

5 ON NEW FIRM ENTRY AND MACRO STABILITY

by Kenneth Hanson

Some implications of firm entry are discussed. The role of entry is generally evaluated with reference to promoting price competition and efficiency. There can also be an impact on growth. Furthermore, I suggest that innovative new entry is important for macro stability. Whether firm entry can promote efficiency, stimulate growth, and maintain stability, given existing industrial organization and behavior, are part of a broader set of issues pertaining to competition as a dynamic process. I explore the impact of entry but not the extent to which entry will occur.

1. Dynamics of Industrial Organization: Some Issues

Competition is a dynamic process. It is a means of generating change in industrial organization through exit of low performers, new firm entry and reorganization of existing firms.

Competing firms make expenditures on capital structures, research and development, advertising, etc. to shift demand and cost schedules. These competitive investments and firm pricing strategy combine with market response into a dynamic feedback process of changing industrial organization. Four feedback issues are particularly important: (1) *whether* market concentration and monopoly power or diversity and further competition is a general tendency; (2) *whether* efficiency in resource allocation is promoted; (3) *whether* aggregate growth is stimulated; and, (4) *whether* macroeconomic stability is enhanced. Also of importance but not explored here are the motivating factors and conducive conditions for entry, in particular the types of entrants which lead to a socially beneficial impact on efficiency, growth and stability.

When looked at from the perspective of a national economy, these issues of competition as a dynamic process pertain to either a closed or an open economy. The industrial organization of an open economy such as Sweden is also influenced by foreign competition. For goods which a country exports

and for goods which a country both domestically produces and imports, foreign competition may stimulate or force change in industrial organization.

In this note I discuss how ongoing research at IUI, the micro-to-macro simulation model of the Swedish economy (MOSES) can be used to explore the impact of entry on efficiency, growth and stability of the aggregate economy. The model takes a dynamic perspective which brings out feedback effects which may go unnoticed in an approach that focusses on comparative statics between long run equilibria. The state of the economy is evaluated as one step in a dynamic process, rather than as a state of long-run equilibrium. To bring out the policy implications in a dynamic perspective and to contrast them to policy advice from a static long-run equilibrium analysis is an aim of work done in association with MOSES.

2. Entry and New Firms

There are several distinctions among entrants which I want to clarify for the following discussion (Granstrand, 1986). First, an entrant will either be a new establishment or an established firm diversifying. When I refer to entry the distinction is not needed, otherwise I will make reference to new firm entry.

A second distinction is between imitative and innovative entry. Innovation is used here in reference to a change in production technology, i.e. process innovation. I use imitation in reference to entrants using the same production technology as existing firms in a sector. Of course, imitation will often involve some modification to production technology and product, but I will treat the entrants as imitative as long as the change is minor relative to the purpose of analysis.

Product innovation is also an important means by which entry occurs. When the new product serves as a change in another firm's production process, the impact is to a large extent similar to a process innovation and is treated as such in MOSES. In a multisector model where product definition in a sector is fixed, new products are redefined as a cost reduction for producing an existing product. There is, however, a diffusion of the new product into the economy and a following of imitators which is not treated here (Granstrand, 1986).

3. Entry and Market Concentration

The evolution of industrial organization, the conditions stimulating and retarding monopoly power, and the role of entry by innovative entrepreneurs are issues Schumpeter addressed (Nelson and Winter, 1978). One might claim that Schumpeter, in his early view of a private enterprise economy,

upheld the merits of entry to achieve competitiveness in price and supply. The Austrian perspective of competition as a dynamic process also upholds the merits of entry (Kirzner, 1973).

Schumpeter's later view is less optimistic about the power of entry. Rather, 'the monopoly profits from one innovation become the means for developing another, etc., thereby offsetting the perennial gale of destruction that imitation brings' (Marris and Mueller, 1980, p. 57). The private enterprise economy to be a 'self-organizing process leading to persistently increasing concentration' at the national level (Marris and Mueller, 1980, p. 50). Evidence supports the contention of concentration of industry as a general tendency in industrialized economies (Jagrén, 1986; Caves, 1980).

An entry does not seem to prevent the size distribution of firms from becoming more concentrated.¹ What has increased is international competition. For a small industrial nation, national measures of concentration may not adequately represent world competition. The growing share of total production in manufacturing among a smaller number of firms is rather an indicator of potential instability (vulnerability) for the economy (Eliasson, 1986).

