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Can Globalisation Result in Less Efficient and More Vulnerable Industries?

Abstract:

Growing economic globalisation (a means of market extension) may increase the economic vulnerability of firms in modern industries, especially those in which firms experience substantial economies of scale. The possibility is explored that globalisation activates competitive pressures that forces firms into a situation where their leverage (fixed costs relative to variable costs, or overhead cost relative to operating costs or capital intensity) rises substantially. Consequently, they become increasingly vulnerable to a sudden adverse change in economic conditions, such as a collapse in the demand for their industry's product. This is explored for monopolistically competitive markets and also for oligopolistic markets of the type considered and modelled by Sweezy using kinked demand curves. In addition, globalisation is hypothesised to induce firms to become more **uniformly** efficient. While this has static efficiency advantages, this lack of heterogeneity in productive efficiency of firms can make for economic inefficiency in the adjustment of the industry to altered economic conditions. It is shown that lack of variation in the economic efficiency of firms can impede the speed of market adjustment to new equilibria and may destabilise market equilibria.

Can Globalisation Result in Less Efficient and More Vulnerable Industries?

1. Introduction

Greater economic efficiency of industry is believed to be an important benefit from growing economic globalisation. This is mainly attributed to an increase in market competition due to an extension of the size of the market. In addition, greater economies of scale and specialisation will be achieved in some industries as a result of market extension. These favourable economic effects on static economic efficiency are theoretically possible. Nevertheless, globalisation can have negative effects on the dynamic economic efficiency of an industry (Tisdell, 1999; Svizzero and Tisdell, 2001; Tisdell and Seidl, 2004; Tisdell, 2004a). But these Schumpetarian type aspects are not the main focus of this paper. Rather it is concerned with the possibility that globalisation (or more generally market extension) may increase the economic vulnerability of firms in an industry subject to this effect and reduce the economic efficiency with which an industry adjusts to sudden changes in its economic conditions. Thus increased static efficiency may be purchased at the expense of greater economic vulnerability of an industry and reduced efficiency in the industry's adjustment process.

Globalisation can have this effect because of its following consequences:

(1) greater similarity in the cost and demand conditions facing firms;
(2) reduced profit margins due to greater competition in markets; and
(3) increased size of firms experiencing economies of scale with a rise in their fixed overhead or inescapable costs relative to their variable, direct or escapable costs.

These combined consequences arising from market extension and greater market competition as a result of globalisation increase the economic vulnerability of modern industries to sudden variations in their economic conditions. The reduced heterogeneity of firms (the growing similarity of firms) results in their relatively equal efficiency and when economic conditions change there are no or few less efficient firms to exit first. This can delay and make for an inefficient adjustment process. It makes no difference that firms may have all adopted industry benchmark techniques (the most efficient techniques in a static setting).

Indeed, while firms by doing so can be statically most efficient, they create inefficiency for industry adjustment. This is apart from the likelihood that lack of diversity of enterprises in an industry may hamper dynamic or evolutionary efficiency.

These possibilities will be illustrated first by using the monopolistically competitive market model (Chamberlin, 1956) and then a Sweezy-oligopolistic model (Sweezy, 1939). Then growing economic inefficiency in market adjustment as a result of increased globalisation is considered. This is followed by a general discussion and conclusions.

It might be noted now, however, that there is very little discussion of the above phenomenon in the existing economic literature. Nevertheless, Scheraga (2004) has raised a similar aspect in relation to the global airline industry. He found that increased operational efficiency in the global airline industry made airlines more vulnerable with regard to their financial mobility. He points out that this was highlighted by the post-September 11, 2001 environment following attacks by terrorists on airlines in the US. Tisdell (2002, 2004b, forthcoming), also put forward a similar thesis in relation to the global tourism industry. This paper, adopts the point of view that these phenomena are not confined to tourist industries but apply to a range of modern industries experiencing market extension via growing globalisation (or via other means) and extends Tisdell's previous analysis.

