

# ETLA

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## **Keskusteluaiheita - Discussion papers**

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### **THE COMPETITIVE ADVANTAGE OF FINLAND:**

**The Primary Research Projects**

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#### **ABSTRACT:**

This discussion paper originated from my interview with Professor M. E. Porter. As he asked about the applications of his 'diamond' model (*The Competitive Advantage of Nations*, 1990) in Finland, I decided to explore the subject. The project grew into a 300-page book which will be published shortly. This note is a preliminary look at some of the issues in this 'magnum opus.'

To summarize, just as the frameworks of Porter's early works (*Competitive Strategy*, 1980; *Competitive Advantage*, 1985) were adopted by the Finnish businesses and corporations in the late 1980s, the principles of *The Competitive Advantage of Nations* (in particular 'cluster' analysis) were adopted in the early and mid-1990s, by the Finnish government agencies, semi-public organizations and associations, and some major corporations. The Finnish 'Porter project' is evaluated as a part of a larger transition process, where the Finnish economy is re-orienting from centralized corporatism toward decentralized market forces.

Had Porter's methodology not been available, the Finns would have used another approach. The Porterian holistic view nevertheless set the project to a pragmatic track. *The Competitive Advantage of Finland* -project has already significantly contributed to the Finnish business environment and competitiveness.

**KEY WORDS:** Competititive Advantage, Industrial Strategy, Cluster, Industrial Competitiveness.

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**Steinbock, Dan, *Suomen Kilpailuetu: Aiemmat Tutkimukset*.** Helsinki: ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 1997, 41 s. (Keskusteluaiheita, Discussion Papers, ISSN 0781-6847; No. 604).

#### **TIIVISTELMÄ:**

Tämän keskusteluaihe lähti liikkeelle haastattelustani professori M. E. Porterin kanssa. Kun hän tiedusteli, miten 'timanttimalia' (*The Competitive Advantage of Nations*, 1990) on sovellettu Suomessa, ryhdyin tutkimaan asiaa. Alunperin pienehkö projekti laajeni noin 300-sivuiseksi kirjaksi, joka julkaistaan lähiaikoina. Oheinen kirjoitelma tarjoaa alustavan katsauksen joihinkin käsiteltäviin asioihin.

Aivan kuten 80-luvun lopulla suomalainen liike-elämä ryhtyi soveltamaan Porterin aiemmin kehittämiä viitekehyksiä (*Competitive Strategy*, 1980; *Competitive Advantage*, 1985); 90-luvun alussa ja puolivälissä timanttimalia ja klusterianalyysi (*The Competitive Advantage of Nations*) on omaksuttu laajalti suomalaisessa yhteiskunnassa mm. eri ministeriöissä, järjestöissä ja eräissä johtavissa liikeyrityksissä. Arvioitaessa Suomen 'Porter'-hanketta on muistettava, että sen kontekstina on koko maan vähittäinen siirtyminen korporatistisesta taloudesta aitoon markkinaympäristöön.

Mikäli Porterin timanttimalia ei olisi ollut käytettävissä, *Kansallinen Kilpailukyky* -projektissa olisi epäilemättä käytetty jotain muuta viitekehystä. Koska ko. lähestymistapa kuitenkin oli tarjolla, tutkimushanke lähti alunperin etenemään varsin käytännönläheisesti. Jo nyt voidaan todeta, että hanke on vaikuttanut merkittävässä määrin maamme yritysten toimintaympäristöön ja kansalliseen kilpailukykyymme.

**AVAINSANAT:** Kilpailuetu, Teollisuusstrategia, Klusteri, Teollisuuden kilpailukyky.

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## Preface

“It was very interesting to hear that *The Competitive Advantage of Nations* has been studied and applied in Finland,” said Professor Michael E. Porter on the phone. “But would you happen to know more about these projects and experiences?”

That was three months and some 300 pages ago.

In February 1997, I interviewed Professor Porter on “What Is Strategy?” (*Harvard Business Review*, November-December 1996), a fascinating essay which sought to put a decade or two of strategic thinking in perspective. In the course of our conversation, he asked if I knew how *The Competitive Advantage of Nations* had been applied in Finland. I promised to explore the matter during my impending visit to Finland.

This discussion paper is the first result of those efforts. But the story began almost a decade ago.

In 1990, Porter’s newly published book, *The Competitive Advantage of Nations*, broadened the definitions of business strategy and the industrial organization, topics discussed in his classic *Competitive Strategy* (1980) and *Competitive Advantage* (1985). The new book was a result of an extensive multinational research effort. And while it did involve strategy, it examined the subject on a far wider scale.

Between 1991 and 1996, Porter’s works would be adopted, albeit in a modified form, in the Finnish government agencies, semi-public organizations and associations, as well as the country’s leading corporations. This book is the story of that diffusion.

During my visit to Finland in March 1997, I interviewed Pekka Ylä-Anttila, research supervisor of The Research Institute of the Finnish Economy (ETLA), on the Finnish applications and modifications of *The Competitive Advantage of Nations*. In order to respond to professor Porter’s initial question, I had written a two-page memo; after my visit to Finland, I wrote a brief essay which soon grew into a far larger research project on the impact of the diamond model and the cluster analysis in Finland (which may present implications for other small European nations).

In the course of the research, I became convinced that, as such, the diffusion of professor Porter's works in Finland was a part of a far larger process - the transition of the Finnish economy from centralized corporatism to decentralized market forces.

Through Porter's theory of dynamic strategy (and its different levels of applications), I had come to examine the contemporary Finnish economy and industry in the light of a century of American thinking on economy, industrial organization and business strategy. All of these approaches emphasize the significance of *competition* which, along with the notion of *location*, may well prove to be the missing link between the kind of macroeconomics and microeconomics. Even if the reader were not to share the author's interest in these theories and notions, the frameworks of these disciplines form the *everyday language of contemporary business*. Whether one agrees with their validity is one thing; but their forceful reality in business activities and operations is a *social fact* that one simply cannot refute.

While Porter's theory was extensively utilized in the Finnish research projects, these uses were based on pragmatic rather than purely theoretical motivations. Had Porter's theory *not* existed, the Finns would have used other kinds of frameworks. Yet, the fact that they *did* exploit Porter's frameworks contributed significantly to the opening of previously sheltered markets and the increased efficiencies in the open markets. As a result, I thought it might be even more significant to explore not only how Porter's frameworks were utilized in *The Competitive Advantage* projects but also how those frameworks (and, more accurately, the underlying views on strategy, industrial organization and location economics) can be applied to Finland in order to better understand the drastic transformation it underwent in the early 1990s.

After the summer of 1997, the result of these efforts will be published as a book, *From Cartels to Competition? The Competitive Advantage of Finland*.

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Manhattan, June 10, 1997

## 1. The First Steps

*The Competitive Advantage of Nations* stemmed from an extensive global study. With attendees representing nine nationalities, a working seminar of Porter's project team had been held at Harvard in 1987 to discuss the preliminary research experiences (Exhibit 1). Local research teams based in many of the nations conducted much of the country-based research. It was the Nordic teams (Norway, Sweden, and Denmark) that the Finns, too, would first look for advice and assistance.<sup>1</sup> This remarkable research project involved a breadth of industries and nations. Simply put, it "sought to represent the richness of international competition."<sup>2</sup>

In Finland as elsewhere, Porter's classic works (*Competitive Strategy*, 1980; *Competitive Advantage*, 1985) soon became the "bible" of the management consultants (see Appendix ). In the early 1990s, this would prove something of an obstacle in parts of the academia. Of course, the image had nothing to do with Porter's body of work on strategy, which derives from the case study tradition (Harvard Business School), the implications of the learning experience (Boston Consulting Group), as well as classic industrial organization.

Although the internationalization of the Finnish companies began in the 1980s, it really took off in the early 1990s. Still, as the Finnish economists became increasingly interested in the globalization phenomena, they hardly noticed *Competition in Global Industries* which Porter edited after the mid-1980s and which, unlike *Competitive Strategy* and *Competitive Advantage*, was not translated to Finnish.<sup>3</sup>

With the release of *The Competitive Advantage of Nations*, the scope of inquiries of the Finnish economists and policy analysts widened significantly. Paradoxically enough, while the Finnish management consultants showed little enthusiasm for this work, Finnish economists and policy analysts were intrigued by what they found so acutely in *their* theory, methodology and

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<sup>1</sup> True, Norway was not among the initial teams either, but Nordic researchers did complete an EC study on the basis of Porter's theory. See Torger Reve and Lars Mathiesen, *European Industrial Competitiveness*, SNF Report 35/94. Iceland did not participate in the project either. In the mid-1990s, however, a Chinese-Icelander Vigdis Wangchou Bóasson did write an M.A. thesis, *ICELAND: an International Competitive Strategy*, at the University of Warwick. The thesis was based on the Porter methodology. See Ingjaldir Hannibalsson (Associate Professor, Department of Business Administration, University of Reykjavik), Comment, May 16, 1997.

<sup>2</sup> See Michael E. Porter, *The Competitive Advantage of Nations* (New York: The Free Press 1990), pp. xvi-xx.

<sup>3</sup> See Michael E. Porter (ed.) *Competition in Global Industries* (Boston: Harvard Business School Press 1986).

empirical practice. Just as their Nordic counterparts, the Finnish economists were also quick to notice that there was an entire body of research providing a bridge between macroeconomics and microeconomics.

When, in the post-WWII era, legitimate issues like “location economics” - which Porter would explore with his notion of “clusters” - became marginal in mainstream macroeconomics, Nordic writers continued to explore them. “This reflects, in part, the structure of the Swedish economy in which the activities of the large Swedish multinationals are often closely connected,” noted Porter in *The Competitive Advantage of Nations* in which he acknowledged his debt to their “antecedents to the notion of clusters.” In particular, he mentions the pioneering work of Erik Dahmen and the latter’s notion of “development blocks,” closely related to the notion of clusters.<sup>4</sup>

As Sweden joined Porter’s research project, the Finnish Management Institute (LIFIM) monitored the developments closely and Seija Kulkki (Project Manager, LIFIM) kept contact with the Swedes. She considered the project significant and thought it should be fully carried out in Finland. In order to obtain the necessary funds, she turned to SITRA (Finnish National Fund for Research and Development).<sup>5</sup> Tuomo Kässi was another observer who understood the significance of Porter’s framework and the productive potential it provided for an analysis of the Finnish economy and competitiveness. In September, he contacted The Research Institute of the Finnish Economy (ETLA) where he had worked some 10 years before.<sup>6</sup>

According to Kari Tolvanen (Director, Research and Training; Finnish National Fund for Research and Development - SITRA), the cluster project began with Kässi and Kulkki on No-

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<sup>4</sup> Porter not only mentions Dahmen in a lengthy footnote but also makes reference to literature on networks, a popular subject of current research. See Porter, *The Competitive Advantage of Nations*, pp. 789-790, footnote 12. Despite the affinities between the notion of clusters and that of development blocks, there are also significant differences between these two concepts. See Risto Penttinen, *Summary of the Critique on Porter’s Diamond Model*, Discussion Papers, ETLA, No. 462, January 11, 1994. On Dahmen’s works, see e.g., *Entrepreneurial Activity and the Development of Swedish Industry, 1919-1939* (Stockholm: Industriens utredningsinstitut 1950); “A Neo-Schumpeterian Analysis of the Recent Industrial Development of Sweden,” in Charles T. Kindleberger and G. De Tella (eds.) *Economics in the Long View: Applications and Cases*, Volume 3.; “Development Blocks in Industrial Economics” *Scandinavian Economic History Review*, 1:3-14.

