

FINNISH ECONOMY

Structural Indicators 2004

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Foreword

The changing economic environment is challenging European governments to renew their economic policies. Competition between countries for investments and skilled labour force is expected to reflect in national economic policies. This publication gives a picture of how Finland stands in terms of economic performance and economic policy compared with other countries. It deals with the structure of the Finnish economy and labour markets. The level and structure of taxation and public expenditure are also covered. Attention is paid to the expected demographic development and ageing population, to income differences and to environmental themes, too.

This publication is a shortened version of the original report *Talouden rakenteet*, a yearly publication in Finnish. The figures of the publication can be found on the web site of the Government Institute for Economic Research (VATT) <http://taloudenrakenteet.vatt.fi>. The pages on the web site are frequently updated.

I hope *The Finnish Economy – Structural Indicators* will be a useful information package for readers interested in the Finnish economy and its performance in the international context.

Helsinki, August 2004

Reino Hjerppe

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1 Overview of the developments in the Finnish national economy

During the 1990s Finland faced the severest depression in its history since the Civil War of 1918. Since the depression the recovery of the economy has been the fastest in the EU after Ireland. In 1994–2000 output grew on average by 4.7 per cent and exports by 10.7 per cent annually. In 2001–2003 the growth rate was close to two percent per annum.

Currently the level of real per capita income in Finland is slightly above the average of EU15 countries.

Long-term prospects are rather bright for the Finnish economy. Price competitiveness is good and the productivity of key industries is high. The ratio of R&D investments to the GDP is the second highest in the world after Sweden.

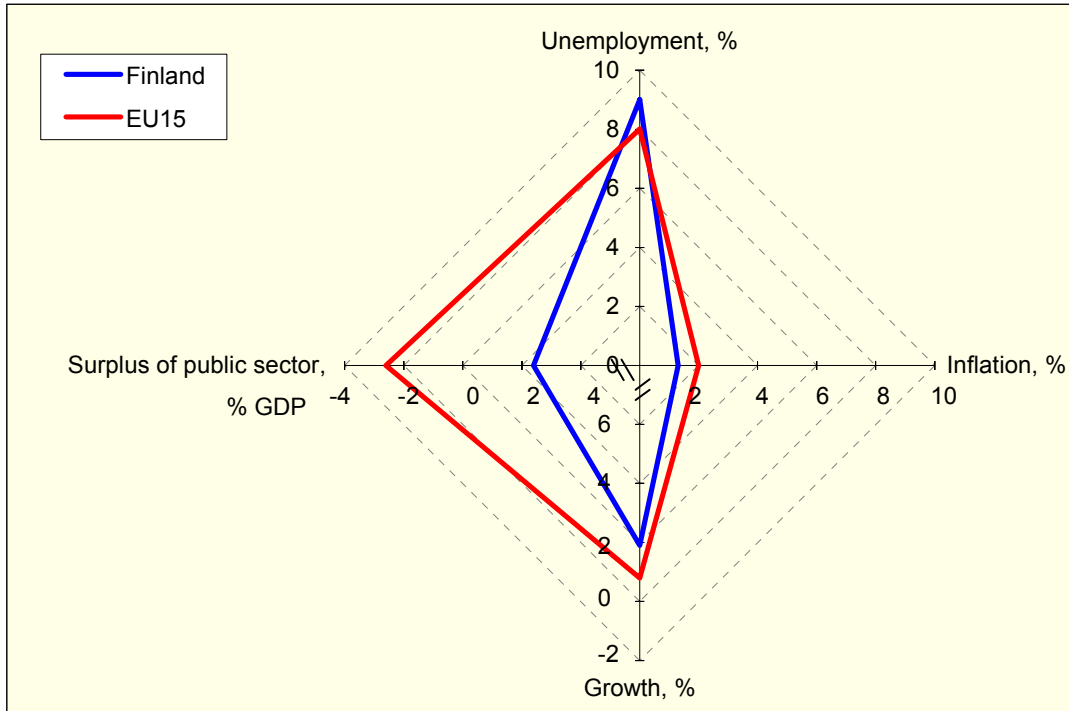
Skilled labour is still available in most sectors and regions notwithstanding the rapid employment growth in 1995–2001. Finnish labour force is highly skilled.

During the 1990s the structure of the Finnish economy was transformed from capital-intensive to strongly knowledge-intensive, owing to enormous growth in the electronics industry, especially in information and communications technology. This structural change was shown in investments. In the 1990s production capacity was substantially increased, although the investments-to-GDP ratio declined.

Strong economic performance during the last 10 years has helped to increase tax revenue and decrease public expenditure. Owing to a considerable surplus in the public finances, the public sector debt has diminished.

1.1 Balance and development of the economy

Figure 1.1. Finnish Economy in 2003 in comparison to the EU15 average (growth, unemployment, inflation and balance of public finances)

