriers. The basic approach to entry barrier does not look at basic conditions. Hence the conclusion that returns to scale constitutes a barrier to entry. Assuming that long run costs are a product of both

internal and external economies of scale, it still does not take into account basic conditions. Our understanding in this context is different from the traditional theory. Once basic conditions like technology are not treated as a parameter but are allowed to change, then it may be seen how it may act as an entry facilitator. It will lead to situation in which long run average cost of new firms will lie at a lower level than the old firms, which initially enjoyed a cost advantage over the new firms. Entry facilitators, along with the concept of strategic group, basic conditions and different elements of market structure are put together in Figure 2, which along with Figure 1 to provide an analytical framework to analyse competition. The figures attempt to synthesise the approaches of S-C-P and strategic groups. While, it includes traditional elements of S-C-P paradigm including entry, economies of scale, product differentiation and price cost margin, it also incorporates basic conditions and strategic groups to analyse the process of market dynamics in the industry. In the traditional S-C-P paradigm, it is structure, which influences entry. However, it has been observed that in case of banking, change in basic condition directly influences
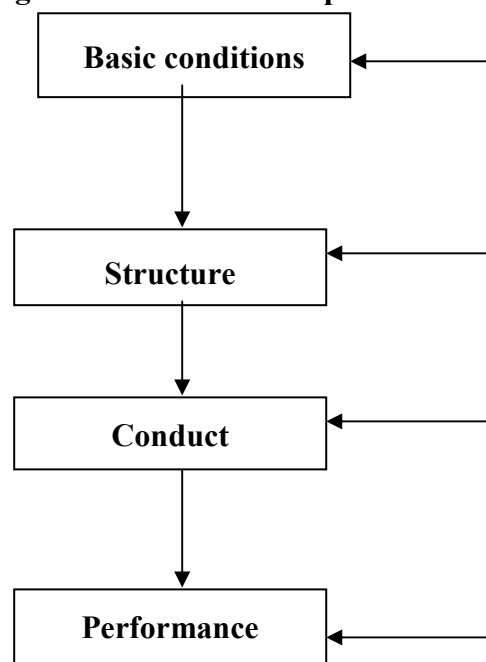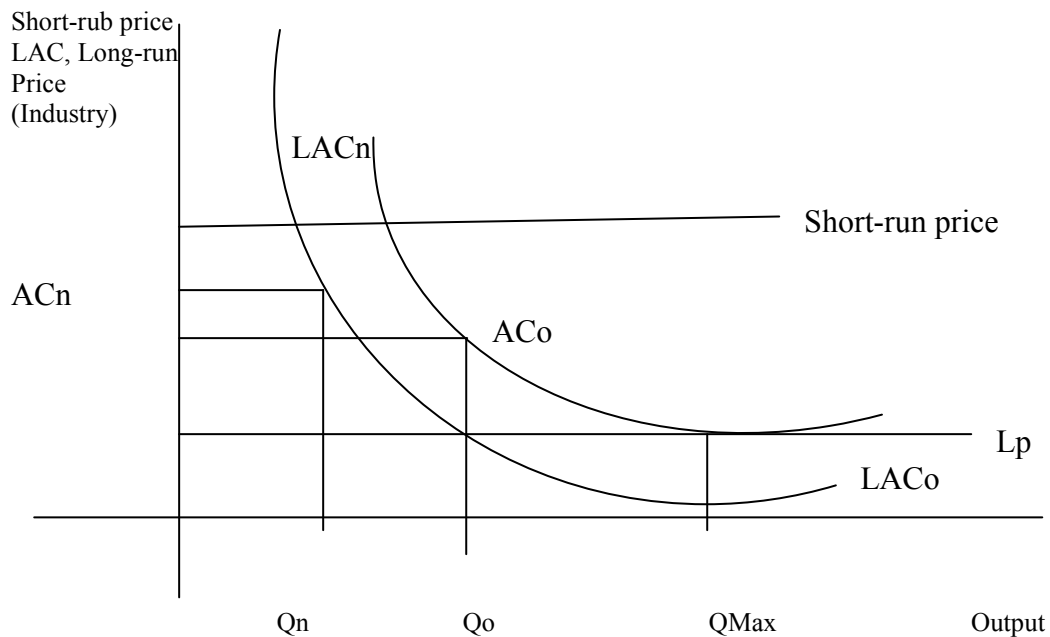
Figure 1: Nature of Competition

Figure 2: Entry and Market Dynamics

LEGEND

LACn = Long Run Average Cost of New Bank   Qmax = Maximum size
ACn = Average Cost of New Bank   Qo = Output of Old Bank
ACo = Average Cost of Old Bank
Lp = Long Run Price
LACo = Long Run Average Cost of New Bank
Qn = Output of new Bank

conduct by bypassing structure. In the Figure 2, output and average cost are represented on the x and y-axes respectively. Let the discussion begin with the status of old banks on the eve of entry of new banks. They did not start with the provision of having to have an optimal scale in the beginning itself. In the absence of new banks, they got the benefit of serving a whole market and in the process, lowered cost through exploitation of economies of scale.

The entry barrier argument can well be granted in terms of internal economies arising in favour of old firms. These would arise out of indivisibilities and experience. However, internal economies are only likely to enhance the advantage the old banks

may be experiencing, in addition to economies that they derive from external economies. External economies arises essentially an expansion of the industry.