<sup>5</sup> In her own research, Seija Kulkki has explored the creation of organizational knowledge, based on the works of Nonaka and Takeuchi. In September 1996, she got her Ph.D., with a dissertation on *Knowledge Creation of Multinational Corporations - Knowledge Creation Through Action*. In order to serve as first examiner, professor Ikujiro Nonaka visited Finland.

<sup>6</sup> Kässi had become familiar with Porter’s writing in 1980, when he still served as an instructor at LIFIM. At the time he also had heard Porter in a Finnish industry seminar and discovered a Harvard case involving the abbreviated version of the “five forces” model. Tuomo Kässi (Manager, Business Development, IVO Power Engineering Ltd, Environment and Refurbishment/formerly Researcher, The Research Institute of Finnish Economy/ Finnish National Fund for Research and Development), Comment, April 24, 1997.

vember 2, 1990. Both were suggesting a somewhat narrow exploration based on Porter's framework, as it was available in *Harvard Business Review* (March-April 1990). On November 20, 1990, ETLA organized the first meeting on the project.<sup>7</sup> After preliminary investigations, the planning began in summer 1991, primarily by Juha Ahtola and Pekka Ylä-Anttila at ETLA. By April 1992, SITRA took charge of the primary funding responsibility.<sup>8</sup>

According to Pekka Ylä-Anttila, research supervisor of ETLA,

From the Finnish perspective, the project was a major one. Although we started with a smaller budget, we used about FIM 7 million (US \$1,4 million). Norway had a similar research budget. The funds were necessary for the industry and case studies. Undoubtedly, it was one of the most expensive Finnish projects in social and economic research, even though not a high-profile project.<sup>9</sup>

In the early 1990s, most ministries were aware of and many participated in various research projects based on Porter's model. But it was the Ministry of Industry and Trade (MTI) that pioneered the *Competitive Advantage* projects in Finland.

Most of the research projects stemmed from a crucial triangle of The Research Institute of the Finnish Economy, the Ministry of Trade and Industry, and The Finnish National Fund for Research and Development. The first conducted and steered the research, the second prepared the policy papers and funded some of the research, and the third followed both developments and funded most of the research projects. Ultimately, too, it was the joint activities of these three institutions which provided the most solid and enduring body of research in these *Competitive Advantage of Nations* projects. In particular, the cluster research and policy analyses generated two highly important and influential publications: *National Industrial Strategy for Finland* (1993), a policy statement by the MTI, and *Advantage Finland - The Future of Finnish Industries* (1996), a synthesis of the cluster projects by SITRA.

It is doubtful that either achievement would have materialized without the severe recession of the early 1990s.

In Finland, economic growth had lagged behind major industrial nations from the early 19<sup>th</sup> century well into the mid-20<sup>th</sup> century, i.e., until the post-WWII era. Between 1950 and 1973,

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<sup>7</sup> Kari Tolvanen (Director, Research and Training; Finnish National Fund for Research and Development, [SITRA]), Comments, April 15 and April 29, 1997.

<sup>8</sup> Kässä, Comment.

<sup>9</sup> Pekka Ylä-Anttila (Research Supervisor, ETLA), Comments and Interview (February-May, 1997).



the small economy enjoyed a 4.9% growth rate of real GDP; that was less than the corresponding growth in Japan (9.3%) or Germany (5.9%), but more than in Sweden (4.0%) or the U.S. (3.6%). Between 1973 and 1989, growth stagnated in most major industrial nations, including Finland (3.1%). Unlike many of its rivals, Finland was spared from the worst excesses of the energy crisis, thanks to its Soviet trade. It was only when the Soviet trade *did* crash at the turn of the 1990s that the Finns woke up realizing that one historical era had passed.

Until the early 1980s, the financial market had been tightly regulated. In the course of the “booming ‘80s,” however, practically no fiscal or monetary policy measures were taken to moderate the expansionary effects of the economic boom. As a result, the effects of liberalization accelerated. When, in 1989, a tighter monetary policy was introduced, it only led to greater foreign borrowing. With the collapse of Soviet trade and increasing competition due to the impending integration, Finland suddenly faced rising external balance problems. As control mechanisms were being implemented, tight monetary conditions with a heavy debt service burden lowered domestic demand, especially in real estate. Hence, asset values and profits plummeted and bankruptcies soared at record-levels. Most alarmingly, some 20% of the Finnish labor force was unemployed. The country became dubious about its impending membership in the EC - nostalgic about its past and fearful of its future.<sup>10</sup>

It was amidst this painful recession that MTI and ETLA found the models and frameworks of *The Competitive Advantage of Nations* pertinent to Finland’s problems. Such projects went against the grain of the times. After initial skepticism, interest began to accelerate, but nothing really happened until a new minister took initiative. After the summer of 1992, Pekka Tuomisto, the current director of Finland’s Social Insurance Institution and a well-known politician of the Center Party, was appointed the minister of Trade and Industry in the Aho government. Looking back some five years later, Tuomisto notes,

During my period as the minister, I launched projects whose objective was to create a direction for the Finnish industrial activity and development.

The research had made it clear we cannot be winners in every area. We must focus and specialize in segments in which we possess the best opportunities.

It was a necessary process. In fact, today Finland needs an extended process.<sup>11</sup>

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<sup>10</sup> The now-familiar story of the rise and crash of the Finnish 1980s is included in the section “Finland - a Nordic welfare state” of *Advantage Finland*, pp. 17-35.

<sup>11</sup> Pekka Tuomisto (Director General, Social Insurance Institution; former Minister, Ministry of Trade and Industry), Comment, April 11, 1997.

Tuomisto's conclusion? The nation needed a new strategy of industrial policy, a coordinated effort so that the country could leave behind the severe recession and move into the 21<sup>st</sup> century. It was his influence and activity that triggered a shift and acceleration of events, argues Pekka Ylä-Anttila. Indeed, Tuomo Kässi and quite a few other commentators considered Tuomisto's strategic move critical. (Unsurprisingly, Tuomisto's political secretary was Esa Sternberg; he and Kässi had conducted lectures on international marketing at the Helsinki School of Economics.)<sup>12</sup>

Deputy director generals Matti Pietarinen and Risto Ranki (Industry Department, MTI) coordinated the project of *National Industrial Strategy for Finland*. ETLA, in particular research supervisor Pekka Ylä-Anttila, contributed research expertise to the project, which also benefited from discussions with some 50 government officials and other experts.<sup>13</sup> *National Industrial Strategy* introduced the notion of the cluster into the Finnish discourse on industrial policy and competitiveness - not only did it popularize the notion, it made the term *the* catchword of the mid-1990s.

In preparing his contribution, Ylä-Anttila worked very much as a one-man-committee. This provided the necessary flexibility in the time schedule as it was very tight. What made things easier, though, was the fact that ETLA was *already* engaged in the cluster research projects. Since Ylä-Anttila himself was writing on industrial policy for the final report, the MTI work followed almost naturally from ETLA's *Advantage Finland* project.

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<sup>12</sup> Pekka Ylä-Anttila, *ibid.*; Tuomo Kässi, *ibid.*

<sup>13</sup> The Finnish version [*Kansallinen teollisuusstrategia*] was released in April 1993. The English version followed in June 1993. See Matti Pietarinen and Risto Ranki, *National Industrial Strategy for Finland* (Kansallinen teollisuusstrategia), Ministry of Trade and Industry Publications 3/1993.

## 2. National Industrial Strategy for Finland

Published in April 1993, the *National Industrial Strategy* followed the trough of the Finnish recession. This singular event highlighted the structural weaknesses of the economy, triggering intense public debate on the future of the nation. Instead of accepting the resignation, the policy statement focused on the positive, i.e., a new industrial strategy. The latter stemmed essentially from Porter's theory of strategy, competitive advantage, as well as competitive clusters.

According to *National Industrial Strategy*, in the early 1990s, Finland's economy and industry were at a turning point. Essentially, the crossroads could be compared with other nodal points in Finnish economic history. Such examples include the early stages of industrialization, the depression of the 1930s, and the reconstruction in the post-WWII period. The nation had to come to grips with the current economic crisis, adjust to the competition spawned by European integration and strive to benefit from rapid advances in technology. The task, however, was complicated by three forms of disequilibria: greater foreign indebtedness than in any other industrialized country, a rapidly-climbing public debt, and - perhaps most importantly - one of the highest rates of unemployment in Europe.

*National Industrial Strategy* advocated the role of industry in finding lasting solutions to these problems: the external imbalance could be corrected solely by rapid growth in exports and by creation of new capacity. The policy statement saw increasing merchandise exports and continuation of the structural changes in export production as keys to preserving the economic well-being of the country. In addition to this adaptive scenario, there was also a worst-case scenario in which the exacerbation of the macroeconomic disequilibria would lead mainly to the streamlining of operations and cost competitiveness (Exhibit 2).

In retrospect, Finland was able to achieve the adaptive scenario. The disequilibrium of the economy was brought under control. After the mid-1990s, the balance of trade ran a surplus of FIM 40 billion, i.e., about 30% relative to export revenues; the results were more "favorable" than the adaptive scenario had calculated. In particular, the rate at which indebtedness had fallen was faster than expected. The trade surplus resulted partly from the rise in industrial exports, and

partly from the low level of imports. Both the "old" and the "new" industry segments had grown. The new electronics and telecommunications equipment segments were the leaders.

While the nation saw a gradual return to economic disequilibrium and an expansion of exports, it remains to be seen whether the production structure had diversified adequately. Moreover, it is debatable whether the structural disequilibria - foreign indebtedness, public debt, unemployment - have been contained adequately in the long-term to allow sustained higher productivity, as well as factor specialization and upgrading.

To explore the current ills of the Finnish economy, the authors of the *National Industrial Strategy* introduced Porter's four stages of competitive development, relying on ETLA's research.<sup>14</sup>

1. Factor-driven stage
2. Investment-driven stage
3. Innovation-driven stage
4. Wealth-driven stage.<sup>15</sup>

It was at this point that the authors of *National Industrial Strategy* left no doubt of their industrial policy preferences. Elaborating on Porter's four-stage classification, they associated the old resource-based clusters with the old industrial policy of the investment-driven stage, and the new technology-based clusters with the new industrial strategy of the innovation-driven stage. Consequently, most Finnish applications of Porter's diamond model and cluster research, the various experiments with national (and not so "national"! ) innovation systems as well as the new and emerging competition policies, could be deduced from the following conclusions:

The role of public policies is clearly different from that in the investment-driven stage. Subsidies, restricting competition, protection of markets and selective industrial policies are not compatible with this stage of competitive development. Instead indirect policy measures like enhancing innovativeness through creating and upgrading advanced factors by improving education and research, encouraging establishment of new firms, enhancing domestic competition and demand sophistication are appropriate in this stage.

