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FINLAND

Selected Issues

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Approved by European I Department

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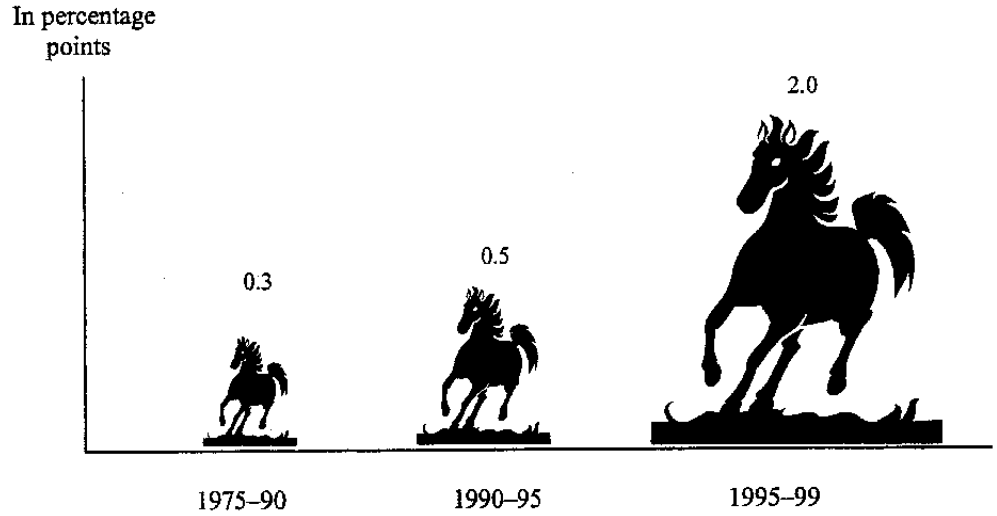
I. A Note on Finland's "New Economy"[1]

A. Introductory Remarks

1. **In the course of one decade, Finland has undergone a fundamental structural shift from a resource-based to a knowledge-based economy.** The basic metals and forestry industries had been the workhorses of the manufacturing sector at the start of the 1990s, but—after Finland emerged from its severe recession in the early 1990s—it was the ICT (information and communications technology) sector providing the horsepower for the vibrant economic growth (Figure 1). Whether measured in terms of value added, export shares, or contribution to growth, the shift toward high-tech has been remarkable. And the productivity surge in the dynamic ICT sector fueled a strong export-driven recovery. Indeed, Finland's economy is truly a "new economy," as few other advanced economies have undergone such a massive transformation in such a short timespan.[2]

Figure 1. Finland: The ICT Sector—The Horsepower Behind the Finnish Economic Recovery
(Annual average contribution to market-sector GDP growth)



2. **This paper is arranged as follows.** It first provides a brief overview of some of the indicators of this change in the Finnish economic structure, then examines the factors which may lie behind this transformation. The question is posed: is it mostly a Nokia story? The

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[1] Prepared by Nancy Wagner.

[2] Ireland has also experienced a similarly large structural shift, but Ireland's strategy to become a high-tech-driven economy has been quite different from that of Finland. More than 90 percent of Ireland's high-tech industry is attributable to multinationals. The converse is true for Finland—only about 10 percent of the high-tech sector is due to the presence of multinationals from abroad, so the Finland story is largely home-grown.

paper then explores the impact of the ICT sector on the wider economy, particularly as it has affected growth, employment, and labor productivity. Finally, against the background of the global economic slowdown, the prospects for Finland's ICT sector in the short and medium terms are discussed.

B. A Radical Structural Change

3. **Today, Finland ranks as one of the world's leading ICT producers, having started the 1990s as one of the least ICT-specialized among the advanced economies.** In fact, Koski and others (2001), using the concept of β-convergence,[3] demonstrate that—among all the EU countries, the U.S., and Japan—Finland was the most prominent "leapfrogger" during the decade in ICT value added. Finland has accomplished this jump up the ranks by pursuing an ICT strategy that differs substantially from that in most other major ICT producers: one focused on wireless communications technology as opposed to wired information technology, reflecting the influence of Nokia, the current global leader in mobile phones.

4. **Within the EU, Finland—along with Ireland and Sweden—stands apart, evidencing a high degree of specialization in high-tech value added, exports, and Research and Development (R&D).** In terms of value added, Finland is likely to have reached the top-ranking position among the major ICT producers as of 2000, with the value-added share of market production more than doubling between 1990 and 1999 and having increased by an additional two percentage points in electronics manufacturing alone in 2000. Table 1 shows the entire ICT sector's share (including, in addition to manufacturing, ICT services and software) as a percentage of the market-production value added.

Table 1. Finland: ICT Sector's Share in Value Added of Market Production[4]
(in percent)

1975	1980	1985	1990	1995	1999
3.7	4.2	5.3	5.8	8.0	13.0

Sources: Statistics Finland, Jalava (2001).

5. **Table 2 highlights the changes in Finland's manufacturing structure.** Here, electronics manufacturing is used as a proxy for the ICT sector. The share of electronics manufacturing in GDP rose almost nine-fold between 1980 and 2000. In 2000, the peak year for the ICT sector, electronics manufacturing contributed 2.4 percentage points to GDP growth and grew in value-added real terms by 35½ percent from the previous year.

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[3] β-convergence attempts to capture the phenomenon of "leapfrogging," or conspicuous changes in the ordinal ICT specialization rankings over time. The authors employ two rank-based test statistics to examine β-convergence: Kendall's W and the Wilcoxon Matched Pairs Signed Rank Test.

[4] Non-market production, provided by government and non-profit institutions and largely financed through taxes and transfers, is excluded.

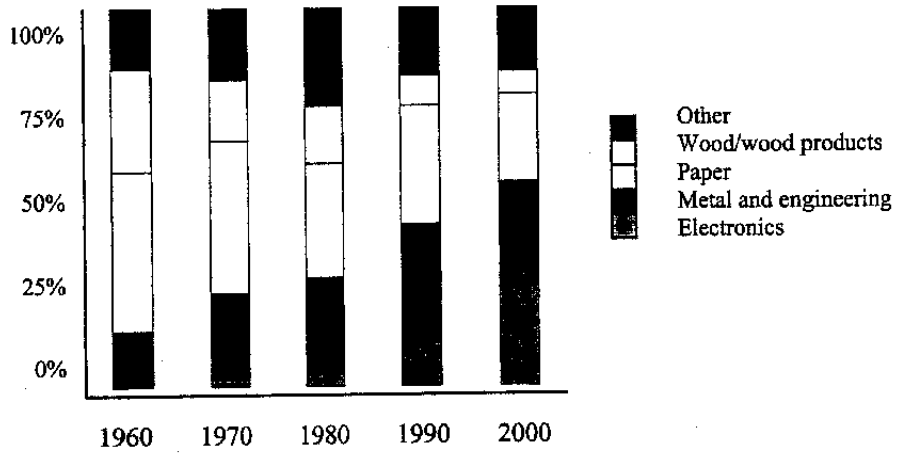
Table 2. Finland: Developments in the Manufacturing Sector, 1980–2000
(In percent)

	1980	1985	1990	1995	2000
Electronics					
Share of GDP	1.0	1.3	1.7	3.5	8.8
Share of manufacturing	4.6	5.8	7.6	13.3	29.4
Contribution to growth*	0.0	0.1	0.1	0.4	1.4
Forestry					
Share of GDP	5.7	5.4	5.4	6.5	6.3
Share of manufacturing	25.3	23.7	23.8	25.0	21.0
Contribution to growth*	0.4	0.1	0.2	0.0	0.3
Metals					
Share of GDP	1.9	2.1	2.4	2.9	3.0
Share of manufacturing	8.5	9.4	10.6	11.1	10.1
Contribution to growth*	0.1	0.1	0.1	0.1	0.2

Source: Statistics Finland.
* In percentage points, annual average contribution for the five years prior to and including reference year.

6. **By the late 1990s, Finland recorded the largest high-tech trade surplus ratio (high-tech exports to imports) in the world among indigenous producers, and is today the most specialized country in the world as regards telecommunications-related trade, exceeding even Sweden.**[5] By 2000, approximately one third of Finnish exports were those of the booming ICT sector (Figure 2).

Figure 2. Finland: Export Shares by Industry Group



Sources: Paija (2001), National Board of Customs, ETLA.

[5] OECD (2000). The degree of specialization is measured by the Revealed Comparative Advantage index, RCA: $RCA_{ij} = (X_{ij}/\Sigma_i X_{ij})/(\Sigma_j X_{ij}/\Sigma_i\Sigma_j X_{ij})$, where X_{ij} is the exports of sector i from country j and $\Sigma_i X_{ij}$ is total exports from country j.

7. **Finland is also the most specialized country with respect to R&D, with R&D spending in the high-tech sector accounting for 51 percent of all such research-oriented spending.** Moreover, Finland had the highest ICT patent share in the OECD in the late 1990s.

C. Why Finland?

8. **Various factors underpinned this unique transformation of economic production and fostered technological innovation, ranging from government policies to promote a competitive market structure to fortuitous business decisions.** At the same time, the structural shift was also precipitated in part by the deep recession in Finland in the early 1990s. The severity of the recession—in which the Soviet collapse in 1991 was a factor—forced a reorientation of external trade, with companies, not least Nokia, restructuring massively and dramatically changing their production portfolios to become more competitive on international markets.

9. **The turning point in Nokia's history was in 1992, when the company suffered heavy losses and creditors threatened to sell Nokia to Ericsson.** At that time, Nokia's management decided to focus the business where profits were expected to be high and prospective market growth large. The company, therefore, began to concentrate heavily on mobile phones and networks, divesting many of its other lines of production.[6]

10. **But the groundwork for this shift was laid much earlier.** The telephone network was never fully monopolized by the state, as was the case in most other European nations,[7] although after Finland achieved independence, there were a number of attempts to nationalize the private telephone network operators. This led to the formation of the Association of Telephone Companies, with the private companies combining forces. When private license applications were rejected for participation in the Nordic mobile telephone network, introduced in the early 1980s, the Association founded a joint venture to operate a private Groupe Spécial Mobile (GSM) digital network. The joint venture became the world's first operator to launch commercial GSM services, giving Finland a head start in this soon-to-explode market. This move was a catalyst for full deregulation and liberalization of the telecoms market, completed in Finland in 1994—supporting Nokia's expansion and the ICT sector more generally.

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[6] Nokia began its existence in the mid-1800s as a forestry company, then diversified out into a vast array of fields, including tires, cables, and consumer electronics.

[7] As recounted by Paija (2001), the fragmented market structure for telephone network operation originated in Finland's history as a Russian Grand Duchy. When telephone cables were being laid in the 19th century, the Finnish Senate chose to grant numerous telephone operator licenses in order to complicate the potential seizure of the network by the Tsar.

11. **The liberalization of capital markets in the 1980s changed the environment for corporate finance and cleared the path for foreign capital investment.** Foreign capital investment has been a crucial factor for a small economy like Finland to develop such a dynamic ICT sector. The high degree of foreign ownership (e.g., about 90 percent of shares in Nokia are held abroad) also plays a valuable risk-sharing role in a country so dependent upon a potentially volatile sector. In the 1990s, the emergence of venture capital financing, in particular, provided opportunities for high-risk technology start-ups, supplying market-based risk financing which did not exist a decade earlier.

12. **Another clear factor underlying the economic transformation has been the rapid increase in R&D.**[8] Finland currently ranks second in the world in terms of R&D as a percentage of GDP. Moreover, since the early 1980s, there has been a consistent upward trend in R&D expenditure, a uniquely Finnish phenomenon within the OECD and reflecting in part the government's orientation of technology policy, adopted in the 1980s. Remarkably, the public sector did not cut back on R&D spending even during the severe recession in the early 1990s, as a policy choice was made to continue to support long-term growth. Thus, the government took the tough decision at the time to scale back other spending in the midst of the downturn to make room for R&D. Public and private sector spending on R&D were seen as likely to be complements, not substitutes, so that public R&D expenditure was not viewed as potentially crowding out private initiative. More generally, the technology policy viewed the government's role as the creator of a favorable environment for supporting innovation.

13. **With the share of public sector R&D funding at about 30 percent of total R&D, lower than in much of the OECD, buoyant R&D spending has especially been the result of exceptional growth in private sector input.** Interestingly, the subsidy element of public support to private R&D is also among the lowest in Finland (OECD, (2001)). One factor supporting private sector R&D in Finland is the low labor cost, in relative terms, associated with R&D. Owing to the compressed wage structure, highly-skilled labor is relatively less expensive in Finland than in much of the OECD. Despite substantially higher productivity than in the rest of the economy, wages in the ICT sector are not significantly out of line with average wages, although increasing use is being made of new tools for employee compensation, such as bonuses and stock options, to retain highly-skilled staff. Such forms of compensation have also helped start-up ICT companies with limited liquidity that are otherwise unable to compete on the tight market for skilled labor.

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[8] Empirical evidence generally supports a strong positive relationship between R&D and output or productivity growth. See, for example, Nadiri (1993). In fact, Bassanini and others (2000) provide evidence that the link between business sector R&D and multi-factor productivity is becoming stronger, noting that the cross-country correlation between the two rates of growth rose from 0.30 in the 1980s to 0.79 in the 1990s.

14. **With 55 R&D centers in 15 countries, Nokia has one of the most international R&D approaches of any multinational.**[9] Nevertheless, the most up-to-date technological research is still concentrated in Finland, with about 60 percent of Nokia's R&D employees Finland-based. However, this represents a decline from 95 percent just five years ago, reflecting in part the increasing structural mismatch in available skills—the result of the rapid pace of Finnish technological development and despite Finland's strong university education system, especially in high-tech fields.