2. Increasing Vulnerability of Monopolistically Competitive Industries as a Result of Globalisation

Monopolistic competition is compatible with substantial economies of scale for individual firms although this was not emphasised by Chamberlin (1950). However, changes in scale of firm's operation usually involve a change in its capital-labour ratio or a variation in its fixed, inescapable, indirect or overhead costs relative to its variable, escapable, direct or operating costs. It is assumed that reductions in a firm's per unit operating costs are achieved as a rule by increasing its overhead costs, that is by rises in fixed costs relative to variable costs. In many cases, this will be reflected in a rising capital to labour ratio (or rising capital intensity) for any particular level of operation by the firm (cf. Salvatore, 2004, p.300). Thus the leverage of the firm rises.

Consider the case illustrated in Figure 1. For simplicity it shows the firm as having a choice of two techniques for its production each of which involves linear total costs of production.

With technique one, its total cost is shown by line ACD and involves an overhead cost of OA. Its average direct costs are constant.[1] Similarly, line BCE represents the total cost of the firm's production using technique two, and OB is its overhead costs. Thus, the firm can obtain reduced per unit costs for an output greater than x_1 by switching techniques and incurring larger overhead costs. This will be reflected in many cases in a rise in the firm's capital to labour ratio and always involves in a rise in its ratio of indirect cost to direct costs of production.

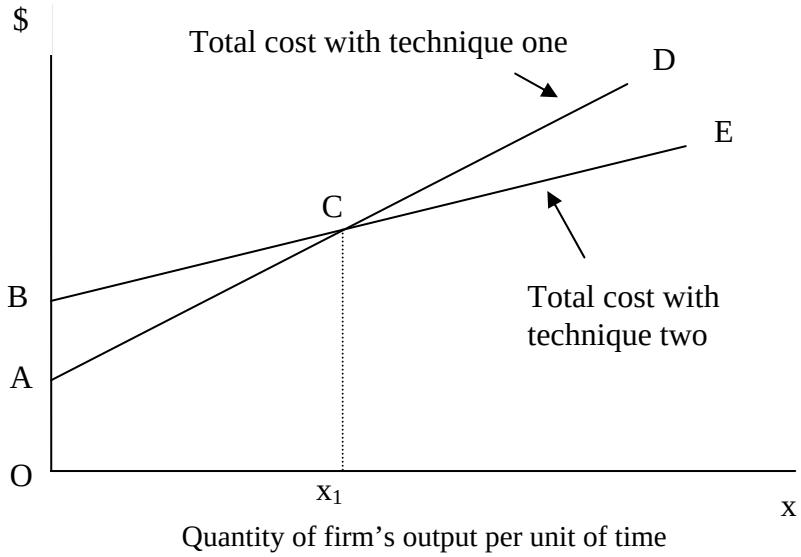

Figure 1: Linear-type break-even analysis as depicted in most textbooks in managerial economics

If the firm is able to sell more than x_1 of its output per period of time, it will pay it to switch from technique one to two. This will enhance its economies of scale because its per unit operating cost will fall as a result. One can also incorporate into this model a fixed capacity limit for each of the techniques or associated 'plants'.

If the firm's market is small, it will pay the firm to adopt the technique with the lower overheads but if it is large it pays to adopt the technique with higher overhead costs. Growing economic globalisation (market extension) increases the size of the market for individual firms, although in the process, it may reduce the number of firms operating in the market globally. Thus, economic globalisation is likely to be associated with a rise in the overhead cost of firms relative to their direct costs and this exposes them to increased economic vulnerability.

Consider the monopolistically competitive case shown in Figure 2. A firm operating primarily in a domestic market, with some degree of protection from international competition, may be faced with a demand curve d_1d_1 for its product and AC_1 may be its cost curve. It may actually be able to make above normal profit even if it does not have an absolute monopoly. Its overhead costs relative to its direct cost will be relatively low. This will be so also if entry into the domestic industry is easy and it is forced into an equilibrium at a point such as B, its average cost being as represented by the curve marked AC_1'. In such a case, however, it has no excess profit to cushion it against unforeseen changes in its economic environment.

