

PORTER'S *COMPETITIVE ADVANTAGE OF NATIONS*: TIME FOR THE FINAL JUDGEMENT?

HOWARD DAVIES

PAUL ELLIS

The Hong Kong Polytechnic University

ABSTRACT

Porter's (1990) *Competitive Advantage of Nations* (*CAN*) was heralded on publication as a book which could build a bridge between the theoretical literatures in strategic management and international economics, and provide the basis for improved national policies on 'competitiveness'. This review of *CAN* draws on papers written since its publication to show that while it was enormously rich in its range and scope it fell far short of the claims made for it. That failure arose from a number of sources. Most fundamentally, there were elisions with respect to the object of the analysis which meant that explanations for productivity at national level became confused with explanations for industry level success in gaining market share. Second, there were fundamental misunderstandings of the factors which determine trade, particularly with respect to the principle of comparative advantage. Third, there were flaws in the methodology and mode of reasoning. Finally, the assertions which form the heart of *CAN* have been refuted. Sustained prosperity may be achieved without a nation becoming 'innovation-driven', strong 'diamonds' are not in place in the home bases of many internationally successful industries and inward foreign direct investment does not indicate a lack of 'competitiveness' or low national productivity. Policy-makers are left with a 'laundry list' on which to base simple SWOT-type analyses of their economies, but there is no reliable guide to policy. Developing countries in particular are inadvertently encouraged to pursue policies which might be harmful. Porter generalized inappropriately from the American experience, while confusing competition at industry level with trade at national level. *CAN*'s failure suggests that academicians of international business would be well advised to revisit the elementary economics of trade and growth before venturing too boldly into the field of policy.

INTRODUCTION

When *The Competitive Advantage of Nations* (*CAN*) was published in 1990 it triggered a wave of interest, as befits a significant development in the work of the world's best known business academic (de Man, 1994). Much of that interest manifested

Address for reprints: Howard Davies, Professor, Department of Business Studies, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.

itself in newspapers and magazines, and was of ephemeral value, being concerned to summarize the main points of the analysis and its perceived implications. However, the academic literature also began to grow, first through more than 30 reviews and then in the form of nearly 50 published articles. Those included a Special Issue of *Management International Review* devoted to the Porter framework and the first issue of the *Journal of Far Eastern Business* which was given over to papers on the application of *CAN* in the 'Far East'.

The purpose of this paper is to reassess the analysis presented in the book in the light of that literature, paying particular attention to its application outside the American context.

PORTER'S ANALYSIS

The main elements of the analysis in *CAN* have been incorporated as received truth into almost every undergraduate text on international business (Daniels and Radebaugh, 1994, pp. 190–2; Griffin and Pustay, 1995, pp. 96–9; Hill, 1994, pp. 137–41). Nevertheless, it is useful to set out their broad sweep in order to help interpret the complex debate which followed the book's publication.

Porter's objective in *CAN* was to elucidate the reasons why 'some social groups, economic institutions and nations advance and prosper' (Porter, 1990, p. xi). The group with which he was most concerned was the nation, and he suggested that 'the only meaningful definition of competitiveness at the national level is national productivity' (p. 6). In some parts of the analysis the focus shifts from the nation to a sub-national region or a city, but the central concern is with the factors which make the *people resident in one place* more prosperous than those in another. (The emphasis on place is important.) Having carried out field studies in ten different nations (Denmark, Germany, Italy, Japan, Korea, Singapore, Sweden, Switzerland, the United Kingdom and the United States), Porter put forward two major propositions. The first of these (in Chapter 3) is that the 'competitive advantage' of a nation's industries is determined by four broad attributes of the national location, referred to as the 'home base'. These are the now-familiar corners of the 'national diamond', namely: factor conditions; demand conditions; related and supporting industries; and firm strategy, structure, and rivalry.

With respect to factor conditions, an industry requires an 'appropriate' supply of factors in its home base if it is to be successful. To be useful in explaining performance, factors need to be defined at a more disaggregated level than the simple trinity of land, labour and capital and the most useful differentiation may be very fine. However, broad distinctions are drawn between 'basic' factors like climate and unskilled labour and 'advanced' factors which have to be created, like computer scientists or telecommunications infrastructure; and between 'generalized' factors which can be deployed in a wide range of industries and 'specialized' factors which cannot. While the abundant supply of a factor may help an industry (Denmark's success in furniture reflects a pool of graduate furniture designers (p. 78)), it is also possible that 'selective factor disadvantages' in the form of shortages and high costs for basic factors may have a stimulating effect. (Italy's expensive capital and energy, and the lack of local raw materials, forced its steel producers to develop mini-steel mill technology, in which they became world leaders (p. 82).)

Demand conditions in the home base affect a sector's ability to compete internationally through three mechanisms. First, an industry will have an advantage in market segments which are more important at home than elsewhere (Swedish firms lead in high voltage electricity distribution over long distances because of their experience in serving remote and energy-intensive steel and paper industries; p. 87). Second, demanding buyers in the home base pressure companies into meeting high standards (Japanese consumers value space-saving, giving Japan a lead in compact products; America's long distances have led to competitive strength in very large truck engines; p. 89). Third, a nation's industries gain if buyers at home anticipate the needs of buyers in other countries, thereby giving it a lead in learning how to meet those needs. (Japanese buyers and government forced firms to make energy-saving products before energy costs became more important elsewhere; Americans' desire for convenience has spread elsewhere, giving an advantage in fast food; pp. 91–2.) In each of these instances, it is not the size of the home market that is important, but the extent to which it encourages firms to innovate. A large home market which meets all three conditions will be highly supportive of international competitiveness, but a large market which does not may simply encourage firms to focus on their undemanding local buyers, leading to stagnation and inability to sell abroad. Saturation of the domestic market may spur firms to go abroad, forcing them to compete in the world market.

Related and supporting industries make up the third corner of the 'national diamond'. A nation's industries will be better able to compete internationally if there are 'clusters' of industries in the home base economy which are linked to each other through vertical or horizontal relationships amongst supplying and buying sectors or common customers, distribution channels or technologies. (Denmark has a cluster in health and home products, Sweden has clusters in paper-making, and Germany in chemicals, metal-working, transportation and printing; p. 149).

The fourth corner of the diamond concerns the strategies and structures of home base firms, and the extent to which there is rivalry amongst them. If the national environment favours family-owned small firms, as in Italy (p. 108), the nation will be competitive in industries which do not experience significant economies of scale. If executives tend to have an engineering background, as in Germany, competitive strength will be concentrated in sectors having a high technical content. Where companies' goals are short-term, because of the governance and capital-raising mechanisms in place nationally, the nation will tend to be successful in new industries with quick returns. Where goals are long-term, they will be better suited to industries that require consistent re-investment (p. 112).

An important aspect of this corner of the diamond concerns the need for rivalry amongst domestic firms in the home base. In a significant move towards a more 'Austrian' and dynamic view of competition (de Man, 1994; Foss, 1996) Porter portrays domestic rivalry as the major spur to innovation and hence success in international competition. As domestic firms are most visible to each other, success on the part of one shows the others that development is possible in the local circumstances. Competitive pressure amongst those in proximity to each other provides the dynamic that drives the search for internationally competitive products and practices.

While the diamond is the central focus of the analysis, allowance is made for two other factors, 'chance' and 'government'. The first of these includes

unpredictable technological discontinuities, wars and other chance events. Those are not part of the diamond itself, but they may alter the conditions within it. Similarly, government has a role to play, but only by affecting the corners of the diamond. Porter does not attribute a positive role to active industrial policy.

After finding confirmation for this framework in case studies of four manufacturing industries, each in a different country (Chapter 5) and the service sector (Chapter 6), *CAN* goes on to examine the nations which were successful in the early post-war period (Chapter 7), the success stories of the 1970s and 80s (Chapter 8) and the position of the US and Britain (Chapter 9). These lead to Porter's second central proposition, in Chapter 10, which is that countries usually go through a series of stages in their industrial development, moving from the 'factor-driven' stage, to the 'investment-driven' stage, to the 'innovation-driven' stage, and finally to the 'wealth-driven stage'. In each of these stages, the industries which are successful in international competition are those whose competitive strategies are appropriate for the country's stage of development. In the factor-driven stage companies compete on the basis of low-cost, arising from cheap labour or low cost natural resources. Wages are low and the nation is not prosperous. Competitive advantage derives solely from factor conditions (p. 547). In the second stage heavy investments are made in factories and infrastructure and new industries emerge. Successful sectors still compete on cost, but that is achieved through scale economies and state-of-the-art manufacturing practices applied to mature products, rather than low wages. Competitive advantage is based on three corners of the diamond: factor conditions; demand conditions; and firm strategy, structure and rivalry (p. 550). The standard of living is higher but still relatively low. If a nation is to achieve prosperity according to Porter it must reach the innovation-driven stage, where competition takes place on the basis of both product and process innovation. In this stage the nation has strength in all four corners of the diamond. Prosperity is achieved and maintained unless the nation proceeds to the wealth-driven phase, in which it essentially lives on its past and goes into decline. In the wealth-driven phase, firms are run by stewards, rather than entrepreneurs. Belief in the value of competition is less intense and firms seek protection through government policy. The motivation to innovate is reduced, employees become more interested in non-economic aspirations, and national goals become more concerned with wealth distribution than wealth production.