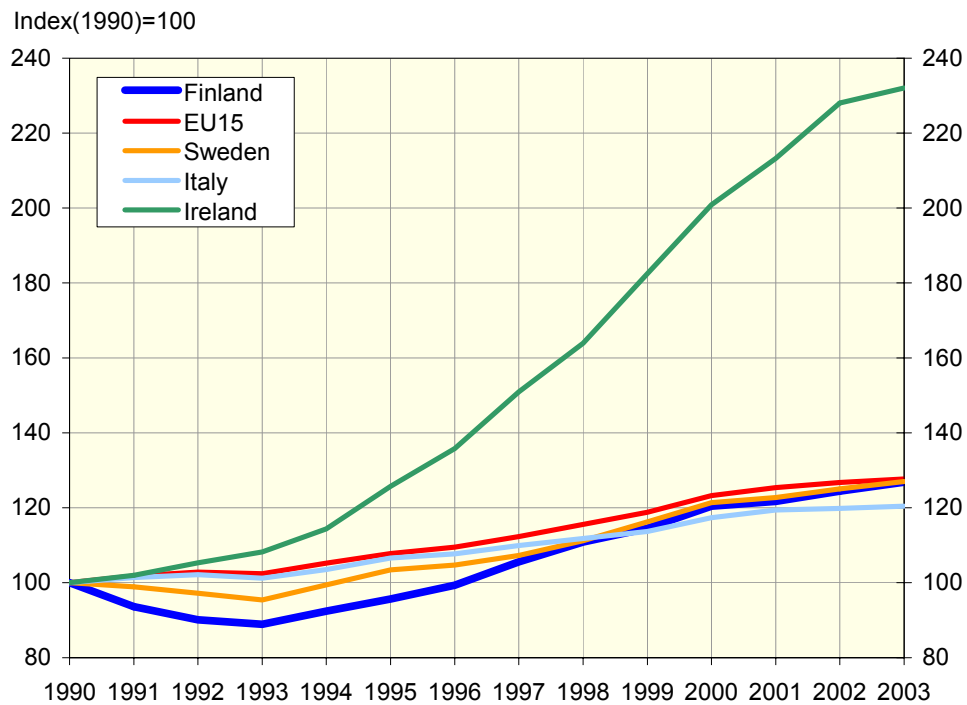


The scales in the figure are selected so that the size of the quadrangle represents the balance of the economy: the smaller the diamond, the better the balance. The inflation indicator used here is the annual change in the harmonised index of consumer prices.

Source: EU.

In 2003, the Finnish economy grew faster than that of the EU area on average. While inflation was below the EU mean, the opposite continued to hold for unemployment. The surplus of the public sector was the largest in the EU, whereas public finances, on the average, show a deficit in the EU area.

Figure 1.2. Volume of the gross domestic product in Finland and the EU15 area in 1990–2003, index(1990)=100

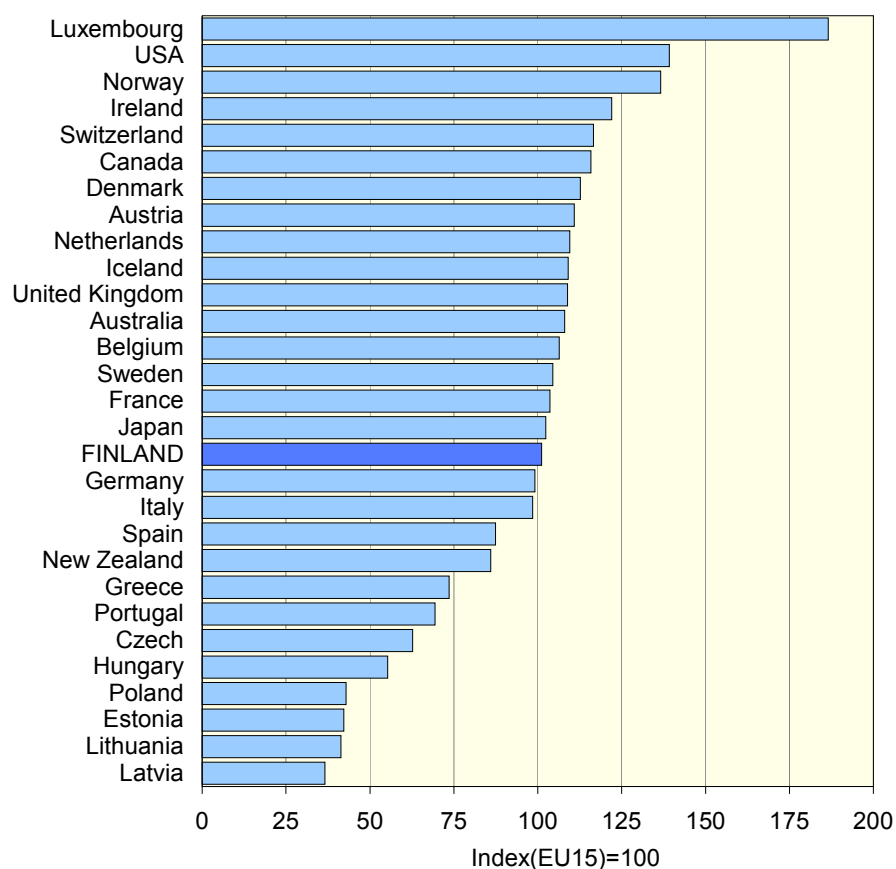


Source: VATT (OECD).

At the beginning of the 1990s output was reduced in a recession worse than in any other Western country after World War II.

After the depression of 1991–1993, the GDP started a rapid growth which lasted until the year 2000. Ireland was the only EU country enjoying faster growth than Finland.

Figure 1.3. Real income level in 2003, index(EU15)=100



Source: VATT (Eurostat).

The real income level in Finland is higher than in the EU countries on the average. The richest country is Luxembourg, where the GDP per capita is 80 per cent higher than in Finland. In the USA, the real income level is about one third higher than in Finland. France, Japan, Germany and Italy produce real income per capita about as much as Finland. In Estonia and the other Baltic EU countries the real income level reaches only one third of the Finnish income level.

Table 1.4. Overview of the economies of the new EU member states

	Total population January 2004 mill.	GDP per capita PPS ¹⁾ 2003* EUR	Trade with EU25 2002 % of total trade	Inflation rate 2003 %	Unemployment rate January 2004 %	General government net lending 2003 % of GDP	General government gross debt 2003 % of GDP
Poland	38.2	10 350	74	0.7	19.1	-4.1	45.4
Czech	10.2	15 410	78	-0.1	8.0	-12.9	37.6
Hungary	10.1	13 370	72	4.7	5.9	-5.9	59.0
Slovakia	5.4	11 740	80	8.5	16.6	-3.6	42.8
Lithuania	3.4	10 660	62	-1.1	11.7	-1.7	21.9
Latvia	2.3	8 940	77	2.9	10.5	-1.8	15.6
Slovenia	2.0	17 200	72	5.7	6.4	-1.8	27.1
Estonia	1.3	10 560	74	1.4	9.5	2.6	5.8
Cyprus	0.7	18 840	57	4.0	4.7	-6.3	72.2
Malta	0.4	16 690	59	2.6	8.8	-9.7	72.0
EU15	380.8	24 360	66	2.0	8.0	-2.6	64.0
EU25	454.9	22 280	66	2.0	9.0	-2.7	63.0

¹⁾ Purchasing power standards

* Forecast

Source: Eurostat.