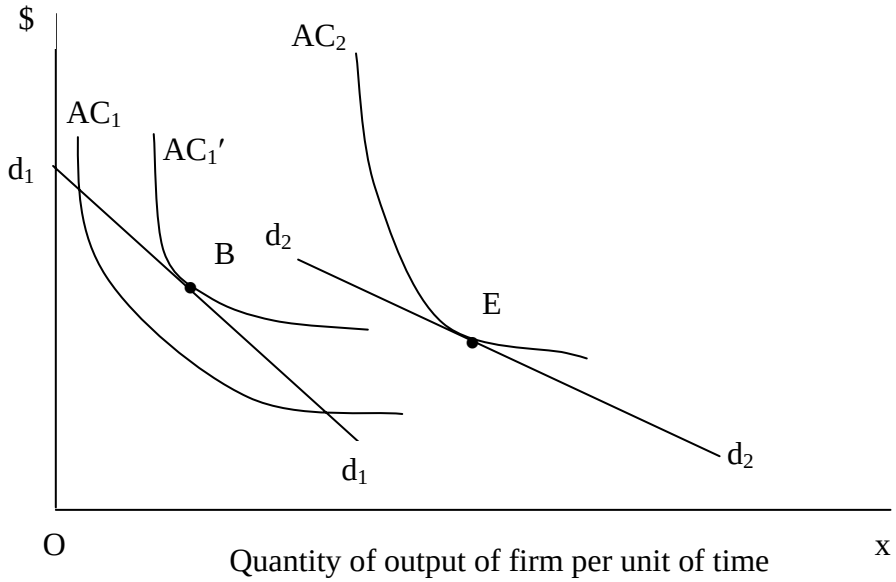

Figure 2: An illustration that a monopolistically competitive firm becomes more highly leveraged and economically vulnerable as a result of globalisation

As a result of globalisation, the 'representative' firm, if it survives, will obtain a larger market but become involved in a more competitive one. The demand curve for the firm's product for example is shown to alter from d_1d_1 to a more elastic one, d_2d_2. Because of greater competitive pressures, the firm will achieve a long-run equilibrium corresponding to point E. It will have zero excess profit to cushion it against a sudden adverse change in its business environment. It will also have experienced a substantial rise in its overhead cost relative to its operating costs.[2] This increases its economic vulnerability to a sudden collapse in demand for its product (such as happened in the international tourist industry following the terrorist

attack on 11 September 2001), or major hike in operating costs due to episodic events, such as possible an oil crisis.

Therefore, it is believed that globalisation by extending the markets of firms remaining in an industry, raises the leverage of these firms. Hence, their break-even points are pushed upward. The leverage of firms rises due to a rise in their fixed costs relative to their variable costs and to a fall in the market price of their product due to greater competition and/or economies made possible by market extension. In the event of the quantity of sales of a firm falling by an equal amount below its break-even point, the business will incur a greater loss in the post-globalisation situation than in the pre-globalisation one. There may also be a higher probability of sales being depressed to a point below break-even one in the post-globalisation situation, but this is not certain.

3. The Increased Vulnerability of Oligopolistic Industries as a Result of Globalisation

Similar arguments can be applied to oligopolistic market variations. This includes industries transformed from ones involving domestic monopolies or near monopolies to oligopolistic ones as a result of globalisation, or ones that are oligopolistic in both situations. Consider the latter case and assume that the type of oligopolistic behaviour analysed by Sweezy (1939) applies. For Sweezy's case, as shown by Tisdell (2004c), linear break-even analysis can be highly relevant to the firm.

The type of changing economic situation faced by a representative oligopolistic can be illustrated by Figure 3. There the curve marked LRAC represents the long-run average costs of the firm which for simplicity is assumed to be the same before and after globalisation. The kinked demand curve, ABC, is assumed to apply prior to globalisation and DEF after globalisation. The customary or accepted price for the oligopolist's product is P_1^C prior to globalisation and a lower one, P_2^C after globalisation. The sales of the firm expand from x_1 to x_2 per period as a result of globalisation but its profit margin is reduced. In addition, though not illustrated, it is hypothesised that the firm's fixed variable cost ratio is increased as globalisation occurs in order to achieve economies of scale. Even though this exposes the firm to greater economic vulnerability, it has no option but to follow this path if it is to have a chance of surviving in the face of international competition.