In long run industry equilibrium, only efficient firms remained because they have achieved the optimal scale. In the regulated period, the old banks reached economies of scale when they were perhaps producing QMax level of output. Now the issue is how the new banks could enter and overtake the old banks, when the latter were enjoying the benefits of economies of scale.

To explain the scenario after entry with new banks with a better technology, two average cost curves are shown, one above the other. The upper curve represents average cost of the old banks and the lower one shows the cost situation of the new firms. This is because the new banks entered with a better technology, which resulted in lower cost of production. Clearly the new banks enjoyed a potential absolute cost advantage because the new banks at a lower cost can produce the same output. However, initially the new banks suffered from a relative cost advantage because of a lower volume of production in the initial period.

After entry of new banks, expansion of the industry benefited the old banks in the initial phase. It was natural for people to go to an established bank as opposed to a new bank, which was yet to establish its credibility. Substitution of an old bank with a new bank took place over time, when the new banks were perceived as provider of better services with the help of new technology. However, there was a caveat here. The amount of money needed to open an account with new banks is substantially higher than that of an old bank. Such difference in strategic behaviour limited the scope of substitution of old banks by the new banks. Thus, it is clear that, the new firms are not likely to have economies of scale during the period immediately after

their entry. However, there was a latent demand for a variety of technology-based services emanating from affluent section of the population. In absence of supply of such services, such a section more readily joined the new banks. This caused an expansion of industry in favour of new banks arising out of new technology thus while, technology and new services enabled differential advantage in favour of new banks, and such advantages however would unfold only over a period of time.

It was imperative for the new banks to expand production in order to realize the benefits of economies of scale. Their strategy was to target the well off segment of the population through provision of technology based services. With this end in view, they engaged in product differentiation and developed brand names and ultimately went in for merger. In such a situation, the only alternative for the old firms was to go for new technology, which also had its own compulsions. Use of new technology is meaningful only when their economy of scale is exploited. With recession affecting their clients, second rung corporates located in their traditional area of operations, they had no choice but to look for expanded markets in metros. It follows from the above discussion that market dynamics is shaped by three factors.

1. Entry of new banks consequent on deregulation, motivated by expectations of profits through use of new technology and strategic conduct.

2. The mechanism through which new banks could actually circumvent the advantages of old banks included new technology and strategic conduct.

3. Means adopted by the old banks to cope up with the new banks in the new scenario.

V.0 HYPOTHESES

The following hypotheses are tested in this paper.

- Entry is not only factor influencing competition

- Entry has an indirect impact on competition.

- Competition is influenced by basic conditions, structure, conduct and performance.

- Rivalry is central to notion of competition.

- Deregulation has led to competition.

VI.0 MEASURE OF COMPETITION USED IN THE STUDY.

The way to understand competition is look at the range of market forms, which at one end is characterised by monopoly, and at the other end by perfect competition. Monopoly signifies absence of competition, while perfect competition signifies extreme form of competition. Competition under perfect competition appears to be random in nature, making it difficult to measure. On the other hand, if rivalry were entirely deterministic, no method or modelling of competition would work. Our concept of competition rests on evolving a notion that can be operationalised and measured. Therefore the conceptualisation essentially relates to intermediate market forms, which are at neither extreme. The requirement therefore is to develop a measure of competition that can incorporate the features of market forms that exist at the two ends of intermediate range. In oligopolistic market forms, both tendencies of rivalry as well as collusion are found. On the other hand, at the higher end of the competitive market forms, such as monopolistic competition, there is no collusion. Hence the measure of competition should have a higher value if competition is greater and a lower value if collusion is greater. In this sense, we must have a measure of

competition that is capable of reflecting this change from the lower end up to the higher end. Therefore, we use the following measure as an index of the degree of competition:

$$\text{Bodenhorn's Measure of Mobility} = \sum_{i=1}^{5} | Ri(t) - Ri(t-1) |$$

Ri (t) = Rank of 'ith' firm in tth year. Leading firms are restricted to 5.

It is the absolute difference in ranks of leading (5-firm) between two time periods.

The earlier studies tended to equate competition to rivalry and measured competition as such. It appears that their interest was only in studying competitive market forms to the exclusion of oligopolistic market forms. Apparently, most of the studies on oligopoly focus on conduct, especially pricing decisions. In the present framework, competition is being studied as characteristics of the entire market form and not just conduct. Secondly, the measure of competition has to be such that it incorporates both the effect of collusion as well as rivalry. Furthermore, it has to encompass a range of pragmatic market forms. It is from this point of view that we shall now be examining our measure of competition.

It may be argued that the degree of mobility and turnover is a consequence of rivalry and collusion. If mobility and turnover is high, then there is more of competition and less of collusion and if it is low, then there is more collusion and less of competition. This interpretation of competition, the extent to which it represents the resultant of both rivalry and collusion on is a contribution of the study. The earlier studies using mobility and turnover interpret the variable to be an indicator of rivalry alone.

Geroski (1990) rightly pointed out that the degree of rivalry in a market is difficult to determine with any precision, and probably cannot be completely captured by just one variable. There had been attempts in the literature to treat concentration and number as indicators of competition the literature. In our case, competition is not captured by one variable, it is sum total of two variables, each capturing different aspects of competition. Moreover, the interpretation being given to our measure of competition is that it incorporates both the effects namely, collusion and rivalry. And thirdly, competition is being measured in a causal framework by a complex set of determinants in a system of three equations.