15. **International comparisons of the general business environment inevitably rank Finland near the top.** According to the Economist Intelligence Unit (2001), in a comparison across 60 countries, Finland was ranked as the sixth most favorable overall business environment through 2005, having placed in the top three on several indicators: political environment, macroeconomic environment, policy towards private enterprise and competition, policy towards foreign investment, financing, and information and communications infrastructure. The *2000 World Competitiveness Yearbook*[10] paints an equally, if not more, compelling portrait of Finland's business competitiveness. In a cross-country comparison of 47 countries, Finland is assessed as being in either first or second place on a remarkably wide variety of indicators, including: gross domestic savings, real growth, restructuring of the economy, growth in direct investment stocks (both inward and abroad), globalization, public service, government decisions, political system, rights and responsibilities of shareholders, insider trading, cellular phone subscribers, connections to the internet, corporate board management, shareholder value, and university education.[11] Finally, Transparency International has again ranked Finland as the world's least corrupt country, a feature highly conducive to encouraging innovation and investment.

D. But Is It Just Nokia?

16. **As described above, Finland's ICT sector is dominated by mobile communications, and this sector's phenomenal expansion undoubtedly reflects in large part the remarkable growth of Nokia.** To this effect, Nokia accounts for 70–80 percent of Finland's ICT exports, 45 percent of ICT production, and 30 percent of ICT employment as of 2000. The importance of Nokia in the whole of the Finnish economy is also quite significant, with Nokia's share of GDP at 3.3 percent in value terms and 5 percent in volume terms, and the share of all exports at 24 percent.[12] According to ETLA (The Research

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[9] About 32 percent of Nokia's worldwide employees are involved in R&D.

[10] International Institute for Management Development (2000).

[11] Surprisingly, in view of the long list above, this is not an exhaustive list of all the business environment characteristics on which Finland ranked in the top two.

[12] Ali-Yrkkö (2001).

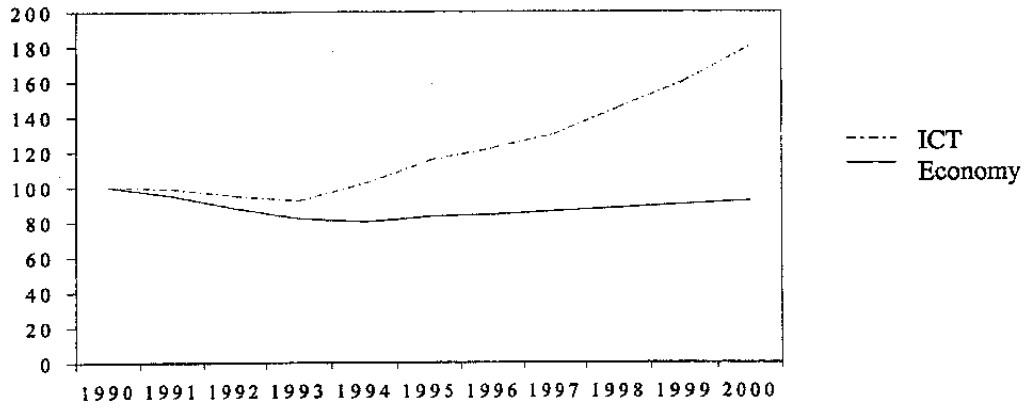
Institute of the Finnish Economy), Nokia's contribution alone to real GDP growth is estimated at 1.9 percentage points out of 5.7 percent in 2000, after averaging about 1 percentage point per year in the late 1990s. Meanwhile, Nokia, as the largest tax payer by far, directly contributes about 4 percent of the central government's total tax revenues, a key factor behind Finland's recent sizeable fiscal surpluses. Indeed, economic forecasters now focus not only on traditional economic indicators, but also on Nokia's profit and sales predictions in making their forecasts for the Finnish economy.

17. **Notwithstanding this central role, Nokia does not stand alone in Finland's ICT cluster.** Today there are approximately 4,000 firms (mostly small- and medium-size enterprises (SMEs)) involved in ICT, with 200 EMS (electronics manufacturing services) companies—including Finland's Elcoteq, the largest EMS company in Europe—and 350 first-tier suppliers to Nokia. Linux, a UNIX-like operating system initially developed in Finland, has been touted as a potential competitor for the ICT behemoth, Microsoft.

18. **The ICT sector in the aggregate is estimated to have accounted for almost 3 percentage points of real GDP growth in 2000, according to ETLA.** Thus, the ICT cluster firms, excluding Nokia, are estimated to have accounted for up to 1 percentage point of GDP growth. Moreover, growth of the ICT cluster could well be self-reinforcing, owing to the benefits from knowledge spillovers and other advantages of spatial agglomeration.

19. **The low employment intensity of high-tech production implies that Nokia's impact on overall employment has been considerably less than that on GDP or exports, with the company's share of Finnish employment at about 1½ percent** (including first-tier subcontractors would increase Nokia's direct and indirect share of employment by another ½ percentage point or so). The share of the entire ICT cluster, including services, software production, and manufacturing, in total employment was 3.6 percent in 1999 and approaching 5 percent in 2000. Notwithstanding these low shares, empirical evidence suggests that the ICT sector has created employment growth for the Finnish economy, especially for skilled labor (Figure 3).

Figure 3. Finland: Employment Growth Indices in the ICT Cluster and Economy
(1990 = 100)



Sources: Paija (2001), Statistics Finland.

20. **The ICT sector has been operating in a market of labor shortages in recent years—and has turned to skilled labor from abroad to cope with the local shortages.** Due to these shortages, Nokia's growth in Finland—at about 20 percent per year—has been lower than its growth abroad, where Nokia has been growing at twice the pace.[13] While Finland is perceived as being above average in Europe with respect to flexibility in hiring foreign workers,[14] employers are pushing for even more liberal policies, to approximate those in Ireland and the United Kingdom, but trade unions have been reluctant to fully support greater liberalization. As of April 2001, the visa process for foreign workers was simplified. The challenge of labor mobility is, however, broader than just the environment in Finland; other problems include lack of pension carry-over between European countries, insufficient education carry-over (carrying credits from one university to another), and differential stock option taxation. Finland labor taxes are among the highest in Europe and could inhibit high-skilled labor immigration (or even induce Finland's skilled workers to seek work abroad, where the tax environment is seen as more advantageous).

21. **As for Nokia's impact on the financial sector, Nokia represented 70 percent of the total market capitalization on the Helsinki bourse (HEX) at end-2000, reflecting the fact that Nokia's market capitalization has been among the fastest growing in the world during the 1990s.** Turnover on the HEX is also dominated by trading in Nokia's shares. With the dampening of foreign demand and, more generally, the deteriorating global sentiment for high-tech stocks, Nokia's share price—and with it the HEX—has tumbled by more than 50 percent since its peak a year ago (Figure 4). While the performance of Nokia has a significant effect on economic growth in Finland, the impact of the fall in its share price, *per se*, on the general economy is limited by the high concentration of share ownership in Finland (80 percent of domestically-held assets are held by only 1 percent of the population) along with the heavy foreign presence in the Finnish stock market (only some 30 percent is held by domestic investors).

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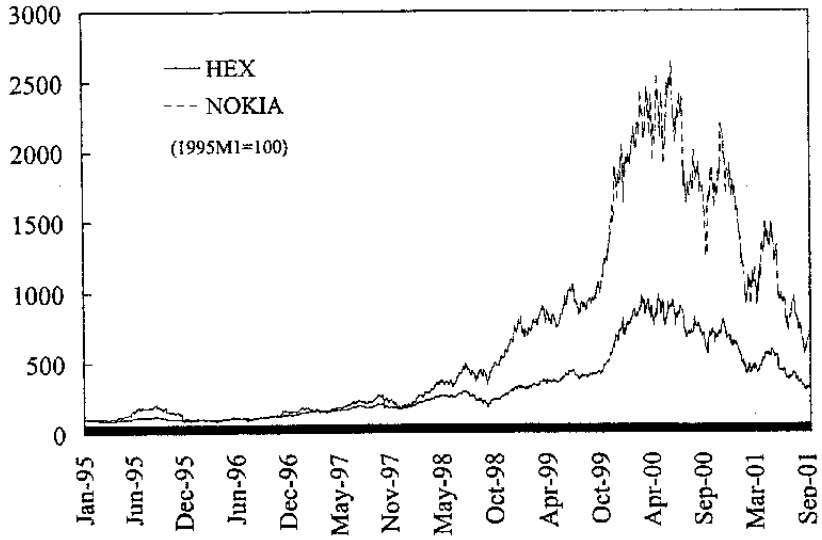
[13] Of course, another reason for Nokia's growth abroad is its strategy to invest where demand is likely to have the greatest growth potential, such as in China or India, where mobile phone penetration is still low.

[14] The 2000 World Competitiveness Yearbook ranked Finland in 3rd place out of 47 countries in terms of immigration laws supportive of competitiveness.

Figure 4. Finland: Developments in the Helsinki Stock Market, 1995–2001



22. **Much of the financing for the ICT sector has been in the form of trade credits or through direct investment by Nokia, but venture capital firms have also played an increasing role since the mid-1990s.** There was a boom in venture capital financing in the latter half of the 1990s (Table 3), with the amount of investment up by more than 10-fold between 1995 and 2000. About 30 percent of private equity investment has gone into ICT (and another 30 percent into biotechnology), and this has boosted the growth of new ICT start-ups. But private equity investors became more cautious in 2000 amid a deterioration in market sentiment for the high-tech sector, and the amount of new funds decreased for the first time in years. The decline in venture capital finance has reportedly been even more marked this year.

Table 3. Finland: Venture Capital Investments, 1995–2000

	Number of cases	Growth (%)	Investments (million euros)	Growth (%)	New funds (million euros)	Growth (%)
1995	122	6	37.8	34	128.5	103
1996	137	12	83.8	122	193.9	51
1997	205	50	136.4	63	305.4	58
1998	265	29	192.4	41	328.3	7
1999	350	32	285.4	48	655.9	100
2000*	420	20	403.7	41	588.7	-10

Source: Rönkkö (2001), Finnish Venture Capital Association.
* preliminary data

23. **In an effort to diversify the economic base yet maintain the strong orientation toward the high-tech sector, government policy has also sought to encourage the**

creation of high-tech SMEs. To this effect, a public agency—the National Technology Agency—provides financing and subsidies to SMEs and universities to set up a broad range of technology programs.

E. What Has Been ICT's Impact On The Larger Economy?

24. **To assess more fully the ICT sector's contribution to Finnish growth, Jalava and Pohjola (2001) use the standard neoclassical growth accounting framework.** The model is disaggregated on the production side into an ICT sector and a non-ICT sector, and is, therefore, expressed at time t as:

$$Y\,(Y_{ICT}\,(t),\, Y_O(t)) = A(t)F(K_{ICT}\,(t),\, K_O(t),\, L(t))$$

where Y, aggregate value added, is comprised of ICT services and goods, Y_{ICT}, and all other production of goods and services, Y_O. Aggregate inputs include ICT capital, K_{ICT}, other capital, K_O, and labor, L. The parameter, A, represents Hicks neutral multi-factor productivity. Under the assumption of constant returns-to-scale in production, and competitive factor and product markets, the share-weighted output growth can be expressed as the sum of the share-weighted inputs growth and the growth in multi-factor productivity, as follows:

$$dY/Y = w_{ICT}(dY/Y)_{ICT} + w_O(dY/Y)_O = v_{ICT}(dK/K)_{ICT} + v_O(dK/K)_O + v_L(dL/L) + dA/A,$$

where the weights w and v represent nominal output shares and nominal income shares, respectively, of the various production sectors and inputs.

25. **From this growth accounting framework, three types of ICT growth contributions are identified:**

- the direct contribution to value added from ICT production, $w_{ICT}(dY/Y)_{ICT}$
- the contribution from ICT capital deepening in the broader economy (i.e., ICT capital as an input into the production of other goods and services), $v_{ICT}(dK/K)_{ICT}$
- the contribution from technological progress in ICT industries ($(dA/A)_{ICT}$) and from spillover effects, captured within the broader term for multi-factor productivity, dA/A.

26. **Table 4 summarizes the contribution to growth of various factors, including that attributable to ICT.** The ICT industry directly contributed about 2 percentage points to Finland's average annual market-based growth (excluding the public sector) of 6 percent in the second half of the 1990s, quadrupling the contribution from the first half of the decade. The contribution to growth from ICT capital deepening more than doubled in the late 1990s compared with the first half of the decade, with hardware investment the primary contributor. Meanwhile, the contribution to growth from other capital was negative during the 1990s.

This reflected, *inter alia*, the fact that the Soviet breakdown made some of Finland's capital stock obsolete, as well as the relatively inefficient use of capital prior to the recession (so-called extensive growth in non-ICT capital) and the resultant shift toward an improvement in capital productivity more recently (intensive growth in non-ICT capital).

Table 4. Finland: Contributions to Finland's Market-Based Output Growth
(In percentage points)

	1975–90	1990–95	1995–99
Output growth	3.2	-0.7	6.0
Direct contribution from ICT production	0.3	0.5	2.0
Contribution (input-side) from:			
ICT capital	0.2	0.3	0.7
Hardware	0.1	0.2	0.4
Software	0.1	0.1	0.1
Communications equipment	0.0	0.1	0.1
Other capital	0.8	-0.7	-0.4
Labor hours	-0.4	-2.9	1.3
Labor quality	0.2	0.2	0.3
Multi-factor productivity	2.2	2.3	4.2

Sources: Statistics Finland, Jalava and Pohjola (2001).