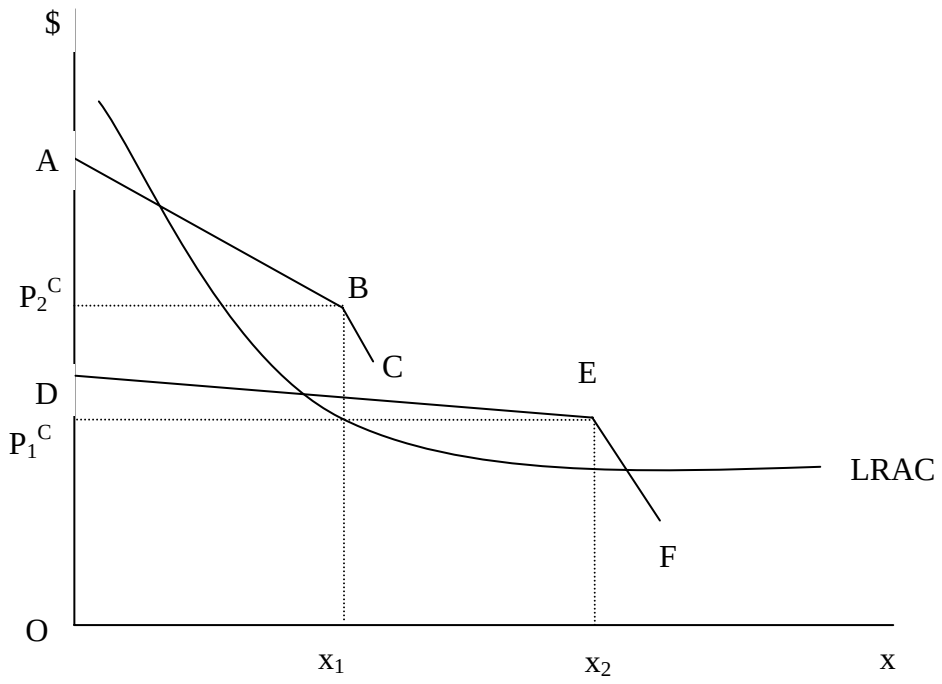

Figure 3: Illustration of how an oligopolist may become economically more vulnerable as a result of globalisation

Of course, an oligopolistic domestic market may be transformed as a result of globalisation to one involving a global monopolistically competitive market. However, this does not alter the substance of the argument. In fact, the latter type of market is likely to be more vulnerable to major changes in the economic environment than an oligopolistic one because excess profit can be expected to be absent. In the long run, monopolistically competitive firms have no profit cushion to soften the impact of adverse economic conditions.

4. Globalisation and Industry Adjustment as an Efficiency Issue

Neoclassical economics has mostly concentrated on the efficiency or otherwise of market equilibria. However, this is only one aspect of economic efficiency and as argued by (Schumpeter, 1942; Tisdell, 2001), such static efficiency may be incompatible with dynamic efficiency. While we agree with the Schumpetarian point of view (Svizzero and Tisdell, 2001), static economic efficiency promoted by competitive economic forces may also create an industry structure that impedes market adjustment when the market environment alters significantly. It may keep a market in disequilibrium for a longer period of time than might

otherwise occur and result in economic losses in excess of those that would be experienced with smoother adjustment.

This would seem to be the case if economic globalisation unleashes competitive forces that put all firms on the industry efficiency frontier, or virtually on it. They adopt the best benchmark procedures and their cost conditions are homogenous. The demand conditions may also be similar if, for example, the principle of minimum product differentiation applies.

In these circumstances, there are no differences in the ability of firms to survive, no diversity exists in the cost and demand conditions experienced by each. So there is no way to know which firm should exit the industry if demand collapses. Only by protracted attrition might adjustment be attained. Self reorganisation would most likely be faster if all firms were not equally efficient (equally fully efficient) and if a gradient of efficiency existed in the industry.

This can be illustrated by Figure 4 for a purely competitive industry. The line D_2D_2 represents the global demand for the industry's product and S_1S_1 is its supply curve. Each firm is assumed to have a reversed-L average variable cost curve and equal overhead costs when using the most efficient technique. International competition results in all adopting the most efficient technique and producing an output of k. Thus,[3] in the initial global industry equilibrium X_3/k firms supply the industry.