Our measure of competition should be sensitive in both directions. If competition is taking place, it should be reflected in the measure and if competition is absent, it should not be reflected in the measure. What will be analyzed below is how our measure of competition remains valid in a set of diverse situations. In other words, the point is what is the code of our measure of competition in different situations and does it faithfully represent the phenomenon of competition in direction and magnitude. A number of proposals are cited below for this purpose. They relate to different situations of rivalry, collusion, and lastly expansion of market. There are different scenarios of market dynamics. While some are able influence a measure of competition some are not.

Proposal 1: Entry in near perfectly competitive market does not produce a change in degree of competition.

If the market form is near to perfect competition, then all firms are small firms and changes in their market share would lead to some market dynamics. But it would not radically alter the ranking of top firms. Therefore neither would concentration

ratio would change, nor would ranking be altered significantly. Hence this kind of market dynamics is almost random. It lacks direction.

Proposal II: Random rivalry amongst small firms, in the presence of few large firms does not increase the degree of competition.

If a few firms dominate the market, the presence of large number of small firms at the bottom is not likely to introduce any significant rivalry and competition. In such a case, random movements in share of small firms take place resulting in no change in rank of large firms. Thus there is no change in mobility and hence in competition. It may be indicative of a mixed market structure where large firms at the top coexist with a number of small firms at the bottom.

Proposal III Non random rivalry amongst small firms increases the degree of competition.

If rivalry amongst small firms is not random, then one or more small firms may cut into the share of other small firms. This may lead to displacement of   firms at the lower echelon of the array of top firms. This creates turnover and the degree of competition increases.

Proposal IV: Rivalry between large firms will lead to increase in the degree of competition.

Rivalry between large firms will be manifested in terms of change in their share, resulting in change in their ranks. This leads to mobility and the degree of competition increases.

Proposal V: Collusion between small banks is not likely to increase the degree of competition.

Collusion leads to retention of market shares but it concerns small firms, it is not likely to affect the ranks of top firms, and hence degree of competition does not change.

Proposal VI: Collusion between small and large banks is unlikely to affect the degree of competition.

A large firm is unaffected by a small firm. It cannot retain its share by colluding with a small firm. Collusion   between them is unlikely to affect the market and the degree of competition. Thus collusion between a large and small firm is unlikely.

Proposal VII: Collusion among large firms does not increase the degree of competition.

Collusion among large firms leads to preservation of their market shares. There is no change in their market shares and rank remains unchanged. Thus mobility does not change and degree of competition will not increase.

Proposal IX: Market expansion is neither a necessary nor a sufficient   condition for increasing the degree of competition.

There is a popular notion that after a market expands, it becomes competitive. This is not necessarily true. The market may expand, but the same set of firms may continue to dominate the market with unchanged ranks. Nor it does not imply that any firm from below affects the top ranks. Thus even when market expands, the degree of competition may not increase.

Our notion of competition is not based on passive entities and random happenings. In our view, competition has to manifest through the actions and identities of particular firms. Hence, any concept of competition has to be based on

behaviour and position of certain firms. Therefore we are aligning our understanding with mobility and turnover, which do not change accidentally.

Our concept of competition is based on the following

1.   Rivalry is not expected from far below. Therefore in the event of such rivalry, it unleashes a greater competitive force. It is indicative of a higher degree of competitive force.

2.   Rivalry is expected from amongst the top firms. But it is also the top firms, which can be lured to collusion. It will dampen the degree of competition. Hence while such an event is more likely, the change in the degree of competition signifies a lower weight.

Hence our measure is assigning appropriate weights to the appropriate events so as to reflect the right degree of competition. Our measure has to be such that it fulfills the following conditions, so that it may be said that the variable used to measure competition is following an appropriate code. Only when degree of competition increases, our measure of competition must increase in value. This is a necessary condition for the measure to be valid. If our measure of competition has increased, then it must be taken to mean that the degree of competition has increased. This is a sufficient condition for the validity of the measure.

VII.0 A PRELIMINARY ANALYSIS OF DATA

Table 1 revealed that ranks of most of the old banks have deteriorated in the industry over time, while those of new banks have improved without a single exception. Only two old banks, one among the top and other among the bottom could retain their ranks. They are LKB and JKB.

Table 1　　　**Ranks of old and new banks during 1995 and 2000.**

Banks	1995	2002
VB	1	7
FB	2	5
JKB	3	3
BOR	4	15
SIB	5	10
UWB	6	12
KB	7	8
KVB	9	13
INDB	10	6
CSB	11	19
TMC	12	16
LVB	13	20
GTB	14	9
SB	15	26
BOB	16	22
DB	17	23
HDFC	18	2
CUB	19	21
UTI	20	4
NDB	21	25
ICICI	23	1
LKB	24	24
RB	26	27
NNB	27	29
CB	28	17
GBK	29	30
BOP	32	18

Table 2　　　**Bodenhorn's Measure of Mobility:1992-2002**

	measure of mobility
1993	2
1994	2
1995	0
1996	2
1997	6
1998	3
1999	11
2000	18
2001	5
2002	0

A look at the Table 2 leads to an important observation. Entry of new banks has led to

emergence of competitive forces reflected in increased mobility and turnover in the

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industry. One can observe a rise in strength of competitive forces following entry of new firms. Forces of competition reached their peak in 1999-2000. It was followed by a period of stability in ranks of leading firms[12]. The period from 2000-01 to 2001-02 was characterized by complete absence of mobility and turnover. It is apparent that a period of instability created by emergence of competitive forces has given way to stability. Thus one may distinguish between two phases of competition following entry in private banking industry. In the first phase, the strength of the force of competition increased to reach their peak. This is followed by a phase, in which competition became less intense and ultimately died down. The course of events related to generation of competitive forces following entry resembles the aftermath of throwing of a stone in a water body, as a result of which ripples are created, gather strength, and disappears.

