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Business research as an educational problem-solving heuristic – the case of Porter's diamond

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Abstract *Explores the link between research practice and business education. The work of Michael Porter has a long association with the field of marketing. Focuses on the Porter's diamond model of national competitive advantage (1990). Draws on recent experiences from an empirical investigation into sources of competitive advantage and suggests that the model is useful as a conceptual framework for practitioner-orientated discourse concerning developmental issues. Outlines the process of review that led to a set of specific action outcomes. Doing so highlights the reflective nature of the research process and provides insights into the usage of theory in a pragmatic manner. In particular, suggests that for those "less steeped in the management life-world" such an account may facilitate a reflective turn in their appreciation of the relationship between marketing management theory and practice.*

Introduction

This paper examines the interrelationships between theory, research and education through a focus on the contribution to education from a specific empirical test of Porter's (1990) theoretical approach. It highlights the reflective nature of applied empirical work through a focus on the research process. Motivation for the paper is a sense that many "customers" of management teaching process education in a manner that lacks adequate reflection. Outlining research experiences in an open manner paves the path for students to think about models in more critical, reflective and pragmatic terms.

Section 2 summarises the link between Porter and the marketing discipline. It is impossible in this paper to outline fully the impact of Porter on the marketing field, however, it is clear that Porter is an influential force. At a general level, Porter provides coherence within the strategy field by critically importing economics, particularly industrial organisational economics, thereby providing a point of reference among strategy scholars (Foss, 1996). More specifically, marketing researchers can rely on the contextual role of the diamond model as a tool to facilitate industry and competitive analysis.

Section 3 outlines Porter's (1990) diamond model and his argument for a generalisable solution for the problem of national competitiveness. The core

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proposition grounds competitiveness in a domestic environment. The geographic proximity of a set of determinants can lead to systemic clustering which correlates with successful industrial performance.

The final section examines how the empirical findings and theory (not just Porter) combine to develop a suitable and appropriate strategy for development. It highlights the role of judgement, continuous reflection and the interaction between theory and data as central to this process. Thus, despite obvious weaknesses in Porter's theory it is useful as a problem-solving device. The paper suggests that students exposed to other similarly less-sanitised accounts would be encouraged to interact with theory in a more meaningful manner.

Competitive advantage, marketing and Porter

Competitive advantage is the means by which firms achieve success. As such, it is not within the domain of any single academic discipline. However, a review of approaches for building competitive advantage illustrates that marketing plays a central role. A number of popular approaches include: strong market positions with products and services not easily substituted, entry barriers, strong bargaining position, mobility barriers; balanced portfolios; core competencies, innovation and speed or time based competition (Eccles and Nohria, 1992). The predominant emphasis is on enhancing, balancing and protecting market positions. As such, competitive advantage is a primary concern for the marketing function within organisations.

In addressing competitive advantage, marketing has drawn extensively on the work of Michael Porter. Porter's "five forces model" (Porter, 1985) provides the basis for structural analysis of industries in most texts (Baker, 1992; Bradley, 1995). Porter's model has also popularised what had tended to be the domain of macro-economists, namely the study of competitiveness. It suggests that study of firm advantage needs to take place in the context of a national environment. The national environment is conceptualised as four determinants (and two exogenous variables) labelled the "diamond". The model advocates that any study of competitive advantage at firm level must take place within the context a particular domestic competitive environment or diamond. Thus, increasingly, marketing courses and texts incorporate the diamond as part of the analysis of industry (Baker, 1992).

An essential innovation in Porter's work is its translation of ideas and concepts from different fields into a framework that is accessible to business researchers across various disciplines. The model presents a dynamic and evolutionary view of the creation of firm advantage based on a number of traditions, for example, it draws on industrial organisational economics and resource based theory. Thus, Porter not only provides a model for strategy research, he also provides a point of reference for the evaluation of research.

Overview of Porter's theoretical perspective

Porter's study continues a tradition that dissents from neo-classical economics with its emphasis on the self-adjusting nature of markets. Porter's theory of competitive advantage is one of a number of theories that place geographical industrialisation and innovation at the centre of the process of development and competition. An extensive review of Porter's (1990) model is contained in O'Connell *et al.* (1997).

Porter's explanation focuses on particular industries within the nation. Certain characteristics of the home nation give rise to competitive advantage and geographic concentration and rivalry enhance this process. Figure 1 outlines the components of the model and its systemic nature. The figure suggests that although the four determinants always interact somewhat, the systemic nature of the diamond is itself variable. Porter's work contains a particular argument about the forces that transform the diamond into a system and the effects of this.

