

# Finland: A Success Story?

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**ABSTRACT** *The Finnish economy has done enormously well in recent international comparisons of technological advancement and economic competitiveness; it has reached a notable runner-up position in just a couple of decades, measured by a range of indicators. The paper looks at the process of national scale competitiveness building in a historical perspective and discusses the reasons for the Finnish success. It analyses the main actors and features in the national innovation system and seeks befitting characterizations of the country-specific social capital that are believed to have provided the resource base for the competitiveness of the Finnish technology sector and the economy at large. Lastly, the paper takes up issues related to the sustainability of the system in light of contemporary understanding of what creates competitive advantage in the present-day world economy.*

## Introduction

Recent comparisons of technological and economic competitiveness have shown that Finland, at the northern fringes of Europe, has performed enormously well *vis-à-vis* the large and powerful economies of the world (see Boekema & Rutten, this issue). It has not always gone so well. Finland industrialized late, and really caught up with the most advanced nations only in the period following World War II. Only a decade before Finland was saluted as the world competitiveness leader, it was deep in trouble: supposedly unbearable public debt, record-high unemployment rate, financial crisis. What turned the seemingly rundown forest-based economy into a technology runner-up? How did the Finnish innovation system succeed?

The “performance” of a nation, typically measured by gross national product (GNP) growth, is an outcome of a complex process with multiple causal relations. Economic studies typically assume a causal chain where research and development (R&D) activities give rise to technological advancement, which leads to productivity growth that in turn brings about GNP growth. Contemporary institutional and evolutionary thinking, in addition, considers a broader range of societal processes influencing national economic performance.

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An institutional way of thinking on national differences in the operation principles and outcomes of various market economies is presently spreading across social science disciplines. It comes, amongst others, in the guise of the comparative work of the economist David Soskice (see e.g. Soskice 1999; Hall & Soskice, 2001) on “varieties of capitalism”, and the British organizational sociologist Richard Whitley’s and his colleagues’ work comparing “national business systems” or “divergent capitalisms” (e.g. Whitley, 1992, 1999, 2002; Morgan *et al.*, 2005). This literature shows via empirical comparisons, that even if globalization seems to create pressures towards convergence and the adoption of “best practices”, these tendencies nevertheless end up producing divergent national “models” in different country settings. Also, the processes through which “globalization” enters—and shapes—countries, differs. There are obviously similarities among country groups. For instance, the Nordic countries are often regarded as a group united with a range of shared societal features (e.g. Asheim, forthcoming). Also, Lorenz and Valeyre (2004) found that a “learning” organizational model appears to be relatively well represented in the Nordic countries. What this literature emphasizes is that nation-specific institutional environments mould the functioning of the economy, the manner in which economic agents go about running their businesses, and the nature of their interaction. This is obviously a view that is shared among institutionalists across disciplines. The nature and development of a country’s economy and society, its relative specialization in terms of dominant and most rapidly developing (innovating and internationalizing) industries, and its pattern of investment in specific kinds of knowledge (through R&D activities), go hand in hand. They are supported by country-specific ways of coordinating the economy and society. A nation’s natural, technological, financial, human and collectively shared resources and competences, its economic activities and institutional features co-evolve.

The institutional and/or evolutionary approaches to evaluating country competitiveness also comes across in the broad body of literature on national innovation systems (NISs),<sup>1</sup> pervasive in policy-making circles and the related academic literature in the Organization for Economic Cooperation and Development (OECD) countries (see e.g. Miettinen, 2002). The literature is not homogeneous, but it by and large adopts an institutional and evolutionary perspective and regards development processes in institution-bound economic systems as path-dependent (Miettinen, 2002; Schienstock, 2004a). While the NIS literature mainly focuses on the key actors (private firms, government bodies, universities and other research institutes) and their interactions in creating innovation systems, at least some of the “comparative capitalism” literature can be seen as placing NISs in the broader historical perspective of the evolution of societies and their economies.

In what follows, some of the key characteristics of the Finnish business system and the inherent innovation system will be outlined from this perspective. Finland has been classified as a “coordinated market economy” (Soskice, 1999); is a member of and subject to regulations by the European Union (EU); a recipient of policy influences by the OECD; and shares a set of distinctly Nordic societal characteristics. Nevertheless, Finland also features a characteristically Finnish economy and society: outcomes of its own cultural, political and economic history. In what follows, an attempt will be made to sum up and discuss some of the socio-economic factors that have contributed to Finland being internationally renowned as a “model case” of knowledge economy.

The following section takes a look at what has happened: Finland’s transformations. The first historical transformation made Finland an industrialized society; the second turned the county into a leading producer of information and communication technologies

(ICTs) in a matter of a few years. This description is followed by a discussion of some of the factors that have been regarded as explanations to the phenomenon. Finally, contemporary challenges for the economy and society are outlined from the perspective of innovative policy-making.