27. **Most remarkably, multi-factor productivity (MFP) almost doubled in the second half of the decade and became the main engine of growth, with the OECD estimating that about 20 percent was attributable to technological progress in ICT industries.** Similarly, if the output share of ICT industries is used to pro-rate MFP, about 1 percentage point of the 4.2 percent growth in MFP would be allocated to the ICT sector. Thus, the contribution from technological progress in ICT production alone has been large and has substantially aided Finland's recovery from the recession.

28. **Nevertheless, the more important question from a longer-term perspective is how the broader use, not the production, of ICT will contribute to growth.** It is ultimately the diffusion of ICT—and the capacity to harness the new technology to enhance productivity in the rest of the economy—that will have the most prolonged and deepest impact. In this regard, roughly 3 percentage points of MFP growth are not directly accounted for by the ICT sector, and could, to some (though unknown) degree, represent spillover effects from the successful deployment of ICT (e.g., more efficient business practices, embodiment effects associated with more advanced capital stock, network externalities, reallocations of labor from low to high productivity activities, etc.). It is MFP growth, rather than capital deepening, that would sustainably increase the long-run trend growth rate, in addition to raising the level of productivity.

29. **By some measures, Finland is very advanced in the use of ICT, with indicators such as Internet connectivity and mobile phone usage among the highest in the world, but spending on ICT capital has not been very high in Finland.** Based on an OECD comparison, Finnish business firms are not yet very advanced in the use of ICT. Between

1992 and 1999, the average share, as a percent of GDP, of ICT spending has been less than 6 percent in Finland, compared with 8–10 percent in the leading countries. As Finnish firms catch up with respect to ICT investment and usage, even larger benefits could yet be reaped from ICT diffusion.

30. **In interpreting these conclusions, a few cautionary notes are in order.** The growth accounting framework's assumptions of constant returns-to-scale and perfectly competitive factor and product markets would seem questionable for Finland's ICT sector.[15] ICT may well be subject to increasing returns-to-scale,[16] and the dominance of Nokia and the presence of centralized wage bargaining (with significant wage compression) undermine the assumptions of perfectly competitive factor and product markets.

31. **An additional complication arises from the measurement of ICT goods' prices.** In view of the rapid quality changes occurring with respect to ICT products, the use of traditional deflators (as employed by most EU countries, including Finland)[17] tends to underestimate the degree of price decline, and hence, underestimate the ICT capital stock.[18] McMorrow and Roeger (2001) explore the impact of using ICT price declines identical to those estimated for the United States to determine the ICT capital stock's contribution to growth in the EU, and compare this to price declines of 50 percent of that for the United States. For Finland, they find that the annual average contribution to growth from ICT capital deepening in the 1995–99 period is reduced from 0.63 percentage points (when the U.S. price deflator is used) to 0.53 percentage points. In addition, measurement problems arise from the lack of data in the Finnish national accounts on a detailed breakdown of gross fixed capital formation in ICT hardware and telecommunications.[19]

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[15] Gundlach (2001) also highlights the methodological ambiguity associated with quantifying the rate of technological change, in that an *a priori* assumption must be made about the type of technological change. Using U.S. data, he demonstrates the substantial empirical difference in assuming Harrod-neutral or Solow-neutral technological change, in place of the customary assumption of Hicks-neutrality.

[16] The high growth rate of MFP could, for example, be capturing increasing returns-to-scale.

[17] The United States., in contrast, employs hedonic deflators in an attempt to more fully capture quality changes. At the same time, this approach risks overstating the contribution to growth if the quality changes are such that they are not fully utilized (akin to a low rate of capacity utilization in traditionally-measured capital stocks). Jalava and Pohjola (2001) use hedonic deflators in their analysis.

[18] The deflator measurement problem is less acute with respect to communications technology, in that the pace of price declines has been far less dramatic than for semiconductors.

[19] For the analysis, Jalava and Pohjola (2001) employed data compiled by the World Information Technology and Services Alliance and the International Data Corporation.

32. **Nevertheless, it is clear that the growth of employment in ICT did not keep pace with the growth in value added.** Thus, average labor productivity growth surged from 1.6 percent in the ICT sector in 1975–80 to 16 percent in the latter half of the 1990s. Over the corresponding period, in contrast, productivity growth in manufacturing, excluding electronics, dropped from 4.9 percent to 2.4 percent. Profitability in the ICT sector was therefore exceptional, benefiting from the unprecedented rise in productivity combined with moderate increases in wages. In fact, there has probably been no other time in Finnish economic history during which companies made profits on such a scale. This has led to a significant shift in the income distribution in capital's favor (Table 5).

Table 5. Finland: Income Shares of Inputs in the Finnish Economy

	1975–90	1990–95	1995–99
ICT Capital	1.7	5.0	5.6
Other Capital	33.9	33.8	38.8
Labor	64.4	61.3	55.6

Source: Jalava and Pohjola (2001).

33. **A puzzling characteristic of Finland is that—while economic growth outstripped that of the United States—economy-wide labor productivity decelerated in the late 1990s (Table 6), in sharp contrast to the United States which saw an acceleration of labor productivity growth (in line with the new economy paradigm).**[20] The decline in Finnish labor productivity stemmed largely from a negative contribution from non-ICT capital deepening, while its contribution to U.S. labor productivity gains was estimated as neutral. At the same time, however, the contribution of MFP to gains in labor productivity, between the second half of the 1990s compared to the first half, was about 2½ times that in the United States Nevertheless, the strong impact of the ICT sector was not sufficient to prevent a slippage in the overall growth rate of labor productivity.

[20] Oliner and Sichel (2000), Jorgenson and Stiroh (2000).

Table 6. Finland: Labor Productivity Growth Rates in Finland

	1979–89	1995–99	Change
Total economy	3.9	2.7	-1.2
Total manufacturing	5.0	5.1	+0.1
Machinery and equipment	5.6	10.8	+5.2
Pulp, paper, paper products	4.7	4.1	-0.6
Basic metals and products	5.4	0.7	-4.7
Total services	2.0	1.6	-0.4
Business sector services	2.7	2.1	-0.6
Finance and insurance	3.8	10.4	+6.6
Post and telecoms	5.5	10.9	+5.4

Source: OECD (2001). The table does not include the period 1991–94, for which labor productivity figures would reflect heavily the labor shedding associated with the severe recession, rather than the impact of the restructuring of economic production.

34. **In those services making intensive use of ICT equipment (such as finance, telecoms, etc.), there was a marked rise in productivity.**[21] For example, in the financial sector, labor productivity growth rates have almost tripled since before the recession, with employment in the banking sector today less than half the level a decade ago. Much of this labor shedding reflects the substitution of ICT capital services for labor. As a result, Finland is today one of the leaders with respect to innovation in banking services such as on-line banking,[22] and the country's banking sector is now regarded as among the most efficient in advanced economies. On the other hand, there was a notable decline in labor productivity in other services, especially in trade, hotels, restaurants, and real estate.[23]

35. **One question that arises is whether an ICT boom could be similar in impact to resource booms associated with the "Dutch disease" phenomenon.**[24] Dutch disease has usually been "diagnosed" with respect to resource- or commodity-based dependence (where the commodity in question dominates the export sector), which differs in some critical ways

[21] Stiroh (2001) examines U.S. data by industry and draws similar conclusions—non-ICT industries that invested most heavily in high-tech equipment evidenced the largest gains in labor productivity growth.

[22] 25 percent of bills are paid via the Internet, for example, compared with 35 percent by ATM.

[23] The following chapter examines Finland's services sector in more detail.

[24] Dutch disease refers to the macroeconomic implications of a booming exporting sector, with its name deriving from concerns about deindustrialization in the Netherlands in the aftermath of the discovery of North Sea oil. This phenomenon is one in which a positive terms-of-trade shock translates into an appreciation of the real exchange rate to maintain equilibrium in the market for nontraded goods. The result is a contraction of output in other import-competing or exporting sectors.

from knowledge-based dependence. An important distinction is that knowledge accumulates and is not depleted, and can be applied to other areas if, for example, problems were to develop in the mobile phone industry. There could, nevertheless, be some crowding out of other sectors—notably the lower-productivity services sector—due to cost-push pressures deriving from higher wages (particularly in view of economy-wide wage links that show little responsiveness to productivity differentials) and the recruiting of much of the skilled labor to the ICT sector. This pseudo-Balassa-Samuelson effect would be less benign than in a convergence economy, as it would be taking place against a background of already high price levels in the nontradeables sector and, therefore, would only serve to aggravate any market disequilibrium resulting from insufficient flexibility in the labor market.

36. **What is likely to be the impact of the ICT sector on potential output and associated growth rates?** With the ICT sector boosting output growth on the order of 2 percentage points per year over the past several years, recent GDP growth rates have been well above historical trends. As forward-looking analysis must often rely on historical relationships, conventional approaches to measuring the output gap (particularly those based on trend analysis) would suggest that GDP in 2000 exceeded potential output.[25] However, the dual economy nature of Finland's recent growth—with the ICT sector distinctly apart from the rest of the economy in terms of its impact on aggregate employment, domestic demand, and wealth creation—has permitted high GDP growth rates without overheating. For this reason, output gap estimates linked to observed tightness in the aggregate labor market imply a negligible gap for 2000.[26]

37. **With a longer-term perspective, higher MFP growth rates certainly translate one for one into higher rates of output growth, but the impact on potential output growth hinges crucially on how much of the recent acceleration in MFP is a cyclical or a trend component of productivity.**[27] In view of the short time series for the ICT sector impact, it is difficult at this point to distinguish between a secular increase and a purely cyclical upturn. And the problem of forecasting long-run MFP growth is exacerbated by the fact that it is calculated as a residual or catch-all term, and therefore not amenable to modeling and deeper analysis.

38. **The shift toward the ICT sector in the economic structure has also had an impact on human capital formation.** Finland now has one of the greatest discrepancies

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[25] Using a Hodrick-Prescott filter, the European Commission estimated a positive output gap of 2½ percent for 2000. The OECD also estimated the gap at 1¼ percent based on a production function approach.

[26] This Okun's law type approach is described in *Finland—Selected Issues*, SM/99/230 (9/15/99).

[27] Gordon (2000), one of the skeptics of the new economy paradigm, argues that much of the recent productivity gains in the U.S. economy are cyclical in nature and will diminish in an economic slowdown. Preliminary developments in 2001 could be interpreted as supporting his conclusion.

among the advanced economies in educational levels between the old and the young. As shown in Table 4, improvements in labor quality—stemming in large part from the shift to higher-skilled labor in ICT—contributed to Finland's strong growth. Thus, some of the productivity gains have been attained through up-skilling of the active labor force, i.e., leaving behind the low-productivity workers.[28] Indeed, Finland's relatively high rate of structural unemployment is heavily concentrated among the low-skilled. Labor market reforms aimed at improving the functioning and flexibility of the labor market—including through enhancing the incentives to work, lowering the tax wedge, and increasing wage dispersion in line with productivity differentials—could, paradoxically, lower the NAIRU[29] with a much less-than-proportionate impact on potential output. Such reforms could foster low-skilled employment—and while they would make growth more labor-intensive and thereby slow the rate of overall labor productivity growth,[30] these are crucial for broadening the employment base, reducing the economy's dependence on the volatile ICT sector, and addressing regional and skill mismatches in the labor market.

F. Looking Forward

39. **The ebullient optimism of the past year has dissipated, as the global slowdown takes its toll especially on the high-tech sector, including international market leaders such as Nokia.** The ICT sector's growth potential depends heavily on global demand, particularly in Finland with its small domestic market. Thus, constraints on growth in Finland's ICT sector have likely shifted away from supply constraints (i.e., skilled labor shortages) in 2000 toward demand constraints in 2001. Corporate profit margins—albeit from high levels—are coming under greater pressures with demand weak, productivity stalling, and unit labor costs on the rise.[31] Analysts have also expressed concern about the saturation of the European mobile phone market and the difficult transition from second to third generation (3G) mobile technology (discussed below).

40. **With more than 90 percent of its market abroad, Nokia is particularly vulnerable to a global downturn.** Indeed, Nokia's profit warning in June 2001 (regarding the second quarter) was a shock to the mobile phone market (evidenced by a 20 percent

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[28] In contrast, the U.S. widened its employment base over the past few years, bringing more of the low skilled into the active workforce.

[29] Non-accelerating inflation rate of unemployment.

[30] Assuming that low-skilled labor input largely translates into low-productivity services or production.

[31] In view of the low-employment-intensity of ICT sector, even a steep and sustained drop in demand growth may have a relatively muted impact on Finland's labor market.

plunge in the share price in one day), as analysts had been most optimistic regarding Nokia's prospects among the handset manufacturers. Nokia had expressed confidence that it could ride out the economic storm by relying on brand building and continuing to increase its already huge market share (Figure 5a), thereby mitigating the impact of the drop in global demand. Indeed, Nokia managed to achieve a 5 percent increase in net sales in the second quarter of 2001, while maintaining solid profit margins, but this compared to the company's projections early in the year of sales growth of 20 percent. Nokia also announced its first layoffs in almost a decade, albeit on a very small scale compared to its major competitors.

41. **A risk for Finland's ICT sector is that mobile phones are increasingly becoming commodities, similar to developments with the personal computer.** This could translate into greater volatility for the market, and ultimately much lower profit margins as competition heats up over prices. Nokia is already being squeezed this year not only by the market downturn and the associated drop in sales volumes, but also by more aggressive pricing by rivals, an indication of commoditization. And such a price war could sharply reduce Nokia's unit profitability. Market saturation could add to the woes of the mobile phone sector. In Europe, estimated mobile phone penetration rates as of 2001 imply that much of the growth potential in this market has now been tapped, and consumers may await significant technological advances before making new purchases. Among advanced economies, there remains, however, greater potential for growth in the U.S. market since the penetration rate, at about 40 percent, is much lower than that in Europe and parts of Asia (Figure 5b).