CAN draws together a superabundance of concrete examples, ranging across a broad sweep of industries and countries, while setting those examples in conceptual frameworks drawn from business strategy, the economic analysis of trade and development, and economic geography. Its scope is tremendous and makes any attempt at summary seem abrupt and even churlish. Nevertheless, the heart of *CAN*, and the basis for both its appeal and its weaknesses, may be found in five central propositions. The first (in terms of logical priority, rather than the sequence in *CAN*) is that a nation must reach the innovation-driven stage of development if prosperity is to be reached and sustained. Closely associated with that is the second assertion, which is that international success cannot be based upon the comparative advantage brought about by an abundance of basic factors. Instead, it must be built on the 'up-grading' of a nation's industries through innovation, product differentiation, branding and marketing. The third assertion is that a nation's prosperity is determined by the performance of the firms for whom it is a home base. The fourth is that in order to achieve sustained prosperity those firms

must operate within 'clusters' of related industries which have strong diamonds in the 'home base' nation. The fifth assertion is that outward foreign direct investment is a manifestation of an industry's competitive strength, and the nation's prosperity, while inward investment is a sign of relative weakness.

While these propositions appear straightforward they have led to a complex and frustrating debate in which Porter, his critics and his supporters argue about different issues at different levels on logical grounds which are constantly shifting. In order to map that debate, this paper begins by examining the reception which the book first received on publication, and then goes on to consider the conceptual, methodological and empirical issues which have arisen subsequently.

THE INITIAL REACTION

The reviews which greeted *CAN* were mixed in the extreme, ranging from the fawning to the choleric with no consensus in sight (Carney, 1991). Critics and supporters found very different grounds on which to damn or praise, and their views were as much a reflection of their own backgrounds as the richness of their subject. The reviewer for *Contemporary Sociology* (Westney, 1992) suggested that *CAN* was one of the most interesting recent books for the field of organizational ecology, despite the fact that it made not one reference to the subject and the author had apparently never read anything in the field! The reviewer for *Political Quarterly* (Metcalf, 1991) criticized Porter for under-estimating the role of government, while British Labour Party politicians (Brown and Mulgan, 1990) praised him for advocating government intervention. Grant (1991, p. 535), in the *Strategic Management Journal*, saw *CAN* as a work which 'bridges the gap between strategic management and international economics, while contributing substantially to both', while Congdon (1990, p. 41) in the *Spectator* found it 'fatuous' and Miller in *The Public Interest* (1990, p. 104) wondered 'how a book devoid of original insights can be thought so important'. The *Journal of Management* (Pressman, 1991) saw an important insight to be that firms cannot do abroad what they have not learned at home, but felt that the points in Porter's diamond might turn out to be determined by national character and culture. Gray (1991), in the *International Trade Journal*, focused on the book's failure to recognize the importance of price competition and the exchange rate in determining international trade, even in advanced goods. In the *Journal of Development Economics*, Smith (1993) described *CAN* as 'extraordinarily important for the development field' focusing on the distinction between basic factors and advanced factors, the attempt to build a more Schumpeterian analysis, and the inclusion of clusters, interpreted as Marshallian industrial districts, as the key features. Jelinek (1992, p. 507), reviewing for *Administrative Science Quarterly*, averred that while the book was 'not perfect', it would do nothing less than 'rescue Economics from its long sojourn as esoteric and impractical theorizing'. Differences of opinion on the content extended to matters of style with a majority of reviewers making references to the book's lengthy and turgid prose, countered by the review in the *Journal of Marketing*, which found Porter's 'vivid descriptions more gripping and inspiring than a novel' (Clark, 1991, p. 119).

Porter's admirers saw *CAN* as an integrating device between disciplines, a theory which might help to explain success in international trade and a framework for empirical work and policy prescription which could be applied to other countries.

His detractors saw a set of theoretical commonplaces, a dubious methodology, and a list of environmental attributes and firm behaviours which might or might not help industries succeed in international competition.

Amid these oppositions, five issues emerge. The first concerns the object of Porter's analysis and the second concerns the relationship between comparative advantage and competitive advantage. The third focuses on the conceptual basis for the national diamond, the fourth on the place of foreign direct investment in national 'competitiveness' and the fifth on the empirical validity of *CAN*'s assertions. The remainder of this paper is structured around those five issues.

THE OBJECT OF THE ANALYSIS: WHAT WAS PORTER TALKING ABOUT?

The central purpose of *CAN* is to explain 'competitiveness' or 'competitive advantage'. However, the meaning attached to those terms shifts throughout the book so that the object of the analysis becomes obscure. Porter begins with the statement (p. 6) that 'the only meaningful definition of competitiveness at the national level is national productivity' and Sagebien (1990, p. 95) found *CAN*'s 'greatest contribution' to lie in that definition. However, it also raises an ambiguity which permeates both *CAN* and the literature which followed. As Eilon (1990) pointed out, productivity is a measure of the efficiency with which resources are used, but 'competitiveness' is usually interpreted as the ability to secure market share against competition (Scott and Lodge, 1985). As the word is a neologism whose meaning has not settled there is nothing to prohibit its use in the sense of productivity. However, the potential for confusion is both clear and soon realized when Porter shifts the meaning of the term in two directions. First, the level of analysis shifts from the nation to the industry, on the argument that the explanation for productivity growth must be sought at that level (p. 9). Then, attention is focused on firms and industries that are internationally successful, as indicated by their market share. The effect of this 'clumsy verbal gavotte between the terms "nation", "industry" and "company"' (Congdon, 1990, p. 42) is that the definition of competitiveness as productivity at national level is not abandoned and yet at the same time it is reinterpreted as the ability of some companies and industries to acquire global market share. Eilon (1990, p. iii) found that sufficiently confusing to conclude that '[A]fter 800 pages . . . the reader is none the wiser about how competitive advantage is to be defined, let alone measured'. Throughout *CAN* there is an elision between competitiveness as the productivity of a nation and competitiveness as the ability of some firms and industries to secure large shares of the global market. These are different phenomena for which explanations must be sought in different conceptual domains and at different levels of aggregation. However, that distinction goes unrecognized and as a result, *CAN* presents the reader with two separate analyses, overlaid upon each other and so intertwined as to be impossible to disentangle. The first, which received most attention, adopts the global market share interpretation. It then uses export shares (sometimes with an 'ad hoc' adjustment for sales arising from foreign direct investment) to identify competitive industries and concentrates upon the national diamond as an explanation for the international success of those sectors. It cannot explain the productivity of national economies because the object of analysis is the export performance of some sectors. There are links between those two phenomena and Porter seeks to make

them synonymous by asserting that high productivity is the key to securing export share. However, that assertion is misleading on two counts. First, the productivity of the tradeable sector is not the same as the productivity of the nation as a whole. The 'gavotte' between nation and industry continues to confuse. Second, despite Porter's claim to the contrary (p. 8) an industry's ability to export is not determined by its absolute level of productivity and that claim arises from a misunderstanding of elementary trade theory (see below).

While most of *CAN* and its associated literature is focused on competitiveness as the ability to secure market share, the issue of national productivity and income per head is not abandoned. It appears in the secondary strand of analysis running throughout the book, made most explicit in Chapter 10. Here, the explanation offered lies in the stage model of 'competitive development', which focuses on the changing relative contributions of capital accumulation and innovation to trade and growth over time. That model re-casts elementary production theory and the theory of comparative advantage in the form of an historical generalization. However, the gap between that analysis and the focus on market share in international trade remains unrecognized and unacknowledged, hidden behind the litany of 'competitiveness', 'competitive advantage', 'international success' and (in this part of the book) 'competitive development'.

A prime example of the confusion caused by *CAN*'s ambiguity over the object of analysis is to be found in the subsequent debate over the role of labour costs and exchange rates. Daly (1993), in common with Eilon (1990), Gray (1991) and Waverman (1995), adopted the market share interpretation of competitiveness, and used export shares as the dependent variable, following Porter's own practice. They then found evidence that export shares are affected by exchange rate changes and labour costs, and presented that as a refutation of Porter's assertion that exchange rates and wages are unimportant in the determination of competitiveness. That conclusion is correct if competitiveness is defined as the ability to secure export share. However, if the definition of competitiveness is switched back to national productivity, there is no refutation. Porter's insistence that competitiveness cannot be achieved through low wages or a favourable exchange rate (*CAN*, p. 7) is then not a claim that export share cannot be increased through those changes. Instead it is the valid assertion that export share gained in that way (through deteriorating terms of trade) does not improve the well-being of a nation's residents. As *CAN* defines competitiveness in both ways at once it is impossible to tell if its assertions have been refuted or not. By switching from one interpretation to another, Porter and his critics can both be right and both be wrong on the same issue, examined with the same set of data.

