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Determinants of Entry and its Measurement – A Critical Review

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ABSTRACT

Bain introduced the concept of the condition of entry and this is the first systematic study on barriers to entry. It has been proved from various empirical findings that conditions of entry play a crucial role in investment decision. So, there is a need to study factors affecting entry and how these factors are measured. This paper analyses determinants of entry. Various empirical studies on determinants of entry have been reviewed and variables have been derived from factors inducing entry and deterring entry. These factors related to determinants of entry and its impact on entry has been analyzed. Further entry barriers have been broadly classified as Structure-Conduct-Performance (S-C-P) framework. This study also examines issues related to measurement of entry barriers and its impact on entry decision. Role of vertical integration, Distribution and Marketing Intensity and export orientation is also explored in measuring barrier to entry. The present study has been envisaged to critically analyze the various barriers to entry that have been identified under various studies.

The concept of barrier to entry was initially explained by J. S. Bain in 1956. He defined a barrier to entry as anything that allows incumbent firms to earn above-normal profits without the threat of entry. Bain (1956) in his pioneer work identified product differentiation, economies of scale and absolute cost advantages as key barriers to entry. After that Stigler (1968), explained barrier to entry is a cost, which is to be borne by new entrants and not the incumbents. He didn't mention the nature of cost and its measurement. Then, Ferguson (1974) added a new dimension that there is non price competition among existing firms in the form of advertisement cost. Fisher (1979) explained in his study that high capital costs are not barriers to entry. Weizsacker (1980) explained the normative aspect of barriers to entry and said that entry barriers increase welfare by reducing numbers of firms to their socially optimal level. Gilbert (1989) in his empirical finding argued that economies of scale and absolute cost advantage are not significant barriers to entry. Carlton and Perloff (1994) gave emphasis on long run barriers to entry. Church and Ware (1999) explain an entry barrier as a structural characteristic of a market that protects the market power of incumbents by making entry unprofitable.

Various empirical studies on determinants of entry have explored variables derived from factors inducing entry and deterring entry. Most of studies in industrial economics refer these factors as barriers to entry and variables have been identified by them to measure these barriers. A variety of industry characteristics that may influence entry into an industry is broadly classified as Structure-Conduct-Performance (S-C-P) framework. In the same tradition, the entry variables explained here presumes that entry of firms is determined by certain industry characteristics. The determinants of entry have been developed from the broad factors identified by studies using the S-C-P framework. The identified variables have been categorized into three groups: Structure, Conduct and Performance related factors. In the process of discussing these factors, some key empirical studies on the determinants of entry have also been reviewed. Similarly, there are some issues related to measurement of entry barriers and its impact on entry decision like role of vertical integration, distribution and marketing Intensity and export orientation is not explored in measuring determinants of entry. Present paper is an attempt to resolve these issues related to determinants of entry. The rest of paper is divided into three sections. In the next session, structural factors relating to determinants of entry and its measurement are explained. Concept characteristics relating to determinants of entry and its measurement are explained in section- II and performance characteristics relating to determinants of entry and its measurement are explained in section- III. The final section tries to conclude the findings of this paper.

1. Structural Characteristics

A variety of structural variables have been identified in various studies that can act as determinants of entry. These are explained as follows:

Minimum Efficient Scale (MES): It is the lowest point on a cost curve at which a company can produce its product at a competitive price. At this point, the company can achieve the economies of scale necessary for it to compete effectively in its industry. The MES is not a single output level; it comprises a range of outputs where the firm achieves constant returns to scale and has reached the lowest feasible cost per unit. The minimum efficient scale depends on the nature of costs of production in a specific industry. This generally occurs in concentrated market structure like oligopoly or monopoly. Economies of scale occur when increased output leads to lower average costs. Therefore new firms, with relatively low output, will find it difficult to compete because theirs average costs will be higher than the incumbent firms benefiting from economies of scale. So economies of scale may act as a barrier to entry because existing firms have achieved cost advantages and they then can reduce prices in the event of new entrant and restrict entry in the industry.

According to Stigler (1968), in his study argue that economies of scale broadly comprise the relationship between size of firm evaluated in terms of output, and production costs. Economies of scale are fully utilized when firm's capacity reaches the level of minimum cost. Firms producing at this cost are considered to be on efficient scale (Bain, 1956; Stigler,

1968). The lowest possible efficient level of output is called the minimum-efficient scale (MES). According to Bain (1956), economies of scale are significant when minimum efficient scale is a significant fraction of the total scale in the industry. Stigler (1968) has analyzed that when the capital-requirements barrier is not a constraint for new player and he is capable to operate at MES, economies of scale do not act as barrier to entry. Gorecki (1975), Kessides (1986) and Saikia (1997) in their empirical investigation did not find MES as significant barrier to entry.

