Porter's Diamond and its Relevance to Irish Trade

Barbara J. O'Toole - Senior Sophister

Porter's 'Diamond' proposes several basic elements which govern a country's trading competitiveness. The theory propounds demand, factor and inter-firm conditions as the rudiments of a healthy open economy. Barbara O'Toole's analysis finds the theory inapplicable to the 'emerald isle' which has implemented industrial policies more like millstones than gems.

Introduction

The conventional wisdom of international trade is challenged by Porter's Model. He argues that the factor endowment theories of Heckscher and Ohlin are too simplistic to determine a nation-state's competitive advantage. Comparative advantage can no longer be seen as 'divine inheritance'. Porter states that international success in a particular industry is determined by four broad mutually reinforcing factors which create an environment which enables these firms to compete. The four include factor conditions, demand conditions, related and supporting industries and firm structure, strategy and rivalry. These determinants also being influenced by the nation's government and by chance events. In theory, to apply the model one should look at the Irish export statistics which indicate the industries in which the country has a competitive advantage and then when analysing the competitive environment using the four determinants one should find an environment which fits the industry and is conducive to its success. The export statistics indicate that Ireland has a national competitive advantage (NCA) in both the manufactures of automatic data processing and office machines and in chemical and pharmaceutical products. However this paper will attempt to argue that the model fails in an Irish context because the competitive environment does not in fact 'fit' these industries. To illustrate this argument this paper will discuss each determinant of the model in an Irish context, however, before doing so it is necessary to provide a brief background of Irish industrial policy.

Irish Industrial Policy

The key features of industrial policy in Ireland have, for the most part been the same for four decades. The three key elements of direct investment incentives and tax concessions to stimulate industrial activity; the focus on foreign direct investment (FDI); and the transition to free trade were all part of the First National Plan. The rationale behind the attraction of FDI through grant and tax concessions was first to remove the weaknesses in technology and marketing evident in the indigenous sector for decades; second to upgrade Irish industrial skills; third to supplement the lack of Irish entrepreneurial initiative and finally (and most importantly) to contribute to the development of the indigenous industrial sector. It was assumed this could be achieved through the positive spillover effects from profit reinvestment and through the establishment of supply linkages between foreign and indigenous companies.

In the early 1970's most effort was concentrated on attracting the 'high tech' sectors which included the electronics and chemicals industries. It was assumed that Ireland would have a comparative advantage in competing for FDI because of her relatively well educated workforce aided by a 10% corporation tax rate for the profit of manufacturing industry until 2010. In the 1970's and 1980's it appeared this strategy was paying off as the country witnessed a substantial growth in Irish based pharmaceutical, electronics and machinery sectors. Also, there was a dramatic change in the sectoral composition of Irish industry as the engineering, metals, chemical and pharmaceutical sectors replaced food as the largest employer. Currently approximately 75% of Irish manufacturing exports come from the subsidiaries of foreign firms and they account for 86% of production compared to 33% for indigenous firms (O'Hagan). One may argue that the growth of modern high tech sectors is not surprising and is a positive feature of most industrial economies, however, the aggregate trade statistic figures conceal the '*dualistic nature of the Irish economy*.'(O'Hagan) Alongside a modern foreign owned sector with high levels of productivity coexists a traditional indigenous sector with low productivity which has been in decline since the 1970's. It is with this background in place that the author applies Porter's Diamond to Ireland's trade statistics.

Factor Conditions

Porter states the traditional factor endowment argument of standard trade theory is too simplistic. He argues that the factors most important to comparative advantage are not inherited, as Hecksher-Ohlin argue, but are created and that the broad categories of land, labour, and capital are too general. He divides factors into basic and advanced, generalised and specialised. Basic factors such as natural resources, climate and un/semi-skilled labour are 'passively inherited' while advanced factors are those whose development demands large and substantial investment in human and physical capital. The distinction of generalised versus specialised is based on their ability to perform tasks. Generalised factors are available in most nations. They can be sourced on global markets and their activities can be performed at a distance from the home base, whereas specialised factors are developed with considerable investment from the generalised factors. Porter argues that sustainable competitive advantage exists when a nation state possesses the factors necessary to compete in particular industry, which are both advanced and specialised.

