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

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ABSTRACT

Porter's (1990) 'Competitive Advantage of Nations' 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 the papers published in the following six years suggests that the book was enormously rich in its range and scope but that there were too many conceptual flaws, particularly of elision, for the theory to amount to more than a useful taxonomy. The research methodology was also flawed and subsequent empirical studies have tended on balance to refute the theory's major assertions. 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. The claimed integration between international economics and strategic management rests upon a mistaken attempt to substitute 'competitive advantage' for 'comparative advantage'. Policy-makers are left with a list on which to base simple SWOT-type analyses of their economies' positions with respect to the competitiveness of different industrial sectors, but no reliable guide with respect to appropriate policies to pursue. Developing countries in particular are given considerable encouragement to pursue policies which may actually be harmful.

INTRODUCTION

When *The Competitive Advantage of Nations* (hereafter *CAN*) was published in 1990 it triggered a wave of interest, as befits a major piece marking a significant development in the work of the world's best known business academic (de Man, 1994). Much of that interest manifested itself in newspapers and popular magazines, and was of ephemeral value, being concerned to summarise the main points of the analysis and its implications for policy-makers. However, the academic literature also began to grow, first through more than 30 reviews and then in the form of nearly 50 published articles.ⁱ The purpose of this paper is to re-assess the analysis presented in the book, in the light of that literature.

PORTER'S ANALYSIS

The main elements of the analysis in *CAN* have been incorporated into almost every popular undergraduate text on international business (Daniels and Radebaugh, 1994; Griffin and Pustay, 1995, pp. 96-99; Hill, 1994, pp. 137-141; Rugman and Hodgetts, 1995, pp. 420-425), to the point where their familiarity means that they need little repetition. Nevertheless, it is useful to set out their broad sweep in order to help interpret the sometimes complex and confusing debate which followed the book's publication.

Porter's fundamental objective in *CAN* was nothing less ambitious than to elucidate the reasons why 'some social groups, economic institutions and nations advance and prosper' (Porter, 1990, p. xi). The social 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). Having established that starting point, he then went on to argue that a nation is essentially an aggregation of industries, its economic performance is determined by the competitiveness of those industries and the appropriate level of analysis should therefore be the industry. A nation's industries are then interpreted to be made up of those firms for whom the country is a 'home base' (p. 19). In some parts of the analysis, and Porter's extensions of it (e.g. Porter, 1995) the focus shifts from the nation to a sub-national region or a city, but there is no doubt that 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 in view of some of the confusions which have arisen within and

around the analysis.) 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 propositions (set out in Chapter 3) is that the ‘competitive advantage’ of a nation’s industries is determined by the configuration of 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. If they are to be useful in explaining industries’ performance, factors need to be defined at a much more disaggregated level than the simple trinity of land, labour and capital and the most useful differentiation may be very fine. However, broad distinctions may be drawn between ‘basic’ factors which are inherited, like climate and unskilled labour, and ‘advanced’ factors which have to be created, like computer scientists or telecommunications infrastructure, and also between ‘generalized’ factors which can be deployed in a wide range of industries and ‘specialised’ factors, which cannot. While the abundant supply of an appropriate factor may help an industry to compete (e.g. 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 (e.g. Italy’s expensive capital and energy, and their lack of local raw materials, forced its private steel producers to develop mini-steel mill technology, in which they have become world leaders (p. 82)).

Demand conditions in the home base affect an industry’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 (e.g. Swedish firms lead in high voltage electricity distribution over long distances because of their experience in serving their remote and energy-intensive steel and paper industries (p. 87)). Secondly, sophisticated and demanding buyers pressure companies into meeting high standards (e.g. Japanese consumers value space-saving, giving Japanese firms a lead in a range of compact products, while America’s long distances have led to competitive

strength in very large truck engines (p. 89)). Thirdly, a nation's industries gain if the needs of its 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. 91-92).) In each of these instances, it is not the size of the home market which 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 is 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 provide the spur which sets firms 'going abroad', forcing them to compete in the world market if they are to grow.

Related and supporting industries make up the third corner of the '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 competitive supplying and buying sectors or common customers, distribution channels or technologies. (Denmark has a cluster in 'health' and 'home' products, Sweden has clusters in sectors associated with 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 favors family-owned small firms, as in Italy (p. 108), the nation will tend to be competitive in industries which are fragmented and 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 or engineering content. Where companies' goals are short-term, because of the governance and capital-raising mechanisms which are in place nationally, the nation will tend to be successful in new industries with the possibility of a quick return. Where their goals are long-term, they will be better suited to industries which require consistent re-investment (p. 112).