There are further ambiguities with respect to the object of the analysis. The book's basic purpose is said to be the explanation of why nations differ in prosperity, which puts the people in one place at the centre of attention. Shifting from national productivity to export share changes the nature of the *explanandum* but it does retain the nation as its focus. However, export share is being used as a proxy for the global market share of those firms for whom the nation is a home base. Throughout *CAN*, the operations of American, Japanese and European firms overseas are seen as an aspect of American, Japanese or European competitiveness, rather than the competitiveness of the host nation. There is therefore a second elision, between the nation construed as the people in one place and the nation construed as the firms for whom the nation is a home base. These two entities

are not coterminous and the object of analysis in *CAN* thereby becomes even more obscure. As Clark (1991, p. 120) put it, '[W]hen Japanese auto-makers set up factories in Britain and beat home-grown firms at their own game using the same factors of production, is it an indication of British competitive advantage or disadvantage, or of Japanese competitive advantage?' If Japan is construed as the firms for whom Japan is the home base, and if competitiveness means global market share, then clearly it is Japanese competitive advantage which is demonstrated. However, if competitiveness means national productivity, as Porter insists, it is Britain whose competitive advantage is enhanced and if competitiveness means export share then again it is Britain who gains. Reich drew attention to the artificiality of the home base firms versus foreign firms distinction in a series of influential papers. His review of *CAN* (Reich, 1990a) pointed out that General Electric, which is an American company with its home base in the United States, achieves a high level of productivity in Singapore, but that does not necessarily bring a higher standard of living to Americans. He also pointed out, when asking 'Who is Us?' and 'Who Is Them?' (Reich, 1990b, 1991) that foreign firms operating in the US contribute to America's national income, rendering the distinction between home base firms and foreign firms increasingly irrelevant. The prosperity of a nation is the income of that nation's residents, regardless of their employer's corporate nationality. In every country, some proportion of that income arises from the activities of foreign firms. In the United States, which fixes and narrows Porter's perspective, that proportion is relatively small. It is therefore not too inaccurate to identify America's prosperity with the activities of American firms, mostly operating in America itself. However, that empirical overlap in one case should not be carried over into the conceptual domain – a country's prosperity is not determined by that group of firms for whom the country is the home base, to the exclusion of others. Nor is it significantly determined by those activities of home base firms that are located overseas. American firms abroad contribute to American prosperity by repatriating profits and the salaries of expatriate employees, and by generating demand for American exports of materials and components. However, the salaries and rents they pay locally and their local purchases contribute to the prosperity of the host nation, not the United States. The inappropriateness of equating a nation's prosperity with that of its home base firms is made most clear by the case of Singapore. That city-state has one of the highest national incomes per head in the world, at purchasing power parity \$US27,000 in 1996. However, as Chia (1994) pointed out, its manufacturing sector, its exports and its overall national product are dominated by the activities of foreign multinationals. Indeed, Singapore's development policy has been deliberately based on the attraction of foreign direct investment (Soon and Tan, 1992). If Singapore's prosperity were determined by the activities of firms for whom Singapore is a home base its residents would be poor people, but they are not. It is notable that, while Singapore was one of the ten nations in which Porter's team carried out field studies, it receives no attention at all in *CAN*, perhaps because the central facts of its existence highlight such a basic conceptual confusion. The natural tendency of an American business academic to see the interests of the United States as synonymous with that of American firms abroad led Porter to equate nations in general with their home base firms. That was incorrect, both as a matter of logic and in terms of the empirical determinants of prosperity.

There is yet another layer of confusion to add to those between productivity/market share and nation/home based firms. This arises when Porter considers what is meant by 'home-based firms'. Received usage would suggest that it refers to firms whose ownership and control resides in the focal nation. However, in two sentences which render 'most of the remainder of the book irrelevant' (Reich, 1990a, p. 926) *CAN* points out that:

... nationality of shareholders is secondary. As long as the local company remains the true home base by retaining effective strategic, creative and technical control, the nation still reaps most of the benefits to its economy, even if the firm is owned by foreign investors or by a foreign firm. (p. 19)

In these two sentences Porter accepts that the 'local company' which is the 'true home base' in America may be European, Japanese or any other nationality. The insistence that a nation's prosperity depends upon that of its home base firms, which is a cornerstone of the book, disappears amongst the verbal convolutions of which *CAN* is constructed.

To sum up on the object of analysis. Porter began by focusing on national productivity but then shifted attention to the global market shares of firms for whom the nation is a home base. It is never clear, therefore, whether the subject being discussed is the productivity of a whole nation or the market share of some of its firms. Neither is it clear whether the 'nation' refers to the people in one place or the firms for whom that place is a home base. The ambiguity is rendered even more unmanageable by the use of export shares as a proxy for the global market share of home base firms. As a nation's export share includes the exports of foreign firms located in the nation, and excludes the sales of home base firms abroad, its use shifts the object of analysis back to the nation as the people in one place, but not back to national productivity. At the same time, Porter accepts that the nationality of corporate ownership is irrelevant, thereby obscuring the meaning of 'home-based firms'.

These confusions are fundamental and they render *CAN* meaningless. However, they were noted by only a minority of commentators, notably Reich (1990a) and Congdon (1990). The majority either failed to notice the ambiguities, or chose to ignore them by settling on one or other of the alternatives without debate. The terms 'competitiveness' and 'competitive advantage' seem so self-evidently to have important meaning that the first requirement of effective discourse was abandoned, namely that the terms used should have a commonly understood meaning.

COMPARATIVE ADVANTAGE VERSUS 'COMPETITIVE ADVANTAGE'

One of the most ambitious claims made for *CAN* by Porter (1990, p. 20) and others (Ettlinger, 1991; Grant, 1991) was that it rendered economic analysis more relevant by replacing 'the simplistic precepts of classical and neo-classical micro-economics' (Magaziner, 1990, p. 189). Central to that claim was the assertion that a 'new paradigm' was created by replacing the outdated concept of comparative advantage with the more dynamic concept of 'competitive advantage'. The former was described as providing a static explanation for international trade on the basis

of relative endowments of basic factors, while the latter put forward a more useful dynamic explanation based upon up-grading and innovation.

If this were true, it would represent a major setback for the economics profession. The principle of comparative advantage is so central to mainstream economic thought that one Nobel Laureate in Economics (Samuelson, 1969) declared it to be the only proposition in the whole of social science to be both true and non-trivial! Fortunately for the economists, Porter's claim does not bear scrutiny. Indeed, four points become clear. First, Porter misunderstood comparative advantage in *CAN* and reverted to a more primitive and long-rejected explanation for trade. Second, his claim to have introduced new elements to the theory of international trade was unfounded because economists had been aware of them for decades. Third, the elisions which arose as Porter championed 'competitive' against comparative advantage led others to misinterpret his position on government intervention. Finally it is clear that, having rejected comparative advantage, Porter then relied heavily on its logic in constructing his stages model of development. These four points may be taken in turn.

Porter's attack on comparative advantage demonstrates a fundamental misunderstanding, located in a confusion between the roles of absolute and relative productivity in the determination of trade, set out on page 8 of *CAN*. Porter argues there that in order to meet competition from abroad, and to export, an industry must meet *absolute* productivity standards. America is described as having a 'growing trade deficit . . . in automobiles because the level of productivity in the German and Japanese industries has been even higher'. That is the 'absolute advantage' theory of trade, put forward by Adam Smith in his *Wealth of Nations* (Smith, 1776). However, the absolute advantage theory contains a logical error and cannot explain the observed pattern of trade because it predicts that countries with lower productivity will be unable to export. The comparative advantage perspective, first formulated by Ricardo (1817), resolved that difficulty by demonstrating that if one country has higher absolute productivity than another *in every sector*, the two countries will still trade with each other to mutual advantage. Both nations can export if they specialize in the products where the *opportunity cost* is lowest. Some industries in the low productivity country will be able to compete successfully and export to other countries, even if their absolute productivity is very low. In China, for instance, the absolute productivity of the toy industry and the machine tool industry are both very low compared to their counterparts in America. However, China has a comparative advantage in toys, which it exports to the US, while the US has a comparative advantage in machine tools, which it exports to China. The comparative advantage perspective explains that Chinese toy manufacture is not competitive because of its higher absolute level of productivity but because toys are cheaper in China when measured in terms of the number of machine tools which could be produced with the same resources. America is competitive in machine tools for the converse reason. America does not have a growing trade deficit in toys with China because China's productivity is higher than America's in that sector. Exasperatingly enough, Porter concedes this point, apparently without noticing. He points out that Korea has been able to export cars to the US, despite higher American absolute productivity in car production because 'American productivity has also not been sufficiently greater than that of Korean firms to offset lower Korean wages' (p. 8). Korea can export (relatively obsolescent) cars to the US because its abundant labour and low wages give

it a comparative advantage in such cars, precisely as predicted by Vernon's (1966) international product life cycle model, which is a dynamic version of the principle of comparative advantage. Korean car exports are not determined by high absolute levels of productivity, nor is the ability to export in general. As so often in *CAN*, Porter generalized from the American experience to the world as a whole, leading him to invalid conclusions. 'Up-grading' is necessary for US firms wishing to export, because wages are high and their comparative advantage lies in that direction. *CAN* was simply exhorting them to do what comparative advantage suggests they should and will do. But one country's comparative advantage is by definition its trading partners' disadvantage. To encourage firms in many of America's trading partner nations (especially developing countries) to adopt the same up-grading strategy is to encourage them to shift away from comparative-advantage-based trade into products where they will not be able to compete without government intervention.

