TOWARDS A NEW MODEL OF INDUSTRY DEVELOPMENT IN AUSTRALIA

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Abstract

In this paper, a case is mounted for shifting the bias of industry policy in Australia away from the present assumptions linking growth with the external orientation of large firms, and the favouring of their activities through mergers, rationalisation and concentration of market strength. Instead, it is argued that a shift in emphasis towards the encouragement of innovation in small and medium sized firms, through promoting the establishment of cooperative networks around appropriate knowledge nodes in our public infrastructure, can be expected to deliver sustainable and balanced growth in a more flexible and technologically advanced fashion than is likely to develop through large firms alone. Experience of economic success in some of the emergent 'new industrial districts' in Europe, North America and Asia, where dynamism has been linked with the creation and sustenance of networks of small firms rather than the fostering of giantism, is drawn on in making the case for change in Australia. These trends are linked with those which see large multinational firms seeking flexibility through internal disintegration, creating internally independent profit centres and spinning off internally generated enterprises. A program for Australia which builds on these developments is offered.
1. Introduction

Industry policy in Australia is currently the subject of intense public discussion. The old verities associated with the ‘Federation Australian’ model, in which industry was protected by tariffs and high wages could be paid through arbitration, the whole structure being glued together by high commodity prices, are now seen as falling apart. A new realism has emerged, based on the understanding that raw material exports could not forever uphold Australia’s standard of living. New concepts such as the notion of an Australian ‘productive culture’ reflect a renewed emphasis on the need for industry to achieve international standards of quality and efficiency. The public debate that is now raging concerns how best this goal may be achieved.

The weakness of Australian manufacturing industry has been revealed in successive reports, and most starkly by the Interim report to the tripartite Australian Manufacturing Council by Pappas Carter Evans & Koop/Telesis (AMC, 1989). This showed a chronic trade deficit in manufactures of $20 billion annually. More alarmingly, it revealed that if simple processing of raw minerals and commodities is subtracted from our ‘manufactured’ exports, this deficit grows to well over $30 billion per year. In the internationally competitive sector of ‘elaborately transformed manufactures’ Australia’s exports amounted to a mere $4.5 billion in 1987/88; of this, $1.3 billion went to New Zealand and Papua New Guinea. This leaves a paltry sum going to the rest of the industrial world.

Clearly, then, tariff barriers protecting industry in Australia have not led, as is conventionally argued, to a stronger domestic base. On the contrary, they have led to a ‘fat and lazy’ industry which survives only through protection. An interesting study was published by Anderson (1980) revealing that assistance, in the form of bounties, subsidies or import quotas, was more likely to be directed to industries using labour-intensive techniques, facing little competition, paying lower wages, and exporting little of their output - in other words, to the very opposite kinds of firms that are supposed to be encouraged by protection. These are the very kinds of firms that make the loudest protests when there is talk of winding protection back. Furthermore, it is widely understood that tariffs in one sector increase costs for industry in other sectors when they need to import capital goods.

There can be no argument, then, that a gradual dismantling of these barriers, and the fostering of a greater external orientation on the part of Australian industry, is a prelude to successful transformation of our industrial structure. This has been the line of argument of a distinguished series of studies of Australian industry, going back through Pappas Carter to Crawford (1979), Jackson (1975) and Vernon (1965). Indeed one can find virtually all the issues that are under current discussion rehearsed in these reports that previous governments ignored.

It is a simple-minded conclusion to draw from this experience that all forms of protection are bad. (Clark, 1990) To dismantle tariff barriers without doing anything else to assist and promote industrial renovation - as advocated strenuously by the economic rationalists in Australia - would be a disastrous course for policy to take. Its effect would be to send Australian firms naked into the international trade arena. Despite the rhetoric of Treasury, this arena is anything but a ‘level playing field’. Most informed comment on business trends acknowledges the strong role played by government in promoting, supporting and shaping the technological and industrial strength of Japan and the Newly Industrialised Countries of Asia. (Magaziner, 1989) The recent Garnaut report on Australia and the Northeast Asian Ascendancy (1989) acknowledges the same point (‘With the exception of Hong Kong, government support has been given at various times both to expanding industries in the manufacturing sector and to
declining industries in agriculture and services', p. 43). Yet Garnaut places his whole emphasis on 'trade liberalisation', acknowledging a role for government intervention only in terms of maintaining macroeconomic stability and ensuring that savings are channelled into education and training. A role for some kind of 'industry policy' is passed over in silence.

A rather more sophisticated analysis is offered by the recent report on 'Strategic Alliances in the Internationalisation of Australian Industry', commissioned by DITAC from the Centre for Technology and Social Change at the University of Wollongong, (TASC, 1990) This report notes the irony of public policy in Australia being so obsessed with market forces, when the large Multinational corporations are developing new techniques for by-passing markets through formation of cooperative consortia, and governments around the world are developing and applying a sophisticated range of non-tariff measures to support their industries. It is when the focus shifts to technological development that it becomes clear that cooperation, on a national and international scale, is an absolute precondition for mastering the complexities of the issues involved. Small and large firms in all countries are seeking strategic alliances as the means of acquiring knowledge and accessing new markets.

The starting point then for the analysis presented in this paper is that the adjustments needed to bring Australian industry to a point of international competitiveness must be accomplished with and through a public policy which shapes and facilitates our economic development. Financial and infrastructural support is needed, if experience from other parts of the world can be taken as a guide to success. So, it is argued, there is a role for government and public policy to play in renovating Australian industry, beyond dismantling existing tariff barriers and letting market forces create larger and larger domestic and international concentrations of capital. The question then arises: what kind of model should inform our industry strategy? To what ends should public policy be directed? What kinds of structures should be promoted?