VIII.0 METHODOLOGY

The following exercises have been conducted in order to understand the market dynamics/status of competition in the market.

1. Correlation coefficients of market shares between 1992 and 1994 as well as 1995 and 2002 are computed and tested for their significance. The first set of correlation acts like a controlled variable. It captures the static picture in the absence of entry and is benchmarked as absence of competition. We postulate no significant change in market shares between 1992 and 1994 and expect them to be having a positive and significant correlation. But if there is a change in the situation, which is induced by entry, it will be reflected in terms

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[12] Mobility in the pre entry phase was at a low level, and there was no turnover. It may be possible to argue that the entire change in mobility can be attributed to adverse impact of change in the rank of J and K Bank due to disturbances related to terrorism in J and K Apart from this change; there was no other change before 1995, in which entry took place.

of either change in the sign or reduction in the value of the correlation coefficient. One may visualize the following scenarios with regard to change in correlation coefficient from one period to another.

- From positive significant to positive significant

- From significant positive to insignificant positive

- From significant positive to insignificant negative

- From significant positive to significant negative

2. Market shares of banks in 1995 were correlated with their market shares in 1996 and then with the same in succeeding years. The purpose of this exercise is to reveal the strength of association of market shares between two years, as the distance of them widens. On the other hand, correlation coefficients between market shares of banks in any two consecutive years are calculated, beginning from the year 1995. This along with earlier exercise will reveal some aspects of market dynamics in the period under study.

3. A chi square test is done to test whether size distribution of the banks is a log normal distribution. This is because calculation of mobility and turnover figures is meaningful only when the size distribution of firms resembles a log normal distribution.

4. Measures of mobility and turnover over the pre entry and post entry periods are calculated and the significance of their difference is tested. This is done with a view to understand whether entry has instilled competitive forces.

5. Karl Pearson and Spearman's correlation coefficients between market shares of banks at the top and the bottom are calculated to see how their market shares are changing, so as to analyse their implication.

6.   The study uses two equations developed in the literature. One for explaining concentration and other one for explaining profitability. In the current paper, another equation is developed for explaining competition in the industry. This equation includes both concentration and profitability as its independent variables. Thus we are led into a system of simultaneous equations, consisting of three equations.

Schmalensee (1989) has reviewed a number of econometric models related to S-C-P paradigm and argued that most of variables used in these models are endogenous to the system. They per se determine and are determined by other variables in the system. There are not many predetermined variables that one could find in the system. This creates serious econometric problems. Schmalensee argued that this endogeneity problem couldn't be solved by more elaborate model specifications. Siddharthan and Pandit (1992) argued that this problem couldn't be dismissed by the observation that least square and simultaneous equation methods yield similar estimates. Schmalensee reviewed a number of cross section studies and suggested that the primary objective of these studies should be to describe main pattern in the data set used in the study. He even goes as far as to say that one should go for descriptive statistics and not structural hypothesis testing.

In our system of equations, the main structural equation, which determines competition, contains two endogenous variables, namely profit and market concentration. In the method of Hayashi and Sims (1983), these endogenous variables are regressed on the explanatory variables upon which they depend so as to obtain the predicted values of these variables. Both market concentration and profit depend upon exogenous variables. Hence their predicted values are truly predetermined variables, which are endogenously determined. For instance, in the

case of concentration, the measure of size is based on asset and not market share. Similarly, the skewness relates to asset size and not market share. Even number is obviously exogenous. In the case of the main structural equation, 'OFA' relates to technology, which is part of basic conditions and hence exogenous to the system. The other variable of wages also clearly does not depend on any variables in the system. In the case of the profit equation, the variable that captures advertisement is expressed as proportion of expenditure and hence is not advertisement intensity as is measured for product differentiation. Once again liquidity and spread are independent variables not being determined by other variables in the system. Therefore the objections by Schmalensee do not appear to be valid for our system of equations. The only limitation may be that the estimators so obtained are 'nearly efficient'. On the other hand, our methodology is an improvement over extant studies because of two reasons. One, the analysis is carried out for the entire population-private banking industry. Two, in our system of equations, competition is explained with the help of feedback of conduct, performance, structure as well as basic conditions.

The equations for profitability and concentration were estimated with OLS techniques and the estimated value of concentration and profitability are plugged in the third equation. However, equation for competition has to be estimated with a technique called Tobit regression, which uses maximum likelihood estimators. This is because the variable used in representing competition assumes the value zero on a few occasions.

IX.0 DETERMINANTS OF COMPETITION

The study has sought to explain competition in terms of variables derived from our modified form of S-C-P paradigm and the basic theme of the paper, which

conceptualizes competition as an all encompassing variable involving all the four elements of the paradigm. Each proposed determinant of competition is derived from different elements of S-C-P paradigm; basic condition, structure, conduct and performance. The variables are discussed as under.

The scenario with regard to technology used in banking industry underwent a drastic change, during the period of the study. A new technological paradigm[13] came into being, which have brought forward new opportunities for development of new products and service. Other fixed asset, aggregated for the whole industry, is used as a proxy for capturing technology in the industry, which falls in the realm of basic conditions. New banks have internalized this basic condition in terms of a higher ratio of other fixed asset to number of conduct variable. On the other hand, this variable, other fixed asset aggregated at the level of the industry is used in the equation to examine the impact of basic conditions on competition.