Having misunderstood comparative advantage, Porter claimed that a new paradigm had been put in its place. On the other hand, *The Economist* (1990) noted that every proposition in the theoretical part of *CAN* is a commonplace and only one of the major academic journals in economics bothered even to review it. That disdain is explained by the fact that Porter and his supporters appeared to believe that the economics of international trade ended with the Heckscher–Ohlin theorem (Grant, 1991, p. 240). In fact more recent trade theory, building on the comparative advantage perspective, had already taken into account most of the supposedly new elements raised in *CAN*. Trade based upon technological gaps has been well understood since Posner's (1961) paper and Vernon (1966) provided a dynamic extension of comparative advantage theory in the international product life cycle model. The importance of factor mobility has been recognized since Mundell (1957) and the implications of different consumer preferences for trade have been part of the standard model since Leontief (1933). Deardorff (1984), Ethier (1984), and Krueger (1984) provide survey articles demonstrating the pursuit of these issues by international economists over decades. In so far as Porter popularized their work he did the economists a service, just as his earlier work (Porter, 1980) popularized the economics of industrial organization. However, the claim to have invented a new paradigm is not supported. The theory of comparative advantage does well in the explanation of inter-industry trade. It does not provide an explanation for intra-industry trade between countries with similar factor endowments, which Porter cites as one of its central weaknesses (p. 12). However, modern trade theory has recognized that point for many years (Helpman and Krugman, 1985) and explains such trade as the outcome of scale economies.

The claim that *CAN* brought a new paradigm to trade theory is so easily dismissed that the economics profession hardly bothered to respond, *pace* Waverman (1995). Nevertheless, in the broader discussion of international business and national policies, the focus on competitive advantage or competitiveness and the exhortation to up-grade have become sufficiently commonplace to be described as an 'obsession' (Krugman, 1994) and to justify closer attention.

As Warr (1994) points out, the attempt to substitute 'competitive advantage' for comparative advantage rests on a misunderstanding and a false analogy. The comparative advantage theorem explains which goods should be produced and exported, and which should be imported. It explains to which industries a country's

resources should be allocated if they are to be used efficiently and national income is to be maximized. It also predicts which industries will be successful exporters if trade barriers are absent. 'Competitive advantage' concerns the way in which firms located in the industrially advanced countries compete with each other. The elision of the two, and the resulting emphasis placed on the 'need' for nations to compete on a basis other than cost, leads to policy recommendations whereby countries are exhorted to change their product-mix towards more differentiated and 'high-tech' products, even when their current resource endowments are inappropriate. As Warr (1994, p. 2) puts it:

The new literature on competitive advantage contains much that is sensible and even useful at the level of industry competition policy, but it also contains a theme that is dangerous. Through its emphasis on the importance of high-technology production of differentiated products as the sources of the competitive advantage of firms operating in advanced countries, and its devaluation of the importance of comparative costs, it appears to legitimize wasteful forms of public expenditure and/or protection policies designed to promote the premature development of high-technology industries. This interpretation of the 'competitive advantage' message, while possibly not intended by its protagonists such as Porter, threatens to encourage policies which will squander the scarcest resources of developing countries.

Nowhere in *CAN* does Porter espouse the view that governments should use public expenditure, protection or administrative fiat to shift resources towards an up-graded mix of industries. Indeed, he is consistently opposed to government intervention (Porter and Takeuchi, 1999). In that sense it is incorrect to assert that *CAN* encouraged government intervention. On the other hand, governments and industry leaders in countries as diverse as Finland (Ministry of Trade and Industry, 1993), Hong Kong (Berger and Lester, 1997; Enright et al., 1997), Venezuela (Enright et al., 1996), Switzerland (Enright and Weder, 1995), New Zealand (Trade Development Board, 1990), and Indonesia (Habibie, 1993) have embraced industrial policy initiatives founded on Porter's assertion that they must develop their competitiveness through the adoption of up-grading strategies. It is not difficult to see why *CAN* should be misinterpreted in this way. Porter denied that competitiveness could be achieved on the basis of comparative advantage and insisted that firms must produce up-graded products in order to compete. That was a valid assertion for American firms. However, the continuing elision of nation with firm and trade with prosperity, combined with inappropriate generalization from the American case, led many to interpret that as a call for nations in general to take action to up-grade their economies away from their comparative advantage in order to reach prosperity. As nations act through their governments *CAN* unintentionally invited public sector intervention.

Whether or not *CAN*'s unintended encouragement of active industrial policy is 'dangerous', as Warr (1994) contended, depends upon the view taken of the role of government in economic development. Chalmers Johnson argued that Japan was successfully guided by MITI (Johnson, 1982) and others have seen the experience of Singapore, Taiwan and South Korea as providing further support for government intervention (Wade, 1990). On the other hand, Chen (1979) argued that the state played a limited role in those countries and Lin et al. (1997) take the view

that the rapid growth of China, Japan and the Asian 'dragons' are all best explained as 'comparative-advantage-based' development. Whichever view is correct, Porter did not intend *CAN* to be read as support for the developmental state. That it was so interpreted further illustrates the central theme of this paper, which is that the elisions in *CAN* led to important confusions.

While Porter was determined to dismiss the theory of comparative advantage he made full use of its logic in the stages model of 'competitive development', which is an informal integration of the comparative advantage theorem with elementary production theory. According to that model, in the 'factor-driven' stage of development, a country which is well endowed with labour will and should produce and export labour-intensive goods. That is precisely the prediction and prescription of the comparative advantage model. The comparative advantage theorem further shows that the nation's income will thereby be increased. If a substantial proportion of that income is saved, the capital stock will increase rapidly. That shifts the economy's resource endowment until its comparative advantage lies in more capital-intensive products, the nation becomes 'investment-driven' and exports more capital-intensive goods. Again, precisely as the comparative advantage model predicts and prescribes. As capital per worker increases, the principle of diminishing returns sets in and extra investment yields increasingly small increments of output. Hence a point is reached where further increases in income per person require technological progress. Companies located in a country which reaches this stage will pay high wages and hence be unable to sell their products on world markets unless those products are 'up-graded'. Market forces therefore encourage them to invest in research and development. The nation's resource endowment shifts towards technological knowledge and its comparative advantage towards technology-intensive products, which it produces and exports.

Porter did make a useful contribution here, parallel to his earlier work on industrial organization (Porter, 1980). That lay in taking very simple economic propositions and bringing them to the attention of the non-specialist in an arresting way. However, the stages model would not be out of place in the first chapter of an elementary economics textbook and it does not topple the theory of comparative advantage. On the contrary, it rests upon that theory as its foundation.

Closer examination of the three stage model also shows that *CAN* was incorrect in insisting that nations must pass through the first two and become innovation-driven in order achieve 'true prosperity'. If a country's only factor is its people, it will produce labour-intensive products, output per person will be low and the people will be poor. However, that argument does not extend to factors in general. If a country is well-endowed with natural resources it can produce and export natural-resource-intensive products. Productivity per person can be very high and the people can be as rich as in countries like Australia, Brunei, Canada, Dubai, Kuwait, New Zealand, Oman, Sweden, and Saudi Arabia. Prosperity can be factor-driven, albeit not labour-driven.

Nations in the investment-driven stage may also be prosperous as witness the 'dragons' of Asia (Davies, 1996). A country whose firms invest heavily in equipment embodying technology developed elsewhere will be able to improve its labour productivity without innovating. By avoiding the costs and risks of technology development, its firms will be able to compete on price and export in volume (as *CAN* explains in detail, pp. 548–52). Rising productivity will secure rising incomes, to levels approaching that of America, which must be deemed 'prosperity'.

The only category of country which cannot increase its income per head without entering the 'innovation-driven' stage is one which has very high levels of capital per worker and which is already on the technological frontier – the technological leader. If such a country does not innovate it can retain its current level of prosperity but it cannot grow. As America is probably the only country in that position, *CAN*'s insistence that the innovation-driven stage must be reached in order to secure 'true prosperity' is simply a misleading re-statement of the valid point that America must innovate in order to grow.