42. **While share prices have plummeted from their highs in 2000, amid marked downward revisions in expected earnings, the impact on the broader economy of the decline in share prices could have varied effects.** Domestic wealth effects should be contained by both the high concentration of equity ownership in the domestic market and the high share of foreign ownership. Confidence effects could, however, play a larger role in dampening economic activity, in view of the perception that Finland's fortunes are closely tied to the ICT sector. Stress tests performed for the recent Financial System Stability Assessment suggest that a permanent downward shock to stock prices of about 20 percent relative to the end-2000 level would lower GDP by an annual average of 0.3 percent over the next three years, with the impact arising from wealth effects on consumption (although limited) and the lower rate of investment, owing to the higher cost of capital. Based on another stress test scenario, the financial system would be fairly robust to a sharp drop (on the order of 33 percent)[32] in ICT exports, reflecting the low direct exposures of the banking system to the ICT sector.[33]

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[32] Implying approximately a 10 percent fall in total exports.

[33] Another stress test scenario was specifically calibrated to generate zero GDP growth over the next three years. This involved combining a stock price shock (with a drop of 40 percent), an additional 5 percent fall in total exports in 2002 and 2003 (over and above that assumed in the export shock scenario), and a decline in residential and commercial real estate values by 10 and 15 percent. In such case, it was concluded that the financial sector, while severely strained, would likely remain solvent.

Figure 5a. Finland: Worldwide Mobile Phone Market Shares, Q1 2001

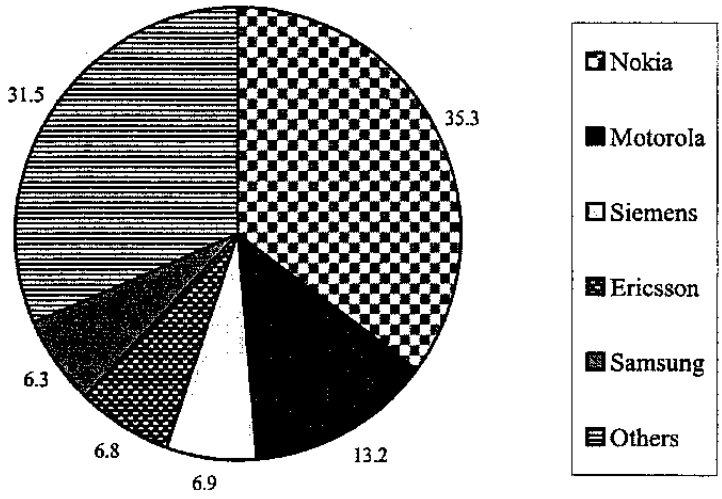
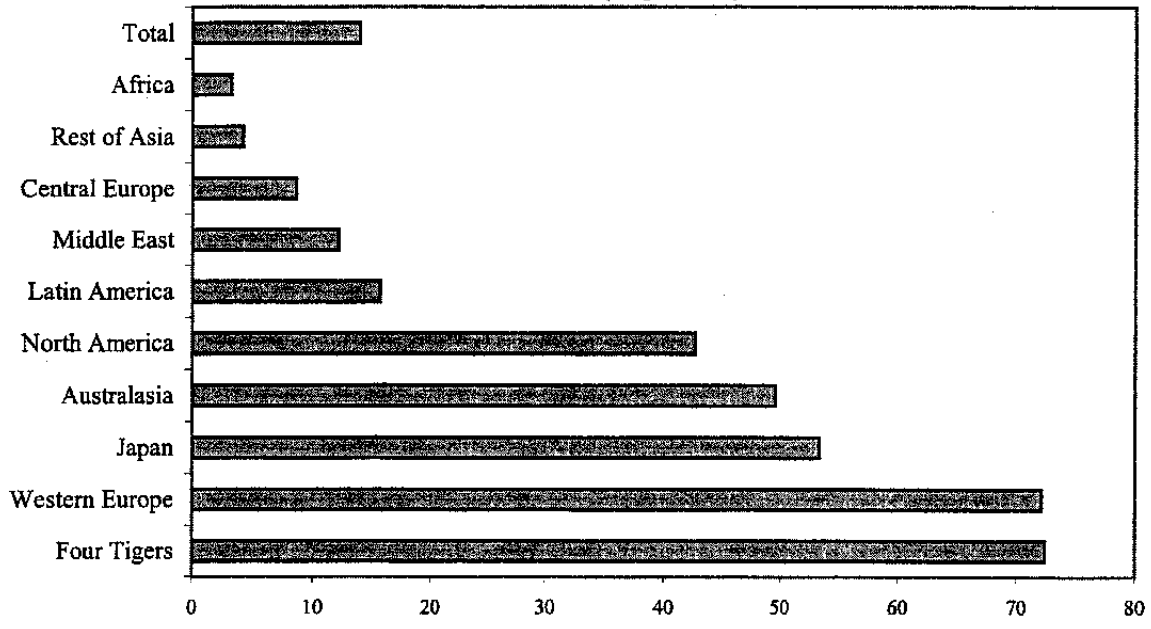


Figure 5b. Finland: Mobile Phone Penetration Rates by Region, 2001
(In percent)



Sources: Waters and Daniel, *Financial Times*, 2001

43. **A significant (and potentially risky) challenge for Finland's ICT cluster, and Nokia in particular, in the coming years will be the shift to 3G communications.**[34] Nokia is well-placed to take advantage of this opportunity, but the launch of 3G will erase some of Nokia's head start from having been one of the earliest movers in GSM (2G technology). Moreover, while the untested 3G technology holds great promises, the environment for developing 3G has been made more difficult due to the excessive prices realized in frequency auctions in Europe, which have placed heavy debt burdens on operators.[35] Nokia is reportedly leading efforts by mobile phone manufacturers to assist in the financing of the 3G networks. Thus, Nokia and its competitors are effectively acting as bankers to finance—via bridge loans to get wireless carriers over the initial hump in outlays—a technology deemed by much of the financial market as too risky. Notably, in line with the government's technology-oriented policy, Finland was one of the few countries which granted the local network licenses free of charge via comparative tendering, recognizing the tremendous potential as well as risks associated with its development.

44. **It is still too early to tell whether the ICT "revolution" is on a par with other technology changes that fundamentally altered long-term economic performance.** Whether the current economic environment is merely a temporary, cyclical downshift from a period of excessive optimism or whether the productivity growth surge of the past few years was a response to unsustainable demand growth is yet unknown. Only after demand recovers will it be possible to assess what is happening to the underlying efficiency of Finnish production. Indeed, the sustainable impact of ICT over the longer run is more likely to be evolutionary in nature, rather than revolutionary.[36] Nevertheless, cautious optimism seems warranted in the case of Finland. Whatever the short-term prospects for the ICT sector might be, many of the positive factors which initially supported technological innovation and the fundamental shift in production are firmly embedded in the Finnish economic structure, and should support Finland's remaining in the top tier of the leading "new economies."

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[34] 3G technology aims to provide a seamless convergence of mobile phones and the Internet, with broad-ranging high-speed wireless data and voice transmission.

[35] *The Economist* (2001) noted that Europe's telecoms companies spent € 110 billion on 3G licenses. Moreover, as a sign of the increasing doubt about the profitability of the 3G venture, Sonera, Finland's largest telecoms operator, decided in August 2001 to return its license in Norway, write off the losses, and concentrate on its other investments.

[36] Hämäläinen (2001) notes that the impact of previous "revolutions" was on the physical production environment, while that of information technology is more on the intangible environment.

REFERENCES

Ali-Yrkkö, Jyrki, 2001, "The Role of Nokia in the Finnish Economy," *The Finnish Economy and Society*, The Research Institute of the Finnish Economy (ETLA) and the Centre for Finnish Business and Policy Studies (EVA).

Bassanini, Andrea, Stefano Scarpetta, and Ignazio Visco, 2000, "Knowledge, Technology, and Economic Growth: Recent Evidence from OECD Countries," OECD, Economics Dept. Working Paper No. 259.

Economist Intelligence Unit, 2001, "World Investment Prospects: Comparing Business Environments across the Globe."

The Economist, "Running for the exit," August 18, 2001.

Gordon, Robert, 2000, "Does the 'New Economy' Measure Up to the Great Inventions of the Past," *Journal of Economic Perspectives*, Vol. 14, No. 4, pp. 49–74.

Hämäläinen, Sirkka, 2001, "Is the New Economy Really New?", paper presented for Jaakko Honko Lecture, Helsinki School of Economics.

International Institute for Management Development, 2000, "The World Competitiveness Yearbook."

Jalava, Jukka, 2001, "The New Economy in Finland," Bank of Finland Bulletin, Vol. 75, No. 2.

Jalava, Jukka and Matti Pohjola, 2001, "Economic Growth in the New Economy," Discussion Paper No. 2001/5, World Institute for Development Economics Research, United Nations University.

Jorgenson, Dale, and Kevin Stiroh, 2000, "Raising the Speed Limit: U.S. Economic Growth in the Information Age," Federal Reserve Bank of New York.

Kandell, Jonathan, 2001, "Finland is now Nokialand," *Institutional Investor*.

Koski, Heli, Petri Rouvinen, and Pekka Ylä-Anttila, 2001, "ICT Clusters in Europe: The Great Central Banana and the Small Nordic Potato," Discussion Paper No. 2001/6, World Institute for Development Economics Research, United Nations University.

McMorrow, Kieran and Werner Roeger, 2001, "Potential Output: Measurement Methods, 'New' Economy Influences and Scenarios for 2001–2010—A Comparison of the EU15 and the US," Economic Papers, European Commission, Directorate-General for Economic and Financial Affairs.

Nadiri, M.I., 1993, "Innovations and Technological Spillovers," NBER Working Paper No. 4423.

OECD, 2000, "OECD Information Technology Outlook 2000: ICTs, E-Commerce, and the Information Economy.,"

OECD, 2000, "A New Economy? The Changing Role of Innovation Technology in Growth."

OECD, 2001, "Basic Science and Technology Indicators," Volume 2001, Release 01.

OECD, 2001, "The New Economy: Beyond the Hype: The OECD Growth Project."

Oliner, S. D. and D.E. Sichel, 2000, "The Resurgence of Growth in the late 1990s: Is Information Technology the Story?", *Journal of Economic Perspectives*.

Paija, Laura, 2001, "The ICT Cluster in Finland—Can We Explain It?", in *Finnish ICT Cluster in the Digital Economy*, Laura Paija (ed.), The Research Institute of the Finnish Economy.

Rönkkö, Perttu, 2001, "Growth and Internationalization of Technology-Based New Companies: Case Study of 8 Finnish Companies," in *Finnish ICT Cluster in the Digitel Economy*, Laura Paija (ed.), The Research Institute of the Finnish Economy.

Stiroh, Kevin, 2001, "Information Technology and the U.S. Productivity Revival: What Do the Industry Data Say?", Federal Reserve Bank of New York, Working Paper.

Waters, Richard and Caroline Daniel, 2001, "Bad signal," *Financial Times*.

II. Labor Market Challenges: Job Creation in the Services Sector[1]

A. Introduction

1. **Finland's economy has undergone a fundamental structural change over the course of the past ten years.** In the early 1990s, Finland experienced economic recession and a breakdown of its traditional patterns of external trade. In the aftermath, a strong information and communications technology (ICT) sector developed and forms today the backbone of the Finnish export-oriented economy. Over the period 1998–2000, the electronics industry alone (and in particular Nokia) contributed 1½–2½ percentage points to Finland's average annual real GDP growth of 5 percent. However, despite the sector's strong contribution to economic growth, it accounted for only close to 5 percent of total employment in 2000, and contributed little to lowering high unemployment in the low-skill segment of the labor force.

2. **Notwithstanding strong economic growth into 2000, Finland's unemployment rate remained among the highest within the OECD.** Unemployment as a percentage of the total labor force was the fourth lowest in the OECD at the beginning of the 1990s. With the start of economic recession, the unemployment rate increased rapidly from 3.6 percent in 1990 to 16.7 percent in 1994 (the second highest rate in the OECD after Spain). Subsequently, it decreased to 9.8 percent in 2000, but it was still among the highest rates within the OECD and the EU, despite the strong economic upturn. At the same time, high-skill manufacturing businesses, and services at all skill levels, showed signs of emerging labor supply shortages according to survey information from the Employers' Confederation of Service Industries in Finland.

3. **Improving the functioning of the Finnish labor market would contribute significantly to economic growth and the soundness of the public finances.** Changes in labor demand reflect the underlying evolution of skill requirements across the various sectors of the economy. The ICT sector has high skill requirements in both the industry itself and related business services. Meanwhile, the demand for lower-skill labor would be more pronounced in personal and other low-productivity services, but the compression of the wage scale inhibits wages from adequately reflecting productivity. This, combined with incentive traps that discourage entry into the labor force, aggravated by a high tax wedge, contributes to a gap between supply and demand in the market for low-skill labor. With the rapid aging of its population, Finland will be confronted with two challenges: pressures on fiscal spending will rise while the demand for personal services can be expected to increase. Market-based policies that improve the functioning of the labor market—and generally broaden the employment base—can help respond to these challenges.

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[1] Prepared by Matthias Vocke.

4. **Against this background, this paper assesses the services sector and its potential for employment creation, in particular in the area of personal services and other services with low skill requirements.** Section B examines available data on the services sector, with a view to identifying categories of services with potential for future growth. In Section C, the paper assesses whether labor market and other factors impede employment growth in the services sector. Finally, in Section D, the paper offers concluding remarks, highlighting specific actions that could be considered to enhance the prospects for employment creation in the services sector.