## Transformations

### *“Finland Lives from its Forests”—Forest-based Industrialization*

Finland’s present level of affluence was reached rather late as until World War II the nation remained relatively poor and largely agrarian. At the time of gaining its independence, in 1917, Finland’s GNP per capita was about half that of Britain, the innovator in industrial practices (Okko, 2003, p. 184). At the beginning of the nineteenth century the Senate of Finland observed the benefits of industrialization British style, but the country did not yet have the financial, infrastructural or entrepreneurial resources to follow the example. In the mid-nineteenth century, however, exports of forest products brought in capital that could be invested in largely forest-based industrial production. With support from the state, the leading national elites, Finnish nationalism (“Fennomania”), along with the consent of the rulers in St Petersburg, the transformation from an agrarian to an industrial society slowly began. (Kuusima, 1999, pp. 67–72). The gap with affluent Western Europe started to close in the 1920s and 1930s, largely due to processed forest product exports (sawn timber, pulp, paper), technological developments giving rise to labour productivity and favourable international trends (Kuusima, 1999, p. 56). Finland finally caught up with the world’s most affluent economies in the period following post-war reconstruction up until the mid-1970s<sup>2</sup> (Pohjola, 2003, pp. 164–165).

For centuries, the abundant forests provided the basis for Finland’s economic progress: in the Middle Ages, the Hanseatic fur trade was important; in the seventeenth century, merchant capitalism made tar the first commodity to be sold in mass quantities in Western Europe (the Dutch and British naval and merchant fleets being among the key final users); in the eighteenth-century, timber and wooden ships were the main products; since the late nineteenth century, pulp and paper have been Finland’s key exports and the basis of the internationalization processes of several large forest-based corporations (Kuusima, 1999, p. 55). Until the late 1950s, around 90% of Finnish export income came from the forest industries (Lilja *et al.*, 1992, p. 143). While the Finnish industry and export base has also strongly diversified ever since, especially into metal and machinery, the forest industries have played a significant role in the evolution of Finland’s economy and society. Nowhere else has the forest sector similarly been the economic engine of a country; for decades, Finland remained a “forest sector society” (Lilja *et al.*, 1992).

The sector includes several industrial branches (forestry, different mechanical and chemical forest industries, supplier and customer industries) which formed a country-wide cluster, having had a strong influence on the economy and the society (for a detailed discussion, see Lilja *et al.*, 1992). Early on, many remote forestry-based industrial communities around the country had emerged as company towns. The basic infrastructure and the gradual diversification of the local economic base grew out of the main employer’s activities. The sector was strengthened by domestic rivalry and innovations diffused among competitors across company boundaries. The forest sector also benefited from the belief, emerging since the nineteenth century, in technological modernism, which

enabled the brightest young people to acquire an education in engineering—and often a job in the forest industry. Forestry, forestry machinery and forest consultancy corporations developed high levels of know-how, giving rise to leading positions in their respective markets world-wide. The long distances from export markets further put pressures to create technologies to cut costs. A further factor is the Finnish institutional condition that forests are largely owned by farmers. They have kept the price of wood high which has created the need to invest in technologies that increase productivity. Finally, the Finnish political elite had traditionally been closely connected to the powerful forestry industry and tended to its needs.

The forestry corporations thus had a central role in the evolution of “Finnish-style capitalism”. The post-war societal system was coordinated by government planning but the system involved a corporatist element, with a strong role of employers’ and employees’ interest organizations in negotiating industrial relations and collective bargaining agreements. In the 1960s, the government committed to building a modern welfare state (Hämäläinen, 2004; Tainio & Lilja, 2003, p. 72). A characteristic institution of the system was the core of the economy being formed by three major bank groups with strong “flagship” corporations attached to them, including the key forest corporations. Firms in the groups were provided credit-based financing by their banks, often patient capital. The post-war business system remained relatively closed. It was characterized by state-led coordination, long-term investments in heavy industries, reliance on cartels, with the economy being dominated by diversified, production-oriented, hierarchical and state-dependent (partially state-owned) corporations (Tainio & Lilja, 2003). Until the 1970s, Finnish companies’ international activities consisted mainly of exports. Only a few companies had sales offices abroad and even fewer had production units (Ali-Yrkkö *et al.*, 2004, p. 6).

The traditional industrial core was challenged in the 1980s, when discussions were launched concerning the need for Finland to modernize and transform into an “information society”. Among the key proponents of such views was Nokia’s chief executive officer, Kari Kairamo. At the time, Nokia was a typical large, diversified corporation, with strong roots in paper and pulp production. In Kairamo’s vision, Nokia was going to be a firm suited for the “information society”. This, however, did not happen immediately or without difficulty. Facing the challenge, the forest companies invested in modern machinery and product development, convincing decision-makers that the paper industry was a science-based, high-technology industry. For a while it seemed that the “forest sector society” would remain intact. (Lilja *et al.*, 1992, pp. 145–146)

#### *From Green Gold to Silicon: The Great Depression and the Great Transformation*

After the years of rapid growth in the 1980s, Finland was especially hard hit by what has been called the Great Depression at the turn of the 1990s. The exceptionality of this recession is demonstrated by time-series analyses covering the whole of the past century and beyond (Teräsvirta & van Dijk, 2003). Following the economic boom of the 1980s, it was a result of a combination of developments in the Finnish and the international political economy: deregulation of the financial markets and liberalization of international capital flows that drove the Finnish banks, among others, to play the international financial markets instead of being limited to the protected home market; surging prices following the economic upswing; an increase in domestic and foreign

debt due to low interest rates; and balance of trade deficit. Finland had traditionally solved its inflationary competitiveness crises via devaluation of its currency. Attempts at moving economically closer to the EU, then in the process of stabilizing currency rates, prevented Finnish politicians from using this measure (although they yielded and devalued again when the economic situation worsened drastically in 1991). Further complication was the economic collapse and systemic change of the former Soviet Union. Finland's export earnings diminished further. The balance of trade deficit worsened, debts amplified, interest rates went up and prices of investment capital fell. Debt-ridden firms and households decreased investment and consumption and sold property, leading to increasingly decreasing price levels. The situation resulted in personal and corporate losses, as well as a major crisis in the banking sector, including the decline of an entire retail banking group. (Kiander & Vartia, 1998)