Perhaps the most important aspect of this corner of the diamond concerns the need for rivalry, particularly 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 further development is possible in the local circumstances. Companies are forced to go beyond competing on the basis of local advantages, which are available to all, thereby using those advantages as efficiently as possible, up-grading them in the process (p. 119). Competitive pressure amongst those in proximity to each other provides the dynamic which 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. These 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.

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 competition with those of other nations are those whose competitive strategies are appropriate for the country's stage of development. In the factor-driven stage successful companies compete on the basis of low-cost, arising from cheap labour or low cost natural resources. Wages are relatively low and the nation is not prosperous. Competitive advantage derives from only one corner of the diamond, namely factor conditions (p. 547). In the second stage heavy investments are made in factories and infra-structure and new industries emerge.

The sectors which are successful are still competing on cost, but that is now 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 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, the country's firms are run by stewards, rather than entrepreneurs. Belief in the value of competition is less intense and rivalry is reduced, as powerful 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's findings may be formulated as five empirical assertions. 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. The second is that a nation's prosperity is determined by the performance of the firms for whom it is a home base. The third is that in order to achieve sustained prosperity a country must develop clusters of related industries which have strong 'diamonds' in the 'home base' nation. The fourth is that outward foreign direct investment is a manifestation of an industry's competitive strength, and therefore the nation's prosperity, while inward investment is a sign of relative weakness. The fifth is that international success cannot be based upon the comparative advantage brought about by basic factor conditions but must be built on the 'up-grading' of a nation's industries through innovation, product differentiation, branding and superior marketing.

While these propositions are simple enough they have led to a complex and often frustrating debate in which Porter, his critics and his supporters argue with each other about different issues at different levels on logical grounds which are constantly shifting. In order to map that debate, and attempt some closure upon it, this paper begins by examining the reception which the book first

received on publication, and then goes on to consider the conceptual and empirical findings of those who sought to build on the initial work.

THE REVIEWS

The reviews which greeted CAN's publication were mixed in the extreme, ranging from the fawning to the choleric with no consensus in sight (Carney, 1991). Furthermore, both critics and supporters found very different grounds on which to damn or praise, reflecting both their own fields of interest and the tremendous richness of their subject. The reviewer for *Contemporary Sociology* suggested that CAN was one of the most interesting recent books for the field of organisational ecology, despite the fact that it made not one reference to the subject and the author had apparently never read anything in the field! (Westney, 1992). The reviewer for *Political Quarterly* (Metcalf, 1991) criticized Porter for under-estimating the role of government, while British Labour Party politicians reviewing for the *London Review of Books* (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 expressed uneasiness that if pursued in more detail the points in Porter's diamond turn out to be determined by national character and culture. Gray (1991), writing 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 non-equilibrium analysis, and the inclusion of clusters, interpreted as Marshallian industrial districts, as the key features. Jelinek (1992), reviewing for *Administrative Science Quarterly* averred that while the book was 'not perfect', being marred by misnumbered Tables and a number of garbled sentences, it would do nothing less

than ‘rescue Economics from its long sojourn as esoteric and impractical theorizing’. These differences of opinion on the content extended to matters of style with a majority of reviewers making references to the book’s unnecessary length 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).

Amid this jumble of contradiction, a number of issues emerged as the focus of debate. The first concerns the meaning and appropriateness of the terms ‘competitiveness’ or ‘competitive advantage’ and the relationship between the competitiveness of an economy and that of the industries and firms which operate within it or for whom it is a ‘home base’. While Sagebien (1990, p. 95) found that Porter’s ‘greatest contribution lay in his definition of competitiveness as national productivity’ others found the same proposition to be a major source of confusion and error. At the level of measurement, Eilon (1990) pointed out that productivity is a measure of the efficiency with which resources are used, while competitiveness is usually interpreted as the ability to secure market share against competition. These are different things between which Porter shifts from place to place so that ‘[A]fter 800 pages... the reader is none the wiser about how competitive advantage is to be defined, let alone measured.’ⁱⁱ

More fundamentally, a number of reviewers noted the difficulties associated with the assertion that the competitiveness or productivity of a nation (which is a group of people *in one place*) is essentially the competitiveness or productivity of ‘its’ industries, if those industries are interpreted with Porter to mean the companies for whom the nation is a home base. Clark (1991, p. 120) posed the question ‘[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?’ In the same vein Reich (1990) noted 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. What determines the prosperity of a country’s residents is the productivity of those activities which take place within the nation’s boundaries, supplemented by the nation’s net property income from abroad. A part of every country’s gross domestic product arises

