

INDUSTRIAL ORGANIZATION AND THE ORGANIZATION OF INDUSTRIES: AN AMERICAN PERSPECTIVE*

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This paper suggests that the scholarly field of industrial organisation is shaped and directed by the debate concerning some of the most pressing policy issues at any historical time period about the link between the organisation of industries and economic performance. By industrial organisation, we mean the scholarly field of research. By the organisation of industries, we mean the actual way in which economic activity is organised within the unit of observation of an industry. A shift in the organisation of industries that is taking place, away from economic activity based on the traditional factors of production, such as labour and capital, and towards knowledge-based economic activity. Accompanying this shift is a new public policy debate focusing on how to create new knowledge and facilitate its commercialisation. The field of industrial organisation is responding with a new focus on the link between the dynamics of the organisation of industries, or how industries and firms evolve and change over time, and innovative performance.

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I. Introduction

The thesis of this paper is that the scholarly field of industrial organisation is shaped and directed by the debate concerning some of the most pressing policy issues at any historical time period about the link between the organisation of industries and economic performance. By *industrial organisation*, we mean the scholarly field of research. By the *organisation of industries*, we mean the actual way in which economic activity is organised within the unit of observation of an industry. The first stirrings of industrial organisation as a field came as a response to the emergence of the trusts of the late 1900s and their perceived adverse impact on performance criteria such as prices and profits. Not only were the trusts attributed to demolishing family businesses, farms in the midwest and entire communities, but the public policy debate at the time accused them of threatening the underpinnings of democracy in the United States. In arguing for the passage of the 1890 Act, Senator Sherman argued, "If we will not endure a King as a political power we should not endure a King over the production, transportation, and sale of the necessaries of life. If we would not submit to an emperor we should not submit to an autocrat of trade with power to prevent competition and to fix the price of any commodity."¹

The field became solidified in the 1930s when there was concern that prices were not downwardly flexible as a result of the administered pricing power of large corporations possessing market power. Such price inflexibility was attributed to exacerbating and prolonging the Great Depression. Industrial organisation responded with a series of studies trying to link the flexibility of prices to the degree of concentration.

Following the second world war one of the most pressing public policy issues was the ability of the United States, along with the rest of the west, to economically compete against the Soviet Union and her Eastern European Satellites. There appeared to be a tradeoff between concentration of production and decision-making which generated greater efficiency on the one hand, and decentralisation of production but lower efficiency on the other hand. Industrial organisation ascended to an important, recognised field of economics because it provided a framework for identifying and analysing this tradeoff and for advocating public policy in dealing with this tradeoff. The scholars of industrial organisation delivered a large systematic body of evidence identifying (1) the extent of concentration in the economy and how it was changing over time, (2) the impact of that concentration on efficiency and profitability, and (3) the appropriate role for public policy, typically in the form of antitrust, regulation or public ownership.

1. Quoted from Scherer (1977, p. 980).

As the easing of the cold war in the 1970s reduced the immediacy of this perceived policy tradeoff, a new policy debate emerged—how to deal with stagflation. Industrial organisation scholars responded by resurrecting the Administered Pricing thesis and undertook a wave of studies to determine the impact of market power on price increases.

The stagflation of the 1970s gave way to a new pressing policy issue in the 1980s—loss of competitiveness in the traditional manufacturing industries to countries such as Germany and Japan. As corporations started massive waves of downsizing, and employment levels fell in the traditionally strong industries such as autos and steel and tyres, the public policy debate shifted from constraining large corporations towards generating more success in terms of creating high-paying jobs. The paper ends by documenting the shift in the organisation of industries that is taking place, away from economic activity based on the traditional factors of production, such as labour and capital, and towards knowledge-based economic activity. Accompanying this shift is a new public policy debate focusing on how to create new knowledge and facilitate its commercialisation. The field of industrial organisation is responding with a new focus on the link between the dynamics of the organisation of industries, or how industries and firms evolve and change over time, and innovative performance.

2. The Price-Profits Criterion

2.1. The Trust Movement and Monopoly Power

The response by the main economic actors of the time—small and family owned businesses suddenly thrust into an inefficient operating size on the one hand and falling prices in the product market on the other hand, big business caught up in a seemingly endless battle for increasing size or being condemned to extinction, and consumers—was political. The political response was in the form of what became known as the Granger Movement and then the Populist Movement, which consisted of a coalition among small business and Midwest farms as a counterforce to the growing economic power of the railroads. Out of first the Granger and subsequently the Populist Movements emerged the mandate for restricting the power of big business in general and the freedom of firms to contract more specifically. In responding to the demands of the Populist movement, which voiced the disgruntled concerns of affected small businesses, government was ultimately given the mandate to constrain the power of big business.

Direct government regulation of big business emerged as a political response to the demands of the Granger and Populist Movements. The

particular concern of these political movements focused on the railroad and grain elevator trusts. The populists managed to pressure a number of Midwestern states into enacting laws regulating interstate railroads and grain elevators. One grain elevator owner, Munn, brought a legal suit against the State of Illinois for enacting a law which enabled the state to control the rates charged by grain elevators and warehouses. When the Supreme Court agreed to hear the case, Munn charged that the statute violated the Fourteenth Amendment to the United States Constitution by effectively claiming a portion of his private property in the form of foregone profits. In the 1877 Supreme Court decision concerning *Munn v. Illinois*² however, the Court ruled that because the product was *affected with the public interest*, government regulation of business was constitutional.

Prior to the middle of the 19th century, production was typically at a small-scale (Chandler, 1977). The minimum efficient scale (MES), or smallest level of output where the minimum average cost was attained was minimal and involved just a handful of employees. Production was typically undertaken in small-scale craft establishments and was centred around family owned businesses. Piore and Sabel (1984) conclude that prior to the middle of the 19th century, a flat average cost curve was not a bad approximation for most firms in most industries.