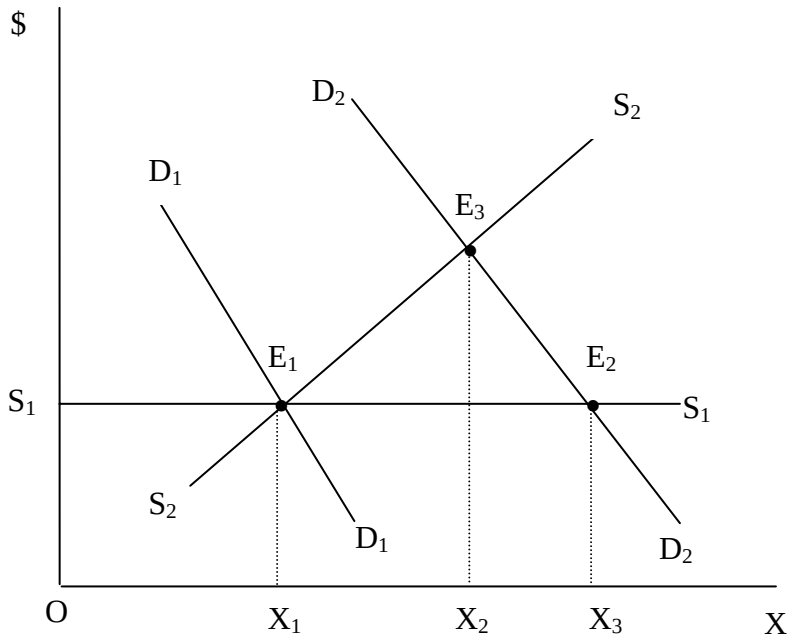

Figure 4: Uniformly high efficiency can hinder market adjustment and make it inefficient – case one

Now if market demand should collapse from D_2D_2 to D_1D_1, achieving a new equilibrium requires $(X_3 - X_2)/k$ firms to exit the industry. But which ones ought to exit? There is no clear guide to self reorganisation.

Suppose, however, that a different situation exists in which firms still have reversed-L supply curves but differ in efficiency so that an industry supply curve like S_2S_2 applies. Actually this curve will consist of little steps each corresponding to a firm but the steps are not shown. For simplicity, once again, assume that each firm has the same production capacity of k. Industry equilibrium is initially at E_3 with X_2/k firms supplying the industry. With the collapse of demand to D_1D_1, firms with per unit costs in excess of the price corresponding to E_1 can be expected to be displaced from the industry. Their losses, especially compared to the continuing profits of the more efficient firms in the industry, may facilitate their rapid exit from the industry. Much depends on the mechanics of the adjustment process but the adjustment process seems more straightforward in this diversity case than in the uniform efficiency case.

In some cases, a cobweb-type market adjustment process could come into play. If so, adjustment to equilibrium is likely to be faster the greater is the efficiency gradient of firms, that is, the greater are the differences in their efficiency. The industry supply curve is then relatively steep. Indeed, if the efficiency gradient is slight, market adjustment could follow an explosive cycle of the type illustrated in Figure 5. This is familiar for the simple cobweb model.

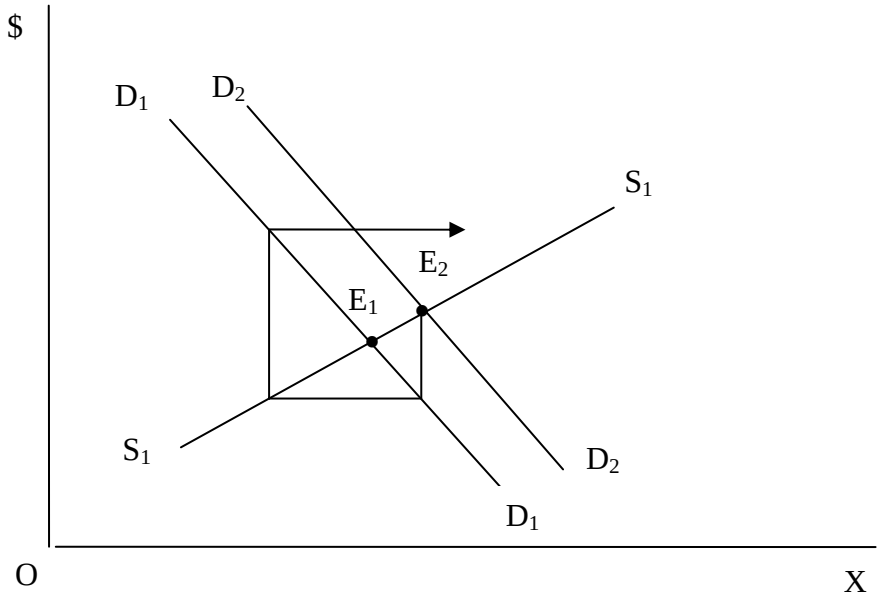

Figure 5: A low gradient of differences in efficiency of firms may result in an unstable equilibrium – case two