from the activities of companies based in other nations. As companies' activities become more global and less concentrated within their home base countries, so it becomes less appropriate to identify a country's prosperity with the activities of those firms for whom it is the home base. Porter's conviction that 'competitiveness' must be the main determinant of the prosperity of the people in one place led him to identify competitiveness at national level with national productivity, which is not unreasonable. However, he was wrong in the next step when he argued that the competitiveness/productivity of a nation's residents depends on the competitiveness of those firms for whom it is the home base. The mind-set of the international business academic, accustomed to seeing America in the activities of American-owned firms world-wide, allied with the elision of the terms 'productivity' and 'competitiveness' led to a simple logical error, hidden in what Congdon (1990, p. 42) described as a 'clumsy verbal gavotte' between the terms 'nation', 'industry' and 'company'. In so far as Porter later went on to use export-share statistics as the empirical basis for identifying a nation's 'competitive' industries he partly and inadvertently corrected the error, but in so doing he opened up a gap between the entity whose performance he was measuring (companies located in the nation, wherever their home base) and that which he was discussing (companies whose home base is in the nation).ⁱⁱⁱ One of the central problems of CAN, identified in the reviews, is that in most places it is the success of a location which is being discussed, while in others it is the success of firms based in that location, but operating in part elsewhere. The object of the analysis shifts from place to place.

The second set of issues on which the reviews focused concerned Porter's methodology and mode of reasoning. Some praised his 'fact-derived' approach, including the reviewer for the *Journal of Business Strategy*, who also drew the rather baffling conclusion that CAN demonstrated the superiority of competition amongst firms over efficient markets as a mode of organisation, as if the two were in opposition to each other (Davidson, 1991). A number took the opportunity to combine praise for Porter's practical and relevant approach with a little harmless economist-bashing. These included Magaziner (1990, p. 189) who declared that 'business strategists have also long known that the simplistic precepts of classical and neo-classical microeconomics are out-moded'. On the other hand, reviewers more familiar with economic analysis (Economist, 1990) noted that virtually every proposition in the theoretical part of CAN is a commonplace to economists, including the role of

innovation in international trade, the impact of different consumer preferences, and the role of intense rivalry in stimulating innovation. It is perhaps noteworthy that the *Journal of Development Economics* was the only major academic journal in Economics which even deigned to review CAN, an indication of either Olympian disdain for its claims, or ivory-tower isolation, according to the reader's taste.

The great majority of the reviews, including some of the most hostile, praised the richness and intrinsic interest of Porter's cases, and some saw the meticulous assembly of cases using a common framework as firm evidence for the value of the case method (Greenaway, 1993). However, many had reservations about the research methods on which the findings were based. Ingram (1991, p. 50) observed that Porter's propositions somehow emerge from 'a shower of anecdotes' and are better considered as suggestive hypotheses than theory development. However, those hypotheses are never subjected to convincing tests. No indication is given of how the cases for detailed analysis were selected so that there are sampling problems, which raises doubt about the external validity of the findings. By focusing solely on industries deemed to be successful an evident bias is introduced and while patterns which appear to be common amongst these successful industries are interpreted as success factors, there is no means of checking whether they also appear in industries which fail. In any event, as Clark (1990, 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 (Wood, 1990).^{iv}

A closely related criticism, expressed with waspish sarcasm by Congdon (1990, p. 42) is that Porter's mode of reasoning is faulty to the point of sophistry. CAN presents the reader with empty 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 issue is pursued and the question asked 'what then are the requirements for a successful environment', the intermediate level answer is a strong diamond (though only in the innovation-driven stage of development). However, even without the qualification concerning stages, 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 suitable factors is often the source of advantage. On the other hand, in many cases a shortage of factors may also be an advantage. It might be argued that this apparent contradiction can 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, supposedly selected for its clarity, 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, 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. The necessary conditions for strength in each individual corner of the diamond are not identified with any clarity so that as Reich (1990) 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’. While that judgment may be unnecessarily harsh, those reviewers who paid attention to questions of method are well represented by Grant’s (1990, p. 542) comment that ‘[A]mbiguity over the signs of relationships, the complexity of interactions and dual causation renders the model unproductive in generating clear predictions’.

To summarise the reviews then, attention focused on questions of definition, the validity of Porter’s claim that a nation’s prosperity is dependent upon the success of the firms for whom it is a home base, the methodology and mode of reasoning, and the value of the diamond model. Despite the fact that in Porter’s schema the full diamond model is strictly only relevant to innovation-driven economies, only two of the reviews made any substantive comment on the stages model of development. The exceptions were Thurow (1990) and Reich (1990), who both saw Porter’s failure to identify the factors which determined whether or not an economy enters the wealth-driven stage of decline as a key weakness.