The fundamental cost structure changed dramatically with the advent of the corporation and the accompanying managerial revolution. The corporation had emerged as the most efficient instrument of resource management during the American industrial revolution. If the application of British inventions had served as the catalyst underlying US industrialisation, the revolution in management techniques—the modern corporate structure—enabled its implementation. According to Reich (1983, p. 26), “Managerialism offered America a set of organizing principles at precisely the time when many Americans sensed a need for greater organization and these principles soon shaped every dominant American institution precisely as they helped those institutions become dominant. The logic of routine, large-scale manufacturing, first shaped its original business environment and then permeated the larger social environment.”

Through the organisational structure of the modern corporation, the new managerialism emerging after the US Civil War excelled at amassing large quantities of raw materials, labour and capital inputs, and at applying particular manufacturing processes, thereby achieving a very specific use of these resources. The leaps in productivity of US manufacturing during the late 1800s were the product of increased specialisation.

The essence of the new managerialism was “command and control of effort.” Labour was considered to be indistinguishable from all other inputs, as long as scientific management was able to “extract a full day’s

2. *Munn v. Illinois*, 94 U.S. 113, 1877.

worth of energy for a full day's pay" (Wheelwright, 1985). As tasks became increasingly specialised, the skill level required of workers became less important. What mattered most under the mass-production regime was the consistency and reliability of each precise cog; what mattered least was the decision-making capability of each unit.

The emergence of mass-production made feasible by the organisation of the corporation combined with the managerial revolution triggered a dramatic shift in the underlying cost structure of firms and industry. The MES increased dramatically in many manufacturing industries, resulting in a shift in the long-run average cost curve from essentially flat to downward sloping.

The response to a decreasing cost curve had three aspects. The first was, for the first time in American history, small-scale production was threatened. Family businesses were confronted by a cost disadvantage vis-à-vis the large-scale corporations, resulting in massive failures and liquidations.

The second aspect involved the massive increases in output as a result of the unprecedented productivity increases generated by large-scale production. This led to chronic downward pressure on prices.

The third aspect involved the emerging large corporations, which generally did not prove capable of mastering the business environment sufficiently to ensure the viability of mass-production. While scientific management provided the means for controlling and assembling resources into specialised production processes, it had little to offer for controlling the external business environment. The stability, continuity and reliability that constituted the core of successful mass production failed to materialise at the market level. The American large corporation was threatened by market volatility.

Market volatility emanated from the relatively capital-intensive production processes required of large-scale mass-production. Attaining the MES level of output and exhausting scale economies through specialisation required historically unprecedented amounts of capital investment. Such investment was rendered particularly risky and vulnerable by two factors. The first was the dependence of profitability and survival upon the achievement of high levels of capacity utilisation. Faced with industry excess capacity, firms resorted to *cut-throat pricing*—dropping price below average total cost but above marginal cost—in an effort to maintain capacity utilisation. Of course, such a policy pursued independently by each firm resulted in disaster for the entire industry. Scientific management, which could methodically squeeze out the high levels of efficiency based on large-scale production, was impotent in the face of such market volatility (Piore and Sabel, 1984).

The second risk associated with large-scale investment was its vulnerability to technological obsolescence. The viability of any one firm investing

in mass production depended upon none of the other firms in the market making quantum-level technological advances. Thus, the corporation was rendered unstable due to its inability to control price through coordinating market output with its rivals and by the devastating effect of being technologically surpassed by rivals (Piore and Sabel, 1984, ch. 4).

Just as the organisation of the corporation combined with modern management to achieve the coordination of production within the firm, it analogously sought to extend that control to the external environment. The condemnation of business policies threatening stability— such as *cut-throat pricing*— is reflected in the frontpiece of Eddy's (1912) *The New Competition*: "Competition is War and War is Hell". Kolko (1963, pp. 30-31) quotes an early American Tobacco Company executive lamenting, "Unrestricted competition had been tried out to a conclusion, with the result that the industrial fabric of the nation was confronted with an almost tragic condition of impeding bankruptcy. Unrestricted competition had proven a deceptive mirage, and its victims were struggling on every hand to find some means of escape from the perils of their environment. In this trying situation, it was perfectly natural that the idea of rational cooperation in lieu of cut-throat competition should suggest itself."

The first attempts to achieve industry stabilisation and offset the *chronically excess output* precipitating *cut-throat pricing* consisted of outright collusion— agreements either to fix price or to restrict output, or both, enabling prices to be raised. Such agreements were typically implemented under the direction of trade associations. For example, the Bessemer Pig Iron and the Bessemer Steel Associations were formed in the mid-1880s to restrict output and stabilise prices among over 700 companies in the blast furnace, steel work and rolling mill industries. However, as the declining prices in 1894-1895 of most steel goods indicated, such stabilisation attempts proved ineffective.

Having failed at price-fixing, the corporations attempted to attain market stability through consolidation. The drive for stabilisation through merger prevailed throughout the economy, culminating in the merger movement at the turn of the century, as documented by Nelson (1959). In 1895 only 43 firms disappeared as a result of acquisition, representing a \$41 million merger capitalisation. Just three years later, mergers resulted in 303 firm disappearances, for a \$651 million capitalisation. US Steel became a giant corporation largely through consolidation and acquisition. The company was created by combining 12 firms, which in turn had been created from merging together some 180 independent companies, with more than 300 plants. However, even such consolidations on a massive scale typically fell short of achieving the desired goal of controlling or at least limiting output and halting the price reductions. According to Kolko (1963, p. 27), "The new mergers, with their size, efficiency, and capitalization were unable to stem the tide of competitive growth. Quite

the contrary. They were more unlikely than not unable to compete successfully or hold on to their share of the market.” Although consolidation had succeeded in amassing giant firms, it had not succeeded in providing long-term industry stability by halting the upward spiral in productivity and output and the subsequent downward spiral in prices. Kolko’s conclusion is certainly consistent with the 1919 Supreme Court ruling in *US v. US Steel Corp.*³, that “Size alone is not an offense.” Even its massive size and market share of 90 per cent in 1901 apparently was not sufficient for US Steel to stem the tide of excess capacity and “*cut-throat pricing.*”