In the case shown in Figure 5, there is relative uniformity in the efficiency of firms in the industry so the industry supply curve is relatively flat. Using the reversed-L approximation considered before and supposing the simple cobweb response, this results in increasing oscillations of entry and exit of firms from the industry with a demand shift, for example, from D_2D_2 to D_1D_1 as illustrated. However, if a large gradient in the efficiency of firms occurs, the supply curve may become steeper than the decline in the demand curve. This makes for a stable equilibrium and speedy convergence to the new equilibrium. Convergence to the new equilibrium is more rapid the steeper is the slope of the supply curve, other things equal. In this model, the supply curve is steeper the sharper are the differences in the economic efficiency of firms in the industry.

Therefore, the above models indicate that while differences in the economic efficiency of firms results in a static economic loss, these may facilitate speedy market adjustment and reduce economic losses that occur during disequilibrium. Although globalisation promotes economic efficiency in the static sense, it may undermine efficiency in the economic adjustment of markets. This is an additional issue to the Schumpetarian position that static efficiency may be at odds with dynamic efficiency (Schumpeter, 1942) and the view that globalisation may weaken the beneficial evolutionary potential of economic systems (Tisdell, 1999; Tisdell and Seidl, 2004).

Note that the above destabilising market phenomena arising from economic globalisation are additional to those identified by Lasselle et al. (2001) and by Tisdell (2003). They found that markets could be destabilised by reduced heterogeneity in the **behaviour** of businesses, the greater responsiveness of businesses to market signals, and reduced transaction costs (frictions) as a result of processes involved in globalisation, could destabilise markets.

5. Concluding Discussion

Many see globalisation as a strong force for increasing the global economic efficiency of industries by promoting market competition and enabling greater economies of scale to be achieved. While at first sight this argument seems to be convincing, this article demonstrates that economic globalisation can result in a greater degree of leverage (higher ratio of fixed or relatively inescapable costs to variable costs) of firms and can be expected to increase vulnerability of businesses to major unforeseen changes in their market conditions. Thus, the increased static economic efficiency is purchased at the expense of greater economic vulnerability of firms in global industries.

Secondly, to the extent that international competition weeds out the less efficient firms and makes for greater equality in the efficiency of firms in an industry (and may even result in all adopting the same best practice technique), it can hamper market adjustment in a disequilibrium situation. Therefore, this paper also demonstrates that economic efficiency losses can occur because globalisation reduces business diversity and this can hamper market adjustment processes. This aspect is not considered in neoclassical theory.

In addition, to those factors, economic globalisation can also undermine Schumpeterian economic growth processes and evolutionary market processes (Tisdell and Seidl, 2004;

Tisdell, 1999). Consequently, unmitigated economic globalisation of markets may not be as great a blessing for economic welfare and economic efficiency as is conventially claimed.

It should be noted that despite the widespread coverage of break-even analysis in economics (including managerial economics and allied subjects) to assess the economic vulnerability of business and the use of break-even analysis to consider the impacts of growing globalisation on the vulnerability of firms, break-even analysis does have serious limitations. It rests on single-period static analysis and Marshall's (Marshall, 1890) analysis of the firm. Therefore, it only partially captures aspects of business vulnerability. It does not consider the time-stream of the economic performance of a business specifically.

Furthermore, it takes no account of sunk costs as a result of business misfortune. For example, Marshall assumes that all fixed costs are escapable in the long-run and does not consider that these may be only escapable with sunk costs or with some cost penalty. When such costs are taken into account, they reinforce the hypothesis presented here. As globalisation and extension of the market proceeds not only is the leverage of businesses likely to increase but their techniques and business routines become more specialised and this is increasingly embodied in their resources, especially their capital. This specialisation enables firms to reap greater economies of scale, as observed by Adam Smith (1910, Vol. 1), and enables them to tap more specialised demands. Their resources, as a result, become more specific to their business and their industry. Because the businesses' resources now lack adaptability or flexibility for use elsewhere, in the event of a business failure, particularly if associated with a general economic collapse in their industry, each firm faces large sunk costs. This is because specialisation narrows the market for the specific resources or assets of businesses. Thus, the extension of markets is a powerful source of increased business vulnerability.