The accession of the new EU members increased the total EU population by approximately 20 per cent. The population size of Poland, 38.2 mill., is far ahead of those of the nine other countries. For the rest of the new member countries, the population sizes account for a small fraction of the total EU population.

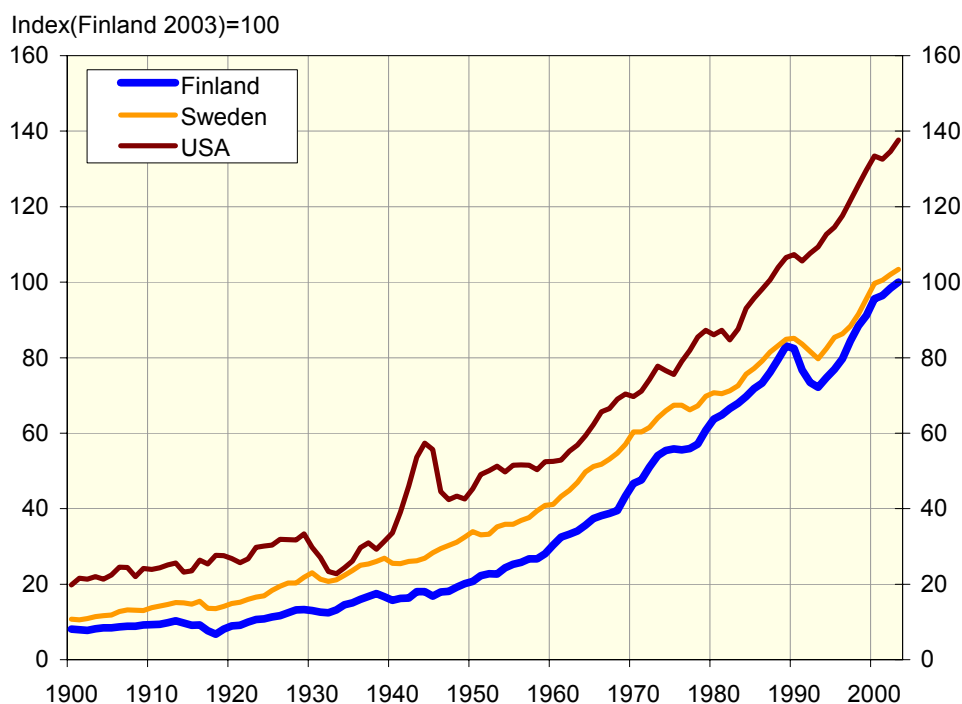
With regard to the GDP per capita figures, it can be argued that the richest population lives on Cyprus. Its GDP per capita is EUR 18 840, which is more than twice that of Latvia, EUR 8 940. The new member countries trade predominantly within the boundaries of the EU. In 2002, the proportion of Slovakia's trade with the Union was 80 percent of total trade. High shares were observed in Czech and Latvia, as well.

In 2003, the prices rose extremely fast in Slovakia, 8.5%. The inflation rates were substantial also in Slovenia and Hungary. There were, however, two countries with negative inflation rates, Lithuania and Czech. Overall, the inflation rate was moderate in the whole Union, 2.0 per cent. As regards the unemployment rates, they vary between 19.1%, recorded in Poland, and 4.7%, found in Cyprus.

Estonia was the only country with surplus in government balance in 2003. Czech performed worst with general government deficit of 12.9% of GDP. The Baltic countries and Slovenia were the countries with a deficit of less than 3.0%

relative to GDP. The gross public debt relative to GDP was highest in Cyprus and Malta, 72.0%. The least indebted economies were those in the Baltic countries and Slovenia.

Figure 1.5. Real income level (PPP) in 1900–2003 in Finland, Sweden and the USA, index(Finland 2003)=100

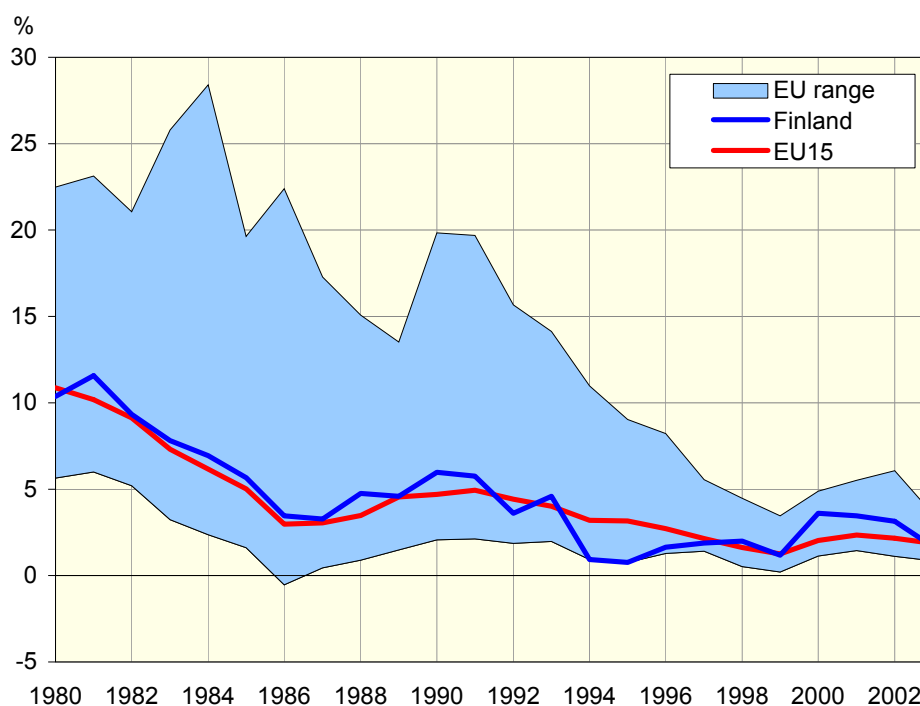


Source: VATT (OECD).