The era of decreasing costs, ushered in by the advent of the large corporation and the managerial revolution, was therefore characterised by what seemed to be a dismal tradeoff confronting economic policy—efficiency and low-costs generated by large-scale production but at the cost of increased economic centralisation on the one hand, versus economic decentralisation, and political democracy, but at the cost of inefficiency on the other hand. Marx (1912) viewed this tradeoff in a larger dimension, where capitalism itself was incompatible with democracy. According to Marx, the advantages of large-scale production in the competitive process would lead to small firms inevitably being driven out of business by larger corporations in a never ending race towards increased concentration and centralisation: “The battle of competition is fought by the cheapening of commodities. The cheapness of commodities depends, *ceteris paribus*, on the productiveness of labour, and this again on the scale of production. Therefore, the large capitals beat the smaller.”⁴

2.2. Collusion and Rigid Prices

During the Great Depression of the 1920s, the prevalent approach towards economic policy was that the sharp decline in demand would lead to a fall in prices, which would subsequently stabilise the economy. Even with a substantial drop in output and explosion of unemployment, the price level in the United States did not fall substantially. In the sphere of macroeconomics, the Keynesian approach attempted to explain price rigidities. In the realm of microeconomics, scholars such as Berle and Means (1932), Joan Robinson (1934) and later Bain (1956) tried to link price rigidities to the organisation of industry. The administered price thesis suggested prices were downward sticky in concentrated industries characterised by an oligopolistic market structure. The point here is not to support or refute the validity of this thesis, but to emphasise that the field of industrial organisation was once again doing what it does best—addressing one of the most pressing issues confronting public policy in that era.

3. *U.S. v. U.S. Steel Corp.*, 251, U.S. 417 (1920).

4. Quoted from Rosenberg (1992, p. 197).

2.3. The Post-War Era

When the Soviet premier Nikita Khrushchev banged his shoe on the negotiating table of the United Nations, and challenged President John F. Kennedy, “We will bury you,” the West was alarmed. At the heart of Khrushchev’s challenge was not necessarily a military threat, but rather an economic one. After all, the Soviets had beaten the Americans in the space race with the launching of the *Sputnik* just several years earlier; and perhaps even more disconcerting was the growth in Soviet productivity, which appeared to greatly exceed that in the West during the 1950s.

Thus, by the 1960s there was little doubt among politicians, intellectuals and economists about the credibility of the threat from the East. Moore (1992, p. 72) has provided compelling documentation of the “view held widely at the time that Soviet central planning would produce persistently high growth rates into the foreseeable future.” Even as late as 1966, the Joint Economic Committee of the United States Congress warned of a “planned average annual increase in industrial output of 8.0-8.4 percent during 1966-70” in the Soviet Union (Noren, 1966, p. 301). After all, the nations of Eastern Europe, and the Soviet Union in particular, had a “luxury” inherent in their systems of centralised planning— a concentration of economic assets on a scale beyond anything imaginable in the West. For example, before the Berlin Wall fell, the East German economy consisted of 224 firms— *Kombinate*, or combines, of which around 180 were in manufacturing. There was essentially one firm, and one firm only for each major manufacturing industry. This degree of concentration and centralisation was the rule and not the exception throughout Eastern Europe.

Although there may have been considerable debate about what to do about the perceived Soviet threat during the cold war, there was little doubt at that time that the manner in which enterprises and entire industries were organised mattered. And even more striking, when one reviews the literature of the day, there seemed to be near unanimity about the way in which industrial organisation mattered. It is no doubt an irony of history that a remarkably similar version of what Rosenberg (1992, p. 197) has termed the “giantism embedded in Soviet doctrine,” fueled by the writings of Marx and ultimately implemented by the iron fist of Stalin, was also prevalent throughout the West. Schumpeter (1942, p. 134), for example, predicted that due to their ability to exploit scale economies, the industrial structure would inevitably consist solely of large corporations: “Since capitalist enterprise, by its very achievements, tends to automatise progress, we conclude that it tends to make itself superfluous— to break to pieces under the pressure of its own success. The perfectly bureaucratic giant industrial unit not only ousts the small- or medium-sized firm and ‘expropriates’ its owners, but in the end it also ousts the entrepreneur and expropriates the bourgeoisie as a class which in the process stands to lose not only its income but also, what is infinitely more important, its function.”

The post-war period represented the pinnacle of mass-production (Chandler, 1977). A massive literature had identified a clear long-term trend towards increased concentration in economic activity both at the aggregate level as well as for individual markets. For example, the percentage of total US manufacturing assets accounted for by the largest 100 corporations increased from about 36 per cent in 1924, to 39 per cent after the Second World War to over 50 per cent by the end of the 1960s, causing F.M. Scherer to conclude (1970, p. 44), “Despite the (statistical) uncertainties, one thing is clear. The increasing domestic dominance of the 100 largest manufacturing firms since 1946 is not a statistical illusion.”

Consistent with the trend towards increased concentration was the shift in economic activity away from small firms and towards large enterprises. The share of employment accounted for by small firms decreased substantially in every major sector of the economy during the post-war period. Perhaps most striking was the decrease in the share of employment accounted for by small firms of nearly one-quarter in manufacturing between 1958 and 1977 (Acs and Audretsch, 1993).