It used to be an article of faith that industry had to concentrate its resources if it were to be capable of facing up to international competition. Yet throughout the OECD, a fundamental reappraisal of the relative significance of small and large firms in industrial development, is under way. This is based on a number of significant considerations. Firstly, small and medium sized industrial enterprises (SMIs) are now known to account for an increasing share of employment and industrial activity in many countries. Across the OECD, SMIs account for more than 90 per cent of industrial firms; in some countries the proportion is overwhelming, such as in Finland (97 per cent), Denmark and Sweden (99 per cent) or Canada (95 per cent). Moreover the contribution of SMIs to job creation in OECD countries is now recognised. In the European Community, the contribution of SMIs to employment rose in the early 1980s: in France from 43 to 46 per cent, in The Netherlands from 53 to 61 per cent, and in Italy from 52 to 58 per cent. In Canada, for example, net job creation by small and medium sized industrial enterprises (SMIs) in the period 1984/85 represented 96 per cent of new jobs in manufacturing industry. (OECD, 1989a) In Japan recent evidence paints a very different picture of small business, reinterpreting the previously dominant view of its marginality and inferior status in a 'dual labour market', and emphasising instead its technological innovation and competitive strength. (Friedman, 1989)

These are trends that cannot be ignored.

Secondly, evidence is now accumulating concerning the strong competitive performance of networks of small firms producing high tech goods and services, in such novel industrial regions as Central Italy, Southern Germany and,
surprisingly, in Japan. In the Emilia Romagna region of Italy, called the Third Italy to differentiate it from the old industrial North and from the South, networks of small high tech firms have become the powerhouse of Italy's industrial performance. In the period from 1970 to 1985, the region moved from 17th in per capita income to 2nd amongst Italy's 21 regions. Over the same period, it generated wage rates 75 per cent above the Italian average - so the phenomenon could not be ascribed to sweatshop conditions. Whereas employment levels in manufacturing have declined elsewhere, they have increased in Emilia Romagna. (Hatch, 1987; Brusco, 1982)

Similar striking developments have been documented in southern German regions such as Baden-Wuerttemberg, where networks of small firms as well as older established capital goods manufacturers have achieved market dominance through their cooperative activities and their use of public sector infrastructure. (Sabel, 1989)

Indeed it is possible to discern a marked shift in emphasis of 'industry policy' in Europe away from national strategies towards regional policies of support. This is based on the realization that real economic networks are established at the regional level. (Sweeney, 1989)

Thirdly, it is now widely acknowledged that the industrial giants of the post-war period have not had things all their own way in the turbulent times since the OPEC oil crisis of 1973. Increasingly, market conditions have turned against the rationale of mass production giants: small niche markets have appeared, and an emphasis on innovation and rapid response has undermined the previous advantages enjoyed by large sized firms. Mass production delivers returns to scale in stable conditions - but it has become counterproductive in times of rapid adjustment. (Mathews, 1989a) Consequently multinational giants are abandoning their global strategies (such as multiple sourcing for a 'world car', and off-shore production in one hemisphere for assembly in another) and are turning instead to internal re-organization, creating autonomous divisions and new, small profit centres within a federated structure. Thus there is a new emphasis on small-scale production, carried out within the framework of large firms. At the same time, large companies are seeking new relations with their customers and suppliers, placing renewed emphasis on joint ventures and collaboration, eg in design. Thus there is a new emphasis on cooperation as well as competition, and a new recognition of the significance of networks - again, within the framework of the large firms. (Sabel et al, 1989) Thus there is a striking convergence between the industrial success of regions based on networks of small firms, and multinationals reorganising themselves internally and in relation to suppliers and customers.

These developments - the new emphasis on the role of small business, a new recognition of the vitality of regional networks of small firms, the clearer understanding of the regional character of development, combined with the current reorganization of large firms into smaller units - are fundamental to the formulation of an industry strategy in Australia. They point to the necessity for strategy to be informed by radical models of development that break with the assumptions appropriate to a past era of industrial gigantism. Along with considerations regarding a shift in the direction of Australian industry strategy, towards value-added processing of our raw materials base, there needs to be consideration of the structure and shape of the strategy. There is scope to foster and promote the development of networks and clusters of small as well as large firms, utilising our public sector infrastructure of research centres and tertiary institutions as nodes around which such clusters may be generated. Such a model is facilitatory rather than prescriptive; it attempts to create the conditions, through targeted infrastructure development, in which firms will take clustering and cooperative decisions for themselves. This is a radically different conception of
State support, breaking completely with a discredited model of tariff and subsidy-driven intervention, and moving instead to a conception of the State as supporting and shaping the activities of enterprises, moving them in the direction of mutual support and cooperation, through its shaping of a public sector infrastructure. This is a model with far-reaching political implications. (Mathews, 1989b)

It is a model which the labour movement is increasingly pursuing as a strategy for industry survival.

As this model develops, so existing clusters and networks of firms in Australia are coming to be identified. They have developed without public support, sometimes in the teeth of public policy. In other cases they are being given modest encouragement, as in the development of technology parks around universities such as Monash in Victoria, Flinders in South Australia, and most recently, the University of New England in North East NSW. In other models, enterprise zones have been created, and are pursuing high value-adding clusters of firms, such as in the North Queensland zone based on Cairns and Townsville.

This paper examines these developments, placing them in the context of global shifts in the patterns of industry development and in the paradigm of productive efficiency that was linked with mass production. The paper looks in detail at trends in support for, and recognition of the role of, small and medium industrial enterprises. It examines the evidence concerning networks of small firms in such areas as Italy, Germany and Japan. It looks at the key role played by unions in maintaining the health and vitality of these networks. The paper also looks at developments within multinationals themselves, and examines the extent to which the organizational changes which are evident are likely to be long-lasting. It asks in more theoretical mode to what extent these developments can be attributed to market forces, State action or technological innovations - or to combinations of all of these. Based on this discussion, the paper attempts to draw some practical conclusions which will help to shape a new model of industry strategy in Australia.