B. A Closer Look at Some Relevant Data

Unemployment Developments

5. **Unemployment remains very high among low-skill workers, despite the downtrend in the overall unemployment rate.** At 9.8 percent in 2000, the Finnish unemployment rate had declined by 6.5 percentage points from its 1995 level. Unemployment varied considerably across regions, age groups, and by gender, but most notably across skill levels. Unemployment of low-skill workers[2] was high by EU standards across all age groups, but it was particularly high among persons aged 15–24 years and 50–59 years, with unemployment rates of 40.4 percent and 11.9 percent, respectively.[3] While younger workers could theoretically still acquire the skills and qualifications necessary for employment in high-productivity sectors, this is more difficult for the older unemployed. Indeed, the number of unemployed older workers fell by 7.5 percent between 1997 and 2000, compared with a drop of 21.5 percent for all unemployed. Moreover, the "effective" unemployment rate among older workers is much higher, in light of the readily available incentives to take early retirement.

6. **The continued outward shift of the Beveridge curve suggests a growing share of structural unemployment in total unemployment.** Based on Finnish data for the 1990s, Figure 1 shows the Beveridge curve, which relates the vacancy rate to the unemployment rate. The outward shift of the curve during the past decade—implying higher vacancy rates coinciding with the same rate of unemployment—reflected both a growing mismatch in qualifications and skill-requirements, and disincentives for labor demand and supply, stemming from tax- and benefit-related distortions.

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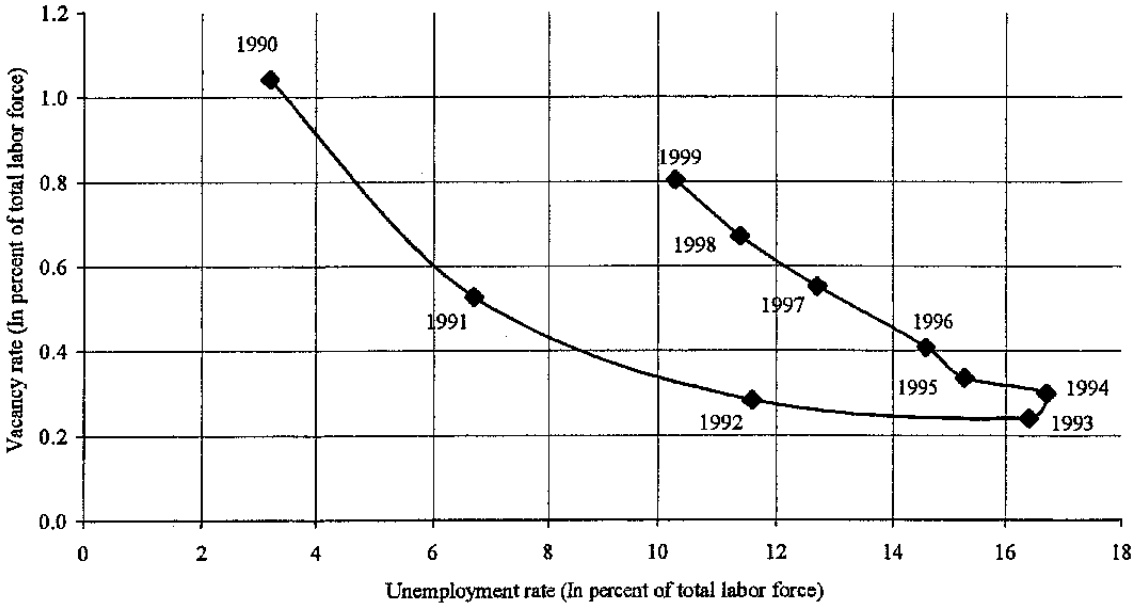
[2] Eurostat publications on unemployment by educational attainment level define an education of less than the upper secondary level as low skill, at the upper secondary level as medium skill, and at the third level as high skill.

[3] OECD (2000) provides details and comparisons across advanced economies.

Figure 1. Finland: The Beveridge Curve (1990–99)



Sources: Finnish authorities; IMF staff calculations.

Employment in the Services Sector—An International Comparison

7. **The employment share of the Finnish services sector increased over the past decade, but remained low by international standards (Table 1).** The services sector is today by far the largest sector in advanced economies, accounting for about 70 percent of total employment on average in a group of broadly comparable OECD economies, and a slightly smaller share of total value added. However, in 1999, the share of the services sector in total employment in Finland was 3⅓ percentage points below the average for other countries.[4] The table also shows that Finland is the only country where the employment share of services decreased between 1994 and 1999.

[4] Interestingly, the inflow of labor from other sectors has persistently been a more important recruitment channel for manufacturing than for services. People hired for manufacturing from other sectors mostly came from nonservice industries (agriculture, forestry, mining, energy and water supply, and construction), while people hired in the services sector from other sectors came mostly from manufacturing. Data on intersectoral labor flows were only available until 1997. See Asplund (2001) for details.

Table 1. Finland: Employment Shares of the Services Sector
(In percent)

	1989	1994	1999
Austria	63.0	65.3	67.0
Denmark	71.4	73.2	74.4
Finland	65.0	69.3	68.5
France	68.2	71.5	73.6
Italy	60.1	63.0	64.7
The Netherlands	69.7	72.9	73.8
United Kingdom	70.3	75.3	76.4
United States	73.7	75.9	76.3
Average[5]	67.7	70.8	71.8

Sources: OECD (2000), IMF staff calculations.

8. **To assess the potential for employment creation in the Finnish services sector, this paper compares data on employment shares and the gross value added (GVA) per employee for Finland and the United Kingdom across 28 different groups of services.**[6] The services groups used in this analysis are listed in Table 2. They fall into three major categories, which can be described as distributive and logistical services, financial and business services, and social and personal services.[7] Within these major categories, the degree of breakdown was determined by the availability of data for the different sub-categories. The services sector of the United Kingdom was chosen as a comparator because of the availability of data and the advanced development of the U.K. services sector (see Table 1 above).[8]

[5] Simple unweighted average of the listed countries.

[6] The GVA per employee and the employment share of individual services were calculated from data presented in OECD (2001). The GVA per employee is defined—according to OECD standards—as the difference between the value of output and the value of intermediate consumption, before deduction of consumption of fixed capital, per employee. It is measured at basic prices. Output is defined as sales plus the net increase in stocks of finished goods and work in progress. Intermediate consumption is defined as the goods and services that are consumed in the production process.

[7] Services with a large public component are excluded from the analysis, however, since it was felt that they are less driven by profitability considerations and that this would unduly bias the results, especially when using data on GVA.

[8] U.K. data were unavailable, however, for industrial cleaning services, other business services, and private households with employed persons. The analysis used Danish data for the first two categories and German data for the last category.

Table 2. Finland: Classification and Abbreviations of Services

OECD Code	Services sector	Abbreviation
1.1.1.1.	Motor trade and repairs	MOT
1.1.1.2.	Wholesale and commission trade	WCT
1.1.1.3.	Retail trade and repairs	RET
1.1.2.	Hotels and restaurants	HOT
1.2.1.1.	Land transport, transport via pipelines	LAN
1.2.1.2.	Water transport	WAT
1.2.1.3.	Air transport	AIR
1.2.2.	Communications	COM
2.1.1.	Financial intermediation	FIN
2.1.2.	Insurance and pension funding	INS
2.1.3.	Auxiliary financial services	AFS
2.2.1.	Real estate services	REA
2.2.2.1.	Renting, etc.	REN
2.2.2.2.	Computer and related activities	CPT
2.2.2.3.	Research and development	RES
2.2.2.4.1.	Legal, accounting services	LEG
2.2.2.4.2.	Architecture, engineering, and other technical services	ARC
2.2.2.4.3.	Advertising services	ADS
2.2.2.4.4.1.	Other business services	OBS
2.2.2.4.4.2.	Industrial cleaning	ICL
3.1.1.	Public administration and defense	PUB
3.2.1.	Education	EDU
3.2.2.1.	Health and social work	HSW
3.2.3.1.	Sanitary and similar services	SAN
3.2.3.2.	Membership organizations	MEM
3.2.3.3.	Recreational and cultural services	REC
3.2.3.4.	Other personal services	OPS
3.2.4.	Private households with employed persons	PHO

Source: OECD (2001).

9. **A comparison of the data is summarized in a scatter plot of the difference in employment share and in GVA per employee for the various categories of services (Figure 2).** These services are categorized as follows:

- *Quadrant 1*: Services that have both a larger employment share and GVA per employee in Finland, suggesting that these services may be either already highly competitive (if they are tradable),[9] or in strong demand (if they are nontradable).

- *Quadrant 2*: Services that capture a greater share of total employment, but show a lower GVA per employee, suggesting that these services could experience a future decrease in the employment share, though this would be more likely for nontradables.

- *Quadrant 3*: Services that are characterized by both a smaller employment share and GVA per employee, suggesting that these services are likely to be either uncompetitive (if they are tradable), or subject to weak demand (if they are nontradable).

- *Quadrant 4*: Services that combine a small employment share and a large GVA per employee, suggesting that these services may be comparatively underdeveloped, and, therefore, have relatively strong market potential.

10. **With 12 of the 28 services categories falling in the fourth quadrant, there seem to be significant areas for employment expansion in Finland's services sector.** These include private households with employed persons, other personal services, hotels and restaurants, retail trade, and wholesale and commission trade (which can broadly be characterized as personal and distributive services). In addition, the categories in Quadrant 4 include computer-related services, renting services, legal and accounting services, financial intermediation, auxiliary financial services, education, and sanitary and similar services.

11. **Other characteristics of the services sector are also relevant to assess its role for employment creation in Finland.** In particular, it is important to keep in mind the significant role of public services in Finland and the crucial importance of business services in supporting economic growth related to the ICT sector. The role of public services is described in Annex I. In addition, Annex II provides an overview of the business services sector and its main characteristics in Finland.

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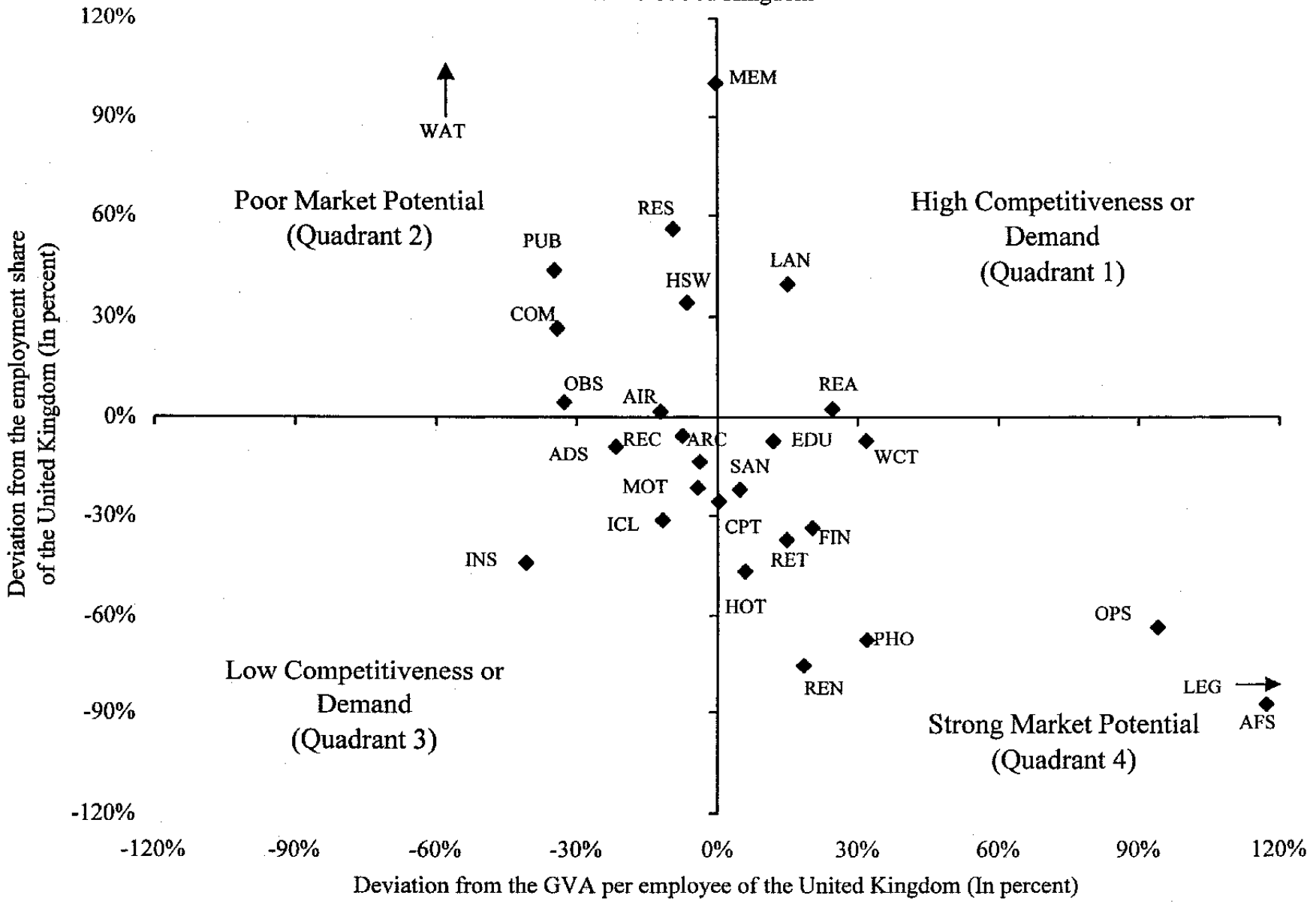
[9] Since tradable services are subject to international competition, a high GVA per employee combined with a large share in total employment can be taken as an indication of a high degree of competitiveness. With nontradable services, by comparison, a high GVA per employee and a large share in total employment can be taken as an indication of a strong domestic preference for these services, since the GVA is measured at basic prices.