The major industries serving as the engine of American economic success— automobiles, steel, tyres, chemicals, aluminum, and later computers— were all characterised by an oligopolistic market structure consisting of just a handful of dominant firms resulting in high and increasing rates of concentration (Scherer, 1970).

There was a distinct social analog to support an industrial structure so dependent upon large corporations. This was the era of the “man in the gray flannel suit” and the “organization man,”⁵ when virtually every major social and economic institution acted to reinforce the stability and predictability needed for mass production (Chandler, 1977; Piore and Sabel, 1984).

The first two decades of the Post-War period were characterised by continued concern and vigilance against the threat to democracy posed by rising economic concentration. This concern is expressed in a broad range of Congressional Hearings, the enforcement record of the antitrust agencies as well as decisions handed down by the US Supreme Court. For example, the Committee on the Judiciary of the US House of Representatives published the influential *Study of Monopoly Power* in 1950. Similarly, the United States Senate held and published hearings on *Economic Concentration* in 1964. Jesse Markham (1965, p. 166) concluded from his reading of the Congressional testimony leading up to passage of the *Celler-Kefauver Amendment* to the Clayton Act in 1950, “Whatever else Congress may have had in mind when it amended that statute, it is clear

5. For a description of the social implications of an industrial structure centred upon big business, see Whyte (1960) and Riesman (1950).

from the Senate and House reports on the bill that one of its purposes was to check the rise of market concentration.”

In the high water mark against the possession of market power in 1948, the Court ruled that “Congress...did not condone good trusts and condemn bad ones; it forbade all.”⁶ Unless a firm could demonstrate that market power was not “thrust upon it” due to “superior skill, foresight and industry,” the Court would infer an intent to monopolise and find a violation of the Sherman Act. Similarly, the strictest ruling against mergers was made by the Supreme Court in 1962,⁷ which branded horizontal mergers as being virtually per se illegal, and lasted until the Court loosened its interpretation in 1974.⁸ The Court justified its strict prohibition against horizontal mergers, and similar strict measures against vertical mergers as, “We cannot avoid the mandate of Congress that tendencies toward concentration in industry are to be curbed in their incipiency.”⁹ This ruling established the strict precedent that monopoly power in its incipiency which could result from the merger was sufficient to disallow the acquisition. The Court also made rulings issuing the tightest restraints on product- and geographic-extension mergers.¹⁰ This was also the same period that saw the Federal Trade Commission undertake its most aggressive cases against tacit collusion or what was euphemistically termed as a *shared monopoly* in a 1972 case against the Cereal Companies.¹¹ Similarly, with the *Schwinn* case in 1967, the Court ruled that vertical restrictions imposed by manufacturers on retailers constituted per se violations of the antitrust laws.¹² A decade later this decision, too, had been significantly weakened.¹³

The strongest government intervention against antitrust came within a relatively small window of time of a dozen years or so in the late 1950s and early 1960s. While this reflected national concern about the threat to democracy posed by increased concentration and the centralisation of economic activity, at the same time concern about the ability of the country to compete against the Soviet Union was also growing.

Perhaps the ascendancy of industrial organisation as a field in economics during this period came from the recognition not only by

6. *U.S. v. Aluminum Co. of America*, 148 F. 2cl 416 (1945). Note that in this case the second Circuit Court served as a “court of last resort”, or substitute for the US Supreme Court, because several of the justices, who had previously worked with the prosecution, had to disqualify themselves, and the Supreme Court was unable to meet the necessary quorum of six justices to hear the case.

7. *Brown Shoe Co. v. U.S.*, 370 US 294 (1962).

8. See for example *U.S. v. General Dynamic Corp.*, 415 U.S. 486 (1973).

9. *Brown Shoe Co. v. U.S.*, 370 US 294 (1962), p. 345.

10. See *FTC v. Consolidated Foods Corp.*, 380 U.S. 592 (1965); *U.S. v. Falstaff Brewing Corp.*, 410 U.S. 526 (1973); and *FTC v. Proctor & Gamble Co.*, 386 U.S. 568 (1967).

11. FTC complaint against Kellogg, General Mills, General Foods, and Quaker Oats, Docket No. 8883, filed 26 April, 1972. The Quaker Oats Company was subsequently dropped from the complaint.

12. *U.S. v. Arnold Schwinn & Co. et al.*, 388 U.S. 365 (1967).

13. *Continental TV Inc. et al. V. GTE Sylvania, Inc.*, 433 U.S. 36 (1977).

scholars but also by policy makers that industrial organisation matters. It became the task of the industrial organisation scholars to sort out the issues involving this perceived trade-off between economic efficiency on the one hand and political and economic decentralisation on the other. The scholars of industrial organisation responded by producing a massive literature focusing on essentially three issues: (i) how much economic concentration is there? (ii) what are the economic welfare implications of an oligopolistic market structure? And (iii) given the evidence that economic concentration is associated with efficiency, what are the public policy implications? A characteristic of this literature was not only that it was obsessed with the concentration/oligopoly but that it was essentially static in nature. There was considerable concern about what to do about the firms and existing organisation of industry, but little attention was paid to where they came from and where they were going.

Oliver Williamson's classic 1968 article published in the *American Economic Review*, "Economies as an Antitrust Defense: The Welfare Tradeoffs," became something of a final statement demonstrating this seemingly inevitable tradeoff between the gains in productive efficiency that could be obtained through increased concentration and exploitation of scale economies, and the gains in terms of competition that could be achieved through decentralising policies, such as antitrust. But it did not seem possible to have both simultaneously, certainly not in Williamson's completely static model. Even as new insights were contributed, such as the theory of market contestability and sunk costs (Sutton, 1991, 1998), the view that such a tradeoff existed remained reinforced.