To sum up on the relationship between comparative advantage and competitive advantage in *CAN*. Porter misunderstood comparative advantage. His claim to replace it with a new paradigm cannot be supported. Confusion over the upgrading prescription which arises from the competitive advantage approach unintentionally gave support to those who advocate active industrial policy. Despite his disparagement of the comparative advantage principle Porter himself used it as the basis for his stages model of development. That model is useful in that it brings together the comparative advantage principle with simple production theory in an attractive way, appealing to the non-specialist. However, it does not support Porter's central thesis that countries must reach the innovation-driven stage in order to have high levels of per capita income.

THE DIAMOND MODEL

The second key claim in *CAN* is that an industry's 'competitiveness' depends upon the strength of the diamond in its 'home base'. A first set of issues raised in that respect concerns the methodology and mode of reasoning by which the evidence examined led to that conclusion. Davidson (1991) praised Porter's 'fact-derived' approach, even the most hostile praised the richness of Porter's cases, and some saw the use of a common framework to assemble cases as firm evidence for the value of the case method (Greenaway, 1993). However, others had reservations about the research methods used. Ingram (1991, p. 50) observed that Porter's propositions emerge from 'a shower of anecdotes' and are suggestive hypotheses rather than theory development. However, those hypotheses are never subjected to convincing tests. Given that Porter's methodology in *CAN* is inductive rather than hypothetico-deductive, criticisms directed at a lack of formal hypothesis testing are unfair. On the other hand, justifiable concerns do arise from the way in which the induction is carried out. No indication is given of how the cases were selected so that there are sampling problems, and hence doubt about external validity. By focusing on industries deemed to be successful a bias is introduced and while patterns which are common amongst these industries are interpreted as success factors, there is no means of checking whether they also appear in industries which fail. As Clark (1991, p. 119) noted, the 'method by which the conclusions are derived is submerged and somewhat hidden' and very different conclusions might be reached on the basis of the same data.

Other critics (Congdon, 1990, p. 42) argued that Porter's mode of reasoning was faulty to the point of sophistry. When expounding the diamond, *CAN* presents the reader with sentences of the type 'x is x because x is x'. Such statements most commonly arise in the form 'a nation/industry is successful when it has the environment required for success and firms are thereby encouraged to be successful'.

If the question 'what are the requirements for a successful environment?' is asked, the answer is 'a strong diamond'. However, that is another empty statement unless the required characteristics for a strong diamond are clearly identified. When the level of operational detail is finally reached, too many of the supposed requirements for success turn out to have counter-examples. For instance, an abundant supply of factors is often the source of advantage. On the other hand, a shortage of factors may also be an advantage. This apparent contradiction might be resolved through the distinction between 'basic' factors, whose shortage may stimulate innovation, and 'advanced' factors which are required to be in abundance. However, Porter's own example shows that this is not the case. In the Dutch cut flower industry a cold climate (lack of a basic factor) forced firms to innovate, supposedly demonstrating the proposition. However, in the same industry in the same place at the same time, the abundance of another basic factor (natural gas) was also an important supportive influence (*CAN*, p. 85). It is impossible to predict the outcome if the Dutch had enjoyed a warm climate, but had no sources of natural gas and difficult to avoid the conclusion that the analysis is simply ex-post rationalization. That is not to argue that relationships in economics must always run in the same direction. It is possible that more of a factor might be beneficial in some circumstances and detrimental in others, just as a plant may have too much water or too little. However, if a theory concerning that factor is to be useful it must explain which circumstances are which. *CAN* does not provide that explanation, nor does it identify the necessary conditions for strength in each individual corner of the diamond. As Reich (1990a) noted, the four corners, supplemented by chance and government, are so broad that they include everything which might contribute to success, thereby identifying nothing as particularly significant. In Congdon's view (1990, p. 42) these weaknesses render the diamond 'completely fatuous, corresponding logically to the statement that movement may be to the North, South, East or West'. Even one of the most admiring reviewers was driven to comment that '[A]mbiguity over the signs of relationships, the complexity of interactions and dual causation renders the model unproductive in generating clear predictions' (Grant, 1991, p. 542).

Methodology and mode of reasoning apart, the assertion that the home diamond determines the performance of home-based firms was attacked as inappropriate when the world economy has become increasingly globalized, and the multinational enterprise increasingly important. Dunning (1993, pp. 9–10) pointed out that in the 1990s 'an increasing proportion of the assets of firms in a particular country are either acquired from or are located in, another country'. For firms having a large proportion of their operations outside their home base it is 'ludicrous' (p. 9) to suggest that their competitive position rests largely upon the strength of the diamond in their home base, although their initial move abroad might have been based on those advantages. That echoes the comments of many reviewers and suggests that the diamond model should at least be reappraised and amended, in line with Dunning's (1993, p. 12) suggestion that 'national diamonds have to be replaced by supranational diamonds'. While the criteria on which the diamond might be given a more appropriate spatial basis have never been spelt out, a number of authors identified 'ad hoc' examples where influences outside the home diamond appear to have been crucially important. Rugman (1991, 1992), Rugman and D'Cruz (1991, 1993) and Rugman and Verbeke (1993) noted that the model is particularly flawed if applied to small, open trading economies and they

suggested that in the Canadian case a 'double diamond' model would be more appropriate, bringing together the Canadian and US diamonds. Similarly, Hodgetts (1993) examined the Mexican case and argued that the competitive strength of that country's strategic clusters rests on their ability to draw on the United States diamond, learning from US customers, using resources from both countries, and purchasing inputs from supporting industries in both places. The same point has been made in respect of other small nations, including Austria (Bellak and Weiss, 1993), Australia (Ellis and Pecotich, 1996; Yetton et al., 1992), Finland (Yla-Anttila, 1994), Hong Kong (Davies et al., 1995; Redding, 1994), the Netherlands (Jacobs and de Jong, 1992) and New Zealand (Cartwright, 1993). The argument that successful companies draw solely or even largely on their home diamond is not supported.

This difficulty with the diamond goes deeper than these commentators realized. It is easy to see why the importance of the home base diamond should be refuted in the context of small open economies, but none of the authors who made this point noticed that the argument is extensible. If firms in small open economies can draw on the diamond in other countries, so can firms in the 'triad' economies. Small open economies provide the most obvious illustration because firms in such locations very often *must* draw on overseas diamonds. A small economy almost certainly lacks at least one strong corner. Firms from the triad may *not need* to do so, because the large size of their domestic economies renders it more likely that four strong corners are in place. However, they *may if they choose* draw on the diamond in other places as do IBM, Nestlé, SKF, Phillips and BAT cited by Dunning (1993, pp. 9–10). But if firms in one country are able to draw upon diamonds in another, the concept of the national diamond is stripped of its content. The home base diamond model is inextricably linked to the assertion that co-location of the diamond's corners in a nation is important. By showing that in many instances it is not, the diamond's critics rendered it empty.

While the debate revealed the fundamental weaknesses of the diamond model, most writers paid them little attention. Despite the already all-encompassing nature of the diamond framework and its consequent 'elasticity' (Redding, 1994, p. 87), they preferred to focus on their own proposals for amendments and further extensions. Van den Bosch and van Prooijen (1992) argued that national culture, as measured by Hofstede (1980), should be given a more prominent place in the analysis and that Porter was wrong to see culture as working through the various elements of the diamond. O'Shaughnessy (1997) added in custom, history and politics while van den Bosch and de Man (1994) argued that government should be given a more prominent position. Cho (1994), considering the Korean case, suggested that the four-cornered diamond would be better replaced with a nine-factor model, which would group four physical factors (endowed resources, business environment, related and supporting industries, domestic demand) and four human resources (workers, politicians and bureaucrats, entrepreneurs, professional managers and engineers), supplemented by chance.

To sum up with respect to the diamond model, the academicians of international business responded in two ways. First, they found fault with Porter's insistence that firms' ability to compete depends on the strength of the diamond in their home base. Second, they suggested a series of additions and amendments to the diamond model. They failed to notice that if firms can draw on diamonds in different places, the concept loses its content.

THE LINK BETWEEN INWARD FOREIGN DIRECT INVESTMENT AND
THE 'COMPETITIVE ADVANTAGE' OF A NATION

A further point of contention between Porter and the academicians of international business concerned his conviction that outward foreign direct investment (FDI) is a sign of competitive strength in a nation's industry while inward investment indicates that 'the process of competitive up-grading is *not entirely healthy*' (*CAN*, p. 671). Lau (1994) pointed out that capital flows towards the locations where it is most highly productive, in which case the inflow of foreign direct investment could be regarded as a positive indicator of competitiveness. Dunning (1993, p. 12) suggested that Porter's interpretation of the link between FDI and national competitiveness rests upon the idea that outward FDI reflects the possession of firm specific tangible assets which give a competitive edge *prior* to undertaking the FDI. While that is valid as an explanation for why individual firms are able to undertake FDI, as in the 'eclectic' model (Dunning, 1977), it does not follow that inward FDI has a negative effect on the productivity/competitiveness of the recipient economies. It may be correct to conclude that, when the incoming investment took place, local companies were at a competitive disadvantage relative to the foreign incomers. However, that does not mean that residents of the host economy were left worse off, even in the short run, and in the long run local firms may have gained through the stimulus of competition and by learning from the incomers. Porter's elision of the competitive success of home base companies with the productivity and well-being of local residents, lead to a misinterpretation of the role of the multinational.