The variable related to the market structure used in explaining competition is concentration. Next two variables used in the equation are related to strategic conduct. A significant result of the discriminant analysis pursued in the literature[14] is that wages paid by new banks, as a proportion to their total operational expenditure is significantly lower than that of the old banks. This strategic variable is used as an explanatory variable in the equation. A significant characteristic of post 1999 period of the study relates to merger, which also falls in the arena of strategic conduct. It is captured in the equation in the form of a dummy variable. It assumes the value one in the years in which merger has occurred in the industry and zero in other years. Lastly,

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[13] A technological paradigm defines contextually the needs that are meant to be fulfilled, the scientific principles utilized for the task, the material technology to be used. (Dosi, 1988)
[14] Deb, A. T. and K.V. Bhanumurthy (2005)

the ratio of profit to asset, a variable in the arena of performance is included as a determinant of competition.

However, there is no a priory theory to specify neither what form the variables is appropriate as determinants, nor what is the direction of their influence on competition in each case[15]. One is not sure whether it is the level variable or a variable that captures the dispersion in that variable is the relevant determinant. Both the absence of knowledge of the form in which a determinant influences competition and the direction of the influence render construction of a model to analyse competition a very difficult task. In absence of any hypothesis about the impact of most of the variables on competition, alternative hypothesis in case of these variables becomes two-tailed.

X.0 RESULTS OF THE STUDY

Table 3   **Correlation coefficient between market shares of banks.**
(Please refer to summary below)

	Correlation Karl Pearson's	Coefficient Spearman's
1) 1992-1994	.96a	.97a
2) 1995-2002	0.05	.53a
(i) to (vi)		
1995-1996	.96a	.94a
1995-1997	.89a	.82a
1995-1998	.80a	.81a
1995-1999	.68a	.59a
1995-2000	.51a	.55a
1995-2001	.36	.52a
(vii) to (xiii)		
1995-1996	.96a	.94a
1996-1997	.97a	.93a
1997-1998	.97a	.90a
1998-1999	.94a	.86a
1999-2000	.91a	.94a
2000-2001	.97a	.99a
2001-2002	.84a	.99a[16]

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[15] This does not apply to concentration ratio, which is hypothesized to influence competition negatively in level form.

16 'a' means significance at 1% level of significance.

Summary of Table 3

Two types of correlations have been tested for their magnitude and level of significance. (With reference to the Table 3 above):

1) This gives the Karl Pearson's' correlation co-efficient between the market shares in 1991-92, the initial year of the study and 1993-94 the terminal year of the pre-entry period. It also gives the Spearman's rank correlation also for the same period.

2) This gives the Karl Pearson's' correlation co-efficient between the market shares in 1994-95, the initial year of entry and 2001-02 the terminal year of the study. It also gives the Spearman's rank correlation also for the same period.

(i) to (vi) This column gives six sets of Karl Pearson's' correlation between the market shares of firms in 1995 as base year and the respective current year. It also gives the Spearman's rank correlation also for the same period.

(vii) to (xiii) This column gives seven sets of Karl Pearson's' correlation between the market shares of firms in 1994-95 and the subsequent year 1995-96. It also gives the Spearman's rank correlation also for the same period.

Table 3 reports the correlation of market share of banks in different years as well as correlations between ranks. To begin with, let us focus on two pairs of years, 1992 and 1994 on the one hand and 1995 and 2002 on the other. Three aspects of the two correlation coefficients need to be commented upon. They include magnitude, direction and significance.

- There occurred a reduction in the correlation coefficient in the post entry period and it ceased to be statistically significant. This reveals weakening of association between original and subsequent market share in the period following entry.

- The rank correlation coefficient has remained statistically significant, even when the association between original and subsequent market shares weakened; there is no major churning of banks, both in the period preceding and succeeding entry.

- There has been no change in sign of the correlation coefficients, which implies that no reversal in market share as well ranks of banks have taken place.

Now correlation coefficients between two successive years are commented upon, starting with 1995 and 1996. Alongside, correlation coefficients of market shares of 1996 onwards with market shares in 1995 also will be looked at. Table 3 provides the details, which reveals the following.

Both the correlation coefficients between market shares in any two consecutive years remain positive, high and significant. This reveals that market shares and rank of firms in 1996 and onwards is closely associated with the succeeding year. There is no significant change in market shares and ranks of banks in the post entry period on a year-to-year basis.

When market shares of banks in 1995 are related to the same in 1996 and then to subsequent years, it is observed that changes in correlation coefficients are consistently taking place in one direction. It has kept on reducing, which signifies a slow process of weakening of association between initial and subsequent market share, as the subsequent year becomes distant from the initial year. Ultimately, the correlation between 1995 and 2001, as well as between 1995 and 2002 has emerged

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insignificant, showing absence of any association between initial and subsequent years. The corresponding rank correlation coefficients have remained positive and insignificant, although its magnitude has consistently declined as ranks of banks in increasingly distant years are correlated with in the same in the year 1995. It is clear that the trend in rank correlation coefficient follows a trend similar to ordinary correlation coefficient. In response to some change in the market, market shares of banks is first to change followed by change in their ranks.