Porter's admirers saw CAN as an integrating device between different 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 laundry list of environmental attributes and firm behaviours which might or might not help industries succeed in international competition. Both sides, with the exception of a few totally dismissive detractors, saw the need and the opportunity for further work to be carried out, using CAN as a starting point.

In order to give some structure to the review of that further work, the remainder of this paper is organised into three main sections. The first examines the issues arising in respect of the comparison between the concept of competitive advantage and that of comparative advantage. The second examines the conceptual issues which were raised amongst academicians of International Business. The third goes on to consider the empirical studies which attempted to develop and apply the analysis set out in CAN.

CONCEPTUAL ISSUES I: COMPETITIVE ADVANTAGE VERSUS COMPARATIVE ADVANTAGE

The most ambitious claim made for CAN by Porter (1990, p. 20) and others (Ettlinger, 1991; Grant, 1990) was that it rendered economic analysis more relevant 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 success in international trade on the basis of relative endowments of internationally immobile 'basic' factors, while the latter put forward a more useful dynamic explanation based upon the up-grading of factors and innovation. However, both Porter and the reviewers who supported that contention appeared to believe that the economics of international trade ended with the Heckscher-Ohlin theorem (Grant, 1991, p. 240), while in fact more recent trade theory has taken into account most of the supposedly 'new' elements raised in CAN, including the mobility of financial and physical capital, trade based on superior technology and trade based upon differing patterns of consumer preference. (See Caves, Frankel and Jones (1993) for a textbook and Deardorff (1984), Ethier (1984), and Krueger (1984) for survey articles.)

The trade-theoretical claims made for CAN are so easily dismissed that the economics profession hardly bothered to respond to them, *pace* Waverman (1995). Nevertheless, in the broader discussion of international business and national policies, the substitution of ‘competitive advantage’ or ‘competitiveness’ for ‘comparative advantage’ has become sufficiently commonplace to be described as an ‘obsession’ (Krugman, 1994) and to justify closer attention and counter-argument. Governments and industry leaders in countries as diverse as Finland (Ministry of Trade and Industry, 1993), Hong Kong (Berger and Lester, 1997; Enright, Scott and Dodwell, 1997), Venezuela (Enright, Frances and Scott Saavedra, 1996), Switzerland (Enright and Weder, 1995), New Zealand (Trade Development Board, 1990), and Indonesia (Habibie, 1993) have embraced policy initiatives or supported studies based on the belief that the key to their economic prospects lies in the development of their competitive advantage. However, as Warr (1994) points out, the attempt to substitute ‘competitive advantage’ for ‘comparative advantage’ rests on a misunderstanding and a false analogy. The theory of comparative advantage explains which goods should be produced domestically and exported, and which should be imported. It therefore explains to which industries a country’s scarce resources should be allocated if they are to be used most efficiently and national income is to be maximised. It says nothing at all about the superior economic performance of one nation over another, and was never intended to. ‘Comparative advantage’ is about which industries a country should have, while ‘competitive advantage’ is about how firms within industries (especially those of the industrially advanced countries) compete with each other. The elision of the two, and the resulting emphasis placed on the ‘need’ for firms to compete on a basis other than cost, even in developing nations, leads to dangerous policy recommendations whereby poor countries are exhorted to change their product-mix towards more differentiated and ‘high-tech’ products for which their current resource endowments are inappropriate. It is true, of course, that countries with high levels of per capita income tend (with some very significant exceptions) to produce and export more highly-differentiated and ‘high-tech’ products. However, that is because over time they have used the maximised income arising from specialisation according to comparative advantage to invest in the resources needed to differentiate and innovate. Their resource endowments and hence comparative advantage have shifted over time so that they currently lie in ‘up-graded’ products. To encourage

countries which have not gone through that process to shift their resources away from the sectors in which they have a comparative advantage in pursuit of 'up-grading' would be to reduce their current income by reducing the efficiency of their resource allocation, thereby retarding the development today of the resources which might be used for up-grading tomorrow.

CONCEPTUAL ISSUES II: THE VIEW FROM THE ACADEMY OF INTERNATIONAL BUSINESS

While the economists largely ignored CAN, its publication triggered a good deal more activity amongst academicians of international business, including 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 devoted to papers on the application of CAN in the 'Far East'.

Some of these papers serve well to illustrate the confusion caused by Porter's lack of clarity. Daly (1993), for instance, in common with Eilon (1990) and Gray (1991) and quoted with approval by Waverman (1995), claimed to have refuted Porter's claim that exchange rates and wages are unimportant in the determination of competitiveness by showing that export growth and export shares are affected by exchange rate changes and labour costs. However, Porter's definition of competitiveness is in terms of national productivity, not export shares (even if he uses export share figures extensively in his empirical work). His assertion that competitiveness cannot be meaningfully defined in terms of low wages or a favourable exchange rate (CAN, p. 7) is not a claim that export share cannot be increased through those changes, but an assertion that export share gained in that way does not improve the well-being of a nation's residents. Daly's paper refutes a claim which Porter never made.