In the beginning of the 20th century Finland was a poor country. In a century the real income level of Finland grew twelvefold. Owing to faster economic growth than in more mature economies Finland was able to catch up with Sweden and approach the US level.

Real income level means the gross domestic product per capita. Purchasing power parity (PPP) calculates the GDP using comparable prices across countries.

Figure 1.6. Inflation in Finland and the EU15 area in 1980–2003, per cent

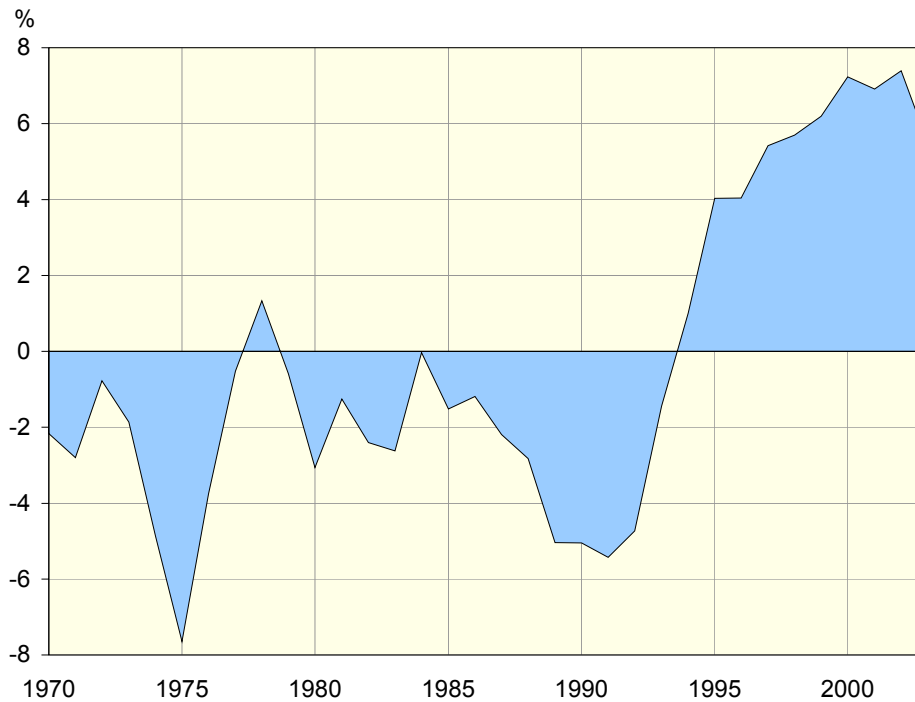


Source: VATT (OECD).

The inflation rate of Finland closely followed the EU average until the end of the 1980s. Both in the EU countries on the average and in Finland the rate of consumer price inflation slowed down from over 10 per cent in the early 1980s to 3 per cent in 1986. At the end of the decade the inflation rate grew faster again. Since the beginning of the 1990s inflation has remained moderate, on average, both in Finland and in the EU countries. In most years the EU average has exceeded the Finnish rate of inflation.

Inflation = rise of the price level, represented by the private consumption deflator (National Accounts) in the figure; a commensurate indicator for measuring inflation.

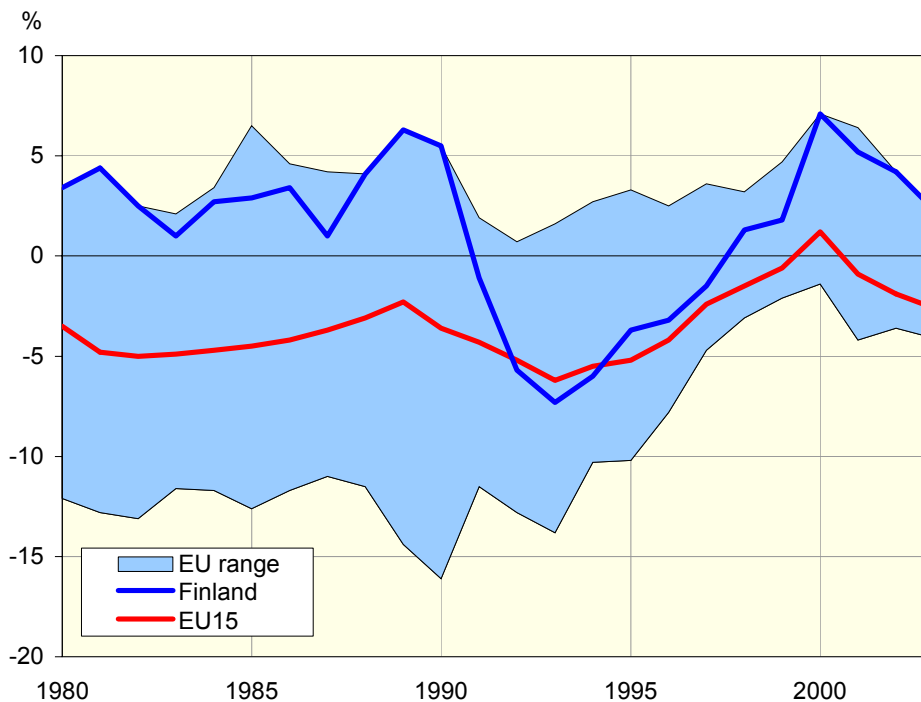
Figure 1.7. Balance of payments in 1970–2003, percentage of GDP



Source: VATT (Bank of Finland).

Previously, the current account deficit was a sure sign of overheating in the Finnish economy and a portent for a period of slow growth. In the present conditions this indicator has lost its importance, since the deficit no longer directly affects the currency exchange rate and the interest rates. The current account surplus has been nearly 10 billion euros in recent years, which, above all, implies an outstanding price competitiveness of the export products and a high domestic savings rate.