Even if some change processes in the political and business systems had already been initiated earlier, the recession and its aftermath were decisive in bringing about a major restructuring of the economy and the configuration of its largely centrally controlled politico-economic institutions, many of which had been designed to endorse Finland's wealth creation and its special relation with the Soviet Union in the post-war geopolitical circumstances (Tainio *et al.*, 2000). Four major changes took place in the 1990s, contributing to rapid but profound qualitative changes in the business system (Tainio & Lilja, 2003):

- (1) The collapse of the bank group-based-coordination of the economic system as a consequence of the recession led to renewed corporate governance structures. With the gradual deregulation and internationalization of the financial markets since the 1980s, the corporate financial system relied increasingly on internationally operating, arms-length financial markets.
- (2) The abandonment of diversified conglomerate types of business portfolios and the emergence of focused global corporations with strong roots in Finland was another factor. These changes were due to internationalization, mergers, and the adoption of Anglo-Saxon corporate governance principles and listings on the NYSE.
- (3) The sectoral specialization of the economy with respect to international trade changed dramatically. Between 1992 and 1996, high-technology industries became the dominant sector in the Finnish economy (Tainio & Lilja, 2003). Finland became a leading producer in communication technologies, internationally. The structural change was drastic in regard to the country's own past history, as well as by international comparison. Finland became a country whose exports were more specialized in telecommunication devices than in any other industrialized country. The swift change enabled it to exploit the exceptionally rapidly growing markets (Koski *et al.*, 2002a, 2002b).
- (4) The shake-up of income distribution in Finland, with respect to capital income versus wage and salary income was the last factor. Ownership of the rising Nokia shares, sales of former family businesses to (international) investors, the large increase in IPOs during the late 1990s "new economy" bubble, along with managerial incentive schemes by means of stock options, contributed to the emergence of a class of *nouveau riche* (which in turn contributed to investment capital availability in the country's growing economy). Together with changes in the traditional collective bargaining towards more firm-based negotiations, income distribution in the traditionally egalitarian Finnish society has changed (even if it remains an egalitarian society comparatively speaking).

In consequence, the country's business system has become more open, internationalized and vulnerable to international competition. But its strongest firms have learned to operate in the international arena and to reap the benefits thereof, thereby contributing to the growth of the national economy.

### **Accounting for the Finnish Transformation Capacity**

What gave Finland the exceptional capacity to carry out a major transformation in its industrial composition and national institutions in a matter of just a few years? What were Finland's resources? Explanations may be sought from a number of external and internal features—the global economy, EU norms regarding the public debt, corporate strategies, Nokia exploiting the Finnish innovation system, or Finnish *sisu* (the guts or stamina, a strong component of the self-image of the Finns with which the resolute, small nation fought to maintain its independence in World War II and worked hard to pay war debts without external support). In the following section features that are difficult to overlook when discussing Finland's economic success are examined: Nokia, the "flagship" corporation; key aspects of the NIS; and unique aspects of Finnish society. The discussion shows the variety of dimensions contributing to the differentiation between national business systems and innovation systems.

#### *Nokia*

When I was young in my native Finland, like most of my friends, I wore Nokia rubber boots. As I grew, I got new ones—always black, the same model. They were popular, and all Finns knew them. Now, my daughter owns a Nokia electronic, multipurpose device, the kind that can also be used as a wireless phone. It is silver-coated today, yellow tomorrow, with different shapes and functional features. The whole world knows them. This anecdote reflects many of the changes that Finnish firms and the economy have gone through and the competitive environment to which they have had to adjust. In the Finnish corporate scene, Nokia has been a forerunner in this process of adjusting and reaping the benefits of the "globalizing", "new" economy. Nokia has been exceptional in that, while adjusting to new circumstances, it has also shifted entirely the product markets in which it operates. At one level, Nokia's transformation is a story of the firm and the struggles related to strategic decision-making. At another, it is a story of the ways in which national institutional environments and corporate strategies mutually shape each other (cf. Morgan, 2005). Without Nokia, Finland would seem different today. But obviously, Nokia would not be what it is had it not emerged in Finland. In other words, the strategies of individual corporations need to be seriously considered in explaining the functioning of business systems and their innovation systems and in accounting for national economic performance.