Two more significant points of contention are Porter's insistence that firms' ability to compete depends largely upon the strength of the diamond in their 'home base' and his assertion that national economic performance depends upon firms for whom the nation is the home base. Both of these have been attacked as inappropriate at a time when the world economy has become increasingly globalized, and the multinational enterprise increasingly important. Dunning (1993, pp. 9-10) points 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' to suggest that their competitive position rests solely or largely upon the strength of diamond in their home base, although their initial move abroad might have been based on those advantages. From the national point of view, it is also clear that the income of a country (the people in one place) is partly determined by the operations of that country's firms in other countries, and foreign-owned firms in their local activities.

These evidently valid arguments echo the comments of many reviewers and suggest that the 'diamond' model should be re-appraised and amended, in line with Dunning's (1993, p. 12) suggestion that 'national diamonds have to be replaced by supranational diamonds'. While the precise criteria on which the diamond might be given a more appropriate geographical basis have never been spelt out, a number of authors have 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) note that the model is particularly flawed if applied to small, open trading economies and they suggest 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 demanding US customers, using resources from both countries, and purchasing inputs from the supporting industries in both places. The same point has been made when the diamond has been considered in the context of other small 'non-triad' nations, as in the case of Austria (Bellak and Weiss, 1993), Australia (Ellis and Pecotich, 1996; Yetton, Craig, Davis and Hilmer, 1992), Finland (Yla-Anttila, 1994), Hong Kong (Davies, Whitla and Kwok, 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 at the conceptual level.

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 papers which focused on these economies took the logical step of noting that the argument is generalizable. If firms in small open economies can draw on the diamond in other countries, there is no reason to suppose that firms in the 'triad' economies

cannot. Small open economies provide the most obvious illustration because firms in such locations very often *must* draw on overseas diamonds because a small economy almost certainly lacks at least one strong corner of the diamond. 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* draw on the diamond in other places as the cases of IBM, Nestle, SKF, Phillips and BAT cited by Dunning (1993, pp. 9-10) make clear. Of course, if even a small proportion of firms in any country are able to draw upon diamonds in any other, the concept of the national diamond is stripped of its content.

A third point of contention between Porter and other academicians of international business concerns his recurring 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, pp. 671). Lau (1994) points out that from an economic perspective, capital flows towards to the locations where it is most highly productive, in which case the inflow of foreign direct investment could actually be regarded as a positive indicator of competitiveness. Dunning (1993, p. 12) suggests that Porter's interpretation of the link between FDI and national competitiveness rests upon the idea that outward foreign direct investment reflects the possession of firm specific tangible assets which give a competitive edge *prior* to undertaking the FDI. While that may be a valid part of the explanation for why individual firms are able to undertake FDI, as in the 'eclectic' model of FDI (Dunning, 1977) and it may be correct to conclude that firms who invest abroad possess important advantages, 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, at the time when the incoming investment took place, local companies were at a competitive disadvantage relative to the foreign incomers. However, that is not to say that residents of the host economy were left worse off, even in the short run, and in the long run local firms may have actually gained through the stimulus of competition and by learning from the incomers. Porter's most basic confusion, whereby he identifies the competitive success of home base companies with the productivity and well-being of local residents, leads to a misinterpretation of the role of the multinational.

This point has been taken up and extended by a number of other authors. Rugman and D'Cruz (1993), examining the Canadian case, note that foreign-owned firms carry out the same level of research and development within the country as domestic firms, thereby creating competitive advantage locally. They also draw attention to the fact that in the Canadian case, foreign subsidiaries export as much as they import. Hodgetts (1993) points out that MNEs have brought technology to Mexico, allowing its industries to enhance their ability to sell abroad and Chia (1994) reminds that residents of Singapore are wealthy despite being almost entirely dependent upon foreign affiliates for both manufacturing output and exports. Liu and Song (1997) take up Dunning's (1995) extension of the Porter model to include 'multinational business activity' as a major determinant of the competitive advantage of firms in a nation. They apply that model to China's recent history and conclude that the country's recent success has been significantly attributable to inward FDI. These findings for the Chinese case are doubly contradictory of Porter's analysis because in common with Lin, Cai and Li (1996) they also attribute 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. In the Chinese case FDI has assisted the development of competitiveness, not hindered it, and that has been done on the basis of the much-maligned comparative advantage, not competitive advantage.