Figure 1.8. Surplus of the public sector (general government net lending) in Finland and EU15 countries in 1980–2003, percentage of GDP

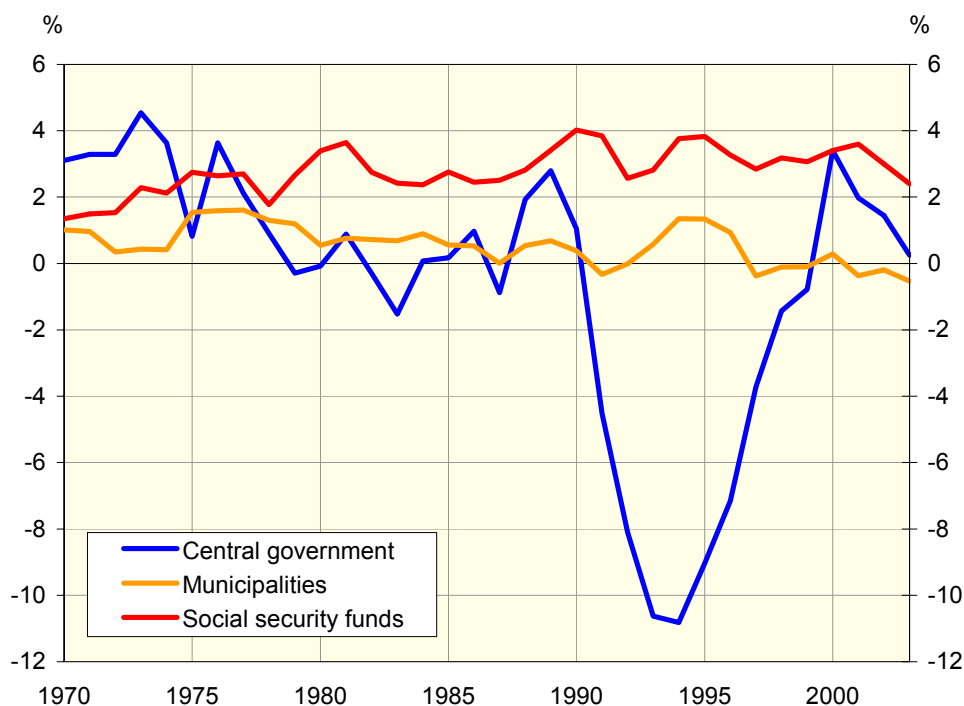


Source: VATT (European Central Bank and EU).

Within the EU, public finances were on average in surplus in 2000 for the first time in three decades. In 2001 the average balance showed a deficit again, and the deficit increased in 2002 and 2003. In Finland, public sector finances have shown a surplus since the depression of the 1990s, a surplus which, relative to the GDP, is currently the largest in the EU area. During the worst recession years the deficit of public sector finances in Finland levelled with the EU average. The EU's weakest balance in public sector finances has most often been in Italy and in Greece. In 2001 the deficit was largest in Portugal, in 2002 in Germany and in 2003 in France.

The converging public sector deficit is a novel phenomenon. As late as the mid-1990s, the range of the public sector deficit ratio to the GDP was over 10 percentage points. In recent years it has contracted to a half of that.

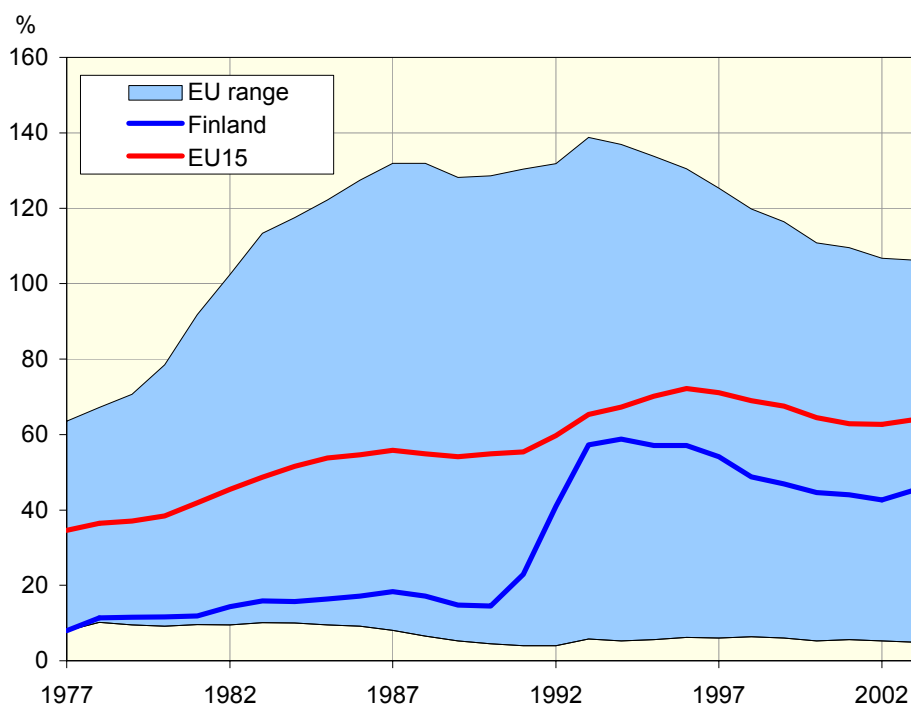
Figure 1.9. Surplus in central government and municipal sector finances and social security funds in 1970–2003, percentage of GDP



Source: VATT (Statistics Finland).

Fluctuations in the balance of aggregate public sector finances mainly result from large fluctuations in central government finances. The municipal sector finances have usually been in balance and the accounts of social security funds show a clear surplus – mostly owing to a partly pre-funded employee pension scheme. The depression of the early 1990s produced a large deficit in the central government finances. However, the central government finances recovered quickly and are showing a surplus again.