Nokia started operations in 1865, when the Finnish Senate gave a Finnish mining engineer a licence and a special permit to establish a mechanical pulpwood mill in the town of Tampere. In 1871, operations were expanded to the nearby town of Nokia, which gave the firm its name, and the firm was officially established. A paper mill was added in 1880. Thus, the corporation started out as a single-business firm, diversified soon into related business in the forestry industry and operated as such for almost 90 years (Kosonen & Oinas, 1990; cf. Rumelt, 1974). In 1967, the firm diversified into unrelated businesses

by merging with Finnish Rubber Works and Finnish Cable Works (factories Nokia had co-established in 1898 and in 1912, respectively) (Von Bonsdorff, 1965). The Cable Works had set up an electronics department in 1960, which became Nokia Electronics at the time of the merger in 1967 (Kosonen & Oinas, 1990; Lovio, 1989). Then, its share of the whole company turnover was 3% and it was running at a loss (Mäkinen, 1995, p. 38). The importance of electronics in the company strategy grew rapidly, however, partially through mergers with innovative forerunners in mobile telephony (Kosonen & Oinas, 1990). In 1984, electronics became the largest business and, by the late 1980s, two thirds of the company's turnover came from electronics (Lovio, 1989, p. 93). Since the 1970s, growth in Nokia Electronics has been increasingly driven by new developments in telecommunications (the Nordic analogue NMT network for mobile telephony opened in 1982 and the pan-European digital GSM network, in 1992).

Nokia was still a highly diversified corporation. The quip: "Which ICT firm produces most toilet paper for the Irish?" (Mäkinen, 1995, p. 245) highlighted the fact that Nokia's corporate image was not very distinct. Jorma Ollila became the man behind the company's renewal strategy. When he started as Nokia's CEO in 1992, he had to deal with a financially distressed conglomerate. It had diffuse businesses and it had over-invested in consumer electronics (televisions) via unsuccessful foreign acquisitions. It was hard hit by the severe recession at home, in its Western European markets, as well as the collapsing markets in the Soviet Union (Tainio & Lilja, 2003, p. 77). In Ollila's vision, Nokia was going to become a focused global telecom company. Ollila persuaded his board to bet everything on a new, yet unproven GSM technology (Guyon, 2004). The strategy sold to investors; in 1994, Nokia was listed on the NYSE, raised the needed capital, learned the rules of the new-to-the-Finns financial game and, consequently, adopted new corporate governance principles. By 1996 Nokia had gone through a transformation during which it divested its traditional businesses, including the ill-fated consumer electronics division, resuming a newly crafted, related-business (Rumelt, 1974) strategy (Tainio & Lilja, 2003, pp. 77–79). Nokia became the world's largest mobile phone producer. Intense world-wide competition for market shares constantly forces the corporation to recreate its innovative capacities and adjust corporate strategy. It needs both to react swiftly to competitors' moves and to create new trends in designs and technologies (presently, e.g. for wireless Internet).

Nokia is a giant in Finland. It is by far the country's biggest firm by turnover (€29 267 million in 2004; that is 2.4 times bigger than that of the second biggest firm, the Finnish-Swedish forestry company, Stora Enso) and the largest private sector employer (53,511 employees in 2004, of which 43% in Finland) (Talouselämä, 2005, p. 40; Karttunen, 2005). Nokia produces in nine municipalities in Finland, it uses large electronics subcontractors in Finland and countless smaller ones for a range of components and services (tens in Finland and hundreds world-wide) (Karttunen, 2005). Its foreign sales account for 99% of its total sales (Lovio, 2004, p. 14). It accounts for around one-fifth of the country's exports (Ali-Yrkkö & Hermans 2004). Its shares are the most widely-traded on the Helsinki Stock Exchange (e.g. 52% of all trade in January–February 2005; Karttunen, 2005, p. 66).

Nokia's organizational culture is non-hierarchical, and supportive of individual learning and initiative, hard work, a humble attitude, and nationalism (Karttunen, 2005, p. 70). It is number one on the list of the country's most wanted employers (Karttunen, 2005, p. 66); it can skim the cream of the country's highly educated labour force. This is relevant since a

major share of Nokia's employees in Finland is engaged in R&D (Karttunen, 2005). Nokia is by far the biggest player in corporate R&D. Its R&D expenditures in Finland in 2003 were about one-third of total domestic R&D spending and almost 50% of business-sector R&D (Ali-Yrkkö *et al.*, 2004, p. 3). Nokia's R&D world-wide is carried out by about 20,000 people, which exceeds the number of researchers in the Finnish university sector as a whole (Ali-Yrkkö *et al.*, 2004). Additionally, Nokia outsources research, thereby transferring know-how to other firms and is a recipient of public research funding via technology programmes. Nokia's research contracts with over hundred universities world-wide include the most important Finnish universities and research institutions (Ali-Yrkkö *et al.*, 2004, p. 4; Ali-Yrkkö & Hermans, 2004).

One of the "Nokia-effects" has been the growing number of engineering students (Ali-Yrkkö & Hermans, 2004; Pajja & Rouvinen, 2004, p. 51). Such an effect was not yet possible in the 1980s, when Nokia suffered continuous shortages of engineers with vocational training and tried to lobby for an engineering education facility near its plant in Salo, the small city where mobile phones production was initially started (Oinas, 1989, p. 53). The national authorities at that time were not persuaded about the scale of the employment needs of the corporation. Now, whatever Nokia does and how it does it, is keenly monitored, supported by the nation's decision-makers, imitated or used as a model or inspiration for strategic thinking in other firms (Tainio & Lilja, 2003; Moen & Lilja, 2005). Internationalizing Finnish small and medium sized enterprises (SMEs) in ICT, for instance, follow in Nokia's footsteps and join global production networks early on (Ali-Yrkkö *et al.*, 2004, p. 7). Nokia has also encouraged their trusted Finnish contract manufacturers to join it abroad (Lilja & Tainio, 2005).