*National Industrial Strategy* saw the nation entering a "new transitional phase in industrial development." This transition involved an increasingly open and international Finnish econ-

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<sup>14</sup> Ibid, pp. 12-16. Based on Vartia and Ylä-Anttila, *Kansantalous 2017* (The Economy 2017), ETLA, The Research Institute of the Finnish Economy, Series B 80, 1992.

<sup>15</sup> Michael E. Porter, *The Competitive Advantage of Nations* (New York: The Free Press 1990).

omy, which prompted fundamental changes in the competitive environment of the Finnish industry, in particular raw material markets. With the increase in competition amongst companies and skilled labor, FDI flows were expected to move toward regions with well-developed infrastructures and highly-skilled labor forces. It would be *the* task of the new industrial policy to provide such a competitive environment.

Since the new Finnish industrial policy could not directly influence firm-specific competitive advantage or industrywide globalization tendencies, the focus was turned to positive externalities. In order to understand the growth dynamics of the industry, however, one had to understand the operations of the companies. Innovation and upgrading in the latter evolved when firms developed links forward and backward in the value chain. It was this reasoning that laid the ground rules of the new industrial policy:

- New (macroeconomic) growth theory,
- Competition policies (vertical and/or horizontal linkages)
- (Microeconomic) value chain analysis.

Each of the above, separately and jointly, were contained in the notion of agglomerations of activities, i.e., clusters which consisted of operationally linked business operations and industry segments of strategic groups of companies. It was these three critical nodal points that, implicitly, tied *National Industrial Strategy* to *The Competitive Advantage of Nations*.

The old industrial policy, argued the authors of *National Industrial Strategy*, sought to restrict the functioning of companies in factor markets, to regulate the competition, to subsidize sheltered industries and to target "national champions." The new industrial policy, however, sought to ensure access to companies, to deregulate competition, and to end subsidies. It also promoted the functioning of factor markets and efficient competition.

With the rapid globalization of the generic industry environments, rivalry no longer meant competition among national economies. Firms, not nations, competed in the markets; firms created competitive advantage; firms integrated vertically or horizontally agglomerating into clusters. As barriers that once divided different nations fell, markets picked the winners. The task of the government was to organize the institutions, support the emergence of specialized and advanced factors of production and foster the functioning of market mechanisms. For the authors of

*National Industrial Strategy*, the key issue had become: "How can Finland be an attractive location for internationally competitive companies?"<sup>16</sup>

Porter's diamond model had four determinants of national competitive advantage (Exhibit 3):

- 1) *Factor conditions*. The nation's position in factors of production, such as skilled labor or infrastructure, necessary to compete in a given industry.
- 2) *Demand conditions*. The nature of home demand for the industry's product or service.
- 3) *Related and supporting industries*. The presence or absence in the nation of supplier industries and related industries that are internationally competitive.
- 4) *Firm strategy, structure, and rivalry*. The conditions in the nation governing the creation, organization and management of companies, as well as domestic rivalry.

These determinants, individually and as a system, created the platform on which a nation's firms were born and competed. More importantly, they accounted for the *pressures* on firms to invest and innovate. As a result, nations were most likely to succeed in industries or industry segments with favorable "diamond," *as a system*. In addition to these systemic variables, Porter postulated two additional determinants which came to influence the national system in important ways.

- 5) *Chance*. Chance events are developments outside the control of firms (and usually the nation's government), such as pure inventions, breakthroughs in basic technologies, wars, external political developments, and major shifts in foreign market demand.
- 6) *Government*. Government, at all levels, could improve or detract from the national advantage. This role is seen most clearly by examining how policies influence each of the determinants.<sup>17</sup>

The diamond conceptualized the first four determinants as systemic, whereas the two last were perceived as extra-systemic.

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<sup>16</sup> *National Industrial Strategy*, p. 29.

<sup>17</sup> On the basics of the determinants of national advantage, see Porter, *The Competitive Advantage of Nations*, pp. 71-73.

The Finns, however, did not want to simply replicate the original research ideas. Instead, they were eager to try ideas of their own. There were genuine differences in the applications of each. The Nordic/Finnish model presented Porter's determinants with two major modifications. First, it presented government policy as an internal determinant rather than an external one. Since Nordic nations were "mixed economies," the Finns regarded government policy as an intra-systemic determinant, even though the Nordic realities were undergoing integration-related changes and dislocations at an accelerated rate. Second, the modified Nordic/Finnish model detailed the components of government policies (Exhibit 4).

If, in Finland as well as in other Nordic countries, the public sector comprised almost half of the GDP, how could one present the government as an external variable? It did not seem to make sense. Still, the issue did not deal solely with the effects of government involvement; it was premised on the *kind* of involvement. And those were the sources of competitive advantage. Indeed, one might argue that the Porter model and the Nordic/Finnish model are not mutually exclusive, even though they reflect different perspectives. The first focuses on the *sources of competitive advantage*, whereas the latter concentrates on the *nations'* available policy tools. One might even redraw the Nordic/Finnish model on the basis of the Porter model incorporating *both perspectives*. In America's industrial policies, one could discern similar *formal* determinants, from general economic policy and logistics to finance and taxation, and technology.

Fundamentally, there should be no mistake in the sources of competitive advantage. While government policies can enhance competitive *conditions* (the government responsibility), they cannot create *value* (the task of the companies).<sup>18</sup>

To the authors of *National Industrial Strategy*, the birth patterns of competitive advantage determined the role of industrial policy, hence the extensive research projects on the Finnish clusters. In addition to the introduction of the diamond model, the publication also included an Appendix on "Finnish industrial clusters," i.e. ETLA's preliminary synthesis of the extensive research projects (which would be fully treated in *Advantage Finland* in 1996).<sup>19</sup>

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<sup>18</sup> On the basis of the new "strategic trade theory," one might, of course, argue that government policies can create value. However, that theory has not been used in Finland for such applications, or rationalizations.

<sup>19</sup> *National Industrial Strategy for Finland*, pp. 29-35, Appendix 1, pp. 1-25.

In principle, the *National Industrial Strategy* argued that there were four groups of approaches to industrial policy:

1. *Traditional Industrial Policy*: subsidies and direct support of industry. (Ordinarily entails subsidizing declining industrial branches or firms.)
2. *Planning Approach*: government officials have more and or better information on markets and efficient production methods, on the basis of which the production decisions of firms are steered. (Industrial activity is consciously steered toward a certain structure deemed optimal.)
3. *Positive Policies*: promotion of structural change via indirect support. (Involves upgrading of the factors of production and developing the technological infrastructure.) Correction of market failures, internalization of externalities (R&D investment, environmental investment). Strategic approach which sets industrial policy priorities in accordance with national goals and visions of future trends.
4. *Market-Oriented Policies*: promoting the functioning of markets. (Implemented via strong competition policy and well-functioning financial markets and institutions.) Stable economic environment. Infrastructure promoting adjustment of firms to market changes (education, research, transport).

At the Ministry of Trade and Industry, the policy analysts opted for the third and the fourth alternative. In the aftermath of the first oil crisis, many European countries had adopted traditional industrial policy, which translated to extensive subsidization. In retrospect, this policy proved largely a failure. Due to the rising momentum of integration since the 1980s, most European governments shifted their emphasis from interventionism to promoting a stable macroeconomic environment and more competitive markets. Integration, in particular the drive toward the European Monetary Union, served as a kind of financial discipline focusing attention on productivity. On the other hand, the globalization of markets forced attention to the promotion of structural change as well as strategic policy approaches.

Whether one interviews the MTI's seasoned analysts, or ETLA's veteran researchers, or the participants of other ministries, or merely the observers of these processes in Finnish universities or media, one cannot help but underline and emphasize the impact the cluster analysis has had in Finland's public, private and academic sectors. In particular, the idea of efficient competition and the lessons of *The Competitive Advantage of Nations* arrived in Finland hand in hand:

Porter's competitiveness model offers a natural framework for contemplation of a new industrial policy. According to this model, competitive advantages are born in closely interrelated firms and branches that form industrial development blocks or clusters. The traditional branch-based line of thinking is rejected. The policies seeking to affect industry and industrial firms directly (industrial support) are of secondary importance in this respect and often even harmful, since they distort competitive conditions. Public policies can have an even greater indirect impact via elements that foster the competitiveness of firms. *The main task is to promote efficient competition, upgrading the quality of factors of production by promoting research*



*and development as well as bolstering the competitiveness of development blocks by supporting the creation of company networks and ensuring the availability of risk financing. [emphasis added]<sup>20</sup>*

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See *National Industrial Strategy*, pp. 42-43.

### 3. Advantage Finland

Along with *National Industrial Strategy for Finland* (1993), Porter's model played an even more significant role in *Advantage Finland - The Future of Finnish Industries* (1996). This was the result of a major research project, managed primarily by The Research Institute of the Finnish Economy (ETLA), starting around 1992 (compare Exhibit 5). It provided the theoretical thinking and empirical evidence for *National Industrial Strategy*. Co-authored by Hannu Hernesniemi, Markku Lammi and Pekka Ylä-Anttila, *Advantage Finland* represented the summary and the peak of the cluster research applications in Finland.<sup>21</sup> Indeed, the Finnish decisionmakers may have relied on cluster studies more than in most countries where such projects have been conducted.

From the very beginning, as suggested by their Norwegian colleagues, ETLA widened the institutional support of the project. It was made financially possible by The Finnish National Fund for Research and Development (SITRA), the Ministry of Trade and Industry, major Finnish companies, and ETLA itself. The project had a supervisory board consisting of representatives of Finnish companies, employers' and employees' organizations, the Ministry of Trade and Industry, as well as the Prime Minister's Office. Finally, methodological and theoretical issues were discussed in a scientific advisory group.

*The Competitive Advantage of Finland* research project generated more than 60 published reports. Many of these cluster projects were conducted at the Helsinki School of Economics and Business Administration (HSEBA). Most studies were initiated in 1992 and 1993. The number of the reports peaked in 1994. By the mid-1990s, *this* project had exhausted most of its resources (compare Exhibit 6).. Yet, ETLA has continued to release some reports in the series. Many other ministries, research institutions and academic departments followed the example of ETLA and MTI, subsequently their contributions came out a year or two later.

Financed by ETLA, the Finnish National Fund for Research and Development, the Ministry of Trade and Industry and major Finnish companies, the project had a supervisory board con-

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Hannu Hernesniemi, Markku Lammi and Pekka Ylä-Anttila, *Advantage Finland - The Future of Finnish Industries*, ETLA Series B 113 (1996).

sisting of representatives of companies, employers' and employees' organizations, the Ministry of Trade and Industry, and the Prime Minister's Office. As a synthesis of more than 60 sectoral analyses, *Advantage Finland* rested on Michael E. Porter's *The Competitive Advantage of Nations*. Still, it differed from Porter's models and analysis in three respects:

- The project sought to present an explicit view of the *future* of the industrial clusters.
- It aspired to lay down the cornerstones of a *new industrial policy* (which, indeed, would be adopted by several government agencies in the coming years).
- And it involved a *wider methodological background*.