Given that the statistics indicate that Ireland has a NCA in the 'high-tech' industries it would be logical to assume that both advanced and specialised factors were both present in Ireland and used in these industries. It can also be assumed that because these industries are dynamic that these factors must continuously be upgraded. However, in Ireland, this is not the case as basic and generalised factors are predominantly used. Despite the fact that the products produced are increasingly 'high-tech', the tasks that Irish employees perform in these industries are predominantly low skilled and the percentage of skilled workers used in the subsidiaries of multinational companies (MNC) compares unfavourably with other developed countries. This seeming anomaly can be explained because MNC's base most of the advanced specialised factor activities in their home country, therefore technology, marketing, innovation and industrial expertise are imported into Ireland from the parent country. The investment in the continuous upgrading of factors also takes place outside Ireland and there is little incentive for these companies to conduct similar investment in Ireland. This lack of interest in investing in or creating Irish advanced and specialised factors is evident from financial behaviour - repatriated profits, royalty and dividends have left Ireland at a fast and rising rate since the 1980's. Their contribution to the positive macro performance of the economy is based on the capabilities which are embedded in their own economies rather than those present in the domestic economy. These enterprises have also made little direct contribution to the learning process which Porter cites as being essential to NCA, therefore Irish factors are not generating knowledge and skill to form the foundations for a more sustainable NCA which is indigenous rather than foreign owned. Overall it is not necessary for Ireland to possess the advanced and specialised factors to compete in the 'high-tech' industries which dominate the trade statistics and yet the country appears to have its NCA in such industries.

What factors are actually present in the Irish economy? At the time of the Telesis Report in the 1960s the low level of skilled factors was identified, but since then indigenous companies have continued to concentrate on low skill, low value added activities with only modest improvement in marketing and technological sophistication. This dependence on basic-generalised factors has not necessitated reinvestment on the part of indigenous firms to upgrade these factors, nor has it necessitated their lobbying pressure on the Government to provide them with more advanced-specialised factors to use. The large successful Irish companies have grown due to their 'defender-like strategies' (Miles) i.e. they stick to what they know best, do not innovate and do not reinvest. In short if they prove successful at one activity they remain with it. One must remember that a key rationale behind FDI was its positive spillover effects to the domestic economy through impacting on the activities of domestic firms - it would appear this has not occurred. However, the model states factor conditions cannot be relied upon solely to generate national competitive advantage as demand conditions, related and supporting industries and firm strategy, structure and rivalry must reinforce each other.

Demand Conditions

Porter argues that local demand is at the root of national advantage. In this he has the agreement of S. Buterlino-Linder who theorised that countries were 'myopic' in the sense that they first supply their domestic market and then export to markets with similar demand patterns. Linder argued that countries will not think of an idea unless domestic demand forces it to, therefore need domestic demand to get a comparative advantage in these products. Porter himself sees this as occurring through a number of channels. First through the pressure placed on producers by buyers to innovate; second through sophisticated domestic buyer needs providing a window into more advanced buyer needs and finally through economies of scale. This argument falls down in Ireland's case on three key points. First, the home market segment in Ireland is too small to reap significant economies of scale benefits and there is little incentive to invest aggressively. Therefore, it is unlikely that a large percentage of Irish firms develop products with only the Irish market in mind. Demand conditions in the UK market are as, or more important, given the close proximity of the UK market and the historical links between the two countries. This is evidenced by the close trade linkages between the economies. This heavy dependence on the UK market has fallen dramatically over the last 35 years but it is still Ireland's largest customer. Second, are Irish buyers truly sophisticated ? In Ireland it is considered poor performance on the part of the buyer rather than the seller should he complain about a defective product, a complaint being more a reflection of his poor character than the poor product quality. Porter found something similar in his New Zealand study where the British 'stiff upper lip' attitude prevented complaints. In Ireland's case this reduces the pressure on producers to continuously upgrade or improve their products or production because buyers, for the most part, accept what they are given. Finally, it seems highly unlikely that the dramatic shift (late 1970's early 1980's) in the composition of Irish sectoral output from low value added uncompetitive food products to machinery, chemicals and pharmaceuticals was driven by local consumers switching their consumption from beef to organic chemicals! Therefore the demand conditions in Ireland do not fit those required for 'high-tech' industries in which Ireland has a NCA.