2. The new regional networks

While most 'industry policy' in Europe in the 1970s and 80s focused on the problems of deindustrialisation, meaning the rundown of large monoculture industrial regions such as the Midlands in Britain, Alsace-Lorraine in France and North Rhine-Westphalia in Germany, the rise of flexible manufacturing networks in non-traditional regions largely escaped general attention. This situation is now being remedied, as the vitality of regional networks in Italy, Germany, Denmark and elsewhere are coming under close scrutiny.

A. Italy

One of the world's most successful Flexible Manufacturing Networks is found in the Emilia-Romagna region of Italy. The foundation of this dynamism lies in networks of vast numbers of small firms. The region of 4 million people numbers more than 325,000 small firms (including 90,000 in manufacturing) - or one firm for every five members of the active labour force. Ninety percent of the manufacturing firms are classified as 'artisan enterprises', employing less than 22 people. (Friedman, 1987) The success of these small firms lies in their being able to specialise and innovate, becoming world leaders in their chosen areas. Around Bologna, for example, firms specialise and cooperate in producing electronics equipment and automation systems; around Reggio Emilia and Modena they specialise in farm machinery; around Carpi the speciality is textiles and knitted
garments; and around Sassuolo it is ceramics. (Burke, 1990) These firms are strong exporters, and find markets in North America, Europe and Asia.

Unlike Hong Kong, which has a similar level of small firm activity, but where the emphasis is on individual innovation, in Emilia Romagna a culture of cooperation as well as competition has been fostered. This is partly a product of the activities of the firms themselves, through cross-contracting and other forms of cooperative work, and partly a product of the public infrastructure and government support offered to them.

It is widely believed that the small firm sector survives largely because of sweated labour, paying low wages and avoiding taxes and other social obligations. But sustained scrutiny of Emilia Romagna exonerates it on this count. On the contrary, it flourishes because it adopts a high quality, high wage competitive posture.

Sources of dynamism

The small firms of Emilia Romagna tend to be run by highly skilled entrepreneurs who were themselves skilled employees. (In fact many of them got their start when they were expelled from the mass production factories after the Hot Autumn of 1969, on account of their perceived political sympathies.) They are, in Piore and Sabel's terms, 'flexible specialists', who bring a craft consciousness to the manufacture of niche products at a high level of quality, utilising advanced technology and rapid response to market shifts. Another source is their capacity to present themselves externally as a total entity. For example, the machine tool manufacturers will combine to mount a single exhibit at the world's leading trade fairs, such as at Hanover; they will also bid for contracts as an entity, parcelling out the work when the bid is successful. They are able individually to take advantage of the flexibility offered through the new computerised technologies, such as CNC machine tools, and have been quick to respond to changes in demand (rather than seeking to shape the demand, in the time-honoured practice of the mass production giants). Thus the prime explanation for the success of the Emilian region lies with the activities of the 'artisan entrepreneurs' themselves, in their capacity to maintain a high level of technological innovation, with high levels of wages and worker skills, and to inter-connect their activities in complex webs of sub-contracting. Proximity and cooperation have been essential to the success of this regional 'industrial district'.

But public policy has also been a critical factor. The FMNs of Emilia Romagna are nourished by an infrastructure of support systems provided by themselves on a cooperative basis, and by government assistance. This assistance is itself channeled in different ways by the national government and regional governments.

At the local level, economic, financial and technological assistance to firms is provided through ERVET, the Regional Board for Local Economic Development, established in 1974. (1) It brings together credit and finance institutions, cooperative, union and professional associations. In addition to its general activities, it has established ten sector-specific Centres which provide strategic information on technology and market developments, delivered through consultants and cooperative programs. (2)

At the national level, a range of legislative, regulatory and infrastructure arrangements support and promote the vitality of networks of small firms. Linda Weiss, in her pathbreaking 1988 study, Creating Capitalism : The State and Small Business Since 1945, has shown in detail how successive post-war Christian
Democrat governments in Italy have promoted small business development, partly for pragmatic reasons and partly on grounds of an ideological commitment to the middle classes and skilled artisans. Remarkably this commitment was shared with the Communist administrations of the regional authorities created in the 1960s. Of special significance was the national Artisan Act of 1956, creating a special category of firm with less than 22 employees (a limit which may be exceeded by 20 per cent for up to three months in the year) as being eligible to a range of benefits and fiscal dispensations. Complementing this was the creation of an Artisan's Fund, guaranteed by the State, from which some 300,000 firms obtained assistance in its first 20 years existence. (Weiss, 1989)

The 'Emilian model' is now the subject of intense scrutiny and interest worldwide. It is also the subject of intense discussion by its Emilian protagonists. An international conference was held in Bologna in November 1989, to discuss 'Industrial Policy : New Issues and New Models; the Regional Experience'. In a keynote address, Claudio Tolomelli identified a number of factors contributing to a new regionally-based definition of industry policy in the 1990s. Amongst these were the primacy of small artisan firms, their technological sophistication, their servicing through specialised centres, their reliance on public sector-private sector cooperation, the integration of their activities within Development Plans for the region, the cooperative linkages they have established through networks, and their progressive integration into national and global markets. (Tolomelli, 1989)

B. West Germany

While the economic success of Germany is popularly linked to the exploits of giant firms like Siemens, Daimler-Benz, VW, BMW or Hoechst, another reality of small firm resilience is also emerging as a dynamic element in the German economic strength. Again networks on a regional basis have played a vital role in bringing about this new perspective.