There are thus many reasons for the popular view that Nokia is one of the keys to Finland's transformation and its relative competitive success. However, the transformation of both Nokia and the Finnish economy is the outcome of mutually dependent processes (Moen & Lilja, 2005). Nokia acted as a flagship firm for other Finnish companies, and it has contributed to the country's innovation system. But its success was facilitated by public investments in R&D, education, and telecommunication infrastructure (Moen & Lilja, 2005; Ali-Yrkkö & Hermans, 2004). In addition, the replacement of bank-group-based finance and governance systems with an internationally open financial market and engagement of international investors facilitated both the transformation of Nokia and the country's sector specialization (Moen & Lilja, 2005; Tainio & Lilja 2003). Koski *et al.* (2002b, p. 16) conclude that Nokia's success is due to a combination of skilful management, wise technology policy and good luck.

The following section outlines some of the key aspects of the "wise technology policy", carefully attended to by the country's high-level decision-makers.

### *The Finnish Innovation System*

The intentional creation of what is presently called the NIS started when the Finnish science and technology policies were formulated in the mid-1960s and the mid-1970s respectively (Lemola, 2001, 2004). The goal was to increase national R&D (Lemola, 2001, p. 30), since especially private sector R&D had been found to be at a very low level in international comparisons. In the 1970s, a policy line was chosen that put emphasis on technical research, technical faculties, research institutes and firms, instead of a more science and university-based policy. It was further strengthened in the 1980s,

along with rapid developments in the ICTs (Lemola, 2001, p. 5). This choice reflects the prevailing, widely-accepted optimism in the country about the role of technology in increasing welfare.

The compilation of the key science and technology policy organizations<sup>3</sup> was largely created in the mid-1970s, and they and their tasks have largely remained intact (Lemola, 2001, 2004; Castells & Himanen, 2002; Schienstock, 2004b). The models for the key organizations carrying out the science and technology policy were traditionally developed elsewhere (e.g. Sweden, OECD). In the 1990s, Finland was the first country to adopt the concept of a NIS, advocated by the OECD, as a basic category of its science and technology policy (Miettinen, 2002, p. 12). Yet, this did not amount to any decisive shift in the funding policies (Lemola, 2004; Miettinen, 2002, p. 83). Key science and technology policy reforms in the 1990s, included regional innovation policies (16 knowledge centres were established to channel EU structural funds and to coordinate knowledge creation and diffusion in the regions); national cluster programmes were coordinated jointly by five ministries; regionally distributed technology centres were established and venture capital funding was arranged (via Sitra) to strengthen the transfer of technology and application of research-based knowledge in new firms; and science policy was strengthened through the Academy of Finland (Lemola, 2001, pp. 46–49).

In the course of the 1990s, R&D investment grew more rapidly than in any other OECD country and it finally rose beyond 3% of the GNP, which brought the country into the top group internationally (Lemola, 2001, pp. 5–6). This was due to increases in both public and private sector investment. The global crisis in the telecommunications industry after the turn of the millennium and the accompanying global economic slowdown affected R&D spending negatively, but the government has recently again raised the target level of national R&D investment to 4% of the GNP (Government of Finland, 2004).

The most important qualitative changes in the functioning of the innovation system in recent years relate to the internationalization of R&D through networking, the strengthened regional innovation policy, more efficient commercialization of research output and intensified national network formation. EU policy instruments have been helpful here, but especially national networking has improved through the Tekes technology programmes, the Academy of Finland research programmes, knowledge centres and cluster programmes (Lemola, 2001, p. 51). Especially Tekes technology programmes drive cooperation between firms, universities and research institutes, potentially including foreign partners (available at <http://www.tekes.fi>). Tekes has foreign offices in Beijing, Shanghai, Brussels, Tokyo, San Jose and Washington, DC.

Cooke (2002, p. 168) highlights the significance of the regional policies for science–industry collaboration. He regards the combination of actors—emphatically collaboration between university research, R&D laboratories of large companies such as Nokia or ABB, their suppliers, and start-up firms spinning out from university research—as key aspects of the success of the regionalized policies. It should be observed, however, that R&D activities are still highly concentrated in the urban innovation systems of Helsinki, Tampere and Oulu (Paija & Rouvinen, 2004, p. 58).

Large corporations obviously play a significant role in the NIS. Their share of R&D investment is considerable. They are important users of knowledge produced in other parts of the NIS. Even if their production is highly internationalized and their R&D is increasingly carried out abroad (albeit mainly via mergers and acquisitions), most of the Finnish multinationals' R&D is still located in Finland. This suggests that Finland

remains a relatively competitive location for industrial R&D and that the Finnish research and education system offers advantages over alternative locations (Ali-Yrkkö *et al.*, 2004, p. 4). This conclusion would also seem to be supported by the increasing flow of foreign direct investment (FDI) to Finland<sup>4</sup> (Lovio, 2004, p. 20). While there is room for improvement (Schienstock, 2004b), cooperation between Finnish companies and research organizations has appeared to be exceptionally widespread by international comparison (Paija & Rouvinen 2004, p. 48). Its importance for larger Finnish firms has been increasing in recent years (Ali-Yrkkö *et al.*, 2004, p. 4).