These three characteristics distinguished *The Competitive Advantage of Finland* program from other "Porter studies." By the same token, they rendered the program more vulnerable to inconsistencies in the approach, public policies and adopted methodologies.

As the *main source of data* in the construction of the competitive clusters, the researchers used the foreign trade statistics compiled by the OECD (export figures for 1,800 categories of goods for the years 1980, 1985 and 1990 in addition to more detailed figures on 3000 goods for the year 1990). Methodologically, the researchers also identified (result and cause) parameters which could be used to analyze industries with the determinants of the diamond model, and which influenced the competitive position of nations' industries.<sup>22</sup>

In the evaluation of Finland's competitive clusters, the most important export products consisted of the forest cluster products, followed by the metal industry products with low value added. On the other hand, the primary growth resided in the telecommunications cluster. While the findings were hardly news, the cluster constellations, as well as the underlying value chains - as depicted by the researchers - provided the Finnish government agencies and companies new information on the "known sectors" of the economy, both on micro- and macroeconomic levels.

Summarizing the development patterns of the Finnish clusters in the past, present and future, the researchers offered several ways to "breed clusters" (compare Exhibit 7). *Advantage Finland* not only presented the figures for the 1990s, but also a prediction of these estimates at the 2010s.

Essentially, *Advantage Finland* predicted that

- There will be a major shift from resource to knowledge-intensive production. In 2010, the telecommunications cluster is estimated to grow as large as the forest cluster was in the mid-1990s.
- While the expanding knowledge base would create new growth potential, the exploitation of this factor pool required that labor and other resources be allocated efficiently. The current high unemployment of the Finnish youth caused not only human suffering but also waste of valuable resources.
- The globalization trend of the Finnish industries was likely to continue since (1) internationalization in Finland had not progressed as far as in other small open economies; (2) knowledge-intensive industries tended to be global; (3) the forest and metal sectors would continue to attract foreign direct investments to ensure their access to raw materials; and (4) Finnish companies would compete for the investments of multinational companies.
- The goals of the new industrial policy were (1) to guarantee the functioning of a free market; and (2) to create advanced and specialized factors of production.

*Advantage Finland* provided greater depth. The competitive clusters, first introduced in *National Industrial Strategy*, were presented in far greater detail. Yet, the basic perspective remained identical. *Advantage Finland* saw Finland at historical crossroads with economy and industry intersecting each other. The Nordic welfare state would survive its current ills in the short term, but, in the longer term, old strengths and policy tools were no longer enough. The growth of the manufacturing industries, as well as the critical role of exports, required a new industry structure, or rather, a new constellation of industry clusters.

#### 4. A New Outlook on Industrial Policies: The Debate

By the mid-1990s, the Finnish economy has experienced a drastic transformation, but it is not that easy to *detail* the linkages on the different levels of the economy. A seasoned observer of the Finnish business, Pertti Monto, editor-in-chief of the nation's most important business weekly, acknowledged the recent changes of the Finnish economy, but he, too, found it quite difficult to sort out the determinants of these changes, especially in the long term.

The Finnish industrial policy has moved from an interventionistic policy to a pro-market approach. But why? I find this hard to analyze. The direction was clear, even before the last recession. The Finnish big business used to be able to rely on state-centrism and subventions, anti-competitive, regulated as well as permissions- and license-steered, administratively stiffened interest rate and currency policies. But, nowadays, even the Finnish big business has had to learn a thing or two about the market economy.

State-owned enterprises are being privatized in a rush. Occasionally, the labor movement protests - in the past winter, for example, with the privatization of Rautaruukki. The recession speeded up the change which had already begun. Consequently, administrative units are being launched as public companies, and public units are being incorporated.<sup>23</sup>

Clearly, the Ministry of Trade and Industry (MTI) had played a role in the process, but

I can't estimate the significance of Porter's work in this context. Neither can I estimate the impact of an active Ministry of Trade and Industry, as well as their strategy papers. Still, it is quite possible that the market-based approaches have increased just because of the MTI, the papers, as well as the diligent officials.

It's also difficult to evaluate whether the Finnish trade policy has become more active. With the eclipse of state-centered policies, it has slowed down in Russia. It is also difficult to deduct active trade policies on the basis of the foreign travels of President Ahtisaari. In some ways, those travels belong to a past era, but they may well work fine in countries characterized by an old-style command economy, in particular China.

Trade policy and industrial policy go hand in hand in the sense that the growing demand for competitiveness forces companies to reorganize their activities both domestically and overseas, through mergers and acquisitions. For reasons of marketing, however, one must often consider locating a factory overseas. In the past, such foreign outsourcing was perceived as synonymous with treason because the fundamental task of the industry was considered to be employment.<sup>24</sup>

As the MTI continued to exploit clusters in its efforts to achieve strategic coherence in dynamic fields, it also prepared a new policy paper, *A New Outlook on Industrial Policies: from*

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<sup>23</sup> Pertti Monto, Editor-in-Chief, *Talouselämä* [Economic Life], Comments, May 2, 1997.

<sup>24</sup> Pertti Monto, Editor-in-Chief, *Talouselämä*, Comments, May 2, 1997.

*Global Economic Change to Sustainable Growth* (1996). Just a few months later, this policy draft resulted in an official document by the executive branch.<sup>25</sup>

In practice, *National Industrial Strategy for Finland* led to discussions not only *within* the Finnish ministries, but also - and, in the long run, perhaps more importantly - *between* them. Wherever such flexibility has existed, the results have been exciting (e.g., the cooperation of the MTI and the Ministry of Social Affairs and Health in the development of the well-being/welfare cluster). Conversely, wherever inflexibility has prevailed, experiences have been few and frustrating.

The MTI presented *A New Outlook on Industrial Policies* as a continuation of the previous cluster research.<sup>26</sup> Still, the cluster studies had no explanatory role in the policy draft. That puzzled the observers.

*A New Outlook* was written by Matti Pietarinen (the MTI Industry Department's then deputy director general) and Timo J. Hämmäläinen (researcher). Just as Pietarinen (who would soon become Counsellor of Permanent Representation of Finland to the European Union), Timo J. Hämmäläinen had researched and felt passionately about the issues of industrial policy. In 1991, he was intrigued by Porter's *The Competitive Advantage of Nations* "because it seemed to provide an entirely new perspective to the causes of Finland's economic crisis."<sup>27</sup> In a Rutgers seminar study, "Porter-Dunning Paradigm of National Competitive Advantage: The Challenge to Finland," Hämmäläinen applied the diamond model to the Finnish environment. The work on the dissertation work was supervised by professor John H. Dunning, who had criticized Porter's model of national competitiveness for the neglect of the international business activities (IBAs).<sup>28</sup> "I find Porter's insights highly significant and they can be justified with existing theories," he notes. "Unfortunately, the development of competitiveness has stagnated after *The Competitive Advan-*

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<sup>25</sup> *A New Outlook on Industrial Policies: from Global Economic Change to Sustainable Growth* Ministry of Trade and Industry, 4/1996; *The Finnish Government's White Paper on Industrial Policy*, 2/1997

<sup>26</sup> "The aim of the Outlook is to set out a clearer view of the tasks and efficient instruments that are the responsibility of the public sector in the new environment. These policies will form a framework for planning actions and improving the environment for both new and traditional industrial clusters." See *A New Outlook*, see "Abstract."

<sup>27</sup> Timo H. Hämmäläinen (Researcher, Industry Department, Ministry of Trade and Industry), Comments, April 29, 1997.

<sup>28</sup> Timo H. Hämmäläinen, "Porter-Dunning Paradigm of National Competitive Advantage: The Challenge to Finland" (94 p., Jan. 1992). Unpublished seminar study.

*tage of Nations*.”<sup>29</sup> To a great extent, Hämäläinen joined the MTT’s Industry Department because of his interest in Porter’s works. In effect, he considers *National Industrial Strategy*, “the first significant step in the new definition of Finland’s industrial policy.”

From the perspective of public policy, however, neither that nor Porter’s *The Competitive Advantage of Nations* went far enough. It was difficult to design the contents and details of an efficient industrial or competitive policy on the basis of Porter’s model. It did not provide more specific receipts or tools to define the division of labor between private and public sector. Neither did it enable one to make decisions on distinct interventions. To accomplish such objectives, one needed a far more precise analysis on the role of the public sector.<sup>30</sup>

Essentially, *A New Outlook* argued that “Finland’s economic and social problems reflect a worldwide techno-economic paradigm change which in its social effects, can be compared to the two previous industrial revolutions. Behind this change is the globalisation of the world economy and the breakthrough of new technologies, especially in information processing and communications.”<sup>31</sup>

The primary theme of *A New Outlook* was that “revolutionary change requires the adaptation of society.” In order to detail this adaptation, the policy statement proceeded in three stages. First, it sought to explain the nature of change in the global economy. Second, it explored public sector tasks in an efficiency-driven growth strategy. And third, it focused on the implications in the key areas of industrial policy.

Certainly, the premise of a “worldwide techno-economic paradigm change” sounded reasonable to some Finnish observers. After all, since the mid-1990s, the Finnish media consistently focused on globalization phenomena and, increasingly, on new technologies. Still, it had little to do with the diamond model and the cluster analysis; it may also have been bad economics.

***The Absence of Cluster Analysis.*** The cluster studies had no explanatory function in the framework of *A New Outlook*. What is essential is not so much the neglect of *Porter’s* theory. What was more troubling was the absence of concrete linkages to half a decade of valuable empirical cluster studies. While the drafters saw the policy statement as a continuation of old drafts, such a view is very difficult to justify, if only in terms of the paper itself.

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29 Timo H. Hämäläinen, Comments, *ibid.*

30 *ibid.*

31 *A New Outlook*, “Abstract,” p. 2.

**Bad Economics.** The premise of *A New Outlook* is not tenable. Finland's economic and social problems did *not* stem from the globalisation of the world economy and the breakthrough of new technologies. These problems, most economists would argue, were structural and had been in existence for decades. In particular, globalisation did not really have an impact on Finland until the integration developments of the late 1980s (the fall of the Berlin Wall, the collapse of Soviet communism). In effect, the enactment of new legislation on the foreign ownership of Finnish companies took until 1993.<sup>32</sup>

The section on "public sector tasks and an efficiency-driven growth strategy" formulated the core of *A New Outlook*. The drafters outlined four stages. First, they explored the role of the public sector in promoting the competitiveness, and the efficiency and growth of an economy. Second, they examined government failures. Third, they identified the problems of a factor-driven growth strategy. Fourth, they sought to replace the old factor-driven strategy with an efficiency-driven growth strategy. The rest of *A New Outlook* was dedicated to the implications of the proposed efficiency-driven growth strategy in the key areas of industrial policy - from technology and education to financial markets, EU industrial policy and competition.

The drafters did acknowledge, however, that "a market economy based on an extensive private sector had proven the most effective way of organizing a modern, complex and information intensive economy." As a result, the role of the public sector should serve the purpose of attacking problems that might hamper the efficient operation of markets. This was the case, they argued, with "market failures,"

Ultimately, the approach of *A New Outlook* depended on the superior information of government officials on markets and efficient production methods, the basis of which determined firm decisions or production. In the light of these implications, it is hardly surprising that the Finnish industry was not satisfied with the policy statement. Johannes Koroma, Director General of the Confederation criticized publicly *A New Outlook*.