This point was taken up by a number of authors. Rugman and D'Cruz (1993) noted that foreign-owned firms in Canada carry out the same level of research and development within the country as domestic firms, thereby creating competitive advantage locally. They also drew attention to the fact that in Canada, foreign subsidiaries export as much as they import. Hodgetts (1993) pointed out that MNEs have brought technology to Mexico, allowing its industries to sell abroad, and Chia (1994) reminded us that residents of Singapore are wealthy despite being almost entirely dependent upon foreign affiliates for both manufacturing output and exports. Liu and Song (1997) took up Dunning's (1995) extension of the Porter model, which adds 'multinational business activity' as a determinant of competitive advantage. They applied that model to China's recent history and concluded that the country's success has been significantly attributable to inward FDI. They also attributed China's success to the exploitation of its comparative advantage in labour-intensive sectors, as opposed to the pursuit of Porter's recommended up-grading strategy.

THE EMPIRICAL STUDIES

While *CAN*'s theoretical under-pinning is deficient, much of the book's appeal lay in its marshalling of a huge volume of facts into an apparently coherent pattern, supposedly showing that strong diamonds must be in place if a nation is to have competitive advantage. That provided an opportunity for researchers to extend the analysis to new locations, and to develop alternative methodologies to test the book's central assertions.

The further studies can be divided into three categories. First, there are two country studies, of New Zealand and Canada, which are essentially extensions to *CAN* itself, having been carried out by Porter and his collaborators or consultancy colleagues (Crocombe et al., 1991; Porter and the Monitor Company, 1991). Second, there are commentaries based upon general descriptive data for individual economies which have assessed the usefulness of the model for those economies without actually working through a systematic process of data collection and analysis. These include pieces on Mexico (Hodgetts, 1993), Canada (Rugman and D'Cruz, 1991, 1993) Singapore (Chia, 1994) and Hong Kong (Redding, 1994). Third, there have been nine detailed empirical studies which have directly attempted to test *CAN*'s central propositions, drawing attention en route to the methodological issues which arise.

Of these nine studies, seven focused on the assertion that competitive success requires strong diamonds. Five of them used the export share criterion to identify a nation's most competitive sectors and then went on to assess whether those sectors had strong diamonds in their home base. Yetton et al. (1992) re-examined Porter's own analysis for Canada and New Zealand and supplemented that with an original analysis for Australia. Their findings were that none of the competitive industries had strong diamonds in their home base. As all three countries have had high standards of living, maintained over decades, the hypothesis that strong diamonds are needed for prosperity is refuted. This study also pointed out that in economies with large endowments of natural resources, the export share criterion identifies resource-based industries as strong and manufacturing as weak, as a statistical artifact.

Bellak and Weiss (1993) adopted a similar approach in a study of Austrian industry. Competitive sectors were identified by using the export share criterion. However, it was noted that this approach fails to identify an important cluster in winter sports because that sector incorporates an important service element and the organization of the Standard Industrial Trade Classification (SITC) does not bring together the goods which it produces. It was also noted that some of the clusters found by using the SITC figures in fact consisted of a single firm, drawing attention to the sometimes false assumption that goods in different SITC categories are produced by different firms. In contradiction to Porter's central assertion it was found that for Austria's competitive industries the corners of the diamond reflecting demand conditions and strategy, structure and rivalry were both weak. It was also found that inward foreign direct investment had been important for those industries having high export shares.

Jacobs and de Jong (1992) also used the export share criterion to identify competitive sectors, this time for the Dutch case. The selected industries were examined for evidence of clusters and only one competitive Dutch cluster was found to be both broad and deep. Dutch industry varies widely in its geographical scope with some sectors serving world markets from production bases solely located in the Netherlands while others produce across the world. The importance of the home base therefore varies significantly from sector to sector and is not always of major importance.

Davies et al. (1995) used the export share criterion to identify Hong Kong's most competitive industries and then used the methodology set out in *CAN* to construct cluster charts. That showed that the territory had only one cluster, related to apparel, and that was very shallow, there being no strong sectors in machinery,

supporting functions or downstream business. Examination of the other corners of the diamond confirmed that Hong Kong's most competitive industries do not have strong demand conditions or favourable factor conditions in their home base.

Suzuki (1994) calculated world export shares for individual Japanese industries for five different years between 1964 and 1990, in order to identify the overall pattern of competitiveness and to consider whether Japanese competitiveness may be considered 'sustained' on the basis of differentiation as Porter claims. The evidence for the existence of clusters was examined and export shares for those clusters calculated. That led to the conclusion that the year 1985, on which Porter based the analysis in *CAN*, was atypical for Japan, with many industries then identified as competitive losing market share in the following five years. Consistent with Porter's stage analysis, there was little evidence of clusters before 1970 when Japan was competing on a factor-driven basis but more evidence by 1985. However, although Japanese firms competed on a more sophisticated basis by 1985, their strength was not based upon product differentiation, as predicted by Porter, but on the basis of lower cost, now achieved through the management of value chains.

From these five studies, only Suzuki's results provided any support for *CAN*, and that resided in the finding that clusters came into existence during the transition away from the factor-driven stage of development. The overall conclusion was that the central hypothesis concerning the importance of the home diamond is refuted. *CAN* might be defended in two ways. The first is by noting that of the five countries examined only Japan might have reached the innovation-led stage of development. In that case the others are competing on the basis of a factor-driven approach or an investment-driven approach and the full diamond does not need to be in place, according to Porter. However, if that argument is made, Porter's other assertion – that a country cannot achieve prosperity without reaching the innovation-driven stage – is refuted as all four countries in question have high levels of income which have been sustained over many decades. The alternative defence, reflecting Porter's judgement on the New Zealand economy, is to argue that prosperity in these countries is 'fragile' and may not be sustained. New Zealand's tiny economy might be fragile. However, as Yetton et al. (1992) noted, Porter approached the evidence by insisting that when the facts contradict the theory, it is the facts which must be about to change. The theory loses all scientific content, becoming an assertion of faith in the central hypotheses.

In addition to these five studies, four others took widely different approaches. Ellis and Pecotich (1996) examined the requirement for a strong diamond by carrying out interviews in seven firms operating from Western Australia, including pairs of exporters and non-exporters in the same industry. The interviews were used to assess qualitatively the strength of each corner of the diamond, paying attention to both domestic and international conditions. The findings were that none of the firms which were exporting successfully had access to strong home diamonds. Careful examination also suggested that where the diamonds did have strength these were correlates rather than determinants of success because the firms in question became successful before strength in the diamond emerged.

Cartwright (1993) divided New Zealand industries into two groups, one competitive and profitable and the other having declining profits. Interval scales were

used to measure the strength of each corner of the diamond for each industry, based on the author's judgement, and two hypotheses tested statistically. The first was that the scores for the competitive industries were not significantly different from the 'ideal' scores according to Porter's diamond model. The second hypothesis was that the scores for the less competitive industries differed more from the ideal scores than those for the competitive sectors. Both hypotheses were rejected as the competitive industries had significantly different scores from the ideals predicted by the diamond model and the less competitive industries actually had scores which were closer to the ideal diamond. In order to test the hypothesis that the competitive strengths of New Zealand's industries were associated with access to 'offshore' diamonds a number of 'offshore' variables were added, measuring the extent to which each industry was able to access corners of the diamond located in other countries. The hypothesis testing procedure was then repeated by examining one model in which offshore variables were added to the original home base variables, and another which included only offshore effects. The results showed that both of the new models improve the explanation of competitiveness. However, the 'offshore only' version, which ignored home base effects, performed better than that with both effects. Access to the diamond in other countries proved to be more important than its configuration in the home base.

Two empirical papers remain. Grein and Craig (1996) shifted the focus to national level, identifying 12 variables intended to reflect national strength in respect of the four corners of the diamond. Data were collected for 49 countries and exploratory factor analysis used to find three factors or corners instead of the four in *CAN*. These three were interpreted as 'infrastructure/demand', 'competitive investment', and 'education'. The factor scores for each nation were used as independent variables in regressions which sought to explain three dependent variables – GDP per capita, net exports per capita and inward FDI per capita. The results showed that the factor scores were effective in predicting GDP per capita across the full sample of 49 countries in both 1960 and 1985, and had some success in predicting inward FDI per capita. However, they did not perform well in predicting net exports per capita. While the national level approach is in direct contradiction to Porter's focus on industries, the authors saw some support for *CAN*'s stage model in that in 1960 'infrastructure/demand' was the most significant determinant, while in 1985 'competitive investment' had become more important. However, the main implications claimed in respect of *CAN* were that factors determining economic performance were identified, but differed from the four corners of the diamond, suggesting that it requires amendment.