Now it is well known that when the economic conditions (such demand conditions) in an industry are quite variable that it is most economic for businesses to adopt flexible on adaptable techniques (Stigler, 1939; Baumol, 1950 pp.92-93; Tisdell, 1968 Ch.7). However, the adoption of such techniques may only evolve in industries that experience regular economic variability or regular stochastic events, that is a comparatively stationary pattern of economic variability. They are unlikely to evolve in an industry subject to more episodic economic shocks because these shocks do not exert regular impacts on competitive processes

within the industry. The possibility of such events will only be taken into account by businesses if all firms, or most, do it. This will not happen because a negative market externality occurs that is similar to that illustrated by the prisoners' dilemma problem.

The hypothesis just mentioned might seem to be inconsistent with the empirical findings of Ghosal (1991). He found on the basis of US empirical evidence that "a significant negative relationship [exists] between demand uncertainty and the capital-labour ratio, and that an increase in firm size counteracts this negative influence" (Ghosal, 1991, p.158). However, he actually does not measure demand uncertainty but demand variability. These may be connected, but as Tisdell (1968, Ch.5; 1996, Ch.5) points out, it is very important to distinguish between those theoretically because their consequences can be quite different. Ghosal's study captures relatively regular features of demand variability. In such cases, economic theory predicts the adoption of more flexible or adaptable techniques and these will often have lower capital-labour ratios. Contrary to Ghosal's (1991) conclusion, these techniques are not necessarily inefficient – they may be relatively efficient given the variability being experienced.

However, from the point of view of this article, a more interesting finding of Ghosal (1991 p.160) is that larger firms tend to have higher capital-labour ratios. This provides empirical evidence to support the increasing leverage hypothesis (underpinning the present article) that larger firms are more leveraged than smaller ones.

The theory presented here also has some features that are akin to Karl Marx's theory of the evolution of free capitalistic markets.[4] He envisaged that with development of the market system, capital-labour ratios would rise, profits would fall and that the system would become more vulnerable to variations in general economic conditions (Marx, 1999).[5] The results, however, in this paper follow from a different theoretical argument. Nevertheless, this article reaches a similar conclusion: capitalistic market development involving the expansion of markets, for example, via growing economic globalisation, raises the capital-labour ratios of businesses and adds to the economic vulnerability of industries.[6] It also contributes to the possible persistence of market disequilibria, and is a potential source of market disequilibrium. At least, this seems to be a theoretical possibility.

Notes

[1] If, the firm's total cost curve is linear and if this has a positive fixed cost component, its average total cost curve is declining as a function of its output. The latter declines at a decreasing rate and can be compatible with long-run monopolistic competition. If the firm's total cost, *C*, as a function of its output, *x*, takes the form:

$$C = a + bx$$

then its average per unit costs of production are:

$$\text{AC} = C/x = a/x + b$$

Its average per unit fixed cost of production component forms a rectangular hyperbola and its average per unit variable cost is the constant, *b*.

[2] In the type of market situation illustrated in Figure 2, the firm if it wants to produce in the globalised situation has no option but to adopt a highly leveraged method of production. Methods with a lower leverage are unprofitable.

[3] The reversed-L shaped supply curve is compatible with a linear total cost curve but assumes a capacity limit of *k* in this case. If the firm's total cost curve is $C = a + bx$ where *x* is it quantity of output, then in the short run the firm's supply is $x = k$ if price exceeds or equals *b*, and is zero if it is less than *b*. In the long run, the supply relationship is as follows: *k* if price equals or exceeds $a/k + b$, and if less than this, zero.

[4] Clem Tisdell is grateful to Rodney Beard for pointing out this feature.

[5] Samuelson et al. (1975, pp. 912-917) discuss Marx's thesis in general terms. Marx's thesis is that market capitalism involves the expropriation of surplus value produced by labour. This is not a part of the theory presented here.

[6] There are, of course, ways in which capitalists can counter that vulnerability given the rise of public companies. Asset portfolios can be diversified. This may reduce individual investors' risks to some extent. However, it may be more difficult for labourers to guard against such risks, especially if their skills are developed so that they become relatively specific to their industry or firm.

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