2.4. The National and International Policy Debates in the Post-war Era

Pessimists became alarmed when confronted by this tradeoff. Perhaps the West would, after all, be buried by the East—productivity gains and a surge of economic growth emanating from the overpowering Soviet combines would simply overwhelm the outscaled firms in the West, burdened with antiquated constraints such as antitrust laws. By contrast, in an effort to achieve both the efficiency needed to compete with the Soviet Union but avoid the threat posed by massive economic concentration, optimists such as John Kenneth Galbraith rejected the antitrust approach in favour of government regulation and public ownership. Regarding East-West relations, Galbraith spoke of a *convergence* between the communist systems of Eastern Europe and the Western style of *managed capitalism*. In his theory of countervailing power, Galbraith viewed the power of big business as being held in check by big labour and by big government. It seemed that both the East and the West were converging toward economies dominated by a handful of powerful enterprises, constrained only by the countervailing powers of the state and workers. The only "trivial" difference would be the ownership.

Thus, the fundamental issue of public policy towards business during the era of decreasing costs was how to live with the apparent trade-off between concentration and efficiency on the one hand, and decentralisation and democracy on the other. The public policy question of the day was, *How can society reap the benefits of the large corporation in an oligopolistic setting while avoiding or at least minimising the costs imposed by a concentration of economic power?* The policy response was to constrain the freedom of firms to contract. As explained above, such policy restraints typically took the form of public ownership, regulation and competition policy or antitrust. At the time, considerable attention was devoted to what seemed like glaring differences in policy approaches to this apparent trade-off by different countries. France and Sweden favoured government ownership of private business.¹⁴ Other countries, such as the Netherlands and Germany, tended to emphasise regulation.¹⁵ Still other countries, such as the United States, had a greater emphasis on antitrust. In fact, most countries relied upon elements of all three policy instruments. While the particular mix of instruments may have varied across countries, they were, in fact, manifestations of a singular policy approach—how to restrict and restrain the power of the large corporation. What may have been perceived as a disparate set of policies at the time appears in retrospect to comprise a remarkably singular industrial policy approach—constraining the freedom of large corporations.

2.5. Stagflation of the 1970s and Administered Inflation

That stagflation emerged as the economic challenge of the 1970s is not hyperbole. As had been the case in the earlier period of the great depression and post-war period, the field of industrial organisation attempted to find the links between the organisation of industries and the prevailing economic problem, in this case stagflation. The conclusion of Robert Heilbroner that, “To a very great degree, the big companies hold the market at bay, raising or lowering prices when they want to, not when an oceanic flood of competition forces them to,”¹⁶ reflected a very lively scholarly debate found in the field of industrial organisation. This debate again focused on the theory of *administered pricing*. But while the theory of administered pricing developed in the 1930s suggested that market power and concentration were responsible for price rigidities and price inflexibility, the 1970s version suggested exactly the opposite—that price increases were the result of market power and economic concentration. What these two versions had in common was that through administered prices, market power and economic concentration were attributed for price phenomena deviating from perfect competition.

14. See for example Hjalmarsson (1991).

15. See for example Klodt (1990) and Geroski (1989).

16. Robert L. Heilbroner, “The American Plan,” *New York Times Magazine*, January 25, 1976, p. 38.

Thus, writing in the *American Economic Review*, Gardner Ackley (1959, p. 1) concluded that, “The inflationary process is essentially an administrative one. It arises from largely autonomous upward pressure on wage rates relative to the cost of living, interacting with administered-price markups applied to rising wage costs, compounded again through agricultural prices, raw materials, the cost of living, wage rates and industrial prices in an endless chain. Similarly, Morris Adelman (1961, p. 18) warned that, “business concerns have so much discretion or power to raise prices and wages that they can choose to inflate or not to inflate.”

Harold Demsetz (1973), among others, found a logical inconsistency in the application of the administered price thesis to inflation. The original price inflexibility argument by Gardiner Means in the 1930s alleged that prices in concentrated markets were unresponsive to market conditions, and by implication prices in concentrated markets would fall less during recessions and rise less during recoveries than would prices in less concentrated markets. However, the reconstituted version for the 1970s (Means, 1972) held that market concentration was responsible not for price changes that were too small but too large.

A large wave of empirical studies was undertaken and published in the industrial organisation literature to test the validity of the administered price thesis. John Blair (1959) linked price changes to the degree of market concentration in recessions and expansionary periods. George Stigler (1962) tried to adjust prices for the difference between listed prices and actual prices in transaction, in “Administered Prices and Oligopolistic Inflation.” David Qualls (1975) linked the relative flexibility of prices to market concentration. Writing in the *Journal of Political Economy*, DePodwin and Selden (1963) found that 10 percent of price variation could be explained by concentration. Leonard Weiss (1966) examined “Business Pricing Policies and Inflation” in the *Journal of Political Economy*. James A. Dalton examined “Administered Inflation and Business Pricing” in the *Review of Economics and Statistics* in 1973.

These studies generated disparate and sometimes ambiguous results. While some studies provided statistical support for the link between market structure and inflation, other studies did not corroborate the *administered inflation* thesis. That this debate died down in the 1980s does not reflect any resolution, but rather the disappearance of stagflation as a driving issue in public policy.

3. The Innovation Criterion

3.1. Innovation as a Source of Comparative Advantage

Globalisation combined with the telecommunications revolution has drastically reduced the cost of transporting not just material goods but

also information across geographic space. High wages are increasingly incompatible with information-based economic activity, which can be easily transferred to a lower cost location. By contrast, the creation of new ideas based on tacit knowledge cannot easily be transferred across distance. Thus, the comparative advantage of the high-cost countries of North America and Western Europe is increasingly based on knowledge-driven innovative activity. The spillover of knowledge from the firm or university creating that knowledge to a third-party firm is essential to innovative activity. Such knowledge spillovers tend to be spatially restricted. Thus, an irony of globalisation is that even as the relevant geographic market for most goods and services becomes increasingly global, the increased importance of innovative activity in the leading developed countries has triggered a resurgence in the importance of local regions as a key source of comparative advantage. Globalisation combined with the telecommunications revolution has shifted the comparative advantage of high-wage countries away from economic activity based on capital, unskilled and even skilled labour, and towards knowledge-based economic activity.