The next exercise is an important statistical prelude to use of measures of mobility and turnover in the study. A chi square statistic given by Jacues-Berra showed that size distribution of the banks resembles a log normal distribution in all the years under study, except for the last year 2001-02. The period covered by the study is divided as before: pre 1995 and post 1995 and a't- test' is used in test in average mobility in these two periods. The 't test' is subject the assumption of unequal variances in the two underlying populations. The result is reported in Table 4. It shows a significant rise in average mobility in the post entry period.

Table 4   Test of difference in means of mobility of banks
               during pre and post entry period.

	Mobility 1992-1994	Mobility 1994-2002
Mean	2	5.625
Variance	0	37.98214
No of observations	2	8
Hypothesized Mean Difference	0	
Degrees of freedom (n1+n2 -3)	7	
t Stat	-1.66c	

Footnote: c. Implies that the t ratio is significant at 10% level of significance.

Firstly, the market shares and ranks of all banks in 1992 are correlated with their market shares and ranks in 2002. Then five largest banks are chosen in 1992, and their

market shares and ranks are correlated with the same in 2002. The exercise is repeated for the firms that follow the five largest banks in 1992. Thus, six correlation coefficients are calculated, all of which turned out be significant. There occurred no significant change in the market share and ranks of the banks belonging to lower segment in 1992 over the period 1992-2002. It is not able to exert any impact on the top firms in 1992, as both the correlation coefficients related to these banks remain significant. It is not likely to effect concentration as well as mobility and turnover. Whatever change is taking place in small firms, it does not affect the whole market. Heggestad and Rhoades (1976) pointed out that the rank changes among smaller firms are more likely attributable to chance. However, whether rank changes of smaller firms are random or not is the issue. The issue is significance of rank changes at the bottom for the whole market. If the rank changes of smaller firms are random, it may not be assumed away that their impact on the top firms and on the whole market is also random. The exercise reveals that effect of these changes at bottom is not likely to be significant for the whole market. It once again reinforces the idea that one ought to focus in the top segment of the industry in an attempt to analyse competition. Thus use of measures of mobility and turnover is vindicated.

We have tried out different forms of the variables along with different functional forms. The different forms of the variable used include its standard deviation, variance, skewness and kurtosis of the ratio. Amongst these, equations using the standard deviation and variance of the ratio performed the best and provided similar results. The complete model to analyse competition consists of the following three equations.

$$H = \beta_{10} + \beta_{11}\,(SIZE) + \beta_{12}\,(SKEW)^2 + \beta_{13}\,(NUMBER)^3 + U_{1t}$$

$$\Pi = \beta_{20} + \beta_{21}\,(LQDR) + \beta_{22}\,(ADEX) + \beta_{23}\,(SPRD) + \beta_{23}\,(DRDM) + U_{2t}$$

$$CMPT = \beta_{30} + \beta_{31}(EH) + \beta_{32}\,(OFA) + \beta_{33}\,(SW) + \beta_{43}\,(E\Pi) + \beta_{53}(MRDM) + U_{3t}$$

The abbreviations in equations are explained below.

H= Herfindal's concentration ratio.

SIZE= Average asset of a bank

SKEW=Skewness in distribution of assets among banks.

NUMBER= Number of banks

Profitability (Π): profit to asset ratio.

Liquidity ratio (LQDT): Liquid asset as a ratio of total asset

Spread (SPRD): Difference between interest earned and expended deflated by asset

Diversification (DVS): ratio of other income to total income.

Advertising Expenditure (ADEX): ratio of expenditure on advertising to total operating expenditure.

CMPT= Competition.

EH= predicted values of Herfindal's concentration ratio, derived from first equation.

OFA= other fixed asset.

SW= standard deviation of the ratio of wages to operational expenditure.

EΠ=predicted values of profit to asset ratio, derived from second equation.

MRDM= dummy for the years in which merger between banks occurred.

The first two equations were estimated as follows[17].

H= 0.093 -0.00000002(SIZE) +0.003(SKEW)^2-0.000001(NUMBER)^3,

   (21.55) (-3.17)   (10.04)   (-8.01)

Adjusted R square=.97 and F=99.43.

Π= -0.002-0.004(LQDT)-0.05(ADEX) +0.41(SPRD) + 0.006(DRDM),
   (-0.37) (-.49)   (-.55)   (4.59)   (5.05)

Adjusted R square=0.82, F=10.44.

The results of Tobit exercise in the current study are given below in Table 5.

Table 5: Structural Equation for Competition -Results of Tobit Regression

Variable	Asymptotic Normalized Coefficient	Standard error	t ratio	Regression coefficient
EH	-9115.4	2444.1	-3.7296	-1760.4
OFA	-0.16548E-02	0.44344E-03	-3.7317	-0.31958E-03
SW	-1070.3	291.15	-3.6762	-206.71
E P	9250.1	2559.8	3.6136	1786.5
MRDM	167.51	44.879	3.7326	32.352
CONSTANT	823.99	220.91	3.7299	159.14
CMPT	5.1779	1.3839	3.7417	

Log-likelihood function= 1.5782253
Mean-square error = 0.29010048E-01
Mean error=-0.63159354E-14
Mean absolute error = 0.13421742
Squared correlation between observed and expected values=. 99906

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[17] The equation for concentration and profitability are developed by two different components of a broader study on private banking in India. The current paper is also a component of the said study. Please refer to Deb, Ashis Taru (2005), page 110, 201-2,205-8.