Figure 1.10. Public sector gross debt in the EU15 countries in 1977–2003, percentage of GDP



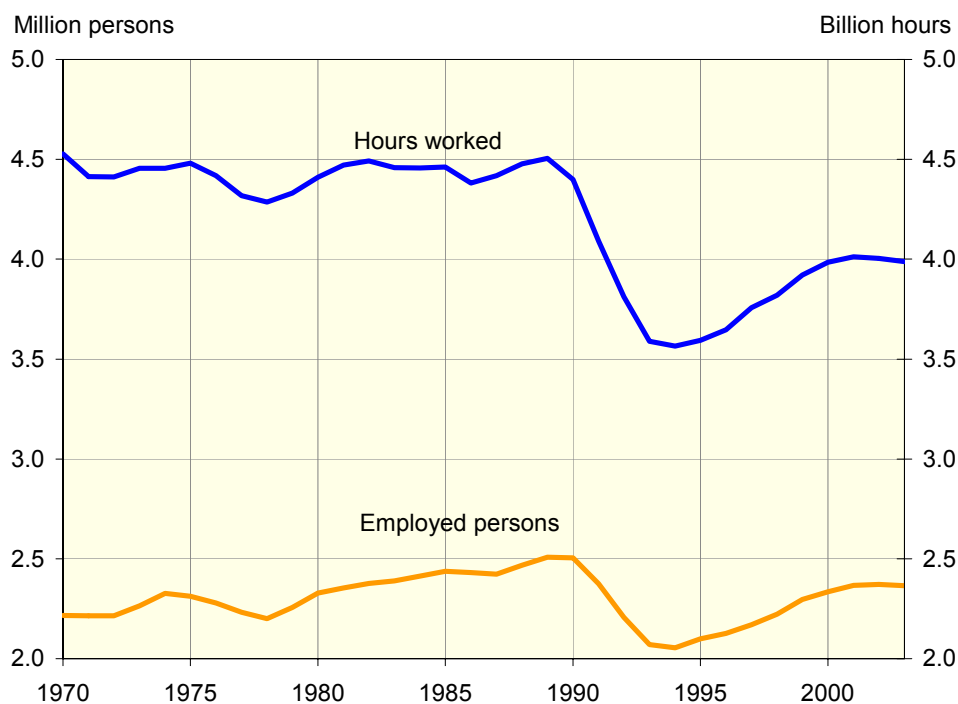
Source: EU.

In the EU area, the ratio of public sector gross debt to the GDP is highest in Italy, Belgium Greece, where the debt ratio is about 100 per cent. In Luxembourg the public sector debt is only a few percentage points relative to the GDP. Before the 1990s the Finnish public sector belonged to the least indebted. The share of the public sector debt remained at 15 per cent of the GDP.

On average, the public sector debt in the EU area still exceeds the 60 per cent of the Maastricht criteria. The share was approaching the criterion, but this trend stopped in 2003. In Finland the public debt remained below the EU mean and the 60 per cent limit even during the depression of the 1990s. In 2003, Finland's public sector debt was among the lowest in the EU, together with that of Denmark, Luxembourg, the United Kingdom and Ireland.

1.2 Growth factors

Figure 1.11. Employed persons and hours worked in 1970–2003, million persons and billion hours

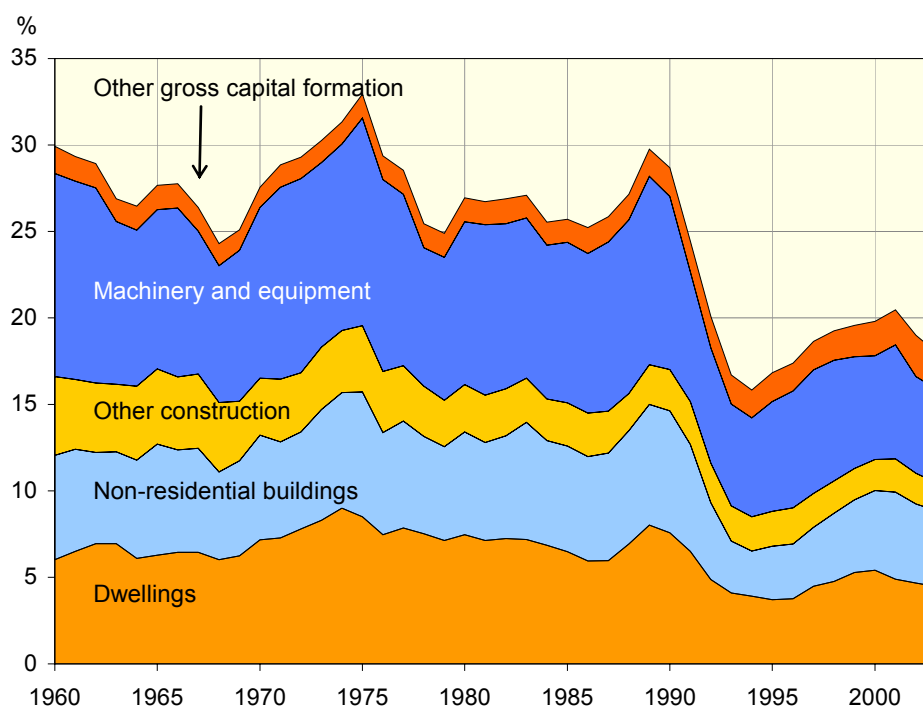


Source: VATT (Statistics Finland).

During the years of recession, 1991–1994, total employment collapsed by close to half a million persons, or by 20 per cent. Since then the economic growth has been fast and employment has recovered. In 2003 there were 2.36 million employed persons in Finland. The number of employed persons still remains below the pre-depression figure by more than 100 000. In 2003 employment office registers held nearly 300 000 unemployed job-seekers.

According to the National Accounts, before the depression the annual aggregate hours worked in the economy equalled 4.5 billion hours. During the worst year, 1994, the total of hours worked was only 3.5 billion. Since then, the number has reached 4 billion, but not recovered fully to the pre-recession level.

Figure 1.12. Investments in 1960–2003, percentage of GDP



Source: VATT (Statistics Finland).

Finland has traditionally been a country of capital-intensive production and high investment rates. Until 1990, the ratio of investments to the GDP fluctuated between 25 and 30 per cent. In 1991–1993 the investment rate collapsed by 10 percentage points. During rapid economic growth since the mid-1990s it rose close to 20 per cent.

The GDP ratio of fixed investments seems to have settled at a clearly lower level than during earlier decades. However, a 20 per cent ratio is enough to increase and renew the production machinery. The Finnish production structure has become less capital-intensive as a consequence of the brisk growth in services and the electronics industry. The use of capital is also now more efficient, owing to economic globalisation and structural changes.