Simulation experiments with MOSES reproduce this empirical finding of industry concentration at the national level. The experiments suggest that high productivity entrants force the exit of existing low productivity firms such that 20 percent fewer firms remain relative to the no entry case. Normal productivity entry reduces the remaining firms even more, 40 percent less than the no entry case, suggesting that cut throat competition of many similar firms forces greater exit. Whether a reduction in efficiency, growth and stability are associated with the change in industry structure are relevant issues to be explored using MOSES simulation experiments with firm entry.

4. Entry and Static Efficiency

Competitive market theory argues that entry induces efficiency in the organization of production (Clark, 1961). Similarly, contestable market theory replaces actual entry with the threat of entry as a condition for efficiency (Baumol, 1982). Both theories argue that entry, through increasing competitiveness, lowers price-cost margins and costs of production which reflect gains in efficiency. These theories differ in that concentration indicates efficiency loss in the competitive market theory, whereas in the contestable market theory concentration is a mixed signal as to efficiency loss or not. The con-

¹ One caution in interpretation of entry data is that new firms introducing innovations often merge with a larger firm reducing the apparent importance of new firms (Jagrén, 1986).

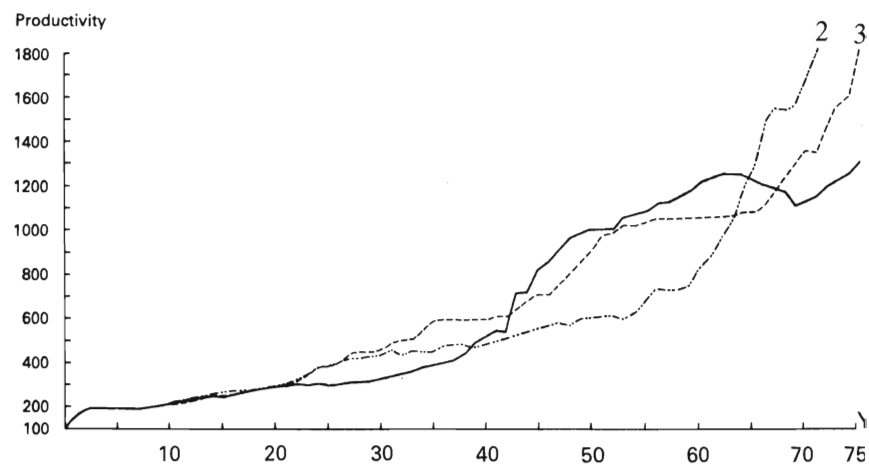
testable market theory allows for complications introduced by cost conditions inherent to the technology of industrialized economies, requiring a study of the causal mechanisms bringing concentration about.

Whether entrants are imitators or innovators is not a distinction made, nor needed for the efficiency role of entry. Of course, innovators will enhance efficiency by reducing cost of production, and innovation may even be necessary for entrants to overcome entry barriers. But for efficiency gains, entrants need not be innovative. Where slack in firm efficiency and excessive price-cost margins exist, imitators, or the threat of imitators, can induce efficiency gains through competition.

Several variations of an efficiency impact of an entry experiment are being performed using MOSES. For thirty years after the first ten years, both high and low productivity entrants are introduced into an economy with slack in efficiency. Firm efficiency is given by a productivity measure of value of output per unit of labor input. Slack efficiency is a dimension of firm behavior that is measured in terms of a deviation from a hypothetical firm production possibility frontier (Eliasson, 1985). Limited information keeps a firm from being on the production possibility frontier.

A first round of simulation experiments suggests that high productivity entrants improve efficiency relative to a base case of no entry, see Figure 1. With the high productivity entrants, efficiency gains arise from greater com-

Figure 1 *The impact of entry on productivity*



- 1 = No entry
- 2 = Normal productivity entry
- 3 = High productivity entry

petition forcing a reduction of slack efficiency in existing firms, from market share shifting towards the firms with the higher productivity technology and from the exit of low productivity firms. Normal productivity entrants do not improve efficiency through competition, see Figure 1. This suggests that it is not just entry that improves efficiency, but that the entrants introduce higher productivity technology.

5. Entry and Aggregate Growth

Entry may or may not stimulate growth. The economic circumstances and type of entrant matter. In discussing the impact of entry on growth, I want to distinguish between high productivity entrants and normal productivity entrants. Another distinction, but one relating to the state of the economy, is whether slack in the availability of resources exist. Also of importance is whether there is slack in firm efficiency.