As illustrated by the title page of *The Economist* proclaiming *The Death of Distance*,¹⁷ the claim that geographic location is important to the process linking knowledge spillovers to innovative activity in a world of E-mail, fax machines and cyberspace may seem surprising and even paradoxical. The resolution to the paradox posed by the localisation of knowledge spillovers in an era where the telecommunications revolution has drastically reduced the cost of communication lies in a distinction between knowledge and information. *Information*, such as the price of gold on the New York Stock Exchange, or the value of the Yen in London, can be easily codified and has a singular meaning and interpretation. By contrast, *knowledge* is vague, difficult to codify and often only serendipitously recognised. While the marginal cost of transmitting information across geographic space has been rendered invariant by the telecommunications revolution, the marginal cost of transmitting knowledge, and especially tacit knowledge, rises with distance.

Von Hippel (1994) demonstrates that high context, uncertain knowledge, or what he terms sticky knowledge, is best transmitted via face-to-face interaction and through frequent and repeated contact. Geographic proximity matters in transmitting knowledge, because as Kenneth Arrow (1962) pointed out some four decades ago, such tacit knowledge is inherently non-rival in nature, and knowledge developed for any particular application can easily spill over and have economic value in very different applications. As Glaeser, Kallal, Scheinkman and Shleifer (1992, p. 1126) have observed, “intellectual breakthroughs must cross hallways and streets more easily than oceans and continents.”

17. “The Death of Distance,” *The Economist*, 30 September, 1995.

The political counterpart of the technological revolution was the increase in democracy and concomitant stability in areas of the world that had previously been inaccessible. The Cold War combined with internal political instability rendered potential investments in Eastern Europe and much of the developing world as risky and impractical. During the post-war era most trade and economic investment was generally confined to Europe and North America, and later a few of the Asian countries, principally Japan and the Asian Tigers. Trade with countries behind the iron curtain was restricted and in some cases prohibited. Even trade with Japan and other Asian countries was highly regulated and restricted. Similarly, investments in politically unstable countries in South America and the Mid-East resulted in episodes of national takeovers and confiscation where the foreign investors lost their investments. Such political instability rendered foreign direct investment outside of Europe and North America particularly risky and of limited value.

The fall of the Berlin Wall and subsequent downfall of communism in Eastern Europe and the former Soviet Union was a catalyst for stability and accessibility to parts of the world that had previously been inaccessible for decades. Within just a few years it has become possible not just to trade with but also to invest in countries such as Hungary, the Czech Republic, Poland, Slovenia, as well as China, Vietnam and Indonesia. For example, India became accessible as a trading and investment partner after opening its economy in the early 1990s. Trade and investment with the developed countries quickly blossomed. Trade and investment with the United States tripled between 1996 and 1997, reflecting the rapid change in two dimensions. First, India was confronted with sudden changes in trade and investment, not to mention a paradigmatic shift in ways of doing business. Second, to the foreign partner, in this case the United States, taking advantage of opportunities in India also meant downward pressure on wages and even plants closing in the home country.

There are many indicators reflecting the shift in the comparative advantage of the high-wage countries towards increased importance of knowledge-based economic activity. For example, Kortum and Lerner (1997, p. 1) point to “the unprecedented recent jump in patenting in the United States,” as evidenced by the rise in applications for US patents by American inventors since 1985, which exceeds the increase in any other decade in this century. Throughout this century, patent applications fluctuated within a band of between 40,000-80,000 per year. By contrast, in 1995 there were over 120,000 patent applications. Similarly, Berman, Bound and Machin (1997) have shown that the demand for less skilled workers has decreased dramatically throughout the OECD, while at the same time the demand for skilled workers has exploded.

3.2. Delinking Firms from Places

Confronted with lower cost competition in foreign locations, producers in the high-cost countries have three options apart from doing

nothing and losing global market share: (1) to reduce wages and other production costs sufficiently to compete with the low-cost foreign producers, (2) to substitute equipment and technology for labour to increase productivity, and (3) to shift production out of the high-cost location and into the low-cost location.

Many of the European and American firms that have successfully restructured resorted to the last two alternatives. Substituting capital and technology for labour, along with shifting production to lower-cost locations have resulted in waves of *Corporate Downsizing* throughout Europe and North America. At the same time, it has generally preserved the viability of many of the large corporations. This wave of corporate downsizing has triggered cries of betrayal and lack of social conscience on the part of the large corporations.¹⁸ This public indignation represents a delinking of the competitiveness of firms from the competitiveness of a particular location. This has led to a shift in the performance criterion which is described in the next section.

3.3. Implications for Policies towards Business

As the comparative advantage in Western Europe and North America has become increasingly based on new knowledge, public policy towards business has responded in two fundamental ways. The first has been to shift the policy focus away from the traditional triad of policy instruments essentially constraining the freedom of firms to contract— regulation, competition policy or antitrust in the US, and public ownership of business. The policy approach of constraint was sensible as long as the major issue was how to restrain corporations in possession of considerable market power. The ineffectiveness of policies of restraint is reflected by the waves of deregulation and privatisation along with the decreased emphasis of competition policy throughout the OECD.

Instead, a new policy approach has emerged which focuses on enabling the creation and commercialisation of knowledge. Examples of such policies include encouraging R&D, venture capital and new-firm startups.