In the conferences of the working team, I criticized the draft of *A New Outlook* quite strongly for too much theory and for deficiencies and one-sidedness in practical policy applications. In particular, I criticized its onesided focus on information technology, which ignored the production of consumer products and services.

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Of course, the Finns were hardly alone in preferring exogenous determinants to endogeneous ones. From the early 1970s to the early 1990s, it was, for political reasons, easier for many U.S. policy analysts to blame Japan for unfair trade than explore the real reasons of stagnation in American economy.



My criticism had nothing to do with the use of Porter's model. Instead, I urged, at that phase of the draft, that the authors find more perspectives by exploring *Advantage Finland*, which I consider quite good.

Apparently, when the final *A New Outlook* came out, it still did not meet the criteria of the Finnish industry. "When *A New Outlook* was completed, we did criticize it," notes Koroma.<sup>33</sup>

One may, of course, wonder why *A New Outlook* adopted an untenable theory to advocate changes, most of which were consistent with *National Industrial Strategy*. This linkage stemmed from the peculiarly Finnish over-excitement in the technology programs without adequate consideration of business economics and competitive strategies.

Yet, one should not view *A New Outlook* too critically. Although the theory of *A New Outlook* may have been mumbled, its concrete proposals (which were not dependent on that theory) were not.

- It saw technology and education as the engines of economic growth and, therefore, spoke strongly for technology funding and educational programs.
- It spoke as strongly for competition (which, ironically, its underlying theory did not), seen as the determinant in improving the efficiency of the economy.
- Keeping in mind the Finnish banking crisis, it advocated more effective operation of the financial markets, in particular the improvement in the availability of financial information.
- It saw rapidly increasing demand for technology, related to environmental protection, opening big opportunities in world markets for Finnish companies.
- It demanded the reform of regional policy, which was essentially based on the kind of location economics, supported by the theory and empirical evidence of cluster studies.
- Making note of the growing importance of EU industrial policy, it sought ways to influence and exploit this policy, as well as to adopt its basic objectives in Finland.
- Finally, it supported economic growth as the critical determinant in the reduction of unemployment.<sup>34</sup>

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Johannes Koroma (Director General, Confederation of Finnish Industry and Employers, Comments, May 2, 1997.

<sup>34</sup>

*A New Outlook*, pp. 33-63.

From the early 1990s to the present, the Ministry of Trade and Industry has taken almost all administrative responsibility in the analysis of the Finnish clusters, and engaged itself in innovative efforts to implement changes and to achieve more coordination between ministries.

As Pekka Lindroos, deputy director general (Industrial Policy, MTI), puts it

When we try to achieve cooperation in the development of eight selected clusters with other ministries, one soon encounters problems with the thinness of "knowledge." It seems that the development of technology is that mantra, which should transfer the competitiveness of Finland's industry into a new atmosphere.<sup>35</sup>

Indeed, much of the Finnish criticism against the MTI should be directed at the absence of the coordinated effort among other sectors of government.

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Pekka Lindroos, Deputy Director General (Industrial Policy, Ministry of Trade and Industry), Comments, May 2, 1997.

## 5. Toward the Analysis of the Finnish Investment System

By the mid-1990s, "every member of the Finnish parliament had probably heard of or knew about the cluster analysis," notes Pekka Ylä-Anttila of ETLA. Indeed, the most intensive research phase had peaked (see Exhibit 8). The initial excitement had calmed down, notes professor Risto Tainio (Department of Management and Organization, HSEBA), but *National Industrial Strategy for Finland* and *Advantage Finland* continued to influence new research projects and policy developments in several fields.

The strength of Porter's research was to identify nationally specific economic drivers, as well as the kind of national competence related to their birth and development. Perhaps the next question is why these specific systems work? In that case, such *national formations of firms* (clusters) must be seen in the totalities of national institutional and social groupings.<sup>36</sup>

In effect, one needed subtle analysis on the interplay of three different levels of variables - macroeconomics (aggregate economy), microeconomics (sectors, industries and industry segments, clusters), as well as competition (competitive strategies, competitive advantages, firm rivalries). In particular, one would have to study the peculiarities of the *Finnish investment system*. More comprehensive analysis, however, would become possible only *after* the mid-1990s when, among other things,

- *The Competitive Advantage* projects had explored the fundamental characteristics of Finnish industries (which forced one to think how to deal with strong and semi-strong, defensive and potential clusters).
- The ownership of major Finnish companies was internationalized in just two to three years after the 1993 legislation (which led to questions on simple notions of "national innovation systems" and "national investment systems").
- The Office of Free Competition had gained more experience in the implementation of competition laws (which meant hands-on knowledge on the complexities of the market forces).
- The integration pressures accelerated through firm rivalry and the impending EMU membership (which added to questions on economic and financial policies).

<sup>36</sup>

Risto Tainio (Professor, Department of Organization and Management, Helsinki School of Economics and Business Administration), Comments, April 2, 1997.

- And the economists were able to detect the determinants behind the myth of "Finland's economic miracle"<sup>37</sup> (which shifted the issues of the innovation-driven stage from clusters and industries toward macroeconomics).

What the rest of Western Europe had achieved in the course of four decades after World War II, Finland would have to accomplish in less than a decade - it would have to move from cartels to competition.

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In *From Cartels to Competition?* (ETLA/SITRA, 1997), I intend to show why and how the initial research projects were bound to downplay this *systemic* analysis. Still, individual Finnish economists had, either on their own (e.g., professor Matti Pohjola's studies on the "inefficient capital") or due to national urgencies (e.g., the research of professor Jukka Pekkarinen and his colleagues on the presumed effects of the EMU membership in Finland), conducted research which reached quite similar conclusions on the macro-level. Similarly, Finnish management researchers (professors Risto Tainio and Kari Lilja and their colleagues) had explored the impact of "political microeconomics" on the nation's market evolution and industrial organization.

## EXHIBIT 1. Porter's Research Project

### Porter's Research Project

... To investigate why nations gain competitive advantage in particular industries and the implications for firm strategy and for national economies, I conducted a four-year study of ten important trading nations: Denmark, Germany, Italy, Japan, Korea, Singapore, Sweden, Switzerland, United Kingdom, and United States.

Included were the three leading industrial powers, the United States, Japan, and Germany, as well as several other nations chosen to vary widely in size, government policy toward industry, social philosophy, geography, and region. Much attention has been directed at Asian nations in recent years, and Japan, Korea, and Singapore were investigated here. However, European nations provide equally interesting and important insights. An array of European nations was included in the study, among them several nations such as Switzerland and Sweden engaged in a remarkable amount of international trade for their size.

***The Fundamental Forces Underlying National Competitive Advantages.*** The focus of the research was on the process of gaining and sustaining competitive advantage in relatively sophisticated industries and industry segments. These hold the key to high and rising productivity in a nation, and are the least understood using established theory. ... Most studies of national competitiveness have focused on a single nation or have relied on bilateral comparisons, often with Japan. While much has been learned from this research, such an approach can only take us so far and can be misleading. The findings of bilateral comparisons often prove to be lacking in robustness when a third or fourth nation is added to the investigation. ... By studying nations with widely different circumstances, I hope to isolate the fundamental forces underlying national competitive advantage from the idiosyncratic ones.

The research was conducted by a group of over thirty researchers, most of whom were natives of, and based in, the nation they were studying. A common methodology was employed in each nation. The study was conducted with the assistance and support of the cooperating organizations that... included government entities such as the Japanese Ministry of International Trade and Industry, private financial institutions like the Deutsche Bank, educational institutions such as the Institute of International Business of the Stockholm School of Economics, and a publication, The Economist. Cooperating organizations provided needed infrastructure, assistance in gaining access to companies and other institutions within the nation, and sometimes also local research help.

**Mapping the Successful Industries in National Economies.** In each nation, the study consisted of two parts. The first was to identify all (or as many as possible) of the industries in which the nation's firms were internationally successful, using available statistical data, supplementary published sources, and field interviews. We were concerned with all types of industries in the economy, including agricultural, manufacturing, and service industries.

... The basic unit of analysis was the narrowly defined industry or distinct segment within an industry. National advantage is increasingly concentrated in particular industries and even industry segments, reflecting their specific and differing sources of competitive advantage. Within the limits of available data, we sought the least aggregated industry definitions.

We defined international success by a nation's industry as possessing competitive advantage relative to the best worldwide competitors. ... We chose as the best measures of international competitive advantage either (1) the presence of substantial and sustained exports to a wide array of other nations and/or (2) significant outbound foreign investment based on skills and assets created in the home country for the statistical phase of our research. ... The nation was treated as the home base for a firm if it was either a locally owned, indigenous firm, or a firm that was managed autonomously though owned by a foreign company or investors. ...

**Successful Industries, Cluster Charts.** We created a profile of all the industries in which each nation was internationally successful at three points in time: 1971, 1978, and 1985. The larger nations exhibit international positions in hundreds of industries. The pattern of successful industries in each economy was far from random, and the task was to explain the pattern and how it had changed over time. Of particular interest were the connections or relationships among the nation's competitive industries. We employed a tool called a cluster chart to map successful industries in each economy. ...

In the second part of the study, we examined the history of competition in particular industries to understand the dynamic process by which competitive advantage was created. Based on the national profiles, we selected over one hundred industries or groups of industries. ... For each nation, the sample of industries was chosen to be representative of the most important groups of competitive industries in the economy. .... In order to understand the dynamic process by which national advantage was gained in an industry, it was necessary to study the industry's history. We went back as far as necessary... to understand how and why the industry began in the nation, how it grew, when and why firms from the nation developed international competitive advantage, and the process by which competitive advantage had either been sustained or lost. ... Each case study considered the entire global industry, including both winning and losing nations.

Adapted from

Michael E. Porter, *The Competitive Advantage of Nations* (New York: The Free Press 1990), pp. 21-29.

## EXHIBIT 2. National Industrial Strategy for Finland (1993): Adjustment Alternatives - Two Scenarios<sup>38</sup>

### National Industrial Strategy for Finland (1993): Adjustment Alternatives - Two Scenarios

#### **SCENARIO 1:**

#### ***Export-Driven Strategy Fails - Economic Disequilibrium Worsens***

International economic growth is very sluggish. Finnish exports grow only modestly for several years and the foreign debt continues to grow. The public finance problems are not resolved and there is no common understanding about economic policy. A lack of faith in the Finnish markka and in the economy's development possibilities become chronic. The markka depreciates continuously and inflation picks up momentum. The economy is thrown into a deep and prolonged financial crisis and the availability of foreign credit becomes a greater problem. In order to stem capital outflows there is a return to restrictions on capital movements. The current account starts to run a surplus only after a considerable fall in private consumption, investment and public expenditures. Finland does not become a member of the EC, at least not during the first phase of enlargement. Finland gains hardly any direct foreign investments. Finnish multinationals carry most of their investment abroad.