In Germany, great importance has always been attached to the 'Mittelstand' (or 'middle sector'). Throughout the 1980s the Federal Government has assisted in the creation of new start-ups, which rose from 3000 per year in the early 1980s, to 9000 per year in 1983-88. Overall, in the five years to 1988, somewhat over 55000 small enterprises were created, with financial assistance totalling DM 2.8 billion. (OECD, 1989)

The southern Land of Baden-Wuerttemberg(BW), not normally associated with industrial development, has emerged in the past two decades as a prosperous centre of technologically advanced industry, based on machine-tool, special machines, textile machines, automobile and automobile components sectors. Sabel et al (1986) have looked at the current success of the textile machinery sector in BW, and contrasted its sources with the malaise of the equivalent sector in the US. Sabel and colleagues identified the BW industry as a network or association of specialists, 'each with unmatched expertise and flexibility in a particular phase or type of production' (p. 21). Joint marketing and research was formalised in the 1920s in the formation of 'specialization cartels' or consortia, as well as industry funded research institutes. In the turbulent years of the 1970s, Sabel et al argue that two further changes occurred: firms began increasingly to subcontract the supply of systems for their machines to other specialists, to offset the costs of design and development of new systems. This has gone so far that it is leading to a fundamental redefinition of the status of the industrial firm - a point we return to below. The complementary change is the rise of small jobbing shops with very sophisticated technology serving a variety of Original Equipment Manufacturers. Sabel et al cite the case of the small firm Kern und Lübers of Schramberg-Sulgen, which from being a supplier of stamped metal parts to the
textile machinery sector, has diversified its product line and range of outlets as it continues to develop its NC technological expertise.

Along with these changes there has been developed a concentration of public sector infrastructure in the form of consulting and extension services, and further increases in what was already an excellent system of public vocational training. Sabel et al conclude their study by contrasting the industrial vigour of BW, based on cooperative self-help networks and technological innovation assisted by targeted government programs, with the meagre efforts to create high technology networks in Massachusetts. Regional networking emerges again as a critical factor in successful industry policy.

C. Denmark

Denmark is a good example of a prosperous industrial country that has never had any real mass production. Its industry is based overwhelmingly in small firms.

The textile industry is a case in point. Faced with rising imports in the 1970s from giant textile firms in Europe and from cheaper Third World countries, it seemed to be doomed. Yet in the past 15 years it has strengthened its position, without major rationalisation, by building cooperative linkages between small firms that oriented themselves towards high quality goods, niche markets and use of advanced technologies. Employment in the industry has stabilised, and it has achieved strong growth in external markets, exporting 80 per cent of its production. (Lundholt, 1987) The Danish Federation of Textile Industries has encouraged networking, strategic planning, and new skill formation pathways in the industry open to all employees.

The Danish government launched a new national program of enterprise networking in March 1989 with an Industry Policy Statement, termed Strategy 92. This program is designed to make a virtue of small size, by encouraging cooperation. The program offers financial incentives for inter-firm cooperation and the training of network brokers. Network cooperation is defined as: 'cooperation on utilisation of resources in one or more fields. As examples of joint functions, joint marketing, utilisation of joint advanced technology, administrative functions, procurement of know-how, observance of markets, competitors and technology, research and product development, quality assurance and offers of training.' (Burke, 1990) The emphasis is one the role of brokers, who bring firms with related interests together and match them up with available resources and technical assistance.

This national program is built on the experiences of a regional program which has operated successfully in North Jutland, Denmark's 'least favoured area' (to use the terminology of the European Commission). Teknord is a program financed by the EC to provide technological assistance to small firms through 'technology managers' being attached to firms for one day per week. They come to play the role of brokers in linking firms with similar interests of problems.

D. Japan

The economic and technological successes of Japan have been widely misunderstood in the West. When Japanese goods started to displace Western goods in the 1960s, the explanation offered was that they were simply cheaper and being dumped unfairly. When this could not be sustained, due to the obvious quality premium carried by many goods, and the incredible productive efficiency of Japanese factories was revealed, explanations tended to focus on cultural
factors, such as social cohesiveness and hierarchies of deference. Valuable as these insights may have been, they clearly could not be sustained as a general explanation as Japan emerged as a technological leader. Since then a new understanding of the Japanese industrial relations and work organization systems has emerged, revealing the break with Taylorist assumptions still widely prevalent in Europe and North America. (Ford, 1987; Kaplinsky, 1988) Japanese success was then equated with the new production systems generated by Toyota and other giants. Important as these are, they do not tell the whole story.

An important recent book by David Friedman, *The Misunderstood Miracle*, places Toyota and other giants in the context of the dynamic small-firm economy of Japan. Far from being sweat-shops surrounding the large firms, and dependent on them in the classic manner of a secondary industry and labour market, Friedman argues that the small firms constitute the core of the Japanese model of success. Friedman's arguments, though controversial, are persuasive. He shows that small Japanese firms extensively cross-contract with each other (rather than dealing exclusively with the giants); they initiate many of the contacts with the giants, on their terms (e.g. with new designs); that the role of MITI and government in shaping Japan Inc has been greatly overstated; and that regional networks of small-scale firms, often in mountain areas, have played a central role in supplying systems to larger Japanese high tech manufacturers.

In the terminology we are using here, the myriad of small, dynamic firms between Tokyo and Osaka would be described as an extensive Flexible Manufacturing Network.

Friedman makes many detailed arguments concerning wage rates and enterprise creation that need not detain us here. Suffice to say he establishes a case to be answered that networks of small firms have played no small part in the rise of Japan as an economic and technological superpower.