The second fundamental shift involves the locus of such enabling policies, which are increasingly at the state, regional or even local level. The downsizing of federal agencies charged with the regulation of business in the United States has been interpreted by many scholars as the eclipse of government intervention. But to interpret deregulation, privatisation and the increased irrelevance of competition policies as the end of government

18. As the German newspaper, *Die Zeit* (2 February, 1996, p. 1) pointed out in a front page article, "When Profits Lead to Ruin – More Profits and More Unemployment: Where is the Social Responsibility of the Firms?" the German public has responded to the recent waves of corporate downsizing with accusations that corporate Germany is no longer fulfilling its share of the social contract.

intervention in business ignores an important shift in the locus and target of public policy. The last decade has seen the emergence of a broad spectrum of enabling policy initiatives that fall outside of the jurisdiction of the traditional regulatory agencies. Sternberg (1996) documents how the success of a number of different high-technology clusters spanning a number of developed countries is the direct result of enabling policies, such as the provision of venture capital or research support. For example, the Advanced Research Program in Texas has provided support for basic research and the strengthening of the infrastructure of the University of Texas, which has played a central role in developing a high-technology cluster around Austin (Feller, 1997). The Thomas Edison Centers in Ohio, the Advanced Technology Centers in New Jersey, and the Centers for Advanced Technology at Case Western Reserve University, Rutgers University and the University of Rochester have supported generic, precompetitive research. This support has generally provided diversified technology development involving a mix of activities encompassing a broad spectrum of industrial collaborators.

Such enabling policies that are typically implemented at the local or regional level are part of a silent policy revolution currently underway. The increased importance of innovative regional clusters as an engine of economic growth has led policy makers to abandon the policy cry frequently heard two decades ago, "Should we break up, regulate, or simply take over General Motors, IBM and US Steel" for a very different contemporary version, "How can we grow the next Silicon Valley?"

One of the most important policies to promote small and medium sized businesses (SMEs) has been the Small Business Innovation Research (SBIR) programme. The SBIR was enacted by the United States Congress in 1984. The Programme provides a mandate that each participating government agency must spend a share of its research budget on contracts to small firms. This includes the major federal agencies, such as the Department of Defense, the National Institutes of Health, the National Science Foundation, Department of Energy and the National Aeronautics and Space Administration. The Small Business Innovation Development Act of 1982,¹⁹ required that agencies with extramural R&D budget of \$100 million or more set aside not less than 0.2 per cent of that amount for the SBIR programme. In addition, the Act provided for annual increases up to a ceiling of not less than 1.25 per cent of the agencies' budgets. The amount of awards will total over \$1.4 billion in 1999.

The SBIR consists of three phases. Phase I is oriented towards determining the scientific and technical merit along with the feasibility of a proposed research idea. Phase II extends the technological idea and emphasises commercialisation. Phase II involves additional private funding

19. Public Law 97-219, 22 July 1982.

for the commercial application of a technology. Under the Small Business Research and Development Enhancement Act of 1992, funding in Phase I was increased to \$100,000, and in Phase II to \$750,000.

The SBIR was an offshoot of the Small Business Investment Company (SBIC) programme, which provided more than \$3 billion to young firms between 1958 and 1969. During this period this amounted to more than three times the total amount of private venture capital.

The SBIR represents about 60 per cent of all public SME finance programmes. Taken together, the public SME finance is about two-thirds as large as private venture capital. In 1995, the sum of equity financing provided through and guaranteed by public programmes financing SMEs was \$2.4 billion, which amounted to more than 60 per cent of the total funding disbursed by traditional venture funds in that year. Equally as important, the emphasis on SBIR and most public funds is on early stage finance, which is generally ignored by private venture capital. Some of the most innovative American companies received early stage finance from SBIR, including Apple Computer, Chron, Compaq and Intel.

3.3.1. Enabling: New Industrial Policies

The policy response to this new view of the knowledge production function has been to shift away from targeting outputs to inputs. In particular, this involves the creation and commercialisation of knowledge.²⁰ Examples include the promotion of joint R&D programmes, education and training programmes, and policies to encourage people to start new firms. As Saxenian (1985, p. 102) points out, "Attracting high-tech has become the only development game of the 1980s." Justman (1995) shows how investment in infrastructure provide an important source of growth.

The provision of venture and informal capital to facilitate the creation and growth of new firms has replaced concern about the market power of existing ones in policy debates. The lack of finance capital for new ventures has been blamed for the inability of Germany and France to shift economic activity into new industries that generate high-wage employment. One of the most repeated phrases on the pages of the business news over the last few years has been "Put Bill Gates in Europe and it just wouldn't have worked out."²¹

20. An anonymous referee pointed out that the strategy of focussing on R&D and high technology industries may be misplaced as a development strategy for regions that need to catch up to the technology frontier. The evidence on the use of structural funds in European cohesion countries shows that the R&D investment needs to be geared towards existing comparative advantages (Middleb'art-Knarvik and Overman, 2000; and Tunzelman and Nassehi, 2004).

21. "Where's the Venture Capital?" *Newsweek*, 31 October, 1994, p. 44. A similar sentiment was expressed by Joschka Fischer, parliamentary leader of the Green Party in Germany, who laments, "A company like Microsoft would never have a chance in Germany" ("Those German Banks and Their Industrial Treasures," *The Economist*, 21 January, 1994, 77-78).

Policy efforts to address the most pressing contemporary economic problems have focused on enablement rather than constraint. Emphasis on enabling firms and individuals to create and commercialise new knowledge is not restricted to any single country or set of countries. Laura Tyson (1994), recently emphasised the importance of government policies to promote entrepreneurship and new-firm startups in the former Soviet Union. Audretsch and Feldman (1996) argue that industrial policies targeting the production and commercialisation of new economic knowledge will have a greater impact on particular regions and not diffuse rapidly across geographic space. They point out that knowledge spillovers are a key source of new knowledge generating innovative activity, but due to the tacit nature of that knowledge, knowledge flows tend to be geographically bounded. Although the cost of transmitting information has become invariant to distance, the cost of transmitting knowledge, and especially tacit knowledge, rises with distance. By creating regions of knowledge-based economic activities, government policies can generate highly concentrated innovative clusters.

