Appendix

MARKET STRUCTURE, COMPETITION AND PERFORMANCE: THE ANALYTICAL BACKGROUND

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Evaluation of the state of competition requires an understanding of how the relevant markets function in practice. Economic theory has developed many models for the analysis of markets. This section provides a non-technical exposition of these important concepts and models. A key question is what are the costs and benefits of deviation from competitive markets?

Meaning of Competition and Competitive Markets:

The concept of competition can be defined in many ways. In common parlance, competition refers to rivalry between firms in a market for objects like market share and profits. Market power is the ability to raise market prices above competitive levels and exclude competition.

Policy intervention requires prior identification and assessment of the degree of competition in real life product markets? What are the standard guiding principles? For this we need to distinguish between competition in a market and competition for a market[1].

Competition *in a market* refers to actions of incumbents in an established market and those potential entrants who would like to sell the same product. The instruments of competition would be price or capacity (quantity competition) and other non-price instruments like advertising etc. This involves erecting entry barriers, product differentiation, vertical integration etc.

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[1] Geroski (2003)

Competition *for a* market is defined as a process of creating a new market based on innovative technologies and/or new standards (example new operating system for Windows). This involves challenging the sellers of existing products through the introduction of new products or creating potential competition by upfront investment in facilities to supply a new product. Here the instrument of competition is not the price or capacity. Measurement of competition for a market is much more difficult than the measurement of competition in a market.

It is helpful to discuss certain standard models that economic analysis uses to understand competition and competitive behaviour.

Perfect Competition

A market is said to be perfectly competitive when firms perceive that they individually have no noticeable influence on market price. The outcome in such an industry is efficient in the sense that the cost of the last unit of output (marginal cost) would just equal what consumers would be willing to pay for that unit[2]. Perfect competition is a regarded as a benchmark market structure for evaluating other market structures.

Monopoly and Imperfect Competition

The polar extreme of perfect competition is monopoly, that is a market with only one producer of the product with no close substitutes. Here the producer enjoys the power to influence market outcomes by his or her actions. This is called market power or monopoly power. He or she restricts output so as to raise the price above the efficient level (perfect competition level). The market price is above the marginal cost of production leading to efficiency loss or inefficiency of monopoly.

Intermediate degrees of competition between perfect competition and monopoly that exist are shown to be more complex. Oligopoly is an example of such a market structure defined as a market with a *few* or a limited number of firms. The fewness character results in strategic interaction of participant firms. In this type of market each firm takes into account the likely response of its competitors to its output or

[2] Such a market is shown to achieve efficient allocation of resources in the Pareto sense. It is impossible to make anyone better-off without making anybody else worse-off

pricing decisions. Most models of imperfect competition predict that firms charge prices above marginal costs. Each firm has some market power to influence the market outcomes. Resource allocation will be less than social optimal as price is greater than marginal cost of production.

Oligopolistic market structures are predicted to give rise to collusive behaviour in price setting. National laws prohibit explicit collusion among participant firms to raise prices or restrict outputs. However, oligopolistic firms may take recourse to implicit collusion using a variety of business strategies like threat of price cuts, parallel pricing and implicit geographic distribution of markets etc. In many cases a market consists of few big firms and a number of small firms. In such markets a single large firm or a few big firms are often found to dominate[3].

Structure Conduct and Performance Approach.

A useful organizing framework to think about competition and market power is provided by the structure conduct performance paradigm[4]. In this framework, structure determines performance. The market structure (measured by market share or concentration ratio) is exogenously determined and conditions the conduct (prices, advertising expense etc) of the firms and that in turn determines the market performance (profitability, productivity etc). A simple diagram can be used to illustrate the inter-connections between the key variables as shown in Figure 1.

A limitation of this paradigm is that it assumes the causation to be unidirectional as indicated by the arrows. Later analysts have pointed out that it is not necessarily be so. For example, market performance can have feedback effects into market structure. Market size obviously influences the market structure and the equilibrium market structure is argued to be endogenous[5]. The traditional framework of S-C-P paradigm has been modified by accommodating the impact of foreign competition on market structure. A further elaboration on the conceptual basis of these three components will be useful.