While the most significant conceptual debate concerns these fundamentals, revealing the weakness of CAN's foundations, a significant number of writers pay them little attention. Despite the already all-encompassing nature of the diamond framework and its consequent irrefutability and 'elasticity' (Redding 1994), they prefer to focus on amendments and further extensions which they themselves would like to make. Van den Bosch and de Prooijen (1992) argue 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) adds in custom, history and politics while Van den Bosch and de Man (1994) argue that government, especially at 'micro-level' should be given a more prominent position. Cho (1994), considering the Korean case, suggests that the Porter model of a four-cornered diamond supplemented by government and chance, 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. Why that taxonomy is superior to the Porter model is not explained, beyond noting that it focuses greater attention on the human factors which the author claims to be the source of Korean success to date.

To sum up the response from academicians of international business, they found fault with CAN in respect of Porter's insistence that firms' ability to compete depends on the strength of the diamond in their home base. They pointed out that national economic performance does not depend on that group of firms for whom the nation is the home-base and they found the role of the multinational enterprise to be misinterpreted. They also suggested a series of additions and amendments to the diamond model.

THE EMPIRICAL STUDIES

While CAN's theoretical under-pinning is weakened by the criticisms examined above, much of the book's appeal lies in its marshaling of a huge volume of facts into a coherent pattern showing that strong diamonds are needed if a nation is to have competitive advantage (in the innovation-driven stage of industrial development). That provided a significant opportunity for researchers to replicate the analysis, extend it to new locations, and develop alternative methodologies to test the book's basic propositions.

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). Thirdly, there have been at least ten detailed empirical studies which have directly attempted to test all or some of CAN's central propositions, drawing attention en route to the methodological issues which arise.

Of these ten studies, seven focus on the hypothesis that competitive success requires strong diamonds. Five of these involve at least partial replication of Porter's approach by first using shares of world exports to identify a nation's most competitive sectors and then going on to assess whether those most competitive sectors have strong diamonds in their home base. Yetton *et al.* (1992) re-examine Porter's own analysis for Canada and New Zealand and supplement that with an original analysis for Australia. Their findings are that none of the competitive industries identified in the countries examined have strong diamonds in their home base. As all three countries have high standards of living and productivity per capita, the hypothesis that 'strong diamonds' are needed for competitiveness is refuted. This study also makes two methodological points. The first is that in economies with large endowments of natural resources the export share criterion, which selects sectors as competitive if they have a larger share of world exports than the economy as a whole, identifies resource-based industries as strong and manufacturing as weak, as a statistical artefact. The second is that if a country's firms operate overseas through local subsidiaries, in a multi-domestic structure, they will not be identified as competitive by the export share criterion.

Bellak and Weiss (1993) adopt a similar approach in a study of Austrian industry. Competitive sectors are first identified by using the disproportionate export share criterion but it is then noted that this approach fails to identify an important cluster in winter sports because that sector incorporates an important service element and the organisation of the Standard Industrial Trade Classification (SITC) does not bring together the goods which it produces. It is 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 sectors. In contradiction to Porter's central assertion it is found that for Austria's competitive industries the corners of the diamond reflecting demand conditions and strategy, structure and rivalry were both weak. It is also found that inward foreign direct investment has been important for those industries having high export shares and that both the service sector and chance had a significant role to play in determining which sectors are most successful.

Jacobs and de Jong (1992) also use the export share criterion to identify competitive sectors, this time for the Dutch case. The selected industries are examined for evidence of clusters using

Porter's distinction between 'primary goods', 'specialty inputs', 'machinery', and 'associated services'. Only one Dutch cluster is found to be both broad and deep and Porter's descriptions of the roles played by both 'primary goods' and 'specialty inputs' are found to be flawed. In the case of 'primary goods' an industry may shed these in the process of up-grading, but it will then be measured as having a less deep cluster, despite the fact that it has become stronger. 'Specialty inputs', which Porter describes as being relatively complex and differentiated may in fact be quite simple, not having the role in 'up-grading' which is ascribed to them. 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, so that the importance of the home bases varies significantly from sector to sector. This study also goes beyond Porter's goods-based analysis by examining the service sector, concluding that the Netherlands is strong in 'goods-related service sectors' but weak in 'knowledge-intensive' services.

Davies *et al.* (1995) adopted the same basic approach for Hong Kong by first using the export share criterion to identify competitive industries and then evaluating the corners of the diamond for those industries, paying particular attention to the construction of 'cluster charts', using the methodology set out in CAN. That process shows that Hong Kong's most competitive industries do not have strong demand conditions or favourable factor conditions in their home base. Furthermore, the territory has only one cluster, which is related to apparel, and that is very shallow, there being no competitive sectors in machinery, supporting functions or downstream business. As in the other studies, the necessity for a strong home diamond as a condition for prosperity is refuted.