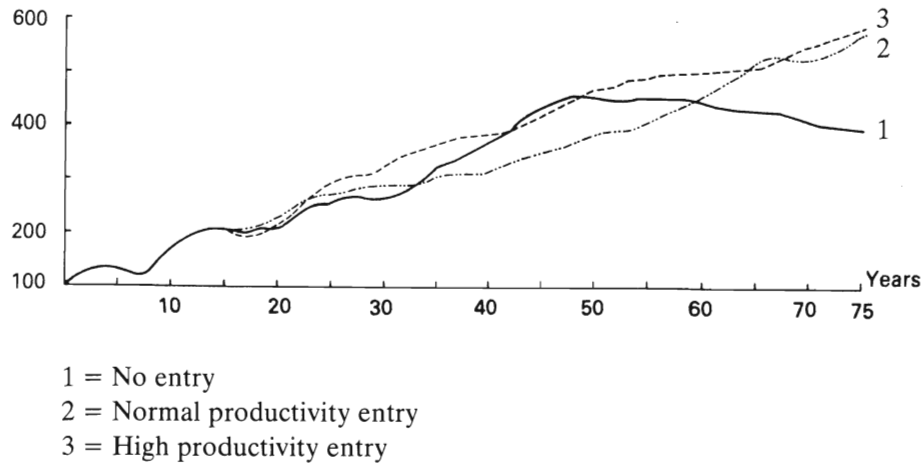
I expect aggregate growth to be stimulated by either type of entrant when slack in the availability of resources exists, notably in the availability of labor and finance for capital. Of course, higher productivity entrants can be expected to improve growth over the normal productivity entry case. The availability of resources allows entry to occur without crowding out effects which result in growth. Unfortunately, the availability of resources is a necessary but not a sufficient stimulus to entry. An anticipated profit incentive is still essential.

With little slack in the availability of resources, as in the simulation experiments, the stimulus of entry to growth is sensitive to the nature of entrants. In the simulation experiments, little or no improvement in growth is generated by the increased competition of normal productivity entry. They drive down prices, lower profits, and force exit, but they do not stimulate growth; see Figure 2. High productivity entrants, on the other hand, force exit of lower productivity firms, releasing resources and stimulating growth; see Figure 2.

6. Entry and Macro Stability

A two fold impact of entry on macro stability is to be addressed here. One pertains to the diversity of technology in a sector and the vulnerability of the sector to adverse shocks. Another dimension in considering the impact of entry on macro stability is the development of new products which take up slack in a depressed economy. With increasing world competition the reduction of demand for home produced goods can occur to the extent the macro economy is adversely affected. Below I discuss the rate of innovative new entry as a stabilizing influence in context of foreign competition.

Figure 2 *The impact of entry on production*



When adverse unforeseen shocks move the economy into disequilibrium, it may be that innovative entry, which compensates for the new conditions, is crucial for maintaining stable macro dynamics (Day, 1984; Eliasson, 1984). I suggest that diversity through entry is important for flexibility in the organization of production, and hence macro stability as will be discussed below. See Figure 2 for an illustration, where high productivity entrants are able to sustain stable growth relative to the no entry case.

7. Entry and Some Dynamic Welfare Implications of Entry

Both competitive market theory and contestable market theory use efficiency as the criterion for assessing welfare gains in the reorganization of industry structure arising from entry. As a welfare criterion, efficiency takes a static perspective and needs to be supplemented with a dynamic criterion such as flexibility or adaptive efficiency (Marris and Mueller, 1980, p. 33).

The need for a broader welfare criterion depends on accepting the economic problem as involving agents 'responding to unforeseen changes in demand and supply conditions' (Nelson, 1981, p. 99). Under conditions of uncertainty, inadequate flexibility in the organization of production impairs macro stability.¹ Flexibility in the organization of production can be associat-

¹ There is 'system fragility' in the organization of production (Minsky, 1982).

ed with the stability of aggregate response to unforeseen change, and as a dimension of adaptive efficiency introduced by Marris and Mueller (1980) and Pelikan (1986).

A difficulty with introducing dynamic considerations into welfare analysis is to assess social costs and benefits over the long run. Static efficiency considerations are short run. They can be approximated with comparative statics from existing conditions. Assessing the social loss of a less stable response to adverse shocks requires anticipating future states of aggregate measures of social welfare such as unemployment, inflation and balance of trade. This is not an easy task, but still one which may prove useful.