All the variables used in the Tobit model to explain competition have turned out to be statistically significant[18]. To start with, it is seen that the predicted values of the concentration ratio exerts a   significant negative impact on competition. This is in line with hypothesis, which already exists in the literature. The variables relating to other fixed asset and standard deviation in wages, as a ratio of operational expenditure has emerged as negative and significant in explaining competition. While other fixed asset is used as a proxy of technology, which in turn is an aspect of basic conditions, other variable captures   a strategic conduct of the new and old banks. Both groups of banks seek to compete with each other, with their strategic stance with respect to the variable. While old banks want to cope up with the new banks with a higher ratio of wages to operational expenditure, new banks sought to contain the ratio and entered the market with a significantly lower ratio of wages to operational expenditure and the standard deviation of the ratio increased in the industry over the period of time as a result of entry. Thus, by means of strategic conduct with regard to wage component of operational expenditure, old banks sought to prevent the new banks from improving their ranks by means of their strategic conduct, while, the new banks sought to dislodge the old banks from their current status. In their attempts to contain each other, they have put pressure on each other, which resulted in a situation, in which a reduction in change of the ranks of banks has come about. This has led to a negative impact on competition. A similar explanation may be provided to explain the negative and significant impact of the variable related to   technology on competition. By going for new technology, both groups of the banks have tried to contain each other, which has led to reduced changes in ranks of banks, resulting in lower rivalry

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[18] The two variables standard deviation of the ratio of wages to operational expenditure and predicted values of the ratio of profit to assets are correlated. The coefficient of correlation is significant at 5%. However, two auxiliary equations were run, and the results show that the multicollinearity is not severe.

and hence lower competition. The next variable, in order, is profitability. It is seen to exert a positive and significant impact on competition. In the standard textbook discussion, entry takes place in an industry to compete away supernormal profits in an industry. Profitability, entry and competition are all linked to one another.

The new banks bought efficient units, with each one to share a larger pie in the total profits. The search for profit by the new banks in a deregulated regime has led to increased churning of banks, resulting in both increased profits and more intense rivalry. Lastly, the dummy, which captures merger activity in the industry, has turned out to have positive and significant impact on competition. It may be attributed to the fact that merger is a strategic variable through which some banks seek to improve their ranks in order to cope up with their rivals in a competitive scenario. The result demonstrates that variables related to basic conditions, structure, and conduct and performance influence competition. This provides support to the idea that competition is an all-pervasive phenomenon, which embraces all the aspects of the S-C-P paradigm.

In the literature, there exist attempts to define oligopoly in terms of concentration ratio alone. Attempts have been made to distinguish between different types of oligopoly (e.g. tight and loose) on the basis of concentration ratio. However, such attempts have the following problems.

- There exists a contradiction among such studies.
- The benchmarks used are not developed rigorously.

We wish to emphasize that the very approach of defining market form in terms of concentration ratio is not satisfactory. Our understanding is that market form is an overall concept. All the elements of structure, conduct and performance are to be

analyzed to define a market form. Traditional S-C-P defines a market form in terms of price cost margin. A major thrust of the paper is that an analysis of market form is neither based on price cost margin nor is it based on a single criterion like concentration.

Market from transcends structure, conduct and performance. Different characteristics of structure, conduct and performance, as emerged from the study need to put together, to examine whether they are providing a consistent picture of market form. We are pursuing the argument about market form through all the aspects of S-C-P approach, so that we can arrive at an integrated view of market form, which is not ambiguous or partial.

It is apparent that concentration cannot provide any clue to existence of oligopoly in private banking industry. Let us look at product differentiation, another element of market structure, analyzed in the literature[19]. It shows that entry has exerted a positive impact on product differentiation. Product differentiation cannot exist in perfect competition.[20].

To reveal presence of firm effect, time effect and variable effect in the data an ANOVA analysis was conducted in the literature[21]. The results confirm the presence of firm effect. Firm effect, once again cannot be reconciled with perfect competition, where a firm is passive it merely adjusts to industry conditions and has no independent existence. Presence of strategic group demonstrated that firms belonging different strategic groups pursue different strategic behaviour in order to manipulate

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[19] Deb, Ashis Taru (2005) Chapter IV.
[20] Deb, Ashis Taru (2005) Chapter V.
[21] Murthy and Deb(2006)

their market shares[22]. Demonstration of product differentiation, firm effect, and strategic group in the literature support our understanding that the private banking market cannot be characterized by perfect competition.

One makes some conjecture about degree of collusion at the top. There was some scope of an institutional framework, called consortium banking to promote collusion at the top. This apparently created a static scenario at the top reflected in unchanged identities of top five banks till 1996. However, such an institutional requirement was made optional in 1997. In the same year, identities of the few top banks changed and two new firms replaced two old firms. There is likelihood that the banks have discontinued the practice of consortium banking, when it was made optional in 1997. It is only when old banks discontinued the practice, new banks replaced two old banks and ultimately two new banks managed to enter the top two slots. Thus while there is some evidence of collusive behaviour and existence of an oligopolistic market structure during 1991-92 to 1995-96 in private banking, such a characterization is not true for the later period.

The above analysis in terms of structure and conduct rejects characterization of private banking market in terms of either monopolistic competition or oligopoly. Now, the aspect of performance needs to be analyzed, to examine if it provides any clue to existence of monopolistic competition in the said industry. Our attempt to infer market form using performance aspect of the S-C-P paradigm is based on a crucial assumption. The mean profit is taken to represent the normal profit.