Figure 2. Finland: GVA per Employee and Employment Share
in Relation to the United Kingdom



Sources: OECD (2001); IMF staff calculations.

The Low-Skill Segment of the Market

12. **High unemployment among low-skill workers in combination with a low-skill services sector that is small by international standards raises questions about the functioning of the market for this category of labor.** Figure 3 shows the evolution of the shares of six low-skill services in total employment over the past decade. In the face of increasing unemployment among low-skill labor, and total employment in 1999 at only 91 percent of its 1989 level, the employment share of the three largest categories of private low-skill services decreased over this period, from already low levels.[10] While the employment share growth of the three smallest private low-skill services in Finland outperformed the corresponding growth rates in the other advanced economies, these services are catching up from internationally very low levels and, taken together, accounted for just over 2 percent of total employment in 1999, compared with more than 4 percent in other advanced economies.[11]

13. **In a related vein, the share in employment of low-productivity services is much lower than in other advanced countries.**[12] Figure 4 shows employment shares in comparison with advanced economy averages for the services with the lowest GVA per employee in Finland (below two-thirds of the average GVA per employee). All of these services are characterized by a significantly smaller employment share than in other advanced economies.

14. **The employment shares of private personal services are significantly below international averages.** Figure 5 compares the employment shares of private personal services with those in other countries and provides additional information about the growth in employment shares. The category of personal services for the most part comprises low-skill, low-productivity services.[13] Judging from their share in total employment compared with other countries, private personal services are underdeveloped in Finland.

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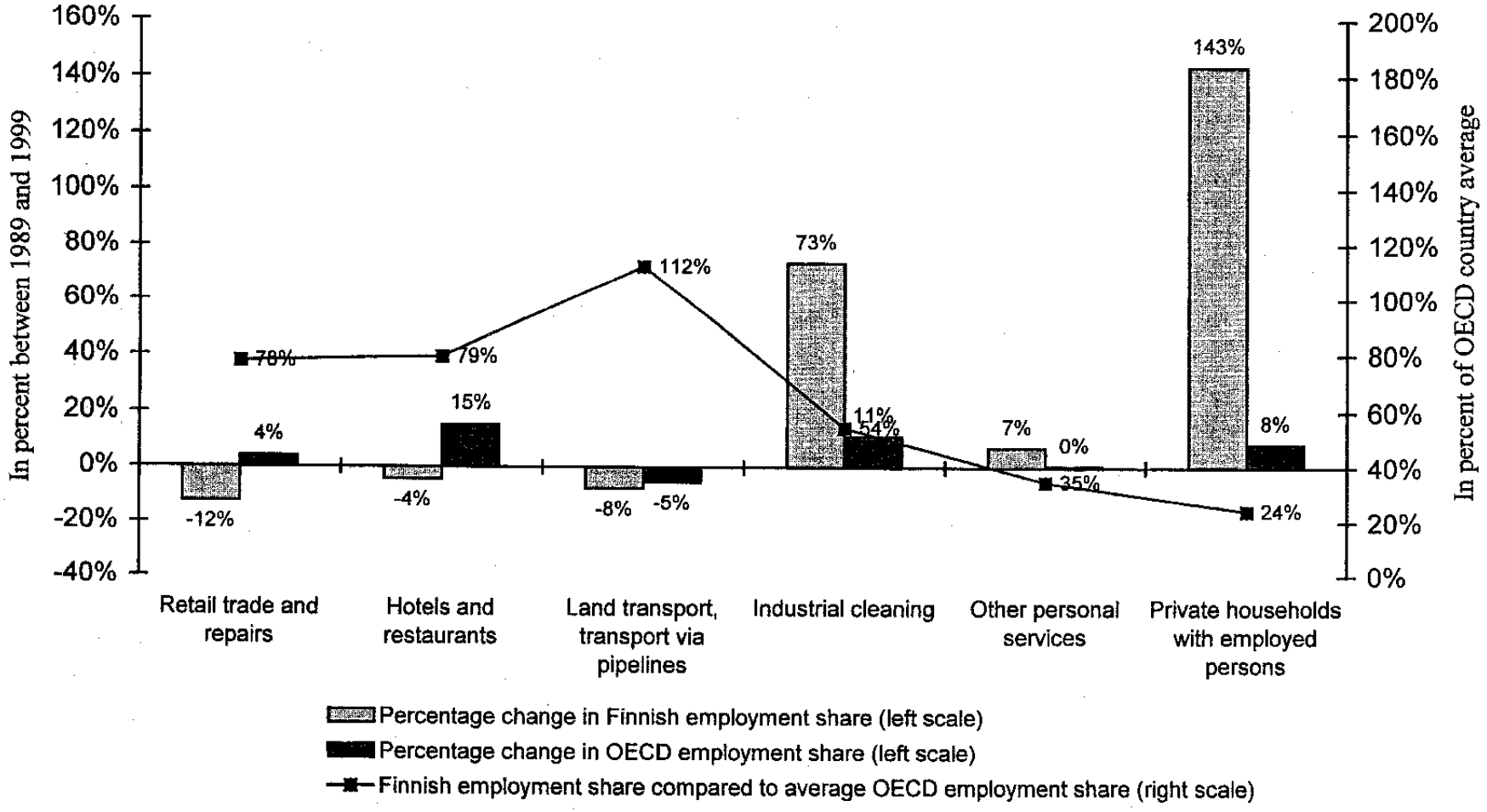
[10] These services were retail trade and repairs, hotels and restaurants, and land transport, which together accounted for 12 percent of total employment in 1999.

[11] These services were industrial cleaning, other personal services, and private households with employed persons.

[12] Low-skill services and low-productivity services are not necessarily identical, though the overlap between the two categories is considerable. There are, thus, some services that do not require high skill levels, but where technological progress and associated gains in labor productivity have allowed increases in the value added per employee. These services include, for example, transportation and sanitary and similar services.

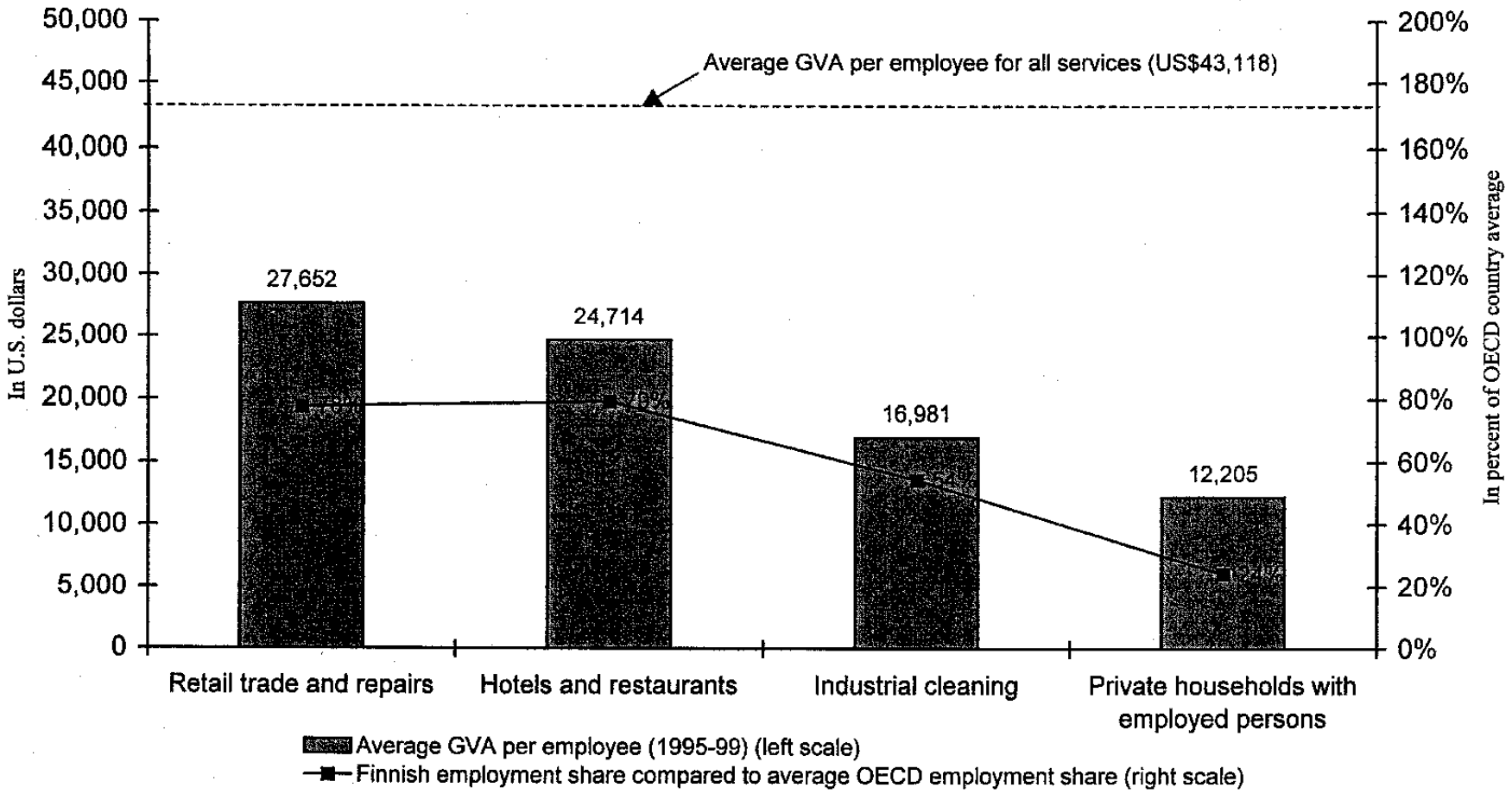
[13] While the ratio of low-skill to medium/high-skill employment for personal services is above the average across all services in Finland, this ratio is even higher for distributive services—unlike comparable ratios in most other OECD countries. See OECD (2000, p. 96).

Figure 3. Finland: Employment in Low-Skill Services



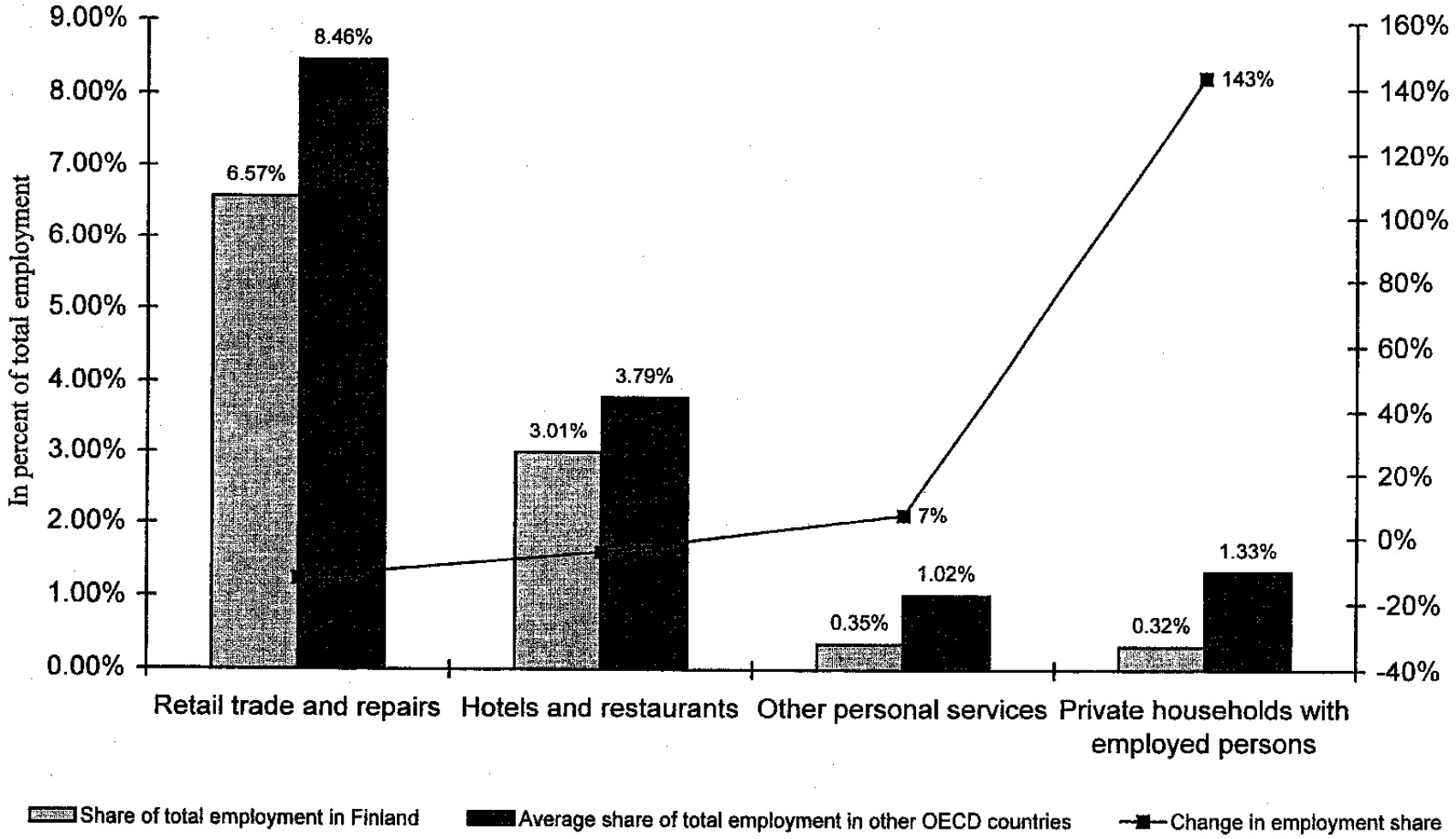
Sources. OECD (2001); IMF staff calculations.