Once again Porter states demand conditions alone are unimportant as they depend on other parts of the diamond such as strong domestic rivalry. He states without this rivalry, rapid domestic demand equals complacency.

Related and Supporting Industries

If there exists a close working relationship between companies within an industry an *'ongoing coordinating process of innovation and upgrading will result where access to information, new ideas, insights and innovation will occur'*. Also if competitive advantage exists in related industries then ' *opportunities abound for positive interchanges and new opportunities are continually perceived*'(Porter 1990). This part of Porter's argument has strong support in advanced industrial economies where 'industrial cluster' exists and a cumulative learning process is the result.

In essence this was the reason for the attraction of FDI to Ireland. The 'hands off' industrial policy assumed that once the correct financial incentives were in place 'industrial clusters' would evolve. This would occur because the positive spillover effects would cause greater demand for inputs and the establishment of strong supply linkages, thus forcing indigenous firms to become more competitive. The Culliton Report recommended the actual promotion of industrial cluster - but this interventionist stance was not adopted.

However 'industrial clusters' did not evolve and the low level of linkages between the indigenous and foreign owned sector is a trend which has continued from the time of the Telesis Report. In the office machinery sector, which is the highest growth sector of the foreign group, linkages in the late 1980's and into the 1990's were particularly low as this group sourced just 4% of their input needs in Ireland. For its counterpart, the electrical and chemical sector, this figure ran less than 7%. This absence of the positive spillover effects was noted in the OECD Report of 1993, in particular the disappointing private service sector employment growth levels as they had been the main engine of job creation in most other OECD economies. The report noted that ' *because these firms receive capital grants they use less labour per unit of capital and rely heavily on foreign affiliates of their inputs*'(OECD 1993), there has been limited spillover effects.

It would appear that the 'high tech' industries do not have, nor need, a strong support network in Ireland and because a close working relationship does not exist they do not put pressure on indigenous firms to innovate and to become competitive. Therefore the pressure for competitive advantage in related industries are absent and opportunities for positive interchanges and the perception of new opportunities do not occur. The two sectors operate, for all intents and purposes, in two separate economies.

As an aside there are those who argue that the benefit of employment creation of MNC's outweighs the costs. It must be borne in mind that these jobs are not created without costs. Between 1981 and 1986 Ireland had one of the highest levels of Government aid to industry among EU countries and research conducted at DCU revealed that just under 50% of foreign firms grant aided since the mid-1970's are no longer in business and that the number of jobs provided by foreign firms typically peaks a few years after their receipt of grants (Sunday Tribune). From the author's perspective this creates three problems. First, it induces a 'grant mentality' in indigenous companies and takes the pressure off them to be innovative and competitive in international markets. Second, it acts as a 'quick-fix' approach to industrial policy and employment creation. Finally, the opportunity cost of this investment includes investment foregone to indigenous industry to make it more competitive, possible tax reform measures to facilitate employment creation or greater R&D expenditure, to name but a few. To embellish on the final point of R&D expenditure, Ireland ranks well below other advanced industrial economies (1991 Stats) despite improving since the late 1960's, therefore the continuous innovation which is necessary to compete in these high technology industries is not occurring in Ireland. Continuous innovation to Porter is *the* source of sustainable competition, but is not viable in Ireland at the rate of other advanced industrial economies thus entailing that it remains a low value-added country. Once again this conflicts with the statistics as a NCA in 'high-tech' industries require heavy R&D expenditure and the ability to innovate.

Firm Structure and Strategy and Rivalry

Due to the scale of this determinant, this paper will concentrate on the first component of structure and deal briefly with the other. Porter argues that vigorous domestic rivalry is strongly associated with competitive advantage in an industry and that success does not grow from one or two firms experiencing economies of scale due to their dominance of the market - only in a closed economy will dominance be profitable. He goes on to say that domestic rivalry creates pressure to innovate and upgrade NCA as local competitors imitate new ideas and the whole industry benefits from overall industry innovation.