Bain (1956) applied questionnaire method to measure economies of scale. Stigler (1968) has used survivor technique to measure optimum firm size. In this method, he classified firms by size then the share of industry output from each size class over time is calculated and if the share of a given class falls over time, then that class is considered less efficient. Geroski et al. (1990) used average plant size to measure MES. In most studies, average scale of operation is used to measure economies of scale and it will be measured as:

MES = Log [∑ (Firm Sales)/N], Where N= No. of firms in the industry

Industry Concentration (IR): Industry concentration is a function of the number of firms and their respective shares of the total production in a market. It measures the extent of domination of sales by one or more firms in a particular market. The market concentration is measured by the concentration ratio. In perfectly competitive markets, higher concentration in an industry deters the entry and act as barrier to entry. Any change in market conditions influences the entry decision of firm. Entry in concentrated market is also possible through mergers and acquisitions which further increase the concentration. Bain (1956) categorizes market concentration not so much as a barrier to entry but as a 'condition of entry', because in his view, degree of concentration is the very basis of the entry. The general explanation of the question, how market concentration restrict entry is that a high degree of concentration will often lead to collusive behaviour among incumbents ((Bain, 1956; Orr, 1974). According to Bain (1956) in highly concentrated industries, incumbents with collective action, affect the conditions of entry by using the strategy of limit pricing.

According to Acs and Audretch (1989) and Geroski (1995) impact of industry concentration on entry is varied in different studies and no consistent pattern seems to emerge. However, few studies have found that high industry concentration deters entry into the industry (see, for example Orr, 1974; Khemani and Shapiro, 1986; and Saikia, 1997).

Concentration in a certain industry is usually measured by concentration ratio (CR). Most of studies have used m-firm concentration ratio (Martin, 2002):

$CR_m = S_1 + S_2 + S_3 + \ldots\ldots + S_m$

(where *m* is the number of firms involved and *S* represents the market share per firm).

Martin (2002) also presents the Herfindahl Index as a widely used measure of industry concentration. This index (H-Index) is defined as the sum of squares of firms' market shares and is measured as:

H-Index = ∑ (Market Share)², where market share = Firm Sales/ Total Industry Sales; and n = number of firms in the industry.

Industry Size (Size): it also has an important role in the study of determinants of entry. Larger size of market provides opportunity to large number of players. Given MES, larger is the size of the industry, larger is the possibility of entry of new firms in market and to produce at optimal scale in the market. Both Orr (1974) and Saikia (1997) in their studies found that industry size to have a positive effect on entry. Empirically, size of the industry is used to measure the scope for entry. It is measured as:

Size = Log (Industry Sales)

Capital Intensity (CI): capital requirements also act as strong barrier to entry because fixed cost and initial investment required for entry varies from industry to industry and influences the entry decision. Therefore, industry where huge capital is required to set up a plant of efficient scale, the decision to enter raises exogenous sunk costs related barrier to entry. Second aspect is that availability capital and lending rates also influences the entry decision. Due to differential lending rates for established and small players, it is sometimes difficult for small players to raise capital. In highly capital intensive industry established firms gets capital at preferential rates than small firms which increases the cost of capital of small firms and make them less competitive. Acs and Audretsch (1989) said that industries where large amounts of capital are required do not present a barrier to entry because the existing firms have to raise funds in continuity for capital investments, just like new entrants. Capital required is traditionally considered as a structural barrier but, Porter (1980) pointed argued that required capital can also be used strategically as a deterrent of entry. For example, in case of telecommunication industry, huge investment is required to set up infrastructure at national level to provide national service. But it is not possible for a telecommunications company to enter the market without offering national coverage. Hereby, the existing companies have raised the required investment needed to enter their market.

Empirical studies of Orr (1974), Duetsch (1984) and Khemani and Shapiro (1986) found that capital requirements is an important barrier to entry, while Highfield and Smiley (1987) and Saikia (1997) did not find the associated sunk costs to be a significant barrier to entry. Capital intensity of the industry represents barriers related to capital requirements, availability of capital, lending rates and sunk costs. It is measured as:

Capital Intensity = Capital Employed in the Industry / Industry Sales

Vertical Integration (VI): Vertical integration occurs when a firm has control over the supply and distribution of the good. A company is able to create a competitive advantage by integrating different stages of its production process and supply chain into their business. Many companies use this strategy because it may decrease cost by eliminating price markups associated with buying a product from a third party. So firms, who strategically develop backward and forward linkages, enjoy the cost advantage compared to the new entrants, where forward and backward linkages are not so developed. This cost advantage arising from vertical integration to incumbent firms create a barrier for new entrants. When existing players in an industry are vertically integrated, it can be difficult for

nonintegrated players to enter. Potential entrants may have to enter all stages to compete. This increases capital costs and the minimum efficient scale of operations, thus raising barriers to entry. Empirical studies on role of vertical integration in barrier to entry are very limited. Barrier arising from vertical integration is measured as:

Vertical Integration = Industry Gross Value Added/ Industry Sales

2. Conduct Characteristics

Conduct features describes the behavior firms toward certain characteristics of the industry. Pricing policies of firms are an important component of the firm's conduct. Variables have been identified from literature which describes conduct characteristics. These are explained as follows:

Product Differentiation: It is a process used by firms to distinguish a product from other similar ones available in the market. Product differentiation can be accomplished through strong brand recognition, great customer service, or a unique feature. If customers perceive existing products are of high quality, then a new entrant have to spend extra money to inform customers about the unique qualities and benefits of its specific products and convince them to switch to other brand. As mentioned above, Bain (1956) identified product differentiation as an important barrier to entry which permits the firms to earn supernormal profits. His empirical finding showed that factors like customer inertia, brand loyalty and advertising contributed to product differentiation related barriers. Schmalensee (1982) said, in general, it is assumed that an incumbent firm can develop brand loyalty and brand awareness with advertisement. As a result customer prefers to buy incumbent's product than new player's product. He also point out that buyers have limited information about new product, so they prefer an incumbent's product and this product becomes standard against which, other products are compared. Second aspect of this barrier is the advantage of brand loyalty, which incumbent has created among its buyers. This allows incumbent to raise price to some extent without loosing customers and at the same time, existing player increase the cost of entry of new player. By spending more on selling expenses like advertisement, incumbent forces the new player to do the same (Bain, 1956; Schmalensee, 1982). On the contrary, Porter (1980) argues that entry of firm is unattractive in industries with low product differentiation, , because these undifferentiated industries usually obtain a high degree of efficiency (large economies of scale), which is difficult to achieve by new entrants. This implies that both low and high product differentiation industry deter entry.

Product differentiation in a market is measured by the cross elasticity of demand and supply. Advertising is main source of product differentiation for certain consumer goods industries. New player in these industries are forced to sell their product at price lower than established product even when branded product of incumbent firm and unbranded product of new entrant may not have any real difference, otherwise he has to spend heavily on selling costs. The reason of selling new entrant's product at lower price is that incumbent firms have advantage of brand name, distribution network, product patent etc. Most of the studies (Orr, 1974; Gorecki, 1975; Kessides, 1986 Khemani and Shapiro, 1986; Duetsch, 1984, Highfield and Smiley, 1987 and Saikia, 1997) use advertising intensity as a measure of product differentiation because data requirement to calculate cross-elasticity are very high. Some other variables like marketing and distribution investments can also be used along with advertising intensity to measure product differentiation.

Advertising Intensity (AI): Advertisement can deter entry through consumer loyalty by establishing brand image. To establish a very strong brand image, a new firm would have to spend a lot of money on advertising, which is a sunk cost and deterrent to entry. Some brands may be so strong, that no amount of advertising may be able to dislodge the incumbent firm. For example, many firms have tried to enter the cola market, but none have been able to dislodge Coca-Cola and to a lesser extent Pepsi. The strong brand loyalty of Google means it will be very difficult for any search engine to displace Google – no matter how technically good it is. According to Kessides (1986), product differentiation through advertising can deter entry in two ways. First, to meet the advertising campaign of incumbent firm potential entrant has to bear additional cost. Secondly, the effect of advertising can be seen from firm's revenue, if the cost of advertisement incurred by firm is less than additional revenue earned by firm through advertisement, then advertisement is effective otherwise it is not effective. Advertising intensive industry also provide opportunities to potential entrants to make a dent in the market. Through advertisement they can inform consumers about new entrants and convince them to switch to new product. Thus advertisement intensity can be used in both ways, to induce entry or to deter entry. It is measured as:

Advertising Intensity = Industry Advertising Expenditure / Industry Sales

Distribution and Marketing Intensity (DMI): Access to distribution channels can be a barrier to entry because of the new entrants needs to obtain distribution for its product. A new entrant may have to persuade the distribution channels to accept its product by providing extra incentives which reduce profits. On the other hand, Incumbent firms have local market links and good distribution network. For example, in FMCG industry building up a distribution network is key requirement and more investment is made on developing distribution network. In today's competitive environment companies are improving after sales service and customer relationship management because it helps in promoting brand image and customer loyalty for a brand. So, to gain market share new firms have to break 'customer inertia' and establish brand image. But this type of activates take time and the incumbent firms have the first mover advantage. This advantage will help the incumbent firms to earn super normal profits and create barrier to entry for new ones. Hence barriers created by such intangible assets help existing players reap supernormal profits while deterring entry of new entrants. This is a new source of product differentiation and not explored in existing studies. It is measured as:

DMI = Industry Distribution and Marketing Expenditure /Industry Sales

Export Orientation (EI): Exporting is one way of increasing your sales potential. Exporting allows a firm to

expand its market beyond the scope of a limited national market. For instance, a domestic producer has access to national market but if he exports the product, he has access to global market. With an expanded market, exporting can pave the way for increased sales and expansion and leaving you less dependent on any single one. Greater production can lead to larger economies of scale and growing export sales provide revenues and profits for firm. A firm with good network abroad may enter in highly concentrated industry has an edge over domestic player, as he can not produce at large scale only with internal demand. On the other side, liberalizing trade and allowing domestic player to sell their output in global market helps small firms to increase their market size and revenue, which otherwise is not possible. In nutshell, export markets can provide opportunity to domestic firms to produce at optimal scale in certain industries, where domestic demand can not increase. But the underlying assumption is that their products are of good quality and they require good network access abroad to market the products. So, export orientation is like a double edge sword, on one side better opportunities may induce entry but maintaining product quality at global standards and network to market the product in global market may deter entry on other side.

So in a sense on one hand better opportunities may induce entry, but delivering the product quality at the international standards and network to market the products on the other hand may act as a barrier. The impact of export orientation of an industry on entry has not been analyzed in existing studies. It is measured as:

EI = Industry Exports / Industry Sales

3. Performance Characteristics

Performance related characteristics of industry like capability of enterprise to earn profits, risk involved, growth potential etc. may also influence entry decision of a firm.

Risks and Returns: Entry of a firm in an industry is an investment (capital) decision. Entrepreneur has various investment options available to him and he has to analyze opportunity cost before taking investment decision. So, he has to evaluate risks involved and the returns associated with various investment options. To study this risk-return perspective, some variables have been explained below. Some existing studies have also investigated the role of risk in entry (Orr, 1974 and Saikia, 1997). In general, entry is found to be slow to react to high profits (Geroski, 1995).

Return on Capital Employed (ROCE): The performance of the industry plays a key role in entry decision. The decision of entry in an industry depends largely on the performance of the industry. It is observed that industry with higher returns will attract more entrants as compared to industries where returns are low (Orr, 1974, Khemani and Shapiro, 1986; Deustch, 1984; Higfileld and Smiley, 1987; Kessides, 1986, Saikia, 1997). This is true for both new players and existing players who plan to diversify or expand (Gorecki, 1975). Lagged profits are used to proxy expected profits post entry. Existing players use different strategies to dominate the market i.e. by launching new products, expanding capacity of existing products and by bringing new technology. The basic idea behind this objective may be to exploit the opportunities available in a profitable industry. Return is a key indicator of performance and it is measured as:

ROCE = Profit before interest and tax/ Capital Employed (both calculated at industry level)

Risk: In general, higher risk is likely to reduce the likelihood of entry taking place unless the potential entrant is risk prone. In initial studies risk is measured as variability in industry performance over time; high variability indicates higher risk involved. Industry risk of an industry can be calculated from Variations in the industry profitability over time. Role of industry risk has been explored by earlier studies (see studies quoted above). It will be measured as:

Industry Risk (IR) = Standard Deviation (Industry ROCE) over the last five years with a lag of one year

Growth: Industry having growth potential provide opportunity to existing players who plan to expand as well as for new players who plan to start their business. Gorecki (1975) found that industry growth has a positive effect new as well as "diversifying entry". Khemani and Shapiro (1986), Deutsch (1984), Highfield and Smiley (1987) and Saikia (1997) also found that growth induces entry. It is measured as:

$Sales_t = Sales_0 (1+g)^t$ Where 'g'is the growth rate, regressed over a period of five years with a one year lag in the starting year.

4. Conclusion

After reviewing above studies related to determinants of entry it is now evident that concept of determinants of entry is of great importance in economics. It can be concluded that initially greater emphasis was placed on structural barriers but later on importance of strategic barriers like pricing policy and performance related barriers are also recognized. Most studies have explained structural aspects of barriers to entry in the industry and its impact on entry like minimum efficient scale, capital intensity and size of the industry. But importance of vertical integration in an industry and its role in entry decision is not identified in any investigation. As far as conduct related features are concerned, most empirical studies evaluated effect of product differentiation related barriers by including variables like advertising intensity of the industry. However, to measure such determinants one can also consider factors like distribution networks, marketing skills and reach. Moreover, from the perspective of analyzing entry as an investment decision, there is a need to explore the role of opportunity costs. Performance factors and its effect on entry are reflected by returns and risks on the capital employed. Although a couple of studies have tried to explore these factors through various measures of risk and profit rates, some measurement issues remain. Importance of risk has been evaluated from the industry perspective as variations in its performance (profitability) over time. There is also need to find variables to measure the effect of policy shift and its implications on entry.

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