How is this phenomenon to be explained? Small firms in Japan preserved the *deishi* system of close personal training, similar to apprenticeship. Lower wages were accepted during training, in this system, in the expectation that the trainee might be able to start his (rarely her) own business at a later date. The giant firms abandoned the deishi system, and adopted models of wage formation closer to their western counterparts. Hence small firms have retained their dynamism and technological sophistication. According to Friedman, small firms purchased 70 per cent of Japan's NC machine tools output by the 1970s - the opposite of the case in the mass production dominated USA.

Furthermore the post-war Japanese government has supported and sustained the small firm sector through subsidy and infrastructure. Once again, it is a case of research unearthing an extensive infrastructure, both financial and technical, which has been put in place to support a dynamic small firm sector - but which has not been seen by observers fixated by the spectre of the giants.

In a stimulating essay, Weiss (1990) advances three reasons why the post-war State in Japan might have offered such extensive support to the small-firm sector. She reasons that the governing Liberal Democratic party championed the small producer as a solid base of support that was more numerous than managers of large firms; that there has been in Japan a strong popular sentiment favouring small firms; and that the corporate sector depended for its own flexibility on maintaining close relations with a network of suppliers. It was these relations that gave rise to the Just-in-Time system and other Japanese innovations.
Whether small-scale firms continue to play such a role in Japan is a moot point; much anecdotal evidence points to Japan having succumbed to the same sort of suppression of innovation at the hands of the giants, that has plagued the Anglo-Saxon economies. (Kotkin and Kishimoto, 1988)

3. New spatial and organizational configurations

Along with the development of successful networks of small scale, technologically sophisticated firms employing highly skilled and flexible labour and producing for sophisticated niche markets, in several regions in Europe and to a strikingly similar extent in Japan, there has occurred a parallel development in the organization of larger firms. Beyond the 'divisionalisation' that large multinationals resorted to in order to escape from the rigidities that flowed from their size, a new trend towards 'system integration' on the part of giants, or towards the development of cooperative consortia sponsored by such giants, has been noted by several authors. (Scott, 1988; Harvey, 1989)

Noting the turn towards flexibility on the part of large firms, as part of the trend away from Fordist rigidities in product and process cycles, Scott and Harvey have coined the term 'flexible accumulation' to describe the new configuration of relationships which is emerging. This term seeks to capture such features of the new regime as: externalisation of production processes, by buying in services and products that might have been produced internally; downsizing of divisional establishments, to enhance flexibility and reduce overheads; and greater responsiveness achieved through entering into closer and more collaborative relationships with suppliers.

From our descriptions of emerging networks of small firms in various regions, these features are immediately recognizable. They have in fact always existed in nineteenth century 'industrial districts' (to use Marshall's expressive phrase), but were bypassed and marginalized by the rise of mass production and its vertically-integrated exponents. (Sabel and Zeitlin, 1985)

In an as yet unpublished paper, Sabel, Kern and Herrigel take this argument further, to claim that what we are witnessing is nothing less than the 'redefinition of the industrial corporation'. (Sabel, Kern and Herrigel, 1989) They advance two models through which the multinationals are transforming themselves from within. One is the 'systems integrator' model, exemplified by BMW, in which the large firm increasingly contracts out the design and production of the various components going into its final products, until in the limiting case it exists merely as the 'integrator' of sub-systems supplied by specialists (who carry the costs and risks of developing new designs). The other model is one they call collaborative manufacturing through 'specialized consortia', in which the firm exposes its in-house suppliers to the discipline of the market, and assigns them areas of specialization. They then proceed to seek collaborative links with similar units outside the firm. General Motors is providing several examples of these latter kinds of practices...In effect, the 'privatisation' phenomenon that has brought a degree of market discipline to government enterprises, has also developed, though in a less reported way, within giant multinationals. General Motors has led the way in forcing its in-house systems and components suppliers to produce for the market, thereby subjecting them to a discipline that might have been absent for several decades.

These changes can be linked to technological developments as well. The new computerised technologies, with their greater flexibility through their programmability, offer possibilities of decentralisation that were not feasible in the mass production firm operating with rigid transfer lines. The contracting out of
functions which can be performed on CAD and CNC systems, or what amounts to the same thing, the purchase of systems rather than components, can then be seen to be a rational response on the part of multinational giants to technological developments.

This brings us to the question: are market forces, State policies, or technological developments the driving influences behind this remarkable convergence in organizational form between networks of small firms, on the one hand, and disintegrating multinational corporations, on the other?

4. Markets, State, Technology

It is important to dispose of some theoretical considerations at this stage. To what extent are the phenomena described above, and which purport to demonstrate the emergence of a new model of industrial development that is applicable to Australia, - to what extent are they products of market forces, State action, or technological developments - or combinations of all three?

There is clearly an element of market response in all these developments. Far from acting as a 'reserve army' for the giants, as dual labour market theory would have it, the small and innovative firms have been able to respond to new market opportunities much more rapidly than their lumbering multinational rivals. Assuredly, once these giants decide to take on a field that has been populated by small firms, as IBM finally did in the case of personal computers, then they scatter the smaller firms before them - but by then the smarter small firms have already moved on, and are exploiting further opportunities and niches that have not yet been detected by the giants.

In other words, the same market developments - differentiation, diversification, innovation - that have made life so difficult for the multinational mass producers over the past decade and a half, have stimulated the establishment of small technologically sophisticated suppliers. Moreover these developments have encouraged these small scale suppliers to form networks and consortia - sometimes, as we have seen above, at the direct instigation of multinationals themselves. Market developments have created the conditions for an uneasy balance of power between the multinationals and these small firm networks, a phenomenon which is becoming visible almost everywhere, but has become particularly evident in Italy and Japan because of favourable State policies pursued in those countries.