However in the very open Irish economy the subsidiaries of the MNC's are highly successful while dominating certain industrial sectors. They do so in the technologically sophisticated industrial activities where no significant rivalry exists and where indigenous firms are far too weak to compete. Their dominance is aided by the structure of indigenous industry which is predominantly small autonomous manufacturing companies. Nearly 65% of the private industrial sector is concentrated in enterprises of less than 100 employees and little co-operation takes place between them.(IDA) However, apart from these structural barriers which make the competitive environment prohibitive there are other disincentives for Irish firms to imitate MNC activities and compete in these sectors. Foreign subsidiaries have the backing of their large parent corporations who benefit from significant learning and scale advantages, advanced and specialised factors and a stock of financial resources for investment in the same.

Imitation of ideas is also constrained not only by the above, but also by the absence of a concerted attempt by the government to gain access to the technologies these companies develop and utilise in order to diffuse it to their indigenous counterparts. The Irish 'hands off' policy stands in stark contrast to the polices of other countries, in particular, the rapidly growing East Asian nations. In these countries the governments have set up agencies in order to learn about the technologies which MNC's bring with them in order to integrate them into indigenous industry.

Porter also states that new business formation will create new competitors and '*feed the process of innovation*'(Porter 1990). But new business formation is not a significant threat to competition in the Irish case. In a recent report by Forbairt it was found that over 60% of new businesses will fail within 5 years and each year about 600 companies are officially liquidated - this despite the favourable economic climate and the generous grant aid available(IDA). Data complied by the Department of Enterprise and Employment indicated that 57% of Irish companies fail while only 43% of foreign companies failed. If this trend continues foreign companies will continue to dominate.

Therefore, Ireland appears to have a competitive advantage in industries in which there is no vigorous domestic rivalry and where success has grown out of a small number of firms experiencing economies of scale due to their dominance, despite the openness of the Irish economy. There are no domestic pressures to innovate as local competitors are constrained in their ability to imitate ideas. Overall this determinant is inapplicable to the Irish economy based on the trade statistics.

Porter also states that countries will succeed where the goal and motivation fit the source of competitive advantage and that these goals are strongly determined by ownership structure. The goals of MNC's are evident from their financial behaviour and they have spin-off effects on the national prestige of their industries - thus affecting the quality of human resources (HR) attracted to them. If MNCs are perceived as using predominantly low skilled labour with little investment in the skills of the domestic labour force then the young educated segment will look elsewhere for employment. Thus Ireland's advanced specialised factors become mobile and emigrate to where investment in human resources is fundamental to organisations. This problem is compounded by the historically low HR investment levels of the indigenous sector and the significant '*skill gap between Irish and best practice companies*'(Culliton) Therefore, even if the young possess the skills there is no incentive to stay in the country as there are no benefits to be reaped in the long term and opportunities are limited. In contrast, one of Japan's key sources of NCA is its high percentage of engineers per capita. This mobile advanced factor is made immobile because of the Japanese engineering and innovative culture which creates the incentive to stay. Once again in the Irish case this does not support the argument that Ireland has a NCA in 'high-tech' industries.

Government

The role of Government in Porter's model is to influence the four determinants through its policies. It is this factor which is the most relevant and applicable to the Irish experience and, in fact, it appears that Government policies have influenced the four determinants to such an extent that it alone could be used to analyse trade patterns. Porter argues that Government policies which artificially create a NCA and/or 'help' that removes the pressure on firms to improve and upgrade is counterproductive. He states these policies will fail because they create a competitive advantage which is unsustainable in the long run due to the pressures of the market and continuous innovation. Governments' role, he states, is to reinforce determinants not to create competitive advantage.

The Irish Government could do well to heed Porter's advice, in the author's view, for a number of reasons. First, the reliance on FDI from the early 1970's as a key element of industrial policy is fatally flawed as it is an increasingly unlikely foundation to achieve sustainable competitiveness in the long term. The 'no ties' financial incentive approach to FDI relied upon in the past provides fewer benefits due to the competitive pressures for mobile investment. However, this cannot be 'tied' now as to do so would cause FDI to locate elsewhere. The fierce competitive environment for mobile investment has seen Ireland's share of FDI fall significantly over the last 15 years. This competition comes from Eastern European countries, China and India - the latter offering labour in abundance and access to high growth markets, France with its more liberalised inward investment rules and the Netherlands and other European countries increasing their tax incentives. There has also been a switch in FDI away from manufacturing to services and a switch from wholly owned sites to strategic alliances and joint- ventures with strong indigenous partners. When strong indigenous partners are not available in Ireland the country has little leverage to compete. As in all markets when competition ensues the price falls and the buyer benefits. In selling Ireland as an industrial location, incentives to the FDI must be increased to compete, investment can be tied to an even lesser degree and overall the 'margin' to benefit from FDI falls. Overall it would appear that he country is too heavily dependent on FDI.