Suzuki (1994) calculates 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 is examined and export shares for those clusters calculated. This leads to the conclusion that the year 1985, on which Porter based the analysis in CAN, was an atypical one for Japan, with many industries which were identified as competitive losing ground 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 in 'clusters'.

Of these five studies, only Suzuki's results provide any support for CAN, and that resides solely in the finding that clusters came into existence during the transition away from the factor-driven stage of development. The overall conclusion is that the central hypothesis concerning the importance of the home diamond is refuted. Within the logic of Porter's approach, 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 diamond does not need to be in place. 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 judgment on the New Zealand economy, is to argue that prosperity in these countries is 'fragile' and may not be sustained. However, as Yetton *et al.* (1992) note this amounts to the assertion that 'when the facts are not in line with 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 the five studies which replicate CAN, there have been five others which approach the book's findings in a variety of ways, two of them maintaining the focus on the importance of the diamond. The closest of these to the replications is a paper by Ellis and Pecotich (1996) which examines the requirement for a strong diamond by carrying out a large number of interviews in seven firms operating from Western Australia, including pairs of exporters and non-exporters in the same industry. The interviews are used to assess qualitatively the strength of each corner of the diamond, paying attention to both domestic and international conditions. The findings are that none of the firms which were exporting successfully had access to strong home diamonds, although international diamonds might have more explanatory value. Careful examination also suggested that where the domestic 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.

In each of the studies above, the strength of the diamond is assessed through direct observation of the components of each corner, for those industries or firms singled out as competitive. The diamond hypothesis is rejected by finding that competitive industries do not have access to strong diamonds. An alternative approach is taken by Cartwright (1993) who first divides New Zealand industries into two groups, one strongly competitive and highly profitable and the other only moderately competitive and having declining profits. Interval scales are then used to measure the strength of each corner of the diamond for each industry, based on the author's judgment, and two hypotheses are then tested statistically. The first is that the scores for the competitive industries are not significantly different from the 'ideal' scores according to Porter's diamond model. The second hypothesis is that the scores for the less competitive industries differ more from the ideal scores than those for the competitive sectors. Both of those hypotheses are rejected as the highly competitive industries have significantly different scores from the ideals predicted by the diamond model and the less competitive industries actually have scores which are closer to the ideal diamond score than those sectors which are more competitive. This study then goes on to use a case study of the New Zealand dairy industry to exemplify the ways in which that sector draws on parts of the diamond in the United States. In order to test empirically the hypothesis that the competitive strengths of New Zealand's industries are associated with access to 'offshore' diamonds a number of 'offshore' variables are added, measuring the extent to which each industry is able to access corners of the diamond located in other countries. The hypothesis testing procedure is then repeated by first examining a model in which offshore variables are added to the original home base variables, and then by a model including only offshore effects. The results show that for industries which are competitive both of the new models improve the explanation of competitiveness. However, the 'offshore only' version, which ignores home base effects, performs better than that with both effects, providing empirical support for the view that access to the diamond in other countries can be more important than its configuration in the home base.

The remaining three empirical studies approach the analysis in very different ways. Grein and Craig (1996) focus at the national level by identifying 12 variables intended to reflect national strength in respect of the four corners of the diamond. Data is collected on those variables for 49 countries and exploratory factor analysis is used to determine whether four factors may be found empirically. The results suggest that there are three factors or corners instead of the four hypothesised in CAN, the three being interpreted as 'infra-structure/demand', 'competitive investment', and 'education'. The factor scores for each nation are then used as the independent variables in regression equations which seek to explain three dependent variables - GDP per capita, net exports per capita and inward FDI per capita. The results show that the factor scores are very effective in predicting GDP per capita across the full sample of 49 countries in both 1960 and 1985, and they have some success in predicting inward FDI per capita. However, they do not perform well in predicting net exports per capita. Separate regressions for industrialised and developing nations give significant results for net exports per capita from developing countries, though not for industrialised nations, with some differences between 1960 and 1985. The separate regressions also give significant results for inward FDI for both groups of countries. While the national level approach is in direct contradiction to Porter's focus on industries, the authors see some support for CAN's stage model in the finding that in 1960 'infra-structure/demand' was the most significant determinant, while in 1985 'competitive investment' had become more significant. However, the main implications which are claimed in respect of CAN are that a group of factors determining economic performance are identified, but that they differ from the four corners of the diamond, suggesting that it requires amendment, particularly in respect of recognising 'education' to be an important 'corner' in its own right.