Oligopoly is top heavy. A few supernormal profit-making firms dominant the industry. A large proportion of firms would be concentrated in the upper end. In

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[22] Lastly, the existence of strategic groups in private banking industry is also demonstrated in the same study.

perfect competition, all firms make normal profit. But in an empirical situation, all firms need not exactly make normal profit. In perfect competition, majority of firms are concentrated around the mean, with a few in the two extreme regions. Thus a perfectly competitive industry would be to be dominated by firms making normal profit. As opposed to the above two situations, long run situation in monopolistic competition is characterised by a constant state of flux. There is entry into the industry along with exit. Entry of new firm is not deterred by exit. New entrants enter with an optimistic note that they will be able to succeed by adopting appropriate strategies. The implication of such a characteristics of long run situation in monopolistic competition manifests in coexistence of firms with supernormal profit, normal profit and losses. Thus in case of monopolistic competition, there will be a large number of firms at the lower end compared to perfect competition. Firms making normal profit do not dominate the industry like under perfect competition, nor do firms making supernormal profit dominate the industry like oligopoly. The following characterises distribution of profits in case of oligopoly, imperfect competition and perfect competition.

- In oligopoly, a larger proportion of firms is concentrated in the top segment of the distribution.

- In perfect competition, proportion firms at the mean of the distribution of profits overwhelmingly dominate the distribution, with an insignificant proportion of firms being at either extreme.

- In case of monopolistic competition, the proportion of firms in the bottom and central part will exceed the proportion of firms at the top.

Let us now analyse the data relating to profitability. The average of the profit to asset ratio (ROA) of the banks, existing over the period 1995-96 to 2001-02, is averaged. This average is taken to be the rate of normal profit. A frequency distribution of the ROA s is constructed. Table 6 reports the distribution.

Table 6   **Frequency Distribution of Average ROA:1994-95 to 2001-02**

Class Interval	Frequency of Banks	Cumulative Frequency (in percentage)
0.3-0.4	4	14.81
0.4-0.5	1	18.51
0.5-0.6	2	25.92
0.6-0.7	4	40.74
0.7-0.8	4	55.55
0.8-0.9	1	62.96
0.9-1	2	70.37
1-1.1	3	81.48
1.1-1.2	0	81.48
1.2-1.3	1	85.18
1.3-1.4	0	85.18
1.4-1.5	3	96.29
1.5-1.6	2	100

The following observations are made from distribution of banks across different categories of profit. The proportion of banks lying within the top two classes is around 18%. Even if the top segment is extended to include two more classes, the proportion increases to a mere 22%, compared to 40% of firms in the lower segment, defined similarly in terms of four smallest profit classes. This shows that the distribution is not top heavy, ruling out oligopoly. The mean lies within the sixth class interval, 0.8 to 0.9. If two classes above and below the mean class are included in the central part of the distribution, it is seen that 52% of the firms belongs to the central part of the distribution of profit. This does not overwhelmingly dominate the distribution, as would have been the case with perfect competition. If the central part

of the distribution is extended to include the class above the mean class, then the proportion of banks in the bottom and the central part stands around 67%, which is much above 33% covered by the top segment. This provides a picture of monopolistic competition.

XI.0 SUMMARY AND CONCLUSIONS

Commercial banking represents the ideal sector that combines the interest of both fiscal and monetary policy. Fiscal policy essentially is about financing growth and development. Banks too provide finance for growth. While a State-led strategy relies on fiscal development finance a market-led one would rely on banks. The study suggests that sources that finance growth should be competitive. While there does not exist much possibility of competition among institutions providing finance for public investment, competition can occur among banks, which are conduit of monetary policy. The study has sought to provide a conceptual and theoretical framework to measure and model competition in private banking industry in India. It used the concept of competition proposed by Stigler (1961) and measured it by Bodenhorn's (1990) measure of competition in terms of degree of mobility. The study provides a critique of the mechanism of inducing competition, which is implicit in the Narasimham Committee (1991). It then provides the theoretical background of an alternative mechanism based on Structure-Conduct-Performance paradigm, which apart from including traditional elements of S-C-P paradigm including entry, economies of scale, product differentiation and price cost margin, also incorporates basic conditions and strategic groups to analyse the process of market dynamics in the industry. The paper goes on to argue that competition goes beyond "conduct" and encompasses all the four components of S-C-P paradigm: basic conditions, structure, conduct and performance. Accordingly, a three equation simultaneous equation model

is developed to ultimately estimate the equation of competition through Tobit technique. The result demonstrates that variables related to basic conditions, structure, and conduct and performance influence competition. The study has found evidence against the simplistic relationship between concentration and competition, which remained implicit in the literature.

The following hypotheses were tested.

- Entry is not only factor influencing competition – This is proven by the fact that entry is only one of the factors in a three equation system.

- Entry has an indirect impact on competition - This is proven by the logic that entry affects concentration, which then affects competition.

- Strategic conduct plays a role in competition - This is clear from the results that show that two strategic conduct variables affect competition.

- Competition can be measured and has specific determinants (Counter wise to Demstez, 1995) - We have shown show competition can be measured and that there are specific determinants through the system of equations.

- The result demonstrates that variables related to basic conditions, structure, and conduct and performance influence competition. This provides support to the idea that competition is an all-pervasive phenomenon, which embraces all the aspects of the S-C-P paradigm.

Finally, the adjunct empirical analysis of the dynamics of market shares, ranks, conduct variables and return reveals that the market form is close to monopolistic competition rather than oligopoly.

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