As long as the major policy issue was restricting large, oligopolistic firms in command of considerable market power, a federal or national locus of control was appropriate. This is because the benefits and costs derived from that market power are asymmetric between the local region where the firm is located and the national market, where the firm sells its product. Not only was production concentrated in one or just several regions, but the workers along with the ancillary suppliers also tended to be located in the same regions. These workers as well as the community at large share the fruits accruing from monopoly power. Systematic empirical evidence (Weiss, 1966) shows that wages are positively related to the degree of market power held by a firm, even after controlling for the degree of unionisation. Higher profits resulting from market power are shared by labour. Workers and firms in the region have the same interest.

As Olson (1982) shows, relatively small coalitions of economic agents benefiting from some collective action tend to prevail over a large group of dispersed economic agents each incurring a small cost from that action. The costs of organising and influencing policy are relatively low for the small coalition enjoying the benefits but large for the group of dispersed economic agents. Government policies to control large oligopolistic firms with substantial market power were not likely to be successful if implemented on the local level. Rather, as Olson (1982) predicts, a regional locus of policy towards business tends to result in the capture of policy by the coalition of local interests benefiting from that policy. Only by shifting the locus of policy away from the region to the national level can the capture of policy by special interest groups be minimised. This is because the negative effects of market power in the form of higher prices are spread throughout the national market while the benefits accruing from that power are locally concentrated.

The most important institutions administering antitrust policy and regulation have been at the national level. But starting in the Carter Administration in the late 1970s and continuing into the Administrations of presidents Reagan, Bush and Clinton, antitrust has been de-emphasised and a 20 year wave of deregulation has led to a downsizing and even closure of a number of the former regulatory agencies.

Some economists interpret the downsizing of the federal agencies charged with the regulation of business as the eclipse of government intervention. But to interpret the retreat of the federal government as the end of public intervention is to confuse the downsizing of government with a shifting of the locus of government policy away from the federal to the local level. The last decade has seen the emergence of a set of enabling policy initiatives at the local level. This new type of industrial policy is decentralised and regional in nature. As Sternberg (1996) emphasises in his review of successful technology policies in the four leading technological countries, the most important public policies towards business in the last decades have been local not national. They have occurred in locations such as Research Triangle (Link, 1995), Austin, Texas and Cambridge (UK). Sternberg (1996) shows how the success of a number of different high-technology clusters spanning the four most technologically advanced countries is the direct result of enabling policies undertaken at the regional level.

Eisinger asks the question, “Do American States Do Industrial Policy?” in a 1990 article published in the *British Journal of Political Science*. Gray and Lowery (1990) confirm Eisinger’s affirmative answer by analysing the impact of state industrial policy in the United States. They develop a new data set on gross state product and a new measure of state industrial policy activism. Their results suggest that the implementation of industrial policy at the state level tends to promote growth. For example, Feller (1997, p. 289) points out that “in theory and implementation, state technology development programs— as in Texas, Ohio, New York, New Jersey, and Pennsylvania— may be viewed as bands on a wide spectrum from basic research to product development, with the ends reflecting quite divergent state strategies.” The Advanced Research Program in Texas has provided support for basic research and the strengthening of the university infrastructure, which played a central role in recruiting MCC and Sematech and developing a high-tech cluster around Austin. The Thomas Edison Centers in Ohio, the Advanced Technology Centers in New Jersey, and the Centers for Advanced Technology at Case Western Reserve University, Rutgers University and the University of Rochester have supported generic, precompetitive research. This support has generally provided diversified technology development involving a mix of activities encompassing generic research, applied research, and manufacturing modernisation through a broad spectrum of industrial collaborators spanning technology-intensive multinational corporations, regional manufactures and new-firm startups.

This shift in the locus of policy is the result of two factors. First, because the source of comparative advantage is knowledge, which tends to be localised in regional clusters, public policy requires an understanding of region-specific characteristics and idiosyncrasies. As Audretsch and Feldman (1995) show, regional strengths provide the major source of innovative clusters. The second factor is that the motivation underlying government policy is now growth and the creation of (high-paying) jobs, largely through the creation of new firms. These new firms are typically small and pose no oligopolistic threat in national or international markets. There are no external costs imposed on consumers in the national economy in the form of higher prices as in the case of a large oligopolistic corporation in possession of market power. There is no reason that the promotion of local economies imposes a cost on consumers in the national economy, so that localised industrial policy is justified and does not result in any particular loss incurred by agents outside of the region.

4. Conclusions

The main thesis of this paper is that the scholarly field of industrial organisation has been shaped and directed by the most pressing policy issues of the day and how they can be linked to the actual organisation of industries. It is not our desire or our task to take sides either in the policy debates or the theories and evidence developed by the industrial organisation scholars to shed light on those debates. Just as these policy debates have typically been fuelled by passions and deep-rooted convictions, the scholarly response from the field of industrial organisation has rarely been without substantial ambiguities. What does emerge is that industrial organisation has evolved and grown in stature in economics by responding to and addressing the most pressing policy issues of the day. The *Voraussetzung* for focusing on the organisation of industries as an important and valuable unit of observation worthy of the economists tool kit is its connection to some real world problem of considerable policy concern. Perhaps one reason why a *New Industrial Organisation* keeps emerging with remarkable temporal regularity is because the policy issues of the day continue to evolve over time. That the field of industrial organisation from just a few years earlier typically seems antiquated to the next generation of scholars, may less reflect the repudiation of incorrect knowledge and methods by correct ones, than a discipline whose inherent value is based on the evolution of public policy issues.

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