Figure 4. Finland: Services with Low Gross Value Added (GVA) per Employee
(below 2/3 of the average)



Sources: OECD (2001); IMF staff calculations.

Figure 5. Finland: Employment in Private Personal Services



Sources: OECD (2001); IMF staff calculations.

Survey Data

15. **While the demand for private personal services can be expected to increase as a result of rising personal incomes and an aging population, recent labor surveys are already pointing to greater difficulties in hiring personnel.** The Employers' Confederation of Service Industries in Finland periodically conducts surveys among its members about the availability of trained personnel. During the past five years, an increasing number of private services companies encountered problems in recruitment and the availability of trained service personnel continued to deteriorate. In 1999, about 65 percent of all Finnish services companies viewed their number of staff as less than would be needed—a higher percentage than in any other EU country.[14] Difficulties in recruitment seem to have increased the least in information technology (somewhat paradoxically, in view of reported shortages of skilled labor for the ICT sector) and social services, in which 25 percent and 30 percent, respectively, of all businesses thought that hiring trained personnel is more difficult than before.

C. What is Impeding Employment Growth in the Services Sector?

16. **Labor demand in the services sector should be rising.** The analysis in the preceding section has suggested that there is a higher demand for labor in several services categories. Looking ahead, the growing share of the population aged over 64 will increase the demand for personal services, in particular in health and social work, but also for distributional and recreational services, as well as for employed persons in private households. In a related vein, an aging of the population is associated with increasing public expenditure and decreasing tax revenues from labor income. The resulting pressures on the public finances could imply a reduction in the range of publicly provided services, and related demand incentives for private services providers to move into these areas. Furthermore, replacing an increasing number of retiring service sector employees has been (and will continue to be) an even greater challenge for the labor market than responding to the growing demand for personal services. According to estimates of Finland's National Board of Education, the growth in new demand accounts for just 20 percent and the loss replacement for 80 percent of the required new labor force in services. In relation to the 1995 workforce in these services, the Board's projections show, for example, a 65 percent loss in cleaning services and a 39 percent loss in social and recreational services until 2010.

17. **Even in the circumstances described above, the centralized wage bargaining system tends to discourage the hiring of low-skilled workers.** The Finnish wage bargaining system has been largely centralized since the 1980s. Agreements between the employers' organizations and the employees' unions regarding the rise in the average hourly

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[14] Interestingly for the discussion that follows on impediments to employment growth, this percentage was also high in Sweden and Denmark—two countries with tax wedges and replacement incomes that are at similarly high levels.

cost of labor usually cover more than 90 percent of all employees—the second most comprehensive coverage within the OECD behind Austria.[15] Generally speaking, this rise is currently defined as an absolute amount for monthly incomes below Fmk 11,000 (which is slightly below the average monthly wage) and as a percentage increase for monthly incomes above Fmk 11,000. In percentage terms, the increases for incomes below Fmk 11,000 are higher than for those above that level, leading to a continued compression of the Finnish wage scale. As the centralized wage bargaining system does not account for the considerable differences in productivity developments across sectors, it tends to contribute to a higher demand for labor in the sectors with the highest productivity and reduced demand for labor in the lowest-productivity sectors.

18. **A high tax wedge on labor discourages both the demand for and the supply of labor in the services sector.** Table 3a provides an international comparison of the effective tax burden on low incomes. The effective tax burden in Finland of more than 40 percent of the total labor cost is well above the EU average and considerably exceeds the ratio for the United States, increasing the cost of and, in consequence, decreasing the demand for low-productivity labor. In comparison with the effective tax burden, the average tax wedge is an even more comprehensive concept, covering income tax, consumer taxes, and the employer's social security contribution. It is expressed in percent of gross earnings. The Finnish tax wedge, on this basis, is also high by international standards—at 58 percent for average incomes in 2001, and is only marginally lower in low-paid services, such as restaurants and personal services. Even more importantly, the marginal tax wedge can exceed 100 percent for lower incomes if the loss of income-related child-care and housing benefits is included in the calculation, which discourages the supply of labor.

[15] During certain years, wage increases were negotiated at the sectoral level. However, wage differentiation across sectors was still rather small and the overall wage increases were often higher than in years when wage agreements were negotiated at the central level.

Table 3a. Finland: Effective Tax Burden in Low-Paid Jobs
(In percent of labor costs)

	Finland	EU	United States
Single person earning 67% of average wage level	42.4	37.6	29.0
Family earning 67% of average wage level[16]	40.8	36.3	26.8

Sources: Finnish authorities, OECD.

Table 3b. Finland: Net Replacement Rates for Low-Paid Unemployed
(In percent of net earnings)

	Finland	EU	United States
Single person, 1st month	72	71	59
Family, 1st month[17]	94	79	51
Single person, 60th month	79	59	10
Family, 60th month[18]	100	77	61

Sources: Finnish authorities, OECD.

19. **High replacement incomes, which are especially prevalent at the low income levels, discourage the supply of low-productivity labor to the services sector.** The replacement income is the publicly provided income that is available to an unemployed person. It can be expressed as a percentage of net earnings when employed. Table 3b provides an international comparison of net replacement rates. It shows that Finnish replacement income is high by international standards, in particular for low-income families. Moreover, the net replacement income increases with the duration of unemployment. It can reach 100 percent of the income from employment of low-income families after 60 months, providing strong disincentives to search for work. Considered in combination, the levels of taxes and replacement income provide strong disincentives to seek employment in low-skill services.

[16] A family of two parents and two children.

[17] See footnote 16.

[18] See footnote 16.

20. **At present, the procurement of private services is limited.** This reflects the shortage of personnel and skills, including tenders for services and construction where the concern about appeals from competing bidders results in little or no procurement taking place at all. In fact, the latter impediment is an even broader issue because existing procedures imply that a large number of bidders must be evaluated for a procurement tender to proceed and that hampers the use of public procurement. Useful changes that might encourage greater use of procurement would include strengthening the skills of procurement authorities and boosting their numbers, and limiting the number of bids that need to be considered. In addition, the use of electronic marketplaces could be beneficial, though this may require changes in existing legal restrictions.

21. **Legal restrictions on health care and subsidies to nonprofit social services providers also inhibit the development of private services.** The reimbursement for private health care services is only 35–40 percent of the price of the services, favoring public over private services in health care. In addition, some subsidies that are distributed exclusively among non profit organizations providing social services leave little opportunity for commercial private providers to effectively compete.[19]

22. **Labor regulations can discourage the emergence of small private enterprises that typically dominate the personal and social services sector.** The structure of the private services industry is characterized by many small businesses (often just a single individual). The social services sector, for example, comprises 14,000 small companies. As extensive labor regulations are more difficult to deal with for small businesses, they tend to discourage the creation and growth of private personal services firms.[20]

D. Concluding Remarks

23. **The services sector would seem to have considerable potential for employment growth, in particular in the low-skill segment of the labor market.** However, there are several impediments to the development of services and policy actions should be considered to deal with them. In particular, greater wage differentiation and improved incentives to work by redesigning social benefits to deal with incentive traps would be beneficial. In addition, continued progress in reducing the tax wedge on labor would be helpful, as would greater efforts by the public sector to promote private services, including through better procurement practices.

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[19] The so-called Finnish Slot Machine Association dedicates some Fmk 1.4 billion in annual subsidies to non profit organizations. This is more than the entire turnover of the commercial private sector providing social services.

[20] Kohi (2001) also emphasizes this argument.

REFERENCES

Asplund, Rita, 2001, Mobility and Earnings. An Analysis of Finnish Manufacturing and Services, ETLA (The Research Institute of the Finnish Economy) Discussion Paper No. 753, Helsinki.

Alho, J., 1998, A Stochastic Forecast of the Population of Finland. Statistics Finland, Reviews 1998/4.

IMD (International Institute for Management Development), 2001, "The World Competitiveness Yearbook."

IMF (International Monetary Fund), 1997, "Finland: Selected Issues," IMF Staff Country Report No. 97/167.

Kohi, Pertti, 2001, "Lacking Incentives for Entrepreneurship in Finland?", Ministry of Finance, Economics Department, Discussion Initiative No. 66.

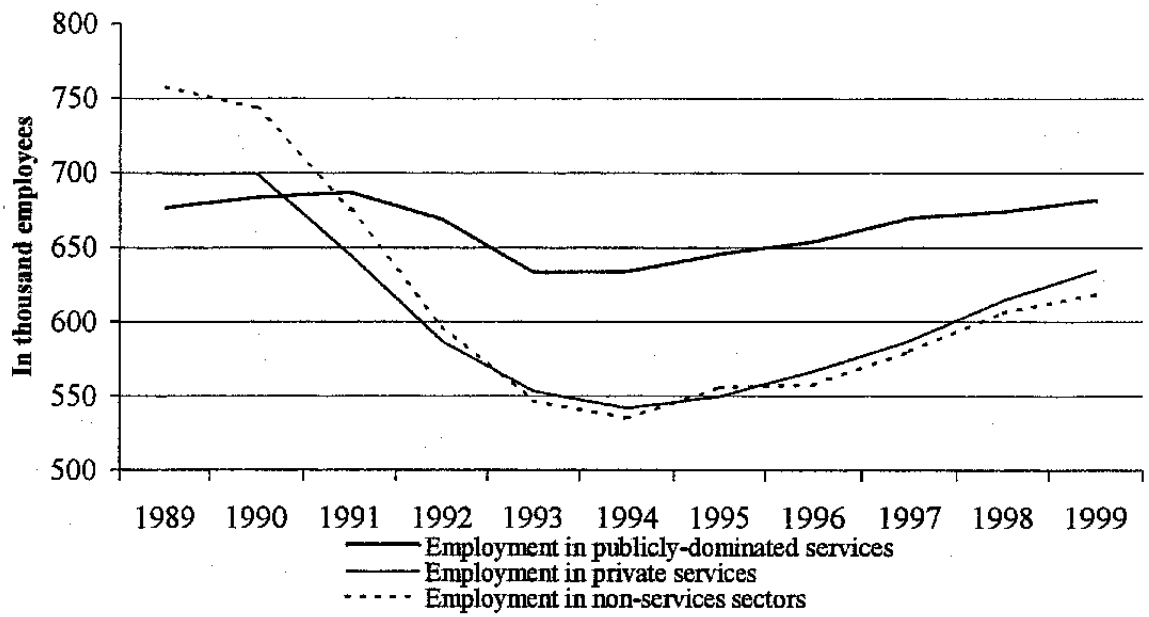
OECD, 2000, "OECD Employment Outlook."

OECD, 2001, "Services Statistics on Value Added and Employment."

THE PUBLIC SERVICES SECTOR

24. **Public services were primarily responsible for the increase in the share of services sector employment over the past decade.** The share of Finnish public services in total employment is large by international standards. Publicly dominated services[21] accounted for 35 percent of total employment or more than half of all services sector employment in Finland in 1999. Their share in total employment widened during the recession from 31½ percent in 1989 to 36¾ percent in 1994 and subsequently decreased only slightly, still accounting for the entire net increase in the share of services in total employment over the past decade. In absolute terms, employment in publicly dominated services grew slightly, while employment in other services and in non-services sectors decreased by 9 percent and 18 percent, respectively. Figure A.1 shows the evolution of employment in these three categories from 1989 to 1999. With already high levels of public sector employment, stronger employment growth in public than in private nonbusiness services during the 1990s suggests some crowding out of the private services sector.