Investments = gross fixed capital formation.

Figure 1.13. Annual changes in labour productivity in Finland in 1960–2003, per cent

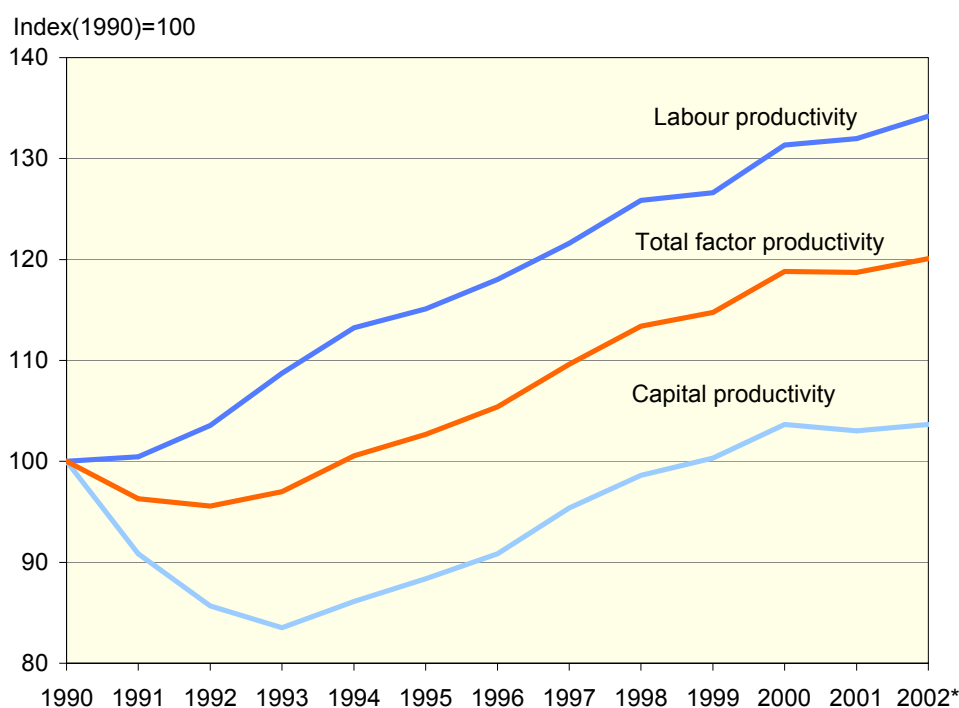


Source: VATT (Statistics Finland, National Accounts).

According to the National Accounts, labour productivity per hour has improved on average 2.7 per cent annually during the last hundred years, and 3.6 per cent annually since 1960. During the last four decades the annual changes in labour productivity have ranged from less than one to nine per cent. The trend has, however, been downwards.

By and large, productivity grows fast under brisk economic growth, when the growth of production is based on exports. Again, when growth centres on construction and other domestic demand, as in 2001, the growth of productivity slackens. Then the employment effect of growth, on the other hand, is good.

Figure 1.14. Labour productivity, capital productivity and total factor productivity in 1990–2002*, index(1990)=100

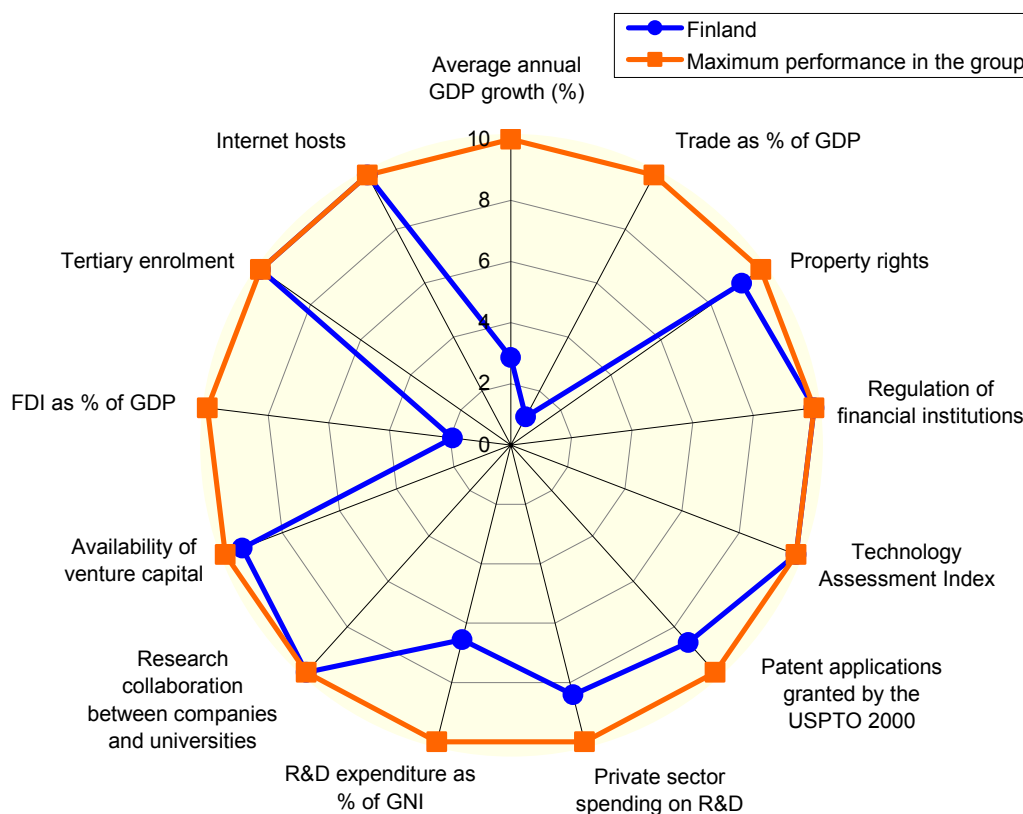


Source: VATT (Statistics Finland).