In conclusion, the Finnish innovation system has evolved as a result of the interaction of government actors committed to a consistent policy line supporting the interactions between private firms and universities and research institutes in R&D activities. It has been positively reviewed in the literature (e.g. Castells & Himanen, 2002). An overall assessment of the influence of government policies is difficult to provide. It remains to be seen whether the joint operation of the NIS actors provides the basis for the success of the national economy in the long run (Lemola, 2004, p. 282). At the very least, the NIS rhetoric "has given policy-planners and decision-makers arguments on the central role of R&D and education in industrial and economic development" and "supported efforts to intensify national and international R&D cooperation" (Lemola, 2004, p. 273).

Authors who have explored the Finnish "business system" propose the identification of specific features in the social structure that should be incorporated into explanations of the economic development of Finland, including the successful features of its innovation system.

### *Flexible Society*

Economic systems are embedded in national, deep-rooted social and cultural traditions, which in part explain particular systemic features. It has been argued that, in the Finnish case, such traditions have been instrumental to the nation's capacity to transform itself. Tainio and Lilja (2003) and Moen and Lilja (2005) suggest that the country's social characteristics have played a key role in crafting the "Finnish model". The characteristics relate to (cross-sectoral) horizontal coordination that has enabled swift mobilization (Moen & Lilja, 2005).

Finland has a small population (around 5 million) with relatively tight social networks and cross-sectoral linkages. Taino and Lilja (2003, p. 86) cite factors that make Finnish society a relatively cohesive one: the free public school system and the prevailing summer cottage tradition bring people from various social circles together; student life and student union politics create tight social networks; for males, this effect is also created by military service, followed by a long-standing reserve-training programme. One could add national television and other media among such cohesive features in a small country (with a unique language). Additionally, arenas for interactive learning have been created (defence courses, leaders' *fora*, etc.) that link elite groups with different knowledge, skills and visions from various sectoral backgrounds (Taino & Lilja, 2003; cf. Schienstock, 2004a). They contribute to "new mental paradigms" in periods of transformation (cf. Hämäläinen, 2004).

Important instances of the mobilization of cross-sectoral elites through "discursive institutions" were the political processes in the 1960s, 1970s and 1980s that drove government commitment to technology-driven development and that led to establishing the tasks

for the institutions implementing science and technology policy, including those moments when this policy was questioned in society (Moen & Lilja, 2005; cf. Lemola, 2001). Another instance was the 1990s, when extensive cross-sectoral coordination was instrumental in bringing about change through establishing new policy institutions that replaced the traditional governance system (cf. Tainio *et al.*, 2000). Discursive institutions, in Moen and Lilja's (2005) view, constituted a vital mechanism for coordinating the transfer from the previous state-led and bank-group-based governance system to the presently evolving, state-enhanced, innovation-oriented system where firms play a more prominent role.

Finland's "great transformation" thus involved a combination of continuity and change: radical change in the country's core economic subsystems and continuity in horizontal cross-sectoral coordination (Moen & Lilja, 2005). Furthermore, Lilja and Tainio (2005) emphasize that the network-based collaboration (involving firms, universities, research institutes and public bodies) that has been instrumental in implementing the Finnish knowledge economy comes about naturally in a small country where decision-makers in different sectors of the economy, researchers, and experts in various fields know each other personally (cf. Skurnik, 2005).

Besides the fact that the society is small, it is also a relatively young society. This may be a reason for being relatively culturally and institutionally flexible and open to external influences. However, due to having been ruled by others in the not very distant past, there is still a shared legacy that requires the creation of a strong nation against external threats, in whatever guise. The creation of strong national institutions to increase the welfare of the people has been one of "national projects" in the past. The need to survive in the global economy might be the "project" that keeps Finland going at present, making it prepared to work hard to maintain the strength of the economy, as it clearly did during its recent transformation. What it might take to succeed in the future remains a pressing question.

## A Success Story?

### *Aspects of the Finnish Market Economy*

While Finland has been regarded as a typical coordinated market economy (CME) (Soskice, 1999), it should be obvious from discussions in the second section of this article that a range of the country's coordination mechanisms have transformed. No consensus has been reached as to what kind of market economy it should be called. While Moen and Lilja (2005) maintain that, regardless of the changes in coordination mechanisms, Finland still remains a coordinated market economy. Skurnik (2005, p. 8) argues that "clear and major changes have moved Finland in the direction of a liberal market economy" (LME). He qualifies this statement, adding interesting nuances to the discussion. He identifies two broad sectors in the Finnish economy and argues that what is emerging is a "new bipolar Finnish business model". He calls the internationally most visible segments of the economy "the silicon and forestry based, export oriented global pole" that has evolved from the earlier business model based on traditional Finnish export industry. The second pole is smaller albeit strategically very important "home market oriented pole". It consists of cooperative, mutual and other customer-owned industries. The first, globalized pole, increasingly involves features of LMEs. It continues to generate a major share of employment in Finland, doing so with increased risk, or vulnerability to outside shocks and loosening of national sovereignty. The second pole maintains CME

features. It has a strategic role in creating stability in the small, vulnerable and export oriented economy. It is domestic by orientation and risk averse.