Porter argues two elements – domestic rivalry and geographic industry concentration – have especially great power to transform the diamond into a system. Domestic rivalry does this because it promotes upgrading of the entire national diamond. Geographic concentration transforms the diamond into a system because it elevates and magnifies the interactions within the diamond. The final link in Porter's argument is that the systemic nature of the diamond promotes clustering, that is, vertical and horizontal linkages between industries.

There is considerable support, for the proposition that successful industries usually are part of competitive clusters, arising from research in a range of different countries reported by Porter (1990). Further studies undertaken by research teams in other countries; include Cartwright (1993); Rugman and Verbeke (1993) and Beije and Nuys (1995). These broadly support the findings on the importance of clusters for competitive advantage, albeit with varying degrees of agreement on some points and both additions to and qualification of others. In addition, complementary work on linkages and networks carried out by other theorists, for example within the industrial district and network paradigms, have clear parallels with Porter's concept of the cluster.

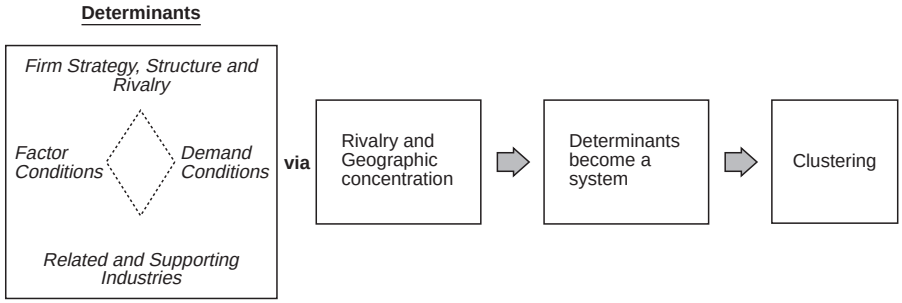

Figure 1.
Determinants of competitive advantage and clustering

Source: O'Donnell (1994)

Furthermore, work on new trade theories and economic geography also show clear similarities with these ideas (cf. Martin and Sunley's (1996) analysis of Krugman's work).

Thus, Porter has unquestionably attempted to create, and has encouraged a research agenda that is attempting to produce, a robust explanation for the development of competitive advantage. Certainly, Porter is clear that the presence of an effectively functioning diamond will address deficits in national competitiveness.

Clancy *et al.* (1997)[1] examine the development of competitive advantage in an Irish context. While other theorists were considered, for example Best (1992) and Whitley (1992), the project increasingly focused on a test of the applicability of Porter's model. The importance attributed to clustering in previous Irish policy analysis (Industrial Policy Review Group, 1992) and the popularity and comprehensive nature of the diamond accounts for this focus. The paper emphasises the interpretation of individual findings in the context of an existing body of theory. It provides an account of an emergent and reflective process that resulted in a specific set of policy options.

Lessons for marketing management education

The following account argues that Porter's model is incomplete as a scientific theory of development. Nonetheless, it proved useful as a conceptual framework for practitioner-orientated discourse concerning developmental issues (O'Donnell, 1998). However, Hackley (1998, p. 97) suggests that this level of reflectivity is unlikely among those not "steeped in the area", instead, education, for these, may "constitute an unreflective process of learning to recite tautologies". It is exactly this concern that prompts this paper.

Outlining the research experience shows that pragmatic informed subjective judgement based on an intelligent assessment of the existing body of theory is an essential part of business research practice. However, the problem remains to persuade others, particularly those less familiar with practice, that this is the case. After all, an examination of Porter's model in a textbook suggests that lack of competitiveness is a rather straightforward problem, solvable through filling the "gaps" in a nascent cluster. This belittles the difficulties with which practice is replete and which require considerable judgement and reflection. Consequently, what follows is a largely non-sanitised account of the process of research and the continuous reflection that took place.

The potential benefits from such an exercise outweigh the obvious risk to the authors' credibility. It aims to support research publications that not just admit but celebrate the inadequate, partial and evolving nature of management models. Therefore, this section concentrates on a number of the prominent problems and their resolution. The account highlights the tensions, contradictions and difficulties applying theory in research. The underlying rationale is that a clearer realisation of the nature of the limitations of models and theories may enhance student education by facilitating a more reflective turn in students' appreciation of marketing management theory and practice.

Clearly defining in a rigorous and objective manner the relationships in a model is prerequisite to any scientific test of its validity. However, Porter (1990) poorly defines many of the important core concepts. This limits its precision and leaves it weak in generating clear predictions on which to formulate policy recommendations (Grant, 1991; Beije and Nuys, 1995). Thus, the group expended considerable time and effort analysing the theoretical and operational specifications of the model.