Finally, Healey and Dunham's (1994) paper illustrated the elasticity of the 'competitiveness' concept and the extent to which *CAN*'s lists of *desiderata* might be used to focus on completely different issues. In that case the analysis concerned the changing competitiveness of a city economy in the United Kingdom, where competitiveness was not measured in terms of either productivity or export market share, but in terms of employment. The diamond model was assumed to be valid and used as an organizing framework to examine the changes in the city's corners over a period in which employment increased substantially. As each of the four corners was found to have some association with changes in the city of Coventry's level of employment, the conclusion drawn was that the ideas in *CAN* deserve wider application in local and regional economic studies.

A FINAL CONCLUSION?

Three sets of conclusions are in order addressing conceptual issues, methodology and the robustness of *CAN*'s empirical propositions. *CAN*'s conceptual foundations were undermined by three very basic elisions or confusions. The first was between 'competitiveness' construed as productivity and 'competitiveness' construed as the market share held by a sub-set of industries. Porter began by opting for the former interpretation but then shifted back and forth between the two, making assertions based on one (prosperity depends on competitiveness *qua* productivity) while investigating the other (competitiveness *qua* market share depends upon strong diamonds). As a nation's prosperity does not depend upon the market share of a sub-set of industries, investigating the basis for market share could not elucidate the basis for prosperity. The second elision was between the nation construed as the people in one place and the nation construed as the firms for whom that place is the home base. While Porter's central concern was to explain the prosperity of the nation in the first sense, the analysis was conducted in terms of the second so that the conclusions drawn do not lie where they are placed. The prosperity of the people in a place is not dependent upon the activities of the firms for whom that place is the home base. A further confusion arose from the interpretation of 'competitive advantage' as an equivalent concept to 'comparative advantage', whereas the first is concerned to explain how firms in an industry compete with each other while the second is concerned with which industries a location should have.

The combined effect of the elisions was to create a gap between that which was to be explained and that which was actually examined. Explaining the prosperity of the people in a place requires an explanation of the productivity of the activities carried out in that place, and the extent to which the returns to those activities accrue locally. Explaining the market share of firms based in that place is a different issue, largely irrelevant to the question on hand.

With respect to methodology, *CAN* failed the basic tests which may be applied to any piece of research in respect of rigour. It contained no set of 'ex ante' hypotheses to be tested on an appropriate set of data. That would be acceptable if a clear inductive methodology had been applied. However, the central assertions were drawn from the data in some unspecified manner, which made it impossible to judge their validity. Factors which were found to support competitive advantage in some circumstances were found to weaken it in others, with no indication given of how that causal path is traced or the circumstances which determine the sign of the relationship. The sample consisted almost entirely of industries identified as 'successful', preventing direct comparison between industries exhibiting different levels of performance.

At the empirical level, all five of *CAN*'s major assertions have been refuted. A nation does not need to reach the innovation-driven stage in order to achieve sustained prosperity. A nation's prosperity does not depend on the activities of the firms for whom it is a home base. Industries which are internationally competitive do not generally have strong diamonds. Inward foreign direct investment is not a sign that an economy is weak in terms of its competitiveness/productivity and international success does not always need to be based upon 'up-grading' through innovation, product differentiation and branding.

In the last analysis, then, we may amend Grant's (1991) judgement from 'gloriously rich but hopelessly intractable' to 'hopelessly rich but gloriously wrong'.

REFERENCES

- BELLAK, C. A. and WEISS, A. (1993). 'A note on the Austrian "diamond"'. *Management International Review*, **33**, 2, 109–18.
- BERGER, S. and LESTER, R. K. (1997). *Made by Hong Kong*. Hong Kong: Oxford University Press.
- BROWN, G. and MULGAN, G. (1990). 'The Competitive Advantage of Nations by Porter, Michael E.'. *London Review of Books*, **12**, 25 October, 10.
- CARNEY, M. (1991). 'The Competitive Advantage of Nations by Porter, Michael E.'. *RCSA/CJAS*, **8**, 4, 288–93.
- CARTWRIGHT, W. R. (1993). 'Multiple linked "diamonds" and the international competitiveness of export-dependent industries: the New Zealand experience'. *Management International Review*, **2**, 55–70.
- CHEN, E. (1979). *Hypergrowth in Asian Economies: A Comparative Survey of Hong Kong, Japan, Singapore and Taiwan*. London: Macmillan.
- CHIA, S.-Y. (1994). 'Trade, industry and government: the development of organizational capabilities in Singapore'. *Journal of Far Eastern Business*, **1**, 1, 52–70.
- CHO, D.-S. (1994). 'A dynamic approach to international competitiveness: the case of Korea'. *Journal of Far Eastern Business*, **1**, 1, 17–36.
- CLARK, T. (1991). 'Review of *The Competitive Advantage of Nations*, by M. E. Porter'. *Journal of Marketing*, October, 118–20.
- CONGDON, T. (1990). 'Autumn books . . . should be made of sterner stuff: *The Competitive Advantage of Nations*'. *Spectator*, **265**, 8463, 41–2.
- CROCOMBE, G. T., ENRIGHT, M. J. and PORTER, M. E. (1991). *Upgrading New Zealand's Competitive Advantage*. Auckland: Oxford University Press.
- DALY, D. J. (1993). 'Porter's diamond and exchange rates'. *Management International Review*, **2**, 119–34.
- DANIELS, J. D. and RADEBAUGH, L. H. (1994). *International Business: Environments and Operations*. New York: Addison-Wesley.
- DAVIDSON, K. M. (1991). 'How CAN we increase US competitiveness?'. *Journal of Business Strategy*, **12**, 5, 57–60.
- DAVIES, H. (1996). 'High IQ and low technology: the key to Hong Kong's success'. *Long Range Planning*, **29**, 5, 684–90.
- DAVIES, H., WHITLA, P. and KWOK, P. (1995). 'The analysis of East Asian competitiveness: lessons from the Hong Kong experience'. *Asia Pacific Business Review*, **2**, 2, 1–22.
- DEARDORFF, A. V. (1984). 'Testing trade theories and predicting trade flows'. In Jones, R. W. and Kenen, P. B. (Eds), *Handbook of International Economics: Volume 1*, Amsterdam: North-Holland: pp. 467–517.
- DE MAN, A. P. (1994). '1980, 1985, 1990: a Porter exegesis'. *Scandinavian Journal of Management*, **10**, 4, 437–50.
- DUNNING, J. H. (1977). 'Trade location of economic activity and the MNE: a search for an Eclectic approach'. In Ohlin, B., Hesselborn, P.-O. and Wijkman, P.-M. (Eds), *The International Allocation of Economic Activity*. New York: Homes and Meier, 395–418.
- DUNNING, J. H. (1993). 'Internationalizing Porter's diamond'. *Management International Review*, **2**, 7–15.
- DUNNING, J. H. (1995). *The Globalisation of Business*. London: Routledge.
- Economist*, *The* (1990). 'Oh, Mr. Porter, what shall we do?', **315**, 7655, 19 May, 99.
- EILON, S. (1990). 'On competitiveness'. *Omega: International Journal of Management Science*, **20**, i–iv.