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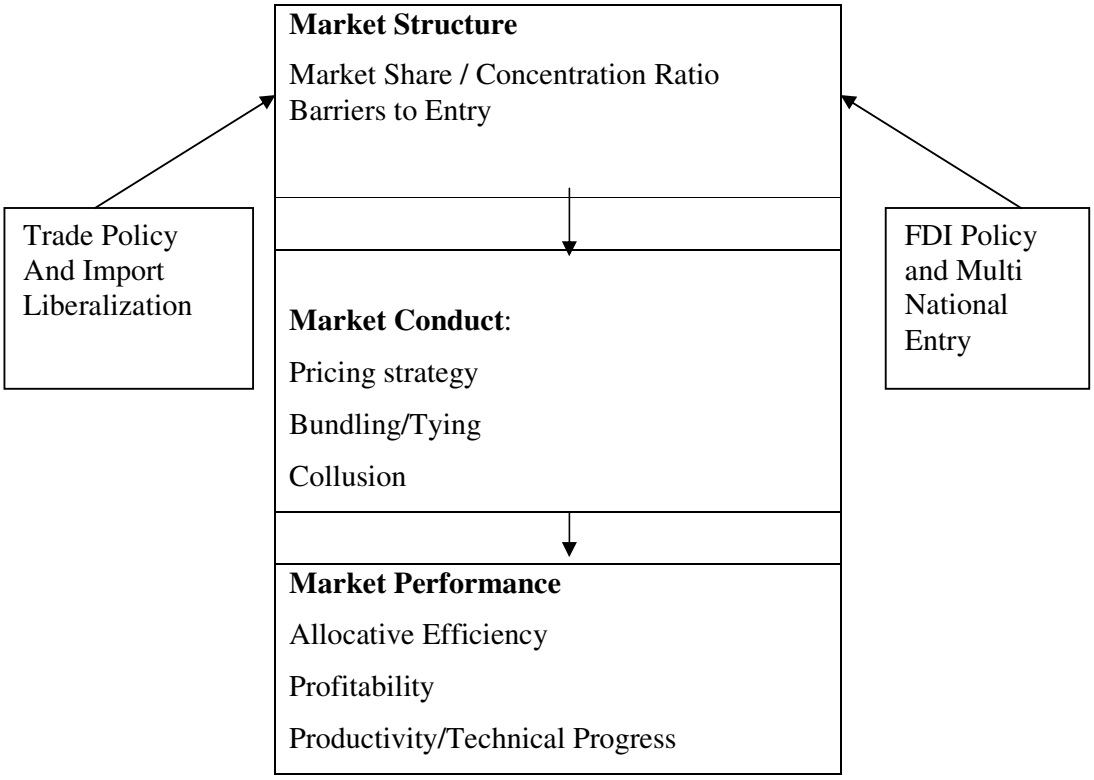
[3] Such a market structure is called the dominant firm and competitive fringe model

[4] Scherer and Ross (1999) provide an excellent exposition

[5] The relationship between market size, market concentration and sunk costs is enriched by the recent contributions of John Sutton (1996).

Figure 1: Modified S-C-P Paradigm



Market Structure and Competition

The market structures tells us about the environment within which an enterprise functions and the nature of external pressure on the enterprise. The elements of market structure that we look at are concentration ratio, stability of market shares, conditions of entry and exit of firms. Knowledge about the prevailing market structure tells us how closely it resembles either a competitive or monopolistic structure. An industry wherein few firms have a large share of the total market is supposed to be concentrated industry. This concentrated structure is supposed to encourage collusive practices (coordinated price and output decisions).

- Concentration ratio

This is defined as the market share of the top 'n' firms in the industry. A widely used measure is the percent of industry sales accounted for by the top four firms, that is the 4-firm concentration ratio. A drawback of this measure is that it does not use information contained in the remaining part of the market share distribution. An alternative index is the Hirfindahl-Hirschman index (HH index). The HH index is defined as sum of the squares of market shares (percentage share) of all the firms in the industry. The HH index declines with increases in the number of firms and increases with rising inequality in market share among a given number of firms. The US justice department considers an HH value of 1000 as critical in its evaluation of merger proposals.