Figure A.1. Finland: Employment in Different Economic Sectors, 1989–99

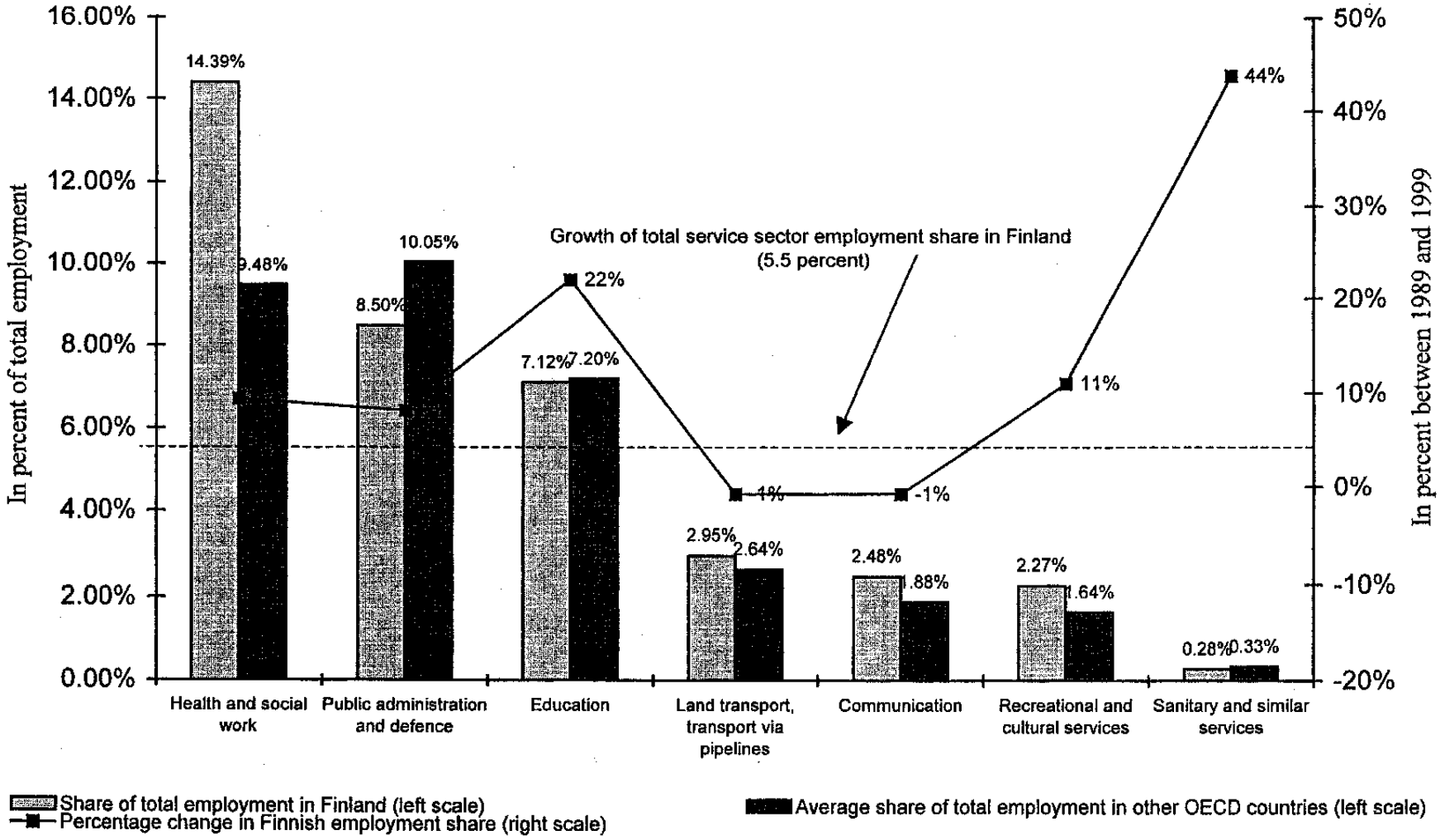


Sources: OECD (2001), IMF staff calculations.

[21] Publicly dominated services in Finland include health and social work, public administration and defense, education, communications, recreational and cultural services, and sanitary and similar services.

25. **The share of publicly dominated services is larger than in other advanced countries—in particular with respect to public health and social services.** This is shown in Figure A.2, which also provides information about the growth of these shares in Finland and indicates that almost all publicly dominated services show above-average growth rates of their employment shares. With an average share in total employment of more than 14 percent, health and social work forms the main services subsector in Finland. Indeed, the subsector also employs a substantially larger part of the total workforce in comparison with other advanced economies, where it accounts, on average, for only 9½ percent. While Finnish municipalities are required by law to provide health, social, and educational services, these services have been allowed to be privately provided since 1993. However, only 1–2 percent of all health services and 9–10 percent of all social services provided by Finnish municipalities are currently provided by the private sector.

Figure A.2. Finland: Employment in Publicly Dominated Services Sectors



Sources: OECD (2001); IMF staff calculations.

THE BUSINESS SERVICES SECTOR

26. **The employment share of business services has increased substantially over the past decade and is converging toward international standards.** This strong employment performance in business services, however, has taken place in the context of a low starting base level.[22] Figure A.1 compares average employment shares of Finnish business services with average shares across advanced economies and provides information about the growth of sector-specific employment shares in Finland. Almost all business services have increased their share in total employment considerably, with the greatest growth occurring in legal and accounting services (+94 percent), computer-related services (+75 percent), and industrial cleaning (+73 percent). Taken together, however, the seven business services displayed in Figure A.3 accounted for only 6 percent of total employment in 1999, which is still below the average across other advanced economies of 7 percent.

27. **The supply of business services in Finland generally supports the international competitiveness of the Finnish economy, but with important exceptions.** Viewed in relation to other indicators, a comparison of the GVA per employee (assuming that average wages are correlated with the GVA per employee) can provide an indication of the cost of these services.

- In both computer-related and research and development services, the GVA per employee is similar to that in the United Kingdom, and the strongly growing employment share—while lagging slightly behind that in the United Kingdom—is above the average for other advanced economies, suggesting strong competitiveness of these services in Finland.

- In both renting and legal and accounting services, the GVA per employee is higher than that in the United Kingdom, which—in combination with a lower employment share—suggests that these services may be underdeveloped in Finland and thus have underserved the business sector relying on them.

- In advertising services, both the GVA per employee and the employment share are only slightly below the corresponding ratios for the United Kingdom, suggesting that these services are available to businesses at competitive prices—especially since cross-border trade in advertising services is quite common, with a large number of internationally operating firms.

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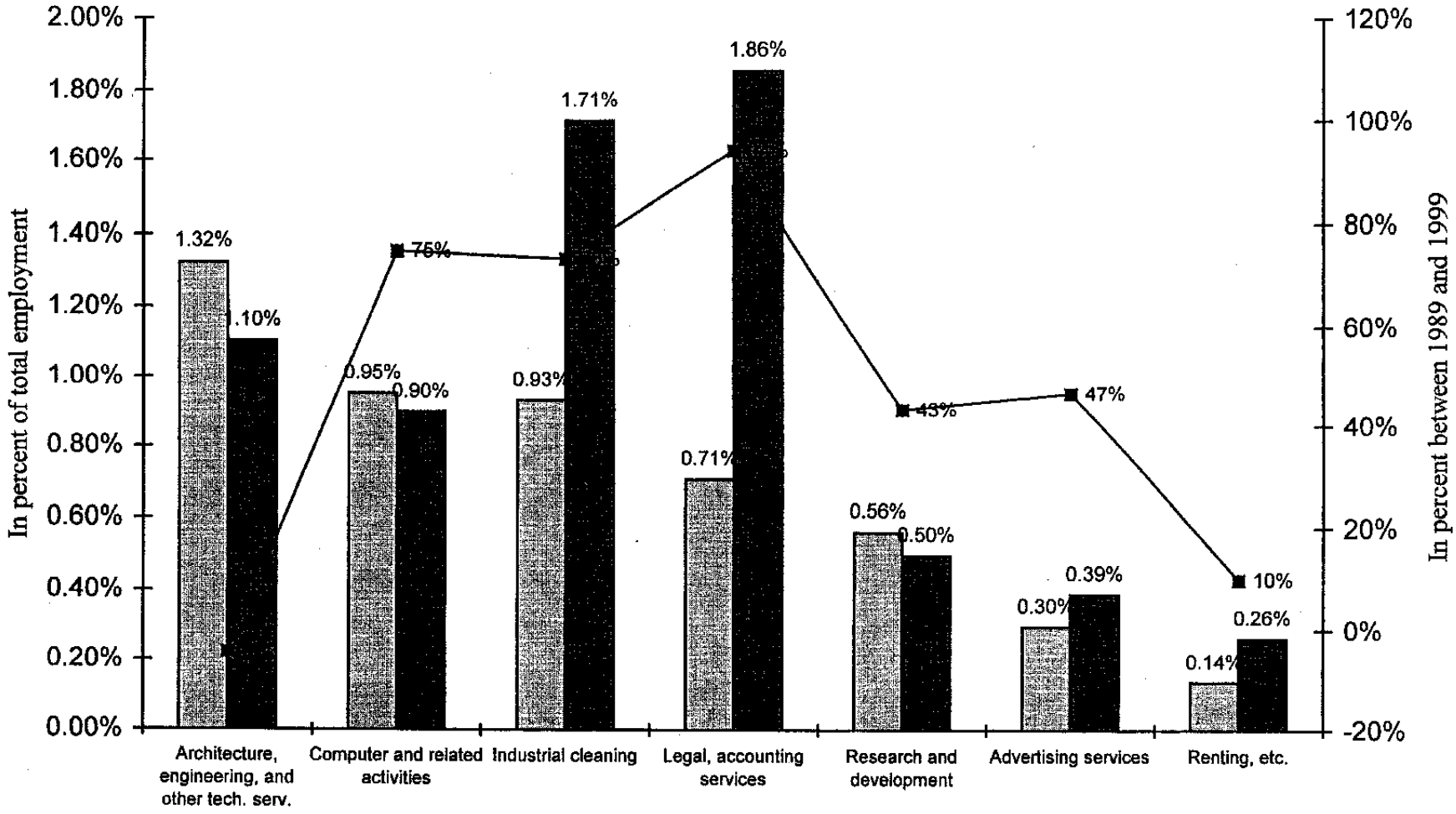
[22] Business services may be underestimated in the data to the extent that they are supplied in-house for manufacturing business. In consequence, some business services are not separately identified as services, but included in the data on the manufacturing sector. The same caveat applies to the data for other countries.

Figure A.1. Finland: Employment in Business Services



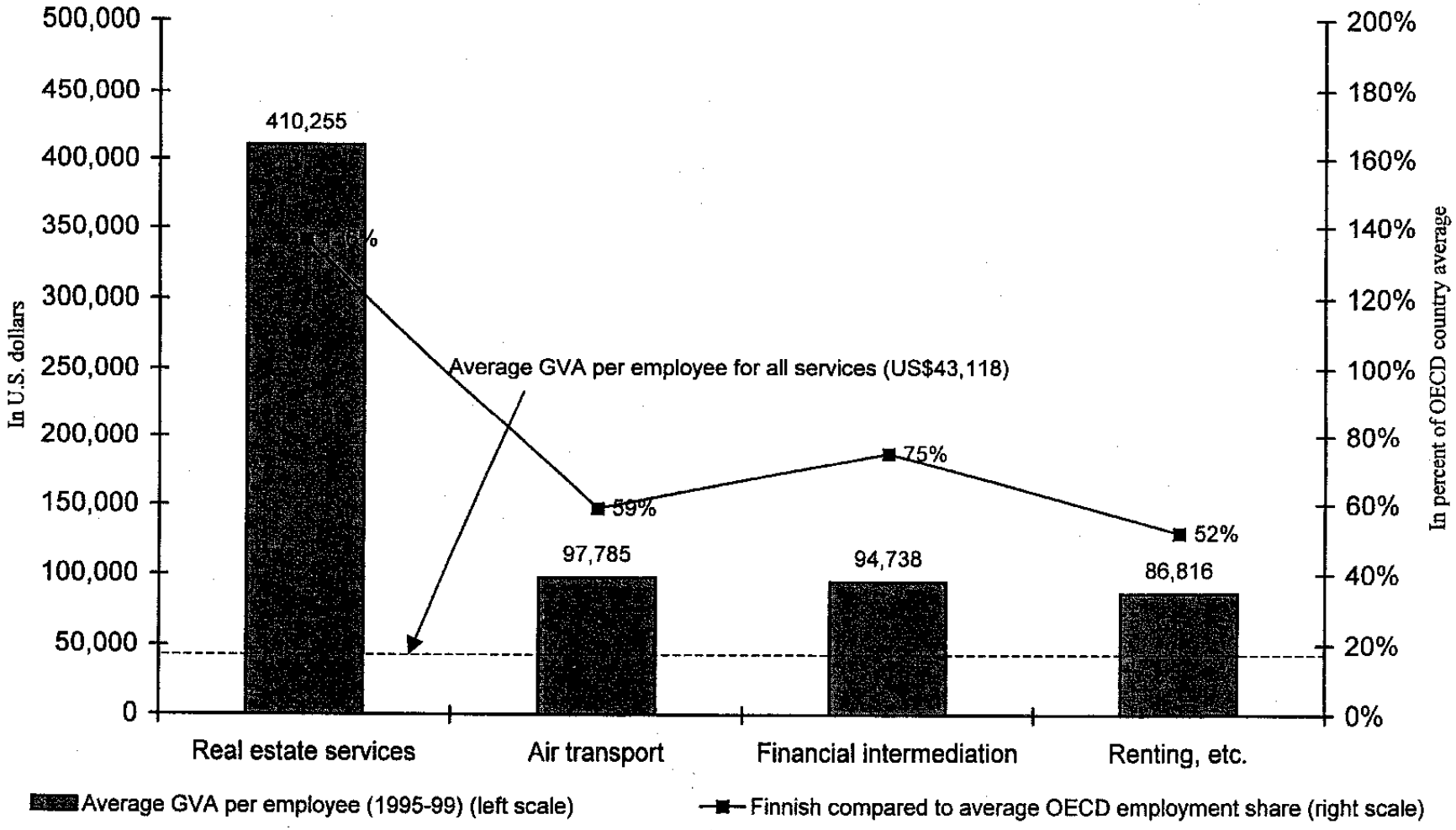
Sources: OECD (2001); IMF staff calculations.

- For industrial cleaning services, the relevant data for the United Kingdom were unavailable.

28. **The compressed wage scale may discourage the supply of labor to high-productivity business services.** This may be one reason, that the share of business services employment in total employment is smaller in Finland than in other advanced economies, notwithstanding the fact that Finland's university level education is first rate and much of the Finnish workforce is highly qualified.[23] Figure A.2 shows employment shares in comparison with advanced economy averages for these categories of services, focusing on those categories with the highest GVA per employee in Finland (i.e., double the average GVA per employee in Finland).

[23] The *2000 World Competitiveness Yearbook*, in comparing 47 advanced and emerging economies, ranks Finland highest for university education and in tenth place for availability of skilled labor.

Figure A.2. Finland: Services with High Gross Value Added (GVA) per Employee
(more than 100 percent above average)



Sources: OECD (2001); IMF staff calculations.