- ELLIS, P. D. and PECOTICH, A. (1996). 'Determinants of international competitiveness of West Australian SMEs'. *New Zealand Journal of Business*, **18**, 1, 79–97.
- ENRIGHT, M. J. and WEDER, R. (1995). *Studies in Swiss Competitive Advantage*. Berne: Peter Lang.
- ENRIGHT, M. J., FRANCES, A. and SAAVEDRA, E. S. (1996). *Venezuela: The Challenge of Competitiveness*. New York: St Martin's Press.
- ENRIGHT, M. J., SCOTT, E. E. and DODWELL, D. (1997). *The Hong Kong Advantage*. Hong Kong: Oxford University Press.
- ETHIER, W. (1984). 'Higher dimensional issues in trade theory'. In Jones, R. W. and Kenen, P. B. (Eds), *Handbook of International Economics: Volume 1*. Amsterdam: North-Holland, 131–84.
- ETTLINGER, N. (1991). 'The roots of competitive advantage in California and Japan'. *Annals of the Association of American Geographers*, **81**, 391–407.
- FOSS, N. J. (1996). 'Research in strategy, economics and Michael Porter'. *Journal of Management Studies*, **33**, 1, 1–24.
- GRANT, R. M. (1991). 'Porter's Competitive Advantage of Nations: an assessment'. *Strategic Management Journal*, **12**, 535–48.
- GRAY, H. P. (1991). 'International competitiveness: a review article'. *The International Trade Journal*, **V**, 503–17.
- GREENAWAY, D. (1993). 'The Competitive Advantage of Nations, by Porter, Michael E.'. *Kyklos*, **46**, 1, 145–6.
- GREIN, A. F. and CRAIG, S. C. (1996). 'Economic performance over time: does Porter's diamond model hold at the national level'. *International Executive*, **38**, 3, 303–22.
- GRIFFIN, R. W. and PUSTAY, M. W. (1995). *International Business: A Managerial Perspective*. New York: Addison-Wesley.
- HABIBIE, B. J. (1993). 'Kertas posisi seri dialog pembangunan; pembangunan ekonomi berdasarkan nilai tambah dengan orientasi pembangunan teknologi dan industri' Conference Paper, Centre for Information and Development Studies, Jakarta, 25 January.
- HEALEY, M. J. and DUNHAM, P. J. (1994). 'Changing competitive advantage in a local economy: the case of Coventry'. *Urban Studies*, **31**, 8, 1279–301.
- HELPMAN, H. and KRUGMAN, P. (1985). *Market Structure and Foreign Trade*, Cambridge, MA: MIT Press.
- HILL, C. W. L. (1994). *International Business: Competing in the Global Marketplace*. Burr Ridge, IL: Irwin.
- HODGETTS, R. M. (1993). 'Porter's diamond in a Mexican context'. *Management International Review*, **2**, 41–54.
- HOFSTEDE, G. (1980). 'Motivation, leadership and organization: do American theories apply abroad?'. *Organizational Dynamics*, Summer.
- INGRAM, G. K. (1991). 'The Competitive Advantage of Nations by Porter, Michael E.'. *Finance and Development*, **28**, 50.
- JACOBS, D. and DE JONG, M. W. (1992). 'Industrial clusters and the competitiveness of the Netherlands: empirical results and conceptual issues'. *de Economist*, **140**, 2, 233–52.
- JELINEK, M. (1992). 'The Competitive Advantage of Nations by Porter, Michael E.'. *Administrative Science Quarterly*, **37**, 507–10.
- JOHNSON, C. (1982). *MITI and the Japanese Miracle: The Growth of Industrialized Policy, 1925–75*. Stanford: Stanford University Press.
- KRUEGER, A. O. (1984). 'Trade policies in developing countries'. In Jones, R. W. and Kenen, P. B. (Eds), *Handbook of International Economics: Volume 1*. Amsterdam: North-Holland, 519–69.
- KRUGMAN, P. (1994). 'Competitiveness: a dangerous obsession'. *Foreign Affairs*, **73**, 2, 28–44.
- LAU, L. (1994). 'The competitive advantage of Taiwan'. *Journal of Far Eastern Business*, **1**, 1, 90–112.

- LEONTIEF, W. (1933). 'The use of indifference curves in international trade'. *Quarterly Journal of Economics*, May, 493–503.
- LIN, J., CAI, Y. F. and LI, Z. (1997). *The China Miracle: Development Strategy and Economic Reform*. Hong Kong: Chinese University Press.
- LIN, X. and SONG, H. (1997). 'China and the multinationals – a winning combination'. *Long Range Planning*, **30**, 1, 74–83.
- MAGAZINER, I. (1990). 'Letters to the editor'. *Harvard Business Review*, **68**, 3, May–June, 189–92.
- METCALFE, L. (1991). 'The Competitive Advantage of Nations by Porter, Michael E.'. *The Political Quarterly*, **62**, Jan/Mar, 130–3.
- MILLER, M. (1990). 'Of pushcart vendors and management consultants'. *The Public Interest*, **101**, Fall, 103–6.
- Ministry of Trade and Industry. (1993). *National Industrial Strategy for Finland*. Helsinki: Publications of the Ministry of Trade and Industry.
- MUNDELL, R. (1957). 'International trade and factor mobility'. *American Economic Review*, June, 321–35.
- O'SHAUGHNESSY, N. (1997). 'The idea of competitive advantage and the ideas of Michael Porter'. *Strategic Change*, **6**, 73–83.
- PORTER, M. E. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.
- PORTER, M. E. (1990). *The Competitive Advantage of Nations*. London: Macmillan.
- PORTER, M. E. and the Monitor Company (1991). *Canada at the Crossroads*. Ottawa: Business Council on National Issues and Minister of Supply and Services.
- PORTER, M. and TAKEUCHI, H. (1999). 'Fixing what really ails Japan?'. *Foreign Affairs*, **78**, 3, May/June, 66–81.
- POSNER, M. (1961). 'International trade and technical change'. *Oxford Economic Papers*, 323–41.
- PRESSMAN, S. (1991). 'The Competitive Advantage of Nations, by M. E. Porter'. *Journal of Management*, **17**, 1, 213–27.
- REDDING, G. (1994). 'Competitive advantage in the context of Hong Kong'. *Journal of Far Eastern Business*, **1**, 1, 71–89.
- REICH, R. (1990a). 'But now we're global'. *Times Literary Supplement*, 30 Aug, 925–6.
- REICH, R. (1990b). 'Who is us?'. *Harvard Business Review*, **68**, 1, Jan/Feb, 53–64.
- REICH, R. (1991). 'Who is them?'. *Harvard Business Review*, **69**, 2, Mar/Apr, 77–88.
- RICARDO, D. (1817). *The Principles of Political Economy and Taxation*. Homewood, IL: Irwin, 1963.
- RUGMAN, A. M. (1991). 'Diamond in the rough'. *Business Quarterly*, **55**, 3, 61–4.
- RUGMAN, A. M. (1992). 'Porter takes the wrong turn'. *Business Quarterly*, **56**, 3, 59–64.
- RUGMAN, A. M. and D'CRUZ, J. R. (1991). *Fast Forward: Improving Canada's International Competitiveness*. Toronto: Kodak Canada Inc.
- RUGMAN, A. M. and D'CRUZ, J. R. (1993). 'The "double diamond" model of international competitiveness: the Canadian experience'. *Management International Review*, **2**, 17–39.
- RUGMAN, A. M. and VERBEKE, A. (1993). 'Foreign subsidiaries and multinational strategic management: an extension and correction of Porter's single diamond framework'. *Management International Review*, **2**, 71–84.
- SAGEBIEN, J. (1990). 'The Competitive Advantage of Nations by M. E. Porter'. *Journal of Macromarketing*, Fall, 94–9.
- SAMUELSON, P. (1969). 'The way of an economist'. In Samuelson, P. (Ed.), *International Economic Relations*. London: Macmillan.
- SCOTT, R. and LODGE, G. (1985). *US Competitiveness in the World Economy*. Boston: Harvard University Press.
- SMITH, A. (1776). *An Enquiry into the Nature and Causes of the Wealth of Nations*. New York: The Modern Library, 1937.

- SMITH, S. C. (1993). 'The competitive advantage of nations by Porter, M. E.'. *Journal of Development Economics*, **40**, 399–404.
- SOON, T.-W. and TAN, S. (1992). 'Public policy and economic development in Singapore'. Paper given at a World Bank Conference on the Role of Government and Asian Success, Washington DC.
- SUZUKI, Y. (1994). 'The competitive advantage of Japanese industries: developments, dimensions and directions'. *Journal of Far Eastern Business*, **1**, 1, 37–51.
- Trade Development Board. (1990). *Export Manufacturing: Framework for Success*. Wellington: New Zealand Trade Development Board.
- VAN DEN BOSCH, F. and DE MAN, A.-P. (1994). 'Government's impact on the business environment and strategic management'. *Journal of General Management*, **19**, 3.
- VAN DEN BOSCH, F. and VAN PROOIJEN, A. (1992). 'The Competitive Advantage of Nations: the impact of a national culture – a missing element in Porter's analysis?'. *European Management Journal*, **10**, 2, 173–7.
- VERNON, R. (1966). 'International investment and international trade in the product life cycle'. *Quarterly Journal of Economics*, **80**, 2, May, 190–207.
- WADE, R. (1990). *Governing the Market: Economic Theory and the Role of the Government in East Asian Industrialization*. Princeton, NJ: Princeton University Press.
- WARR, P. G. (1994). 'Comparative and competitive advantage'. *Asia-Pacific Economic Literature*, **8**, 2, 1–14.
- WAVERMAN, L. (1995). 'A critical analysis of Porter's framework on the competitive advantage of nations'. In Rugman, A. M., van den Broek, J. and Verbeke, A. (Eds), *Research in Global Strategic Management (Vol. 5): Beyond the Diamond*. Greenwich, CT: JAI Press.
- WESTNEY, D. E. (1992). 'Global markets and competition – The Competitive Advantage of Nations by Michael E. Porter'. *Contemporary Sociology*, **21**, 6, 749–51.
- YETTON, P., CRAIG, J., DAVIS, J. and HILMER, F. (1992). 'Are diamonds a country's best friend? A critique of Porter's theory of national competition as applied to Canada, New Zealand and Australia'. *Australian Journal of Management*, **17**, 1, 89–119.
- YLA-ANTTILA, P. (1994). 'Industrial clusters – a key to new industrialisation?'. *Kansallis Economic Review*, **1**, 4–11.