Second, Government policies create a 'grant mentality' among the indigenous sector when it offers a generous grant environment to firms, as is currently the case. This removes the pressures to innovate and to reinvest in human and physical factors. In the history of industrial development the significant feature of the process of innovation, once begun, is its source of capital funding i.e. retained earnings. This feature is evident across successful companies in different countries. In Ireland successful companies which have built up large reserves have not reinvested that money to upgrade the innovative capabilities of the sector, ' *where there has been reinvestment it has been in low skilled sheltered activities in which these companies have already proved successful*' (O'Sullivan in O'Hagan 1995). This 'defender type' strategy aims to minimise risk and relies on grants and government subsidies as sources for investment funds.

Through these policies and others, Government has impinged on the dynamism needed to create a sustainable NCA based in indigenous industry. This paper agrees with Porter when he states that ' *policies implemented without consideration of how they influence the entire system are as likely to undermine national advantage as enhance it*'(Porter 1990). There are many lessons to be learnt from the Asian Tigers and their interventionist policies to increase the international competitiveness of indigenous firms and to make them more responsive to the pressures of global competition. This in order to reap the real benefits of international trade.

Conclusion

This paper concludes that Porter's model is unhelpful to explain the pattern of Ireland's trade. The competitive environment created by the four determinants does not fit with the statistical NCA. The statistics indicates Ireland's NCA lies in the 'high-tech' industries, however, the factor conditions, demand conditions, related and supporting industries and the structure and strategy of firms do not create a competitive environment that fits these industries - Government policies have artificially created this 'statistical NCA'. The Government industrial policy of attracting FDI has been responsible for the creation of 'high-tech' industries in Ireland and their dominance of the trade statistics is in large part due to the attractive corporation tax rate which create the incentive for Profit Switching Transfer Pricing.

Porter's model can also be criticised on a number of other points. First, it is an ex-post model and therefore has no predictive powers, also the number of variables involved weakens any predictions, in particular the inclusion of 'chance' into the equation; second, Porter uses examples of success to back up his theories but his 'interpretation' of the reasons behind the success is subjective in many cases and could be explained by other factors; third because of the number of variables and the inclusion of chance, the model has the ability to explain away evidence which does not agree with its findings and finally he also provides himself with a 'get-out' clause when at the end of discussing each determinant he states it will not be effective unless the others reinforce it.

Bibliography

Black, J. & Winters,A. (1983) Policy & Performance in International Trade, in Papers of the Sixth Annual Conference of the International Economic Study Group.Macmillan

Culliton, J. Ireland: Department of Industry and Commerce Report, Industrial Policy Review Group. Department of Industry and Commerce, Dublin

IDA (1995)Press Release

Miles, R. & Snow, C. (1978) Organisaional Strategy Structure & Process

Murphy, A. (1994) The Irish Economy Celtic Tiger or Celtic Tortoise, Money Markets, Dublin

OECD (1993) Report

O'Hagan, J.W. (1995) Economy of Ireland, Policy and Performance of a small European Economy, Gill & Macmillan, Dublin

Promfret, R. (1991) International Trade, Blackwell, Cambridge Mass.

Porter, M. E. (1994) Competitive Advantage of Nations, Harvard Business Review, Central Statisitcs Office, Trade Statisics, Dublin

Porter, M. E. (1990)Competitve Advantage of Nations, London

Small Business Review Sunday Tribune, 3 December 1995

1991 Stats :

R&D -.8%; Irish GDP - 2.7%; Sweden 1.3%; Denmark and Norway 1.5%; Netherlands 2.1%; UK nad West Germany 2.5%.