Economic equilibrium is reached by a lowering of wages and other costs. New production capacity in industry is built around low labor cost solutions. The widening of the technological base that began in the 1980s comes to a halt. The competitive advantage of Finnish firms is based on cost competitiveness: the significance of labor- and raw material-intensive branches within the industrial structure grows. Finland's main competitors are the NIC countries (mainly from the Far East) and some of the CIS countries.

<sup>38</sup>

Matti Pietarinen and Risto Ranki, *National Industrial Strategy for Finland* (Kansallinen teollisuusstrategia), Ministry of Trade and Industry Publications 3/1993, pp. 4-5 [slightly abbreviated].

**SCENARIO 2:**

***Gradual Return to Economic Equilibrium - Exports Expand and Production Structure Diversifies***

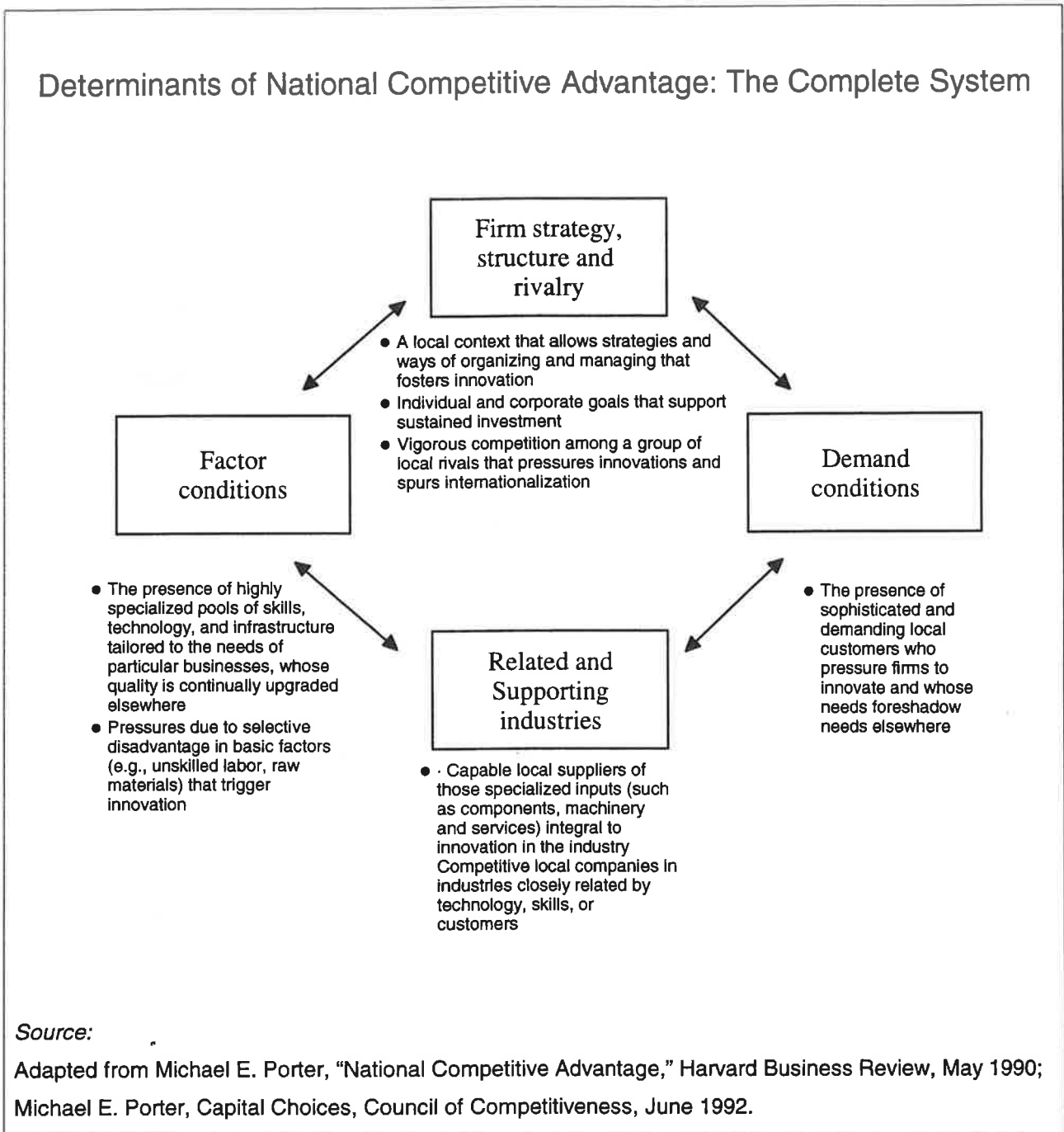
The disequilibrium of the economy is brought under control. The growth in exports fostered by the strong competitiveness boosts the merchandise trade account to a surplus of 4-5% of GDP, which is sufficient to bring the growth of the foreign debt to a halt. The central government debt rises to new heights, but its growth is stopped by cutting public expenditures; this requires a continuous decline in non-interest expenditures as well as increased tax revenues spurred by the economic recovery. The confidence in economic policy strengthens and interest rates fall, as a result of which investment starts to pick up. The European integration process proceeds without great setbacks and Finland becomes a member of the EC.

The role played by manufacturing in the balancing of the economy is of key importance. In order for Finland to start reducing its foreign indebtedness, the balance of trade must for several years run a surplus of FIM 30-40 billion, i.e., about 30% relative to export revenues. This is a demanding task: only Japan and Germany have been able to sustain such sizable surpluses. In terms of export growth this means an average rise in exports of 6-8% per annum during the entire 1990s. In tandem with traditional exports, the output and exports of new know-how based branches will expand. The structural change in production that began in the 1980s will continue. The production and export structure will become more diversified.

Technological advances are rapid and the efforts made in the 1980s show up as higher productivity and as new products. The competitive strategies of companies are based on factor specialization and upgrading into, for instance, skilled labour and know-how related capital. The role of basic factors of production (raw materials, unskilled labour) will be of less importance than previously.

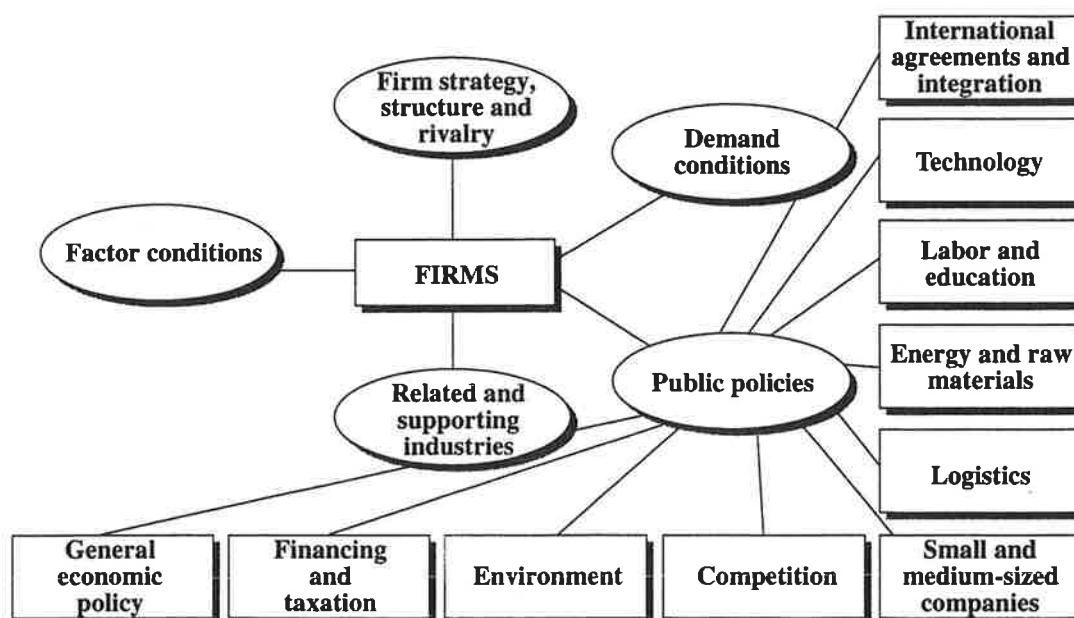


### EXHIBIT 3. Determinants of National Competitive Advantage: The Complete System



**EXHIBIT 4. Determinants of Finland's Competitive Advantages;  
The Components of Economic and Industrial Policy**

Determinants of Finland's Competitive Advantages;  
The Components of Economic and Industrial Policy



Source:

As adapted from Porter, *The Competitive Advantage of Nations* (New York: The Free Press 1990) and Langtidsprogrammet 1994-97, Norwegian Ministry of Finance (1993) in *National Industrial Strategy for Finland*, p. 31.

## **EXHIBIT 5.      The Research Institute of the Finnish Economy (ETLA)**

### **The Research Institute of the Finnish Economy (ETLA)**

Founded in 1946, ETLA was a private, independent, non-profit research institution. Its primary mission was to conduct research in economics, finance and social policy designed to serve financial and economic-policy decision making in Finland. The members of the association sponsoring ETLA consisted of the central association of industry and employers, major banks and central association of insurance companies. The institution had two major activities: macroeconomic forecasting and project studies. The institution also conducted special studies financed from sources outside the association, for which a separate unit (Etlatieto Ltd) had been established. ETLA was the largest economic research institution in Finland. Pekka Ylä-Anttila would serve as research supervisor of the ETLA projects, just as he had served as the research authority in the policy statements of the Ministry of Trade and Industry).

## **EXHIBIT 6. The Diamond Model - Selected Finnish Reports**

### **(The Research Institute of the Finnish Economy, ETLA)**

#### **The Diamond Model - Selected Finnish Reports**

##### **(The Research Institute of the Finnish Economy, ETLA)**

###### **Year 1996**

- HERNESNIEMI, HANNU - LAMMI, MARKKU - YLÄ-ANTTILA, PEKKA - ROUVINEN, PETRI (ed): Advantage Finland. - The Future of Finnish Industries. 1996 ETLA B 113. 236 p.
- KÄSSI, TUOMO: Engineering-ala Suomessa - toimialasta klusteriksi? 1996 ETLA B 122. 294 s.
- PAIJA, LAURA - YLÄ-ANTTILA, PEKKA: The Impact of Structure and Competition on Employment in Telecommunications Cluster. Case Finland. 1996 Nro 549.

###### **Year 1995**

- HERNESNIEMI, HANNU - LAMMI, MARKKU - YLÄ-ANTTILA, PEKKA: Kansallinen kilpailukyky ja teollinen tulevaisuus. 1995 . 458 s. ETLA B 105.
- PUTUS, ANTTI: Matkapuhelinverkkojen kehitys ja alan kotimaisen teollisuuden kilpailukyky. 1995 35 s. Nro 528.
- ROUVINEN, PETRI - SARANUMMI, NIILLO - LAMMI, MARKKU (toim.): Terveystieteiden tutkimuskeskus - Hyvinvointiklusterin kilpailukyky. 1995 . ETLA B 109. 126 s.
- SARANUMMI, NIILLO: Lääketieteelliset laitteet ja tietojärjestelmät. 1995 . 87 s. Nro 533.