An example of the lack of clarity is Porter's treatment of the terms "cluster" and "clustering". They are used much more often than they are defined, and the central concept being debated often remains unclear. Porter (1990) defines clusters in various ways. He talks of "clusters of industries connected through vertical and horizontal relationships" (Porter, 1990, p. 73). Later, he defines clusters more broadly as "consisting of industries related by links of various kinds" (Porter, 1990, p. 131). He also states that the "systemic nature of a diamond promotes clustering" (Porter, 1990, p. 148) and the "reasons for clustering grow directly out of the determinants of national advantage and are a manifestation of their systemic character" (Porter, 1990, p. 149). Porter defines clusters as linkages between competitive related and supporting industries, which are in turn just one of the four determinants of competitive advantage. Thus, he appears to confuse the concept to be explained with part of the explanation for it. Furthermore, the capacity for clustering to stimulate and facilitate a capacity to learn, upgrade and innovate does not lend itself easily to measurement, since the explanation resides in part in more nebulous and abstract cultural and sociological concepts.

A model which does not provide clear bases on which to make predictions can lead to problems, as the following accounts illustrate. In various ways, domestic demand conditions, in the Irish software industry have had a significant positive influence on developing the competitive advantage of many firms in the indigenous software industry (O'Gorman *et al.*, 1997). However, there are undoubtedly some indigenous software companies for whom domestic demand conditions have been of little or no relevance. Furthermore, there are also indications that the influence of domestic demand has become less important as time elapsed. Thus, a large majority of indigenous software companies agree that interactions with their customers in Ireland have been beneficial for the development of their businesses. However, some of these state that this applied mainly to the early development of their firms, before they became very highly export-oriented. In addition, most companies say that meeting the requirements of customers in Ireland is at least an adequate preparation for selling to export customers. However, there are some companies, most of them relatively new, which have started by exporting without selling in Ireland first. Porter's model is somewhat imprecise, to the extent that it is not entirely clear whether these findings contradict the model or not.

Further examples in the music and dairy sectors illustrate the difficulties. In the music industry, it is difficult to establish with certainty the impact of, for

example, language as a source of international competitive advantage. It is possible to argue that it has contributed (Clancy and Twomey, 1997). However, at what point does the contribution become the basis for international competitive advantage? The problem is that no measure of relative strength is available on this and many of the explanatory variables in Porter's model. Furthermore, in the dairy industry, for example, research institutes are significant, but Porter provides little basis on which to decide if they contribute to competitive advantage. While a measure based on research output is possible it will not capture the important interaction affect namely, how is the interaction between institutions and other elements of the diamond measured? This highlights the ambiguous nature of the model.

While many aspects of Porter's determinants of competitive advantage are, in fact, significant influences on competitive advantage, the three sectors analysed do not always correspond fully to the expectations of Porter's model (O'Connell *et al.,* 1997; Clancy and Twomey, 1997; O'Gorman *et al.,* 1997). The influence of domestic demand, rivalry and suppliers is not always a key influence on at least some parts of the industries and is often overshadowed by characteristics of foreign markets.

For example, in relation to demand, the dairy industry illustrates that domestic demand is a significant influence. However, two important caveats apply. First, external demand conditions, created by the CAP, tend to overshadow the effect of domestic demand on the product portfolio of the Irish dairy companies. Second, many companies in the dairy industry are fostering intensive and beneficial relations with retail and industrial customers located abroad, relations that can be as significant as links with customers in Ireland.

Further, domestic suppliers had a limited effect on competitive advantage in all three industries. For example, in the music industry, most internationally successful artists avail of supplier inputs from abroad and the important supplier industries in Ireland are relatively weak.

Moreover, foreign-owned MNEs in Ireland play an essential role in the development of competitiveness. In Ireland, over half of the product categories with large exports, and a relatively large share of world exports, come from industrial sectors that are predominantly foreign-owned. It certainly questions the validity of Porter's exclusion of foreign owned firms as sources of competitive advantage for the host country. Indeed, for many Irish companies or parts of sectors, foreign-owned MNEs in Ireland have had significant positive influences. For example, in the indigenous software industry – as customers, as developers of labour skills, and through various forms of formal co-operation or alliances.

Finally, the research challenged Porter's core proposition that sectoral specialisation is a phenomenon associated with growth. In Ireland, economic growth is occurring and yet it is extremely difficult to find clear examples of specialisation in competitive indigenous sectors. Relatively high levels of growth in indigenous industry have occurred across a range of different sectors, however, many of these were quite weak to begin with, and remain not

truly competitive in the sense implied by Porter. Nonetheless, Ireland's recent economic performance has been exemplary (National Competitiveness Council, 1998).