But before examining government strategies, it is important to register the impact of technological developments as well. In the past decade and a half, small firms have been able to take maximum advantage of the flexibility inherent in the programmability of computerised manufacturing and distribution systems. Numerous studies have shown how small Japanese firms, for example, have exploited the productivity gains associated with programmability of CNC machine tools and fullFlexible Manufacturing Systems (FMSs) in a way which larger Anglo-Saxon firms have yet to come to grips with. (Jaikumar, 1986). Perez and Freeman (1988), and now the OECD (1988), characterise the diffusion of new computerised technologies as the shift to a new 'technoeconomic paradigm', requiring new systems of work organization, skill formation, product development and management strategies if firms are to survive in the new conditions. Small firms are self evidently better adapted to make the flexible responses called for. These technological developments, then, have interacted with market developments to create a favourable climate within which networks of small technologically sophisticated firms might flourish.
In the words of the OECD's Sundqvist Report (1988), current technological developments are linked with the 'revitalisation of traditional industries and the creation of small firms'. The report states:

'There are already many examples of applications of information technology which have led to the survival or rejuvenation of old established industries... As part of the same restructuring process many new, small firms are often created, the new technologies making small batch production more profitable. To be successful in the market requires that these new, small firms take over some of the functions of existing firms, whether by clustering production in new ways or including new functions and supplying new products.'

The OECD report goes on to note, however, that:

'There is a need for a broad shift of government support from existing firms with established positions towards entrepreneurship in its formative stages, and towards infrastructural and intangible investment. Growth of small firms and their geographical dispersion also depends importantly on there being in place appropriate telecommunications infrastructures in networking, as well as on availability of venture capital and community services.' (OECD, 1988)

What of the argument, also advanced by the OECD in other publications, that the introduction of Advanced Manufacturing Technology (AMT) has proceeded to a much greater extent in large firms than in small ones - the implication being that the larger firms are more efficient? The data on this matter are clear enough. In 1983, for example, there were some forms of advanced processing applications in over 90 per cent of manufacturing establishments employing more than 1000 workers, in France, Germany, Japan and Britain, but they were being used in only about 30 per cent of establishments employing between 20 and 100 employees (ie the SMIs). (OECD, 1989b) But it can be argued that these data mask two important trends. Firstly, where small firms cooperate tightly in networks, their usage of AMT is much greater: the figures above are national averages that obscure tendencies in clustered networks. (NIB, 1988) And secondly, the small firms that utilise AMT generally do so in a flexible and efficient manner, unlike many large firms which simply install new systems in the same rigid work and management frameworks they have operated with in the past, thereby losing the flexibility offered by the new equipment. (Jaikumar, 1986)

This raises the role of government in promoting the success of networks of small scale firms. Numerous authors, particularly Weiss (1988), have emphasised how important the role of the State has been in shaping overall patterns of industry development in the twentieth century. Far from economic, industrial and technological development being a 'neutral' process, subject only to its own 'laws' of development, it has been shaped by explicit and implicit government strategies - positive where these favour the survival of small firms, as in Japan and Italy, and negative where they favour giantism.

Weiss argues against the claims of 'dual labour markets' theory (Piore and Berger, 1980) that small firm sectors have survived in the late twentieth century merely to service the large firm sector and to provide them with a 'reserve army' of skills and labour. Her argument proceeds through three stages.
First, the evidence is overwhelming that regional networks of small firms can achieve competitive superiority, based on technological sophistication, cooperation and shared infrastructure, that belies the traditional image of a 'sweatshop' paying low wages, dodging taxes and existing only in the interstices of the economy. Thus the basic starting point of dual labour market theory is negated. Secondly, these regional developments are not 'one-off' exceptions that merely prove the general rule that favours giantism. On the contrary they have been carefully nurtured by favourable national and regional government programs and infrastructure. These programs are eminently transportable to other countries - a point we pick up in a moment when turning to the situation in Australia. Thirdly, the prevalence of giantism in most Anglo-Saxon regions as well as others, such as France, is not to be explained by its natural superiority, but by the effect of government programs explicitly and specifically favouring concentration and centralisation. Weiss, basing her argument on Mann (1988) ascribes this bias to the effect of war: the rise of mass production of armaments in the First World War, the impact of armaments production in the Second World War, and the 'war mobilisation' posture maintained internally in mass production plants ever since. This is a most suggestive line of argument - but it would take us too far afield to pursue it now.

A fourth element can be added to this argument, in the form of the transformations under way in the internal organization of multinationals. Such convergence of organizational form, between networks of small producers cooperating together, and 'collaborative manufacturing' inspired by multinationals, is a clinching argument in favour of public policy re-orienting itself towards ensuring the health and vitality of a small firm sector. What then can we do in Australia to bring about such a re-orientation?

5. Practical prospects in Australia

Australia is well placed, for a number of reasons, to adopt the social strategies advocated by the OECD that will facilitate the shift to the new 'technoeconomic paradigm'. In particular, Australia is in a position to abandon its hitherto half-hearted support for industry development along vertically integrated, multinational lines (an approach that derives its rationale from adherence to the canons of mass production) in favour of a more decisive policy oriented towards the promotion and sustenance of networks of small, technologically sophisticated firms. This latter is a policy that breaks decisively with the rationale - and its antidemocratic rigidity - of mass production.

Firstly, Australia already has a rich complement of small firms. This country has never been completely dominated by massive multinational giants, with the exception of certain sectors such as steel (BHP) or motor vehicles. At the beginning of the 1980s, Australia had between 600,000 and 750,000 small firms, in both the manufacturing and service sectors. In 1981 Enterprise Australia estimated that 93 per cent of Australian firms employed less than 100 workers. These small enterprises employed 40 per cent of all people working in the private sector, and were responsible for 32 per cent of the value added by that sector. By 1986 this proportion had grown to over 50 per cent of all employed people in the private sector. (Marceau, 1989)

The problem is that the majority of these small firms are operating at the low value-added end of the market, with out of date technology. The 'cutting edge' small firms are few and far between.
Secondly, Australia has a strong, existing public sector infrastructure commitment, in the form of research centres and technical colleges, which can form the nucleus of networks or clusters of small sophisticated firms. The trick is to encourage the existing firms to upgrade their skills, sophistication and technology by utilising this existing infrastructure.