###### **Year 1994**

- AALTO, Jari: Suomalaisten teräsrakenteiden toimittajien kilpailukyky. 1994 28 p. Nro 506.
- ANGENENDT, GEORG: Identification and Discussion of parameters that can be used to analyze industries with Michael E. Porter's system of determinants that influence the competitive position of nations' industries. 1994 37 p. Nro 482.
- HINTSANEN, SUVI: Energia-alan tietämuspohjainen vienti. 1994 49 s. Nro 487.
- HOPPONEN, ERKKA: Itsenäisen voimantuotannon rahoitus ja kilpailukyky. 1994 75 s. Nro 494.
- ILKKA, Jari: Kirjapainojen kansallinen kilpailukyky ja teollinen tulevaisuus. 1994 54 s. Nro 490.
- JUNNONEN, JUHA: Vesihuoltoon ja vedenkäsittelyyn liittyvän rakentamisen kilpailukyky. 1994 30 s. Nro 521.
- KAIPAINEN, PIIA: Competitive Advantage of Finnish Steel Industry. 1994 76 p. Nro 493.
- KAUPPALA, PETTERI: Matkustajalaivaliikenteen kansallinen kilpailukyky. 1994 54 s. Nro 499.
- KONTULAINEN, NINA J.: Competitive Advantage of the Finnish Fiber Processing machinery industry. 1994 60 p. Nro 511.
- KOOTA, JAANA: Hirsi- ja puutaloteollisuuden kilpailukyky. 1994 19 s. Nro 517.
- KORHONEN, KATI: Advantage Finland - Metals Production Technology. 1994 34 p. Nro 480.
- KORPINEN, PIA: Kilpailuetu kansainvälisessä kaupassa - suomalainen kuntovälineiteollisuus. 1994 78 s. Nro 507.
- KUOKKANEN, PASI: Energian tuotannon koneet ja laitteet. 1994 46 s. Nro 481.

- KYHERÖINEN, TEPPO I.: Teletöiminnan kansallinen kilpailukyky. 1994 91 s. Nro 479.
- LAAKSONEN, KALLE - VOLK, RAIJA: Elintarvikeklusterin kilpailukyky. Väkiraportti. 1994 59 s. Nro 501.
- LAIHOSOLA, HELENA: Suomalaisen lääkeketeollisuuden kilpailuetu. 1994 60 s. Nro 523.
- LAMMI, MARKKU: Paperin, koneiden ja osaamisen menestystarina. Metsäklusterin kilpailukyky. 1994 ETLA B 99.
- LEIPONEN, AIJA: Malmista metalliksi maailmalle - Perusmetalliklusterin kilpailukyky. 1994 ETLA B 98. mk 170,-
- MATILAINEN, JAANA - PAJAKKALA, PEKKA - LEHTINEN, ERKKI: Yhteistyöllä innovaatioita uusille markkinoille. Rakennusklusterin kilpailukyky. 1994 144 s. ETLA B 97.
- MÄENPÄÄ, KEIJO - LUUKKAINEN, SAKARI: Teletekniikasta monimuotoiseen viestintään. Teleklusterin kilpailukyky. 1994 126 s. ETLA B 96.
- MÄKELÄ, JOUNI, P.: Teleklusterin tutkimus- ja kehitystoiminta sekä koulutus ja konsultointi. 1994 67 s. Nro 495.
- OJAINMAA, KAISA: International Competitive Advantage of the Finnish Chemical Forest Industry. 1994 167 p. ETLA C 66.
- PENTTINEN, RISTO: Summary of the Critique on Porter's Diamond Model. Porter's Diamond Model Modified to Suit the Finnish Paper and Board Machine Industry. 1994 82 s. Nro 462.
- PENTTINEN, RISTO: Timanttimalin arvostelu. 1994 32 s. Nro 508.
- PUTUS, ANTTI: Matkapuhelinteollisuuden kotimainen kehitys ja kilpailukyky. 1994 41 s. Nro 489.
- RANTALA, JARKKO: Suomalaisen rakennusteollisuuden kilpailukyky projektiviennissä. Case: Venäjän sotilaskylät. 1994 25 s. Nro 515.
- ROUVINEN, PETRI: Energian niukkuudesta teknologian vientiin. Energiaklusterin kilpailukyky. 1994 112 s. ETLA B 93.
- ROUVINEN, PETRI: Hyvinvointiklusterin kilpailukyky - alustavia havaintoja. 1994 66 s. Nro 503.
- SAASTAMOINEN, SONJA: Kotimaisen sähkömoottoriteollisuuden kilpailukyky. 1994 42 s. Nro 475.
- SALMI, MINNA: The Rise of Kone Elevators to the Top of the World. 1994 29 p. Nro 505.
- SOININEN, MARKKU: Rakennuspuusepänteollisuuden kilpailukyky. 1994 22 s. Nro 519.
- SOLA, KRISTIINA: Rakennusalan suunnittelun ja konsultoinnin kilpailukyky. 1994 32 s. Nro 520.
- TEIVAS, MARKO: Talotekniikan kilpailukyky. 1994 23 s. Nro 518.
- TORRI, TOMMI: The World Economy of Metals. A Finnish Perspective. 1994 49 p. Nro 492.
- TÖRMÄLEHTO, VELI-MATTI: Huomioita endogeenisen kasvuteorian ja Michael E. Porterin kilpailuteorian yhtäläisyyksistä. 1994 33 s. Nro 524.
- VEHMAS, JARMO: Massa- ja paperiteollisuuden elinkaariarviointi ja metsäteollisuuden ympäristöhaasteet. 1994 Nro 485.
- VILJAKAINEN, JUHA: Euroopan unionin teollisuuspolitiikka ja suomalainen terästeollisuus. 1994 30 s. Nro 510.
- VUORI, HANNA: Betoniteollisuuden kilpailukyky. 1994 39 s. Nro 512.

#### **Year 1993**

- AALTO, AKI: Talouselämä-lehden suuryritystietokanta Etlassa. 1993 53 s. Nro 441.
- HERNESNIEMI, HANNU: Kansallista kilpailukykyä etsimässä Kansallinen kilpailukyky ja teollinen tulevaisuus -projektin neuvottelukunnan 21.1.1993 kokouksen aineisto. 1993 26 s. Nro 439.
- HIETA, PAULA: Energiatoimialan kehitys Suomessa. 1993 31 s. Nro 454.
- HYVÄRINEN, JARI: Alueellinen kilpailukyky Suomen itäisellä rannikkoseudulla, Pietarissa ja Virossa. 1993 105 s. Nro 455.
- HÄMÄLÄINEN, TIMO J.: Resources, Organizational Efficiency and International Competitiveness: A Systemic Framework. 1993 108 s. Nro 447.
- KALOINEN, MARIA: Suomen kilpailuetu Venäjän transit liikenteessä. 1993 62 s. Nro 459.

- LEIPONEN, AIJA: Henkinen pääoma ja talouskasvu - Suomi ja muut OECD-maat empiirisissä vertailuissa. 1993 60 s. Nro 451.
- MALASSU, ALI: Advantage Finland - Sawmill Industry. 1993 82 p. Nro 442.
- MALIRANTA, MIKA: Tuottavuuden kehitys ja taso Suomen metsäteollisuudessa ja sen yrityksissä - kansainvälinen vertailu. 1993 56 s. Nro 449.
- MATIKAINEN, ESA: Kilpailuetu kansainvälisessä kaupassa - Suomen laivanrakennusteollisuuden ja sen liitännäistoimialojen klusteri. 1993 65 s. Nro 446.
- MONONEN, ARI: Metsänkorjaamiseen erikoistuneen konepajateollisuuden kansallinen kilpailukyky ja teollinen tulevaisuus Suomessa. 1993 53 s. Nro 452.
- PALO, KATRIINA: Network Interaction - Development of Expertise in Finnish Technical Consultancy Firms. 1993 46p. Nro 445.
- RAUMOLIN, JUSSI: Ahlström: Shift from Forest Products Company to Environmental Technology. 1993 15 p. Nro 458.
- ROUVINEN, PETRI: Data-guide to OECD Exports. 1993. 75 p. Nro 426.
- TAMMINEN, MARKUS: Sähkön siirron ja jakelun tekniikka. 1993 37 s. Nro 456.

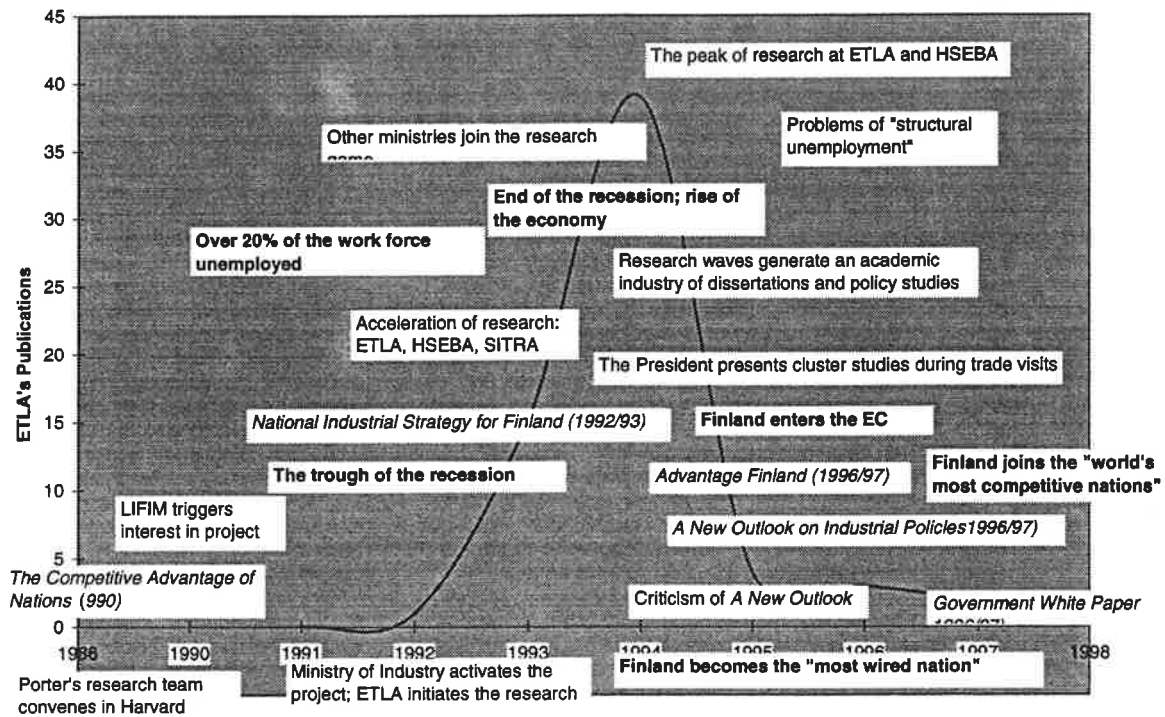
## EXHIBIT 7. Finnish Clusters

Finnish Clusters		
Type	Nature	Cluster
<b>Strong Cluster</b>	Complete cluster structure, fierce competition, dynamic relations between participants create advantages, many interconnections between firms via product and knowledge flows	Forest Cluster
<b>Semi-strong Clusters</b>	Stable, but partially incomplete cluster structure, positive cluster relations	Base Metal Cluster Energy Cluster
<b>Potential Clusters</b>	Cluster structures are still fragile, but strengthening, positive development	Telecommunications Cluster Environmental Cluster Well-Being Cluster Transportation Cluster Chemical cluster
<b>Latent (defensive) clusters</b>	Some cluster structures exist, negative aspects in cluster relations, under-utilization of capacity	Construction Cluster Foodstuffs cluster

Source: *Advantage Finland*, p. 40.