- Stability of Markets Shares

A limitation of the above summary measures of concentration is that they ignore the dynamic changes in the market shares of individual firms. Market shares of dominant firms may increase or decline over time. Greater churning of market shares in given market suggests greater intensity of competition. Whether the dominant firms' leadership persists over time is another indicator of persistence of market power.

- Entry and Exit Conditions

There may be legal barriers (example, industrial licensing) or non-legal barriers that restrict entry of firms that could provide alternative supply. The condition of entry into an industry is important in the assessment of competition for two reasons. First, the number of firms in an industry is influenced by cost of entry and consequently influences the level of concentration. Secondly, the conditions of entry determine the extent of potential competition. Exit conditions are important because it influences the original entry decision of a firm. If firms anticipate that the cost of future exit, perhaps due to unfavorable business conditions, is likely to be high then they may not enter the industry at all. This is likely to diminish the threat of potential competition.

Two important barriers to entry are scale economies and excess capacity [6]. The existence of economies of scale implies that production facilities must be of certain

[6] The third factor is product differentiation. Product differentiation makes competition less perfect by reducing the degree of substitutability between products that are essentially same. This gives some

minimum size. This minimum efficient scale varies from industry to industry. Market size or size of the national market for a particular product may not be large enough to support more than few firms. That is the minimum efficient scale (MES) of a production unit may be large relative to the total market. A new entrant with an MES plant will cause post entry prices to fall and this makes an entry decision unattractive. The extent of this barrier to entry may be measured by the ratio of output corresponding to MES plant to total plant capacity in the industry. Imperfect competition is unavoidable in many developing country product markets simply due to small size of market for those products.

Firms may build excess capacity for both strategic and non-strategic reasons. Holding excess capacity to meet contingencies of cyclical demand is an example of non-strategic reason. If firms build excess capacity either to deter new entry or to pre-empt existing competitors then it is regarded as strategic reason. Strategic excess capacity enables incumbents to threaten potential entrants with output expansion and price-cutting to prevent their entry. In this situation incumbents prior to announcement of entry hold excess capacity.

Market Conduct and Competition

Market conduct refers to the ways in which the firms in a market interact with each other and the business practices that they adopt to achieve their competitive objectives. Market conduct of firms is a reflection of competitive activity in terms of pricing strategies, policies toward product design and services, how they advertise and promote their products like bundling, tie-ins etc. An examination of market conduct is supposed to reveal the sources of observed conduct. The origin of an observed conduct may be the attainment of monopoly position or superior competitive capabilities attained. What can be regarded as anticompetitive and what is pro-competitive conduct is arrived only after a detailed examination of the given industry.

Market Performance and Competition

Market performance is the outcome of the market conduct of the participating firms. Is the observed outcome closer to the one that is expected to occur under perfectly

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power to the individual supplier of the product to influence the market price. However, benefit aspect is that it satisfies consumer preference for variety.

competitive conditions? The two standard measures of market performance are: (1) rate of Return on Capital: Value of output minus Total Costs divided by Total assets and (2) Price cost margins. Value of Output minus Total Costs divided by Value of output. This is a measure of margin of price over average cost. These two measures are estimated for firms in an industry and compared with the industry-wide average return or margin on sales. This would shed light on the existence of excess profits or above normal returns. The persistence of profits over time is another issue that may be addressed in this context.

It is suggested that instead of studying profitability it is preferable to study the relationship between price and concentration (Weiss, 1986). Do higher prices persist in concentrated industries, is a relevant question in any assessment of the state of competition.

Another significant performance indicator is total factor productivity growth or technical progress. Competition is supposed to improve efficiency and productivity of firms in order to sustain competitive positions. The relationship between market structure and productivity growth is a relevant issue in this context.

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