Thirdly, Australia already has a proud record of forming cooperative networks and consortia, drawing their membership from small firms, particularly in the areas of training and skills formation. Examples include the following.

* Lend Lease group through the ACTU-Lend Lease Foundation, has developed an interesting program, offering joint training and skills development opportunities to small firms in the building and construction industry.

* Electronics industry collaboration, for example around the Australian Electronics Development Centre for commercialisation established at L.M. Ericsson in Victoria. This offers small firms access to Ericsson technology to develop commercial products for the telecommunications networks.

* Collaborative networks have been catalysed by some of the Federal government's industry plans, particularly in heavy engineering (eg in North East Melbourne) and in small shipbuilding (eg in Fremantle).

Government programs along these lines have already been mounted. For example, the Victorian government, through the Ministry of Education, launched a program to bring local industry and TAFE colleges into closer alignment, with a view to making the TAFE colleges more relevant in their activities, and to upgrade the skills and capacities of the local industries. Drawing on overseas examples of collaboration between tertiary institutions and local start-up industry, the Victorian government has promoted the notion of 'technology precincts' in connection with key centres of knowledge infrastructure, and has fostered the development of small business incubators as joint ventures between tertiary institutions and private sector developers.

Successful 'technology parks' have been established in conjunction with tertiary institutions around Australia, such as at Curtin University of Technology (WA), Flinders University and South Australian Institute of Technology, and most recently at the University of New England, in northern NSW. This last Technology Park, launched in April 1990, will provide a link between the substantial intellectual and material resources of the university, and the development of new technology based firms in the region. It provides an infrastructural support for local firms which are skills-based and ecologically sound in their development.

Other regions in Australia are promoting local development utilising elements of the successful Italian, German and Danish models. The Cape York-North Queensland Enterprise Zone, based on the cities of Townsville and Cairns, is one such novel example. This was established in 1988 as an incorporated entity governed by a Board, with powers to extend a range of concessions to attract and assist start-up ventures. It is not operating as a cost-cutting exercise, as might appear at first sight to be the case, but is actively promoting high value-added, high quality ventures in a targeted series of specialist sectors with an emphasis on export or import replacement production (for example, in on-processing of sugar and sugar cane, in the areas of biotechnology, and in further processing of minerals and earths, in the area of new materials). The knowledge resources of
James Cook University are central to this venture. Collaboration between firms will be a feature of its operations.

The role of public sector research in creating commercial opportunities in Australia is increasingly being recognized. (BIE, 1989) Several of Australia's most successful technology-based firms, such as Nucleus, Austek Microsystems, Geoscan and MicroBRAIN remote sensing, have their origins in CSIRO or other public sector research institutions. This kind of private sector-public sector collaboration can clearly be extended in the future. As the recent TASC report on Strategic Alliances notes, the world-class public sector research work performed in Australia constitutes a major attraction for foreign firms, and should be further exploited as the basis for international alliances that give complementary advantages of access to overseas markets for Australian partners. (TASC, 1990)

The Multi-Function Polis, if it goes ahead in the form so far discussed (eg by Garnaut, 1989) will also play a significant role in fostering clusters and networks of SMEs in specific technological sectors. The MFP discussions themselves have already triggered many consortia proposals. Peter Roberts in the AFR noted a number of proposals have emerged for meeting freight transport needs as a result of MFP discussions. For example, the small firm Amscan and Mayne Nickless are proposing a single national freight tracking system based on smart electronic 'tags' being attached to all freight consignments. (Roberts, 1990)

The most recent initiative of the Federal government, in calling for the establishment of 50 centres of collaborative research and development, has the potential to create strong clusters of technologically sophisticated firms organized in collaborative networks around these centres. But this potential will be lost if the management of the centres is captured by the model of productive efficiency associated with mass production, and seeks collaboration only with large, established firms. It is in the making of such decisions that industry policy is fashioned.

6. Trade union responses

Australia enjoys a political climate favouring cooperation in industrial relations, within which it is feasible for employers and unions to agree, at national and sectoral levels, that small firms should be encouraged and fostered. Such an approach presents unions with a new and exciting challenge. A dynamic and sophisticated small firm sector should not be an enemy to trade unionism; on the contrary, unions can play a vital role in ensuring that firms in the network do not 'backslide' towards cost cutting and retrenchment, thereby undercutting the competitive basis of the entire network which is based on high value-added and high quality production, paying high wages for high levels of skills. This is precisely the role that unions in the Third Italy have played.

Of course unions will have to adjust their strategies and perspectives if they are to cope successfully with the demands that SMEs will place upon them. To a very real extent, unions today are the product of large scale mass production industry, and this is what they feel most comfortable with. But restructuring is willy-nilly shifting the focus of union concerns to the enterprise level, and as much to issues of production (such as skills formation, work organization and productive efficiency) as to the traditional issues of distribution. This enterprise focus is precisely what is demanded by the SMEs. In these organizations, as in restructuring larger firms, the union presence will very much be a product of the activity and capacity of enterprise delegates who will be called on to intervene in basic questions of production. They will look to the union for advice and
assistance, reversing the role they played in the past when the union looked to them for support during national wage campaigns. Thus the turn to SMEs is consonant with the emergence of the 'new unionism' in Australia. (ACTU/TDC, 1987)

Similar developments are discernible in Europe. Italian unions have welcomed the rise of the enterprise culture manifested in the Third Italy, and as noted above they have played an important role in maintaining the technological dynamism of the networks by preventing the SMEs from 'backsliding' under competitive pressure into sweatshop conditions.