## EXHIBIT 8. Cluster Studies (1986-98)

### Cluster Studies (1986-98)



SOURCE: Dan Steinbock, *From Cartels to Competition?* (forthcoming, Fall 1997)



## APPENDIX: Publications Related to *The Competitive Advantage of Nations*

Professor Michael E. Porter  
Harvard Business School  
Rev. 5/21/97

DRAFT

### Books (M. Porter author or co-author)

"Construir as Vantagens Competitivas de Portugal," (with Monitor Company), Forum Para a Competitividade, Lisbon, Portugal, 1994.

Upgrading New Zealand's Competitive Advantage (with Graham T. Crocombe and Michael J. Enright), Oxford University Press, Auckland, 1991.

Advantage Sweden (with Örjan Sölvell and Ivo Zander), Norstedts Förlag AB, Stockholm, SWEDEN, 1991.

Internationale Wettbewerbsvorteile: Ein Strategisches Konzept für die Schweiz (International Competitive Advantage: A New Strategic Concept for Switzerland), with Silvio Borner, Rolf Weder, and Michael J. Enright, Campus Verlag, Frankfurt/New York, 1991.

Canada at the Crossroads: The Reality of a New Competitive Environment, (with Monitor Company), Business Council on National Issues and the Government of Canada, Ottawa, 1991.

The Competitive Advantage of Massachusetts, in collaboration with Monitor Company, Office of the Secretary of State, Boston, MA, 1991.

Toward a Shared Economic Vision for Massachusetts, (with Rebecca E. Wayland and C. Jeffrey Grogan) in collaboration with *Challenge to Leadership*, December 30, 1992.

Two Japans: Competitive Advantage and Disadvantage of the Japanese Economy (with Hirotaka Takeuchi and with the assistance of Mariko Sakakibara), forthcoming.

### Articles (M. Porter author or co-author)

"Competitiveness in Central America," in *Competitiveness in Central America: Preparing Companies for Globalization*, a publication of the Latin American Center for Competitiveness and Sustainable Development, INCAE, Alajuela, Costa Rica, July 1996.

"A New Vision for Indian Economic Development: The Corporate Agenda," (with Pankaj Ghemawat and U. Srinivasa Rangan), working paper, October, 1995.

"A New Vision for Indian Economic Development," (with Pankaj Ghemawat and U. Srinivasa Rangan), working paper, March 1995

"The Role of Location in Competition," *Journal of the Economics of Business*, Volume 1, Number 1, 1994.

"Applying the Competitive Advantage of Nations Paradigm to Norway," PRAKTISK ØKONOMI & LEDELSE: ET KONSURRANSEDYKTIG NORGE, Number 1, February 1993, Bedriftsøkonomens Forlag A/S, Oslo, Norway.

"Comment on 'Interaction Between Regional and Industrial Policies: Evidence From Four Countries,' by Markusen", in *Proceedings of The World Bank Annual Conference on Development Economics 1994*, Supplement to The World Bank Economic Review and The World Bank Research Observer, Michael Bruno and Boris Pleskovic (editors), Washington, DC.

"The Competitive Advantage of Nations," HARVARD BUSINESS REVIEW, March-April, 1990. Also reprinted in ENGINEERING MANAGEMENT REVIEW, Volume 18, Number 4, December 1990.

"Don't Collaborate, Compete," THE ECONOMIST, June 9, 1990.

"America's Green Strategy," SCIENTIFIC AMERICAN, Volume 264, Number 4, April 1991, page 168.

### Publications on or related to The Competitive Advantage of Nations theory, other authors

#### Empirical Testing

Dan Steinbock: "The Competitive Advantage of Finland: The Primary Research Projects", ETLA DP 604.

"Changing the Competitive Advantage of Nations: Lessons from the New Zealand Experience", Colin Campbell-Hunt and Peter McKiernan, paper presented at Strategic Management Society, 16<sup>th</sup> Annual International Conference, Phoenix, 1996

"User-producer interaction, learning and comparative advantage," Jan Fagerberg, *Cambridge Journal of Economics*, Volume 19, pp 243-256, 1995.

"On the Competitive Advantage of Nations, Continents and College Sports Schedules," Cary Atlas and Mark Zupan. Department of Finance and Business Economics, USC Business School, Los Angeles, California, March 1992.

#### Nations

The Hong Kong Advantage, Michael J. Enright, Edith E. Scott, and David Dodwell, Oxford University Press, New York, 1997.

Venezuela: The Challenge of Competitiveness, Michael J. Enright, Antonio Francés, and Edith Scott Saavedra, St. Martins Press, New York, 1996.

"A Competitividade da Economia Portuguesa 95," Forum para a Competitividade, Lisbon, Portugal, July 1995.

Projecto Porter: Aplicacao a Portugal, 1993/94, Ministerio da Industria e Energia, Lisbon, Portugal, 1995.

El desafio de la competitividad. Los más autorizados conceptos acerca del tema que determinará el futuro de Colombia, Ministerio de Desarrollo Económico de Colombia, November 1993.

Et Konkurransen-Dyktig Norge (A Competitive Norway), Torger Reve, Terje Lensberg, Kjell Grønhaug, Tano Publishers, Norway, 1992. Awarded the Shell Prize in Economics by A/S Norske Shell, November 1993.

"A Time for Change: Industrial Policy for the 1990s," report of the Industrial Policy Review Group, Dublin, Ireland, January, 1992.

Korean Competitiveness: A Shortcut to an Advanced Nation, Dong-Sung Cho, 1992.

Deutsche Wettbewerbsvorteile (The Competitive Advantage of Germany), Claas van der Linde, Econ Verlag, Düsseldorf, Germany, 1992.

Maroc: Le Prochain Dragon? (De nouvelles idées pour le développement), Serge Leymarie and Jean Tripier, Editions EDDIF, Casablanca, Morocco, November 1992.

Vækst og dynamik i dansk erhvervsliv, Henrik Pade (editor), J.H. Schultz Information A/S, København, Denmark, 1991.

Partnership and Enterprise: Putting Porter into Practice, Graduate School of Business and Government Management, Victoria University of Wellington, Wellington, New Zealand and New Zealand Strategic Management Society, GSBGM Special Report Series No. 3, October 1991.

"De Economische kracht van Nederland: Een toepassing van Porters benadering van de concurrentiekracht van landen," D. Jacobs, P. Boekholt, W. Zegveld, SMO, Den Haag, 1990.

"The Netherlands as a National System of Innovation," Dany Jacobs, Jeanne M. Lynch, Celeste P.M. Wilderom, and Walter Zegveld. Paper presented at the Ninth Annual Strategic Management Society Conference, San Francisco, October 11-14, 1989.

Industrielt Succes: Konkurrencefaktorer i 9 danske brancher, Kim Møller and Henrik Pade (editors), Samfundslitteratur, Denmark, 1988.

Studies in Swiss Competitive Advantage, Michael J. Enright and Rolf Weder (editors), Peter Lang AG, Bern, Switzerland, 1995.

#### States

"International Strategic Action Plan," Department of Economic and Community Development, Connecticut, February 1997.

"The Connecticut Connection: Implementation Strategy for The Connecticut Competitiveness Initiative," prepared for the Connecticut Economic Conference Board by DRI/McGraw-Hill, 1994.

"California's Jobs and Future," Council on California Competitiveness, April 23, 1992.

### Clusters

"Canvi estratègic i clusters a Catalunya," J. Conejos, E. Duch et. al. Papers d'economia industrial, Generalitat de Catalunya, Barcelona, 1997 (ISBN 84-393-4235-7), pp 107.

"Cambio estratégico y clusters en Cataluña," J. Conejos, E. Duch et. al., Ediciones Gestión 2000, Barcelona, 1997.

"Hard and Soft Networks: Helping Firms Cooperate for Export Growth", Ifor Ffowes Williams, *New Zealand Strategic Management*, Summer, 1996

"Samenwerken en concurreren: een case-study van de Nederlandse sierteelt," Managers Ontmoeting Overheid Bedrijfsleven, SMO, Den Haag, 1990.

"Building on Strength: Upgrading the Medical Device Cluster in Massachusetts," Elizabeth Olmsted Teisberg with the assistance of Yiannis Monovoukas and Scott Wilkin, in collaboration with Michael E. Porter, Jeffrey Grogan, and executives in 31 Massachusetts medical device firms, Governor's Council on Economic Growth and Technology, March 1995.

"Twin Cities Industry Cluster Study," a joint study: University of Minnesota Metropolitan Council, July 1995.

"Southeastern Minnesota Industrial Cluster Study," conducted for The Initiative Fund by the Hubert H. Humphrey Institute of Public Affairs State and Local Policy Program, September 1996.

"Executive Summary" and "Interim Summary of Progress," *Northern Ireland Growth Challenge*, May 10, 1995.

"Appendix 1: Finnish Industrial Clusters," in *National Industrial Strategy for Finland*, Ministry of Trade and Industry in Finland, Industry Department, 1993.

### **Work by others using the CAON framework**

"Rapport fra Idé-og Ressursgruppen til Maritim Stortingsmelding," Sven Ullring, Høving, Norway, September 1995.

"De economische kracht van de bouw: Noodzaak van een culturele trendbreuk," D. Jacobs, J. Kuijper, B. Roes, SMO, Den Haag, 1990.

"L'Atlas industriel du Québec," sous la direction de Pierrette Gagné et Michel Lefèvre avec le concours de Gérald Tremblay (préface de Michael E. Porter), Publi-Relais, Montreal, 1993.

### **Consulting studies using the CAON Framework**

"Building the Competitive Advantage of Peru," Monitor Company, Cambridge, MA, 1995.

"Creating the Competitive Advantage of Colombia," Monitor Company, Cambridge, MA, 1993.

"Strategy for a Competitive Greece," Monitor Company, Cambridge, MA, 1993.

"The Competitive Advantage of Scotland," Monitor Company, Cambridge, MA, 1993.

"The Competitive Advantage of Euskadi," Monitor Company, Cambridge, MA, 1992.

"Estudi Sobre els Avantatges Competitius de Catalunya," Monitor Company, Cambridge, MA, 1992.



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- No 601 JUKKA LASSILA - HEIKKI PALM - TARMO VALKONEN, FOG: Suomen kansantalouden limittäisten sukupolvien malli. 21.05.1997. 83 s.
- No 602 JOUKO NÄTTI, A Typical Employment and Gender in Finland. 02.06.1997. 33 p.
- No 603 MIKA MALIRANTA, The Determinants of Aggregate Productivity, The Evolution of microstructures and productivity within plants in Finnish manufacturing from 1975 to 1994. 09.06.1997. 38 p.
- No 604 DAN STEINBOCK, The Competitive Advantage of Finland: The Primary Research Projects. 11.06.1997. 41 p.

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