These findings raise concerns in relation to using the diamond as an analytic technique. First, central to Porter's model is that geographic proximity augments the impact of the diamond. In this regard, this empirical evidence seriously challenges the dynamic that underpins the model. Second, it is clear that the emphasis on the special importance of customers, competitors and suppliers that are located within national boundaries is not always reflected in the sectors studied. Third, for at least some parts of the three industries, the influential customers, competitors and suppliers are located abroad rather than in Ireland. However, it is unclear what significance attaches to these findings. In particular, the scarcity of indigenous sectors which are competitive in Porter's sense makes it difficult to make any conclusive recommendations on the validity or otherwise of the model.

Thus, the evidence of clustering in Ireland is limited. In simplified terms, this may indicate either under development or alternative development. Strong national economic performance undermines the former. The latter seems rather speculative and may be difficult to substantiate. The resolution of this debate was time consuming. However, ultimately Porter's model facilitated a healthy and productive debate both within the group and with others (cf. O'Donnell, 1998). Throughout this discourse, Porter's model provided the terms of reference. Ultimately, the conclusion on Porter was less important than the policy solution that emerged.

Thus, while the group did not accept Porter as the guiding framework for development of Irish competitive advantage[2] the analysis was not limited to this finding. The "problems" summarised above are used to develop a unique strategy of development. Thus, a desire to derive value from the research resulted in the following recommendations for government policy:

- Support for the emergence and development of groupings of connected companies and industries, however, the groupings recommended can be quite different to Porter's clusters.
- Support for existing set of industrial policies to be continued.
- Attraction of FDI with certain characteristics to be continued – those characteristics to include a requirement for skilled labour, local sourcing and compatibility.
- A strong focus on technology, however, particular emphasis to be placed on acquiring and further developing technology from abroad.
- Support for co-operative alliances between companies (Clancy *et al.,* 1998, pp. 41-5)

Further, the international dimension of Irish business both inward, in terms of linkages with foreign owned MNEs, and outward, in terms of the impact of international expansion by Irish industry, require exploration that is more

detailed. These features, in particular the former, tend to be discounted by Porter (1990).

The course of action rejects any Procrustean tendencies. Thus, the account demonstrates resistance to accepting the universal validity of the model and does not suggest that Irish business practice and industrial policy needs to change to fit the diamond. For example, reduced reliance on foreign owned MNEs is not suggested. Instead, the researchers suggest a set of policy alternatives informed by Porter (and other theorists, for example Staber (1996)) but not dictated by Porter. The spirit of the conclusions is certainly in line with Porter's thinking, for example the emphasis on the importance of sectoral linkages and the salience of technology. However, the content is often at variance with Porter. For example, in suggesting that Ireland continue to attract FDI and rely on imported technology in certain areas to supplement national resources, the conclusions are at odds with Porter (1990). Therefore, whether the conclusions are supportive of Porter or not became a secondary issue. The primary concern is to develop a set of policy recommendations that the authors adjudge to suit the particular characteristics of Irish industrial development. Doing so uses theory pragmatically as a guide to decision making; it provides a context for informed reflection and discussion on the importance of particular findings.

Conclusions

The paper shows the difficulties inherent in effective research. The underlying intention is to demonstrate to students of management and marketing education, in particular those uninitiated in the management life-world, that theory is an extremely powerful instrument when used reflectively. In this regard, the group confirms an informative role for theory.

The paper highlights that theory is useful for probing and examining a particular issue and providing a source of coherence as the problem-solving evolves. The essential notion is that the relationship between theory and its users must always be open to evaluation and reinterpretation through the process of research whether "real world" or in the "classroom"

However, this seems too obvious, almost banal. After all most students of business have a notion that theory is unreal or suspect – almost by definition. The problem is that to move beyond simple assessments that theory, such as Porter's diamond, the product life cycle or the Boston Consulting Group matrix, are right or wrong requires more detailed accounts of how these ideas are used by the academy that takes primary responsibility for them. Thus, accounts need to focus on the pragmatic employment of theory to develop effective and workable solutions for specific contexts. This might encourage a more reflective, pragmatic and critical appreciation among students of management education concerning the potential of theory.

In this vein, the paper highlights how research findings are purposefully employed in tandem with the dominant framework(s) to arrive at specific actionable solutions for the development of competitive advantage. This

recognises the intrinsic value of theory as an investigative tool in pursuing a deeper understanding of the particular business situation. It admits, unapologetically, that theory and the particular uniquely intertwine and confirms the role of judgement in the development of business knowledge.

Notes

1. The project carried out on behalf of The National Economic and Social Council of Ireland (NESC) lasted over two years, and involved extensive analysis across a number of sectors. In-depth work focused on three; dairy, software and music.
2. This judgement was made on the basis that while no single piece of evidence disproves Porter, the evidence taken as a whole amounted to a serious challenge to the validity of the model.

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