These issues were considered by European unions at a conference held in Bonn in September 1989 to discuss 'problems and opportunities in restructuring industrial regions'. (TUAC, 1989) The conference noted with concern how formerly dominant centres of industry (in our terms, mass production centres) have declined and become centres of de-industrialisation, unemployment and manifest social problems. Many unions have grasped the nettle that these regions pose, and are working on programs for their renewal that embrace enterprise formation and networking, frequently involving regional and municipal public infrastructure on the Emilia-Romagna model. Having said that, the European unions also stated their firm opposition to programs of restoration that were based on creation of 'free enterprise zones' in which all protection of wages and conditions was abandoned. This is a position that would no doubt be strongly echoed by Australian unions.

7. An Australian model of support

The prospects for a strategy bringing together all the elements discussed to be pursued in Australia are good. The 'less favoured' industrial regions, such as WA, SA, Queensland and Tasmania, can promote the establishment of technologically sophisticated networks of small firms, just as well as the industrial heartlands of Victoria and NSW. But the lessons from Europe are that there are no easy results in this game. The fostering of networks takes time, patience and a strategic perspective over one or two decades. They cannot be created by 'quick fixes'. They demand a political commitment that can withstand temporary setbacks, such as inevitable failures on the part of some of the start-up ventures. Governments that cannot cushion themselves against such setbacks have little role to play in regional economic development.

Drawing on the experiences obtained to date in such areas as Europe, Japan and North America, the outlines of a model of industry development in Australia would appear to be as follows.

* There needs to be legislative support for a defined category of small business (e.g. less than 30 employees), combined with numerous concessions directed towards this sector (tax breaks, low charges etc., contingent on certain strategic criteria being met).

* Interested parties (governments, employers, unions) need to develop strategic criteria for a dynamic, innovative small firm sector, involving skills upgrading, technological development, and strategic planning of each firm's future.
* Positive assistance is needed in the form of well-financed technology enhancement grants, tied to the formation of consortia through existing industry associations and networks (ie to offer incentives for formation of consortia).

* There needs to be much greater investment in a public technological infrastructure, involving telecommunications networks, research centres and training and R&D centres for different sectors and located in targeted regions.

* Government contracting requirements should be modified to allow for consortia of small firms to bid for contracts.

* Assistance should be offered with the promotion of regional consortia and networks nationally and internationally (eg through AUSTRADE) as coherent trading entities offering specialised skills.

* Continued efforts should be made to bring Australian consortia into strategic alliances with overseas firms through international collaborative programs such as Esprit, Eureka and the Japanese Human Frontiers Program.

The provision of low interest finance would also be commercially desirable, although it is not politically attractive in Australia currently, given the disastrous (but misunderstood) experience with WA Inc and Victoria's ill-fated agencies, VEDC and VIC.

Such a series of policies departs radically from existing small business development extension services (such as NIES and, in Victoria, the SBDC) in that it places its key emphasis on the encouragement and facilitation of the formation of networks of small firms. It is a 'self-help' approach, based on a new and more modest understanding of the role that governments (ie the State) can play in fostering economic development. A model of development based on small firm clusters is likely to be more responsive to concerns over ecology and the environment, in developing benign technologies and recycling initiatives. It is a model which is rich in theoretical challenges, in that it posits a new and interesting role for the public sector (in providing an extensive infrastructure and nodes around which firms cluster) and for the trade unions, as well as for the State. It is a perspective which brings together recent conceptual breakthroughs in the understanding of technological evolution, paradigm shifts in business organization and management strategy, and the trend towards a more participative and democratic social order.
Notes

1. ERVET is the Ente Regionale per la Valorizzazione Economica del Territorio, located in Bologna. The Italian name emphasizes its role in promoting the economic development of the region, and more specifically, adding value to the land, such as through creating a number of enterprise zones. It is a regional holding joint stock company, with the majority of shares held by the Emilia-Romagna region.

2. The Service Centres established by ERVET include:

* ASTER - Agency for the Technological Development of Emilia-Romagna, based in Bologna, providing a sophisticated technological information, referral and brokerage service to all firms in the region (Agenzia per lo Sviluppo Tecnologico dell'Emilia Romagna);

* Ceramics Centre of Bologna, located in the University. Its staff of 37 is now more than 80 per cent self-funded through fee-for-service;

* CITER - the Textile Information Centre, based in Carpi, provides firms with data on fashion trends, technological innovations, and socio-economic data affecting the knitwear and clothing industries;

* CERCAL - the Footwear centre, based in San Mauro Pascoli, operates like CITER and provides training for footwear workers as well;

* CESMA - the Centre for Agricultural Machinery of Reggio Emilia, provides market information and promotion, technological data and training services;

* CERMET - the regional Metals centre for research, testing and analysis, based in Bologna;

* QUASCO - the Centre for Services to the Construction Industry, in Bologna;

* RESFOR - the sub-contracting network of Parma, has established a computerised database of all the sub-contracting firms in Emilia-Romagna;

* SVEX - the Centre for Export Development of Emilia Romagna, located in Bologna, offers group marketing and promotion services abroad;

* CETAS - the Training Centre for Agro-Industrial experts of Developing Countries, offers training services to Developing countries' nationals in the food and agriculture industry.

In addition, ERVET operates twelve industrial-artisanal areas (or 'enterprise zones') in cooperation with Local Authorities. ERVET supports its own laboratories and research services, and has a high quality publishing program.
References


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