Ultimately, there may be a problem in the somewhat misleading conceptualization. All economies—unless they fall into chaos during wartime, after a natural catastrophe, or a serious recession—are coordinated in some way. What in the “varieties of capitalism” literature are called uncoordinated or liberal market economies (Hall & Soskice, 2001; Soskice, 1999) are obviously also coordinated. The question is what are the mechanisms and principles of economic coordination, in regard to the role of the state, market mechanisms, and informal forms of coordination. Thus, rather than focusing on the labels of “liberal” or “coordinated”—that are not all that informative as such—it is more important to understand the nature of coordination and the evolution of the mechanisms of coordination in detail. In judging what kind of market economy Finland possesses, Skurnik’s view of the “protective belt” of the more slowly moving, nationally oriented pole provides a valuable perspective to the Finnish economy. Even if the internationalization of Finnish firms started late, the large Finnish corporations are presently among the most internationalized in the world (Ali-Yrkkö *et al.*, 2004, p. 6). The focus on the success of these firms mainly takes place when discussions are carried out about the Finnish economy. However, not all firms are following in Nokia’s footsteps; some firms do not even wish to open up to global competition—and this creates the kind of stability to social life that is also needed in nation-building.

Whether the Finnish economy will remain successful over time, then, may depend on the sustainability of both sectors: the ability of the increasingly globally operating firms, supported by the state-enhanced innovation system, to attract financiers, innovators, and customers, and the ability of the more nationally oriented sector, supported by the still strong cooperative tradition, to renew itself at a more steady pace. Both poles of the economy need resourceful talent to sustain them and to coordinate the economy hosting the different spheres of operation.

### *Resisting Hypes*

Due to the rapid growth rate of the Finnish economy and its structural transformation led by the ICT sector, Finland has been cited as a model case of the global information economy. The strongest creator of this image has probably been the fact that, since the late 1990s, Finland has figured prominently in the Institute for Management Development (IMD) and the World Economic Forum (WEF) competitiveness rankings. Finns have been quick to take a cautious stand in regard to these rankings. They are partially based on subjective evaluations; and the countries and variables included and the methods used change annually (Rouvinen & Vartia, 2002, p. 95). They should not be confused with measures of economic growth or level of socio-economic development. Using the standard indicator for economic comparisons—gross domestic product (GDP) per capita—Finland belongs to the richest countries in the world, but among the richest, it remains a middle range country, as Pohjola (2003, pp. 170–171) attentively points out. The fact that Finland for the first time was ranked first in the WEF comparison in 2001 has some historical significance however, since Finland was the first European country to gain this position, ahead of the winners of previous years, the US and the fast-growing Asian countries (Koski *et al.*, 2002b, p. 16). Besides contributing to the creation of a national image, it remains an open question as to which precise message is conveyed by these rankings.

Vartia and Nikinmaa (2004) contemplate the possibility that a good ranking might be taken to suggest low risk for investors. Even so, past positions in the WEF and IMD rankings have not, e.g. provided good predictions in regard to future GNP growth rates (Vartia & Nikinmaa, 2004).

Whether or not directly related to the competitiveness rankings, Finland has certainly become internationally known for its exceptional specialization in the ICT sector. However, this is specialization in ICT production. As an ICT user, Finland has been rather average by international comparison (Jalava & Pohjola 2002). Honkapohja (2005) observes that Finland was conspicuous among countries in which ICT investments (especially in communication equipment) grew more quickly than the European average in the early 1990s. In the late 1990s, Finland's ICT investment decreased to an average European level (still predominantly communication equipment). The critical question pertains to Finland's future capability to exploit advanced technologies to enhance productivity in the rest of the economy (Paija & Rouvinen, 2004, p. 52).

There is a serious challenge to strengthen the existing firms participating in the tightening international competition in the telecommunications production and to increase the number of successful ICT firms. Also, the competitiveness of the traditional industrial sectors (forest products, metal and engineering) has to be strengthened in order to balance the risks of the economy (Lemola, 2004, p. 282). The most creative effort, however, should go to crafting entirely new growth strategies for the country's future (cf. Schienstock, 2004b).

#### *Generating Success: Between the Next Big Thing and the Own Thing*

“[A]s a small economy and a small people, [...] the course of the country's history and economy has always been determined by external currents, to which Finland has had to adapt, dodging dangers and watching for favourable winds” (Kuisma, 1999, p. 58). This line of thinking—dependence on external forces—has traditionally underlined Finnish economic decision-making in both the private and the public sphere, quite realistically so. This, however, is where a key contemporary challenge lies.

Running after innovations created elsewhere was Finland's “national project” in the past. The aim was to catch up with more technologically advanced societies. This also was the mission of the large state-owned corporations: to create wealth for society by modernizing the economy (cf. Virkkala, 1999). Finland's prosperity until relatively recently was based on latecomer advantages: “We have borrowed technologies developed by others to utilize our own raw materials, we have invested in the needed machinery and equipment, and acquired the required knowledge and skills” (Jalava & Pohjola, 2002, p. 355). As a consequence of this strategy, the growth of labour productivity accelerated until the 1970s. The situation has changed, however. Since the Finns have become technology leaders in specific industries—in sawn timber, wooden products, basic metals, and communication devices—labour productivity is higher than in the US or any other European country (Jalava & Pohjola, 2002). In these industries, the Finns create technologies that are copied by others. Since capital and labour tend to flow to sectors where labour productivity is highest, those are likely to remain Finland's key industries in the years to come. In the sectors showing highest productivity growth (communication devices), the “Nokia-effect” is visible, but the successful forestry corporations have also invested in R&D (making Finland a leading forestry machinery producer, which has led to

productivity growth in the basic processes of the industry). Additionally the basic metals industries have been subject to intensive R&D efforts.