Dominguez *et al.* (1993) focus on a sample of 253 nontraditional exporting companies in Central America, in order to identify the impact of environment, strategies, competences and motives on export performance. Data are collected on export performance and clustering is used to group firms by their performance characteristics. Factor analysis is then used to identify three factors representing strategy and two reflecting underlying competences. The environment is represented by measures of labour-intensity and national location. Logistic regression is then used to test the impact of strategy, competences and environment on membership of the different performance groups and

analysis of variance is used to test whether labour-intensity or location account for differences in motivation, competences or strategy across performance clusters. The analysis is interpreted as an exploratory study of Porter's framework which is interpreted as predicting that the highest performing firms would be in labour-intensive industries in Honduras and Costa Rica. The results arising from this rather baroque methodology show that membership of the different performance groups was not significantly determined by either labour-intensity or location and that managerial factors were more important. However, labour-intensity and location did positively affect the managerial variables, notably motivation and competences, thereby having an indirect and positive effect on performance. Porter's assertion with respect to the ways in which firms compete in the factor-driven stage is found to be largely supported by these results for that reason.

Finally, Healey and Dunham's (1994) paper illustrates the extent to which some authors have re-interpreted CAN in order to use it as a lens to focus on different issues. In this case the analysis is concerned with explaining the changing competitiveness of a city economy in the United Kingdom, where competitiveness is not measured in terms of productivity or export market share, but in terms of employment. The diamond model is accepted as valid and is used as an organising framework to examine the changes in the city's corners over a period in which employment increased significantly. As each of the four corners is found to have some influence in explaining the change in the city of Coventry's competitive advantage, the conclusion drawn is 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 are undermined by three very basic elisions or confusions. The first is between 'competitiveness' construed as productivity and 'competitiveness' construed as the market share held by a sub-set of industries. Porter begins by clearly opting for the former interpretation but then shifts 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 cannot elucidate the basis for prosperity. The second elision is 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 is to explain the prosperity of the nation in the first sense, the analysis is 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. The third elision lies in interpreting '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 these elisions is to create a gap between that which is to be explained and that which is 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 fails the basic tests which may be applied to any piece of research in respect of rigor. It contains no set of 'ex ante' hypotheses which are tested on an appropriate set of data. Instead, the conclusions are drawn from the data in some unspecified manner. Factors which are found to support competitive advantage in some circumstances are 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 consists solely of industries identified as 'successful', thereby preventing any comparison between industries exhibiting different levels of performance. The central conclusions are better described as hypotheses and these are specified in such an 'elastic' way that they can only be refuted by being re-formulated more tightly.

At the empirical level, all five of CAN's major propositions are refuted if they are framed tightly enough for refutation to be possible. 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 very often do not 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 (1990) judgment from 'gloriously rich but hopelessly intractable' to 'hopelessly rich but gloriously wrong'.

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NOTES

ⁱ A search of ABI/Inform, ABI/Inform Research and UMI Periodicals Abstract at the beginning of 1997 identified 34 reviews, 48 refereed papers and 6 unpublished PhD dissertations.

ⁱⁱ Having defined competitiveness for himself, in terms of market share, Eilon (1990) notes that productivity may partly determine competitiveness but that it may also be assisted by low wages and low exchange rates and that Porter's dismissal of these as sources of competitive advantage is therefore misplaced. This line of argument is one which was taken up by others in the empirical work (e.g. Daly, 1993). However, it may be argued that Porter's definition of competitiveness is more complex than simply market share, requiring increasing returns to residents of the nation. This renders invalid the argument that competitiveness may be enhanced through low wages or exchange rates.

ⁱⁱⁱ This gap is half-closed, adding further confusion, by the way in which Porter's empirical work identifies a country's most competitive industries. This is done by first selecting those industries which have a higher share of world exports than the country's average. That is measuring the competitiveness of firms located in the country, including those whose home base is elsewhere. However, having selected industries in this way, adjustment is made in some 'ad hoc' fashion to further include industries which have significant market share overseas through foreign direct investment. No attempt is made to de-select industries which have high export shares on the basis of high levels of inward investment. The industries selected therefore correspond to neither of the possible objects of the analysis. They are not necessarily industries where home-based firms have a significant world market share, because the high export share criterion may be met by the exports of local branches of foreign firms. Nor are they industries where operations located in the country under scrutiny are securing large market shares, because of the 'ad hoc' adjustment for shares held by outward foreign investment. The case of Singapore illustrates this problem vividly. That city-state's manufacturing output and exports are almost entirely attributable to the subsidiaries of foreign firms.

^{iv} The book does have a Methodological Appendix but that only explains how the 'cluster charts' were drawn up.

^v JoFEB has since been re-named the Asia-Pacific Business Review.