If one accepts what is assumed in standard welfare analysis – that rapid convergence from one equilibrium to another is the inevitable response to an unforeseen change – then dynamic considerations are not necessary in welfare analysis of industrial organization. I take the perspective that we cannot assume rapid convergence and that the adjustment dynamics out of equilibrium is important. With such a disequilibrium dynamic perspective, adaptive efficiency is a desirable characteristic of an economy, a hedge against an adverse future outcome which may or may not occur. Can adaptive efficiency be maintained by new firm entry?

8. Macro Stability through Diversity from Entry

Firms in an industrial sector striving towards efficiency tend to invest in the same least cost technologies. As investments accumulate, the production technology among firms in the sector becomes similar. If and when adverse shocks in the price and supply of factors occurs, the response among firms will be similar and accumulate into an aggregate impact on the macroeconomy. I suggest that a high degree of similarity in production technology among firms in a sector increases the risk that an adverse shock will destabilize the macroeconomy. Conversely, I suggest that firm diversity in a sector will enhance flexibility, thereby stabilizing the macroeconomy (Eliasson, 1984).

The relevant form of diversity among firms in a sector depends on the types of adverse shocks which are considered. Of particular interest are price shocks to factors of production such as oil, and foreign competition with respect to consumer nondurable goods which are both domestically produced and imported, and with respect to exports.

Consider the case of a factor price shock. In the short run, the flexibility of a sector depends on potential substitution among factors given existing capital stocks. Over the medium to long run, the adjustment dynamics will depend on the potential for installing new capital which compensates for changes in anticipated relative factor prices. As the analysis extends into the long run the impact of induced innovation will appear.

Let us return to the short run impact of a factor price change where firm response arises out of a substitution among factors. If fixed factor technology prevails among firms with the same technology, then no substitution will occur. The impact of a factor price change will be on the firms' price and production. How individual firm adjustment accumulates into aggregate dynamics is being explored with the micro-to-macro simulation model, MOSES (Eliasson, 1985).

Substitution among factors requires either variable factor technology or firms with diverse technology, using different combinations of factors. Consider the firm diversity situation, maintaining fixed factor technologies. Production will shift towards those firms with technology favorably inclined to the change in relative factor prices. How the aggregate impact compares with the case of similar firms is being explored with MOSES.

I suggest that greater diversity in production technology among firms in the sectors of an economy, reduces the impact a factor price shock has on aggregate production, price and employment. Diversity will increase stability, due to the greater substitution possibilities. Stability through diversity in production technology is a characteristic of flexibility to the factor price shock situation.

When individual firms have factor substitution possibilities, then diversity of production technology among firms is less important. It is my feeling, though, that given technology firms have little substitution potential among factors of production in the short run. Rather, flexibility is best maintained by existing firms having alternative technologies, entrants introducing process innovation and multidivision firms using different technologies in different divisions.

Without innovative entry there may be a tendency towards homogeneity of technology, since competition forces the same least cost investments. For reasons of flexibility it may be useful to consider policies that support innovative activity and provide new technologies which serve as viable alternatives under changing factor price and supply conditions. Whether the innovative activity is carried out by existing firms or new potential firms makes no difference in this context. Though, an issue is whether existing firms or potential entrants will carry out the appropriate research and innovative activity (Kamien and Schwartz, 1975).

9. Macro Stability with Foreign Competition

An open economy, where exports compete in foreign markets and domestic goods compete with imports, is subject to a greater potential of influences which may destabilize aggregate growth. Changing foreign prices, fluctuating exchange rates and innovations from abroad can favor the balance of

trade toward foreign companies. As domestic firms compete for market share there will be repercussions throughout the domestic economy. The aggregate unemployment and inflation problems which arise during the traverse of disequilibrium adjustment are complex. One approach to the analysis of the traverse is through micro-to-macro simulation (Eliasson, 1985).

The entry and exit of firms is one dimension of the disequilibrium dynamics which is of interest here. As market shares are lost, low performers exit. In a responsive economy, innovative entry will be induced. Both process and product innovations may stimulate growth and stabilize the aggregate economy. Those firms which persist in the sector will have to develop technology which allows cost to be reduced and price to be competitive. An alternative method for making prices competitive is by government devaluation of the domestic currency. Such policy may have medium to long term repercussions which may not be desirable. The extent to which innovation can be relied upon to maintain viability of firms given foreign competition is an industrial policy issue. Export driven growth in an economy threatened by foreign competition, is maintained through viable product innovations and through innovative entry. The critical question is how and to what extent the innovative function can be influenced through policies.

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