This means that waiting for “favourable winds” is not enough—technological leaders need to “generate their own winds”. Maintaining acquired leading positions and gaining such positions in new businesses requires innovation, both in manufacturing and services (Jalava & Pohjola, 2002, p. 358). Creativity, as the omnipresent business jargon has it, is in high demand—and the ability to coordinate individual and collective creativity to bring into being goods and services that out-compete rivals; experimentation is expected, not replication of what was new yesterday and trivial today. Succeeding in such a competitive environment requires knowing what rivals are doing and moving beyond that. This is why the Finnish innovation system is busily engaged in searching for innovative ideas in new growth areas. What are the sources of such unique ideas?

### *Wise Society?*

Finland has succeeded in transforming itself. The question that follows is: what next? For a small country to keep making a distinction in the global economy, Finland is investing in areas of expertise that at least partially can be interpreted as stemming from the kind of society Finland is: a good, internationally reputable (and free) educational system at the basic level (OECD, 2003); commitment to social and regional equity (Hämäläinen, 2004); relatively strong welfare state (Castells & Himanen, 2002; Schienstock 2004b); shared sense of closeness to nature; environmental and health consciousness; high regard for safety issues; social responsibility; trust in others (Halpern, 2005, pp. 60, 163) and in the workings of the public sector (NRC Handelsblad, 2004); appreciation of functionality combined with design; safeguarding cultural traditions; technological ambition. An overall strategy that recognizes the specific nature of the people and the society behind a business system provides a source for global competition that is not imitable in competition. If the strategy is explicit, managers and employees at all levels, along with people at large, can identify with it more easily than with anonymous “market forces” or “imperatives of the global economy”. It is more natural to make it “our project” when it is built on values that are shared within a nation (cf. Lilja & Tainio, 2005). It may aim at being “experimental” (Zysman, 2004), yet respect the roots of the society. To maintain its reputation as an innovative economy, Finland is also in need of experimenting with corresponding science and technology policy measures.

In a healthy society, firms remain “civilized” and respect the institutional preconditions that have made their existence possible in the first place (Kristensen, 2005; Morgan, 2005). Nokia is obviously at the focus of attention in this regard. Recent relocations of production units of Finnish firms to Asia have raised questions about the social responsibility of the business sector both locally and nationally. For future-oriented strategists, however, they again demonstrate the need to create employment in future-oriented business areas (cf. Government of Finland, 2004). With an increasing tendency towards modularization and fragmentation of parts of production systems, and increasingly international value chains and innovation systems (e.g. Gereffi *et al.*, 2005; Sturgeon, 2005; Oinas & Malecki, 2002; Oinas & Lagendijk, 2005), Finland needs to invest in the parts that lie in the designing and governing end of those systems. These requirements will challenge the abilities of Finland’s “creative class” (Florida, 2002), the estimated ~25% of Finland’s workforce that holds occupations supposedly relating to the creation of new ideas, new

technologies and new content (with this share, Finland ranks ninth in Florida's (2004) international comparison). To support future innovation-based wealth creation, Tekes' present focus areas are the renewal of products and business models; environment and energy, health and well-being, services, security and safety, work and leisure (Tekes, 2005). Notably, in Tekes' strategy, business competence is becoming equal in importance to technology competence.

The general state of society and the consequences of the pressures of work have come under fire in Finnish public discussions recently (e.g. Hautamäki, 2001). This time it is not about paying war debts but about paying the debts of the recession. Discussions seem to echo Sennett's (1998) concerns about the moral corrosion of over-worked individuals, a lack of sense of community and meaning of life. It has been argued that people are suffering, while families and children are paying for the sacrifices by virtue of the fact that (typically both) parents have had to work hard, increasingly on short-term contracts, to bring about the competitive economy (cf. Siltala, 2004). Equality and social cohesion are traditionally valued in Nordic societies—but they do not feature in the WEF and IMD competitiveness calculations (Rouvinen & Vartia, 2002, p. 97). A pressing question at present is whether the future business system, innovation system and the society at large will accommodate some of the shared social values of the past. The challenge is how to design a sustainable society that is wise enough to combine its firms' competitiveness, satisfactory level of living, and healthy, contented people?

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### Notes

1. "National innovations systems" (NIS) are defined variously in the literature. In Edquist and Lundvall's (1993, p. 267) view, NIS "include not only the system of technology diffusion and R&D system but also institutions and factors determining how new technology affects productivity and economic growth". For Nelson and Rosenberg (1993, p. 4), "the 'systems' concept is that of a set of institutional actors that, together, play a major role in influencing innovative performance".
2. Since the late 1970s the level of GNP per capita has remained about 70% of that of the US.
3. The key agents implementing science and technology policy are the Science and Technology Council (the coordinating body, bringing together high-level representatives from the government, industry, academia, and labour market organizations), the Academy of Finland, National Technology Agency of Finland (Tekes), The Finnish National Fund for Research and Development (Sitra), The Technical Research Centre of Finland (VTT), and the universities.
4. The share of foreign ownership in the Finnish companies listed on the Helsinki Stock Exchange has grown from 10% in 1990 to 60% at present.

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