Labour productivity grew strongly in the depression years of the early 1990s. At the same time, capital productivity fell and, because of that, total factor productivity also either fell or grew slowly. After the recession labour productivity continued to grow steadily, while capital productivity also started growing faster and even exceeded the rate of growth of labour productivity in the late 1990s. Consequent to that, the growth rate of total factor productivity was equal to that of labour productivity. During the last two years the growth of capital productivity has been very slow. On average, labour productivity grew annually by 2.2 per cent, capital productivity by 2.3 per cent, and total factor productivity by 2.3 per cent between 1995 and 2002.

1.3 Knowledge, technology and innovations

Figure 1.15. Competitiveness of the Finnish economy in comparison with small EU countries

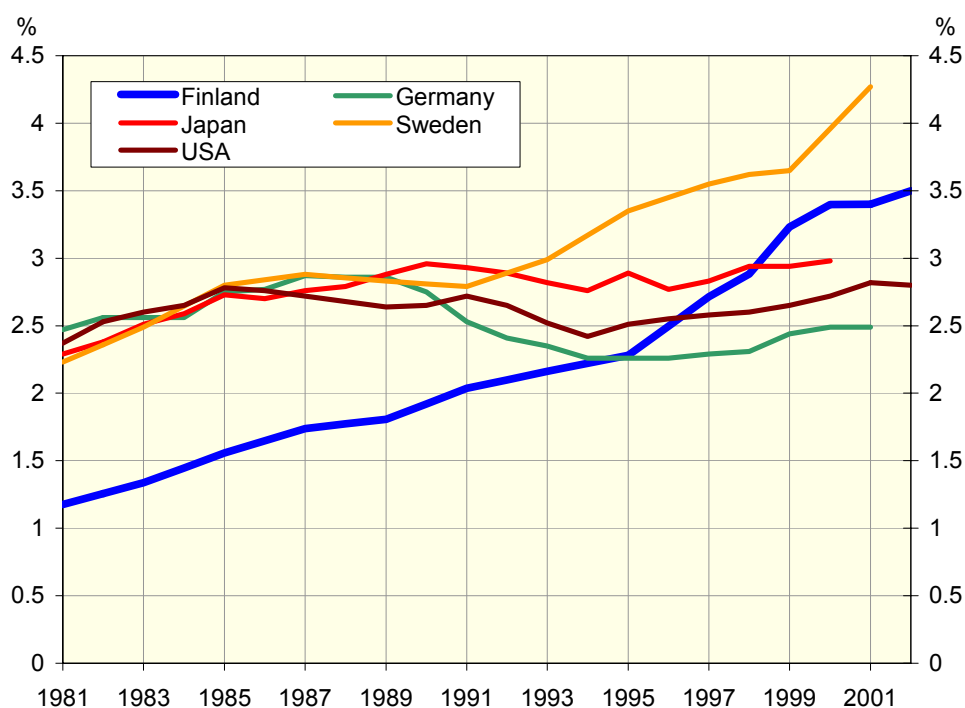


Source: World Bank Institute.

Finland's relative competitiveness is strong. Many indicators of knowledge-intensive growth rank Finland first among small EU countries. However, Finland has been less successful in attracting foreign direct investments. The clearest weakness has been the fairly low average growth rate of GDP, mainly resulting from years of economic recession in the early 1990s. Nevertheless, since that period the Finnish economy has enjoyed the second fastest growth in the EU after Ireland.

The figure is based on an interactive programme of the World Bank Institute, which consists of a set of 69 structural and qualitative variables that benchmark economies. The comparison may be undertaken for a group of 100 countries. In this figure the reference group includes all non-G8-member EU countries i.e. mainly small EU countries. For each variable the point of comparison is the best performing country in the group, which receives a value of 10. The data is from various recent years.

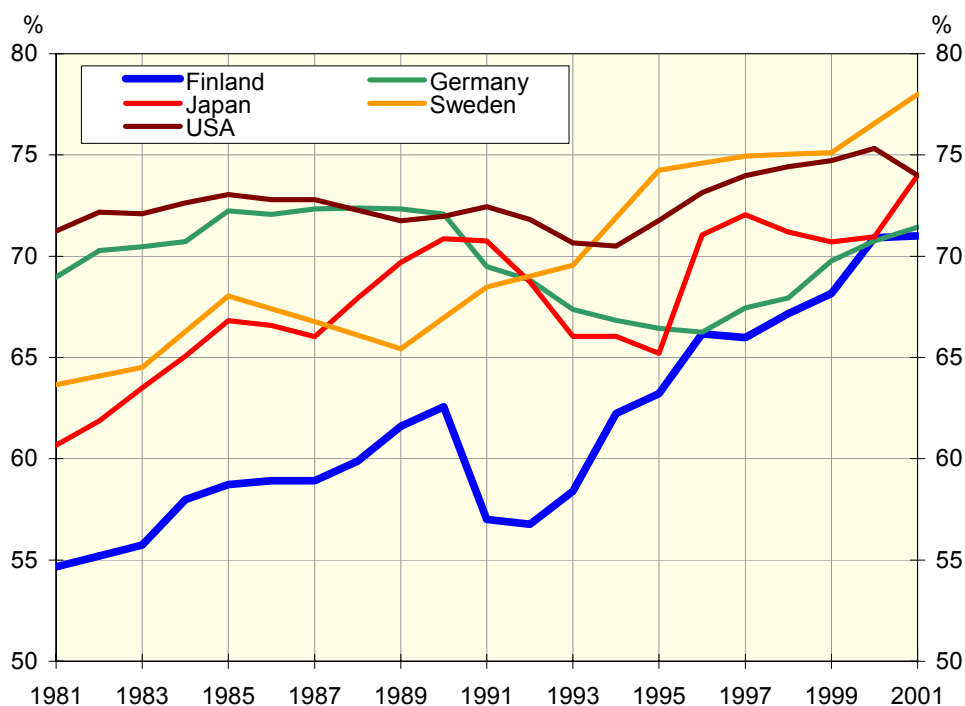
Figure 1.16. R&D spending in countries with the highest R&D intensity in 1981–2002, percentage of GDP



Source: VATT (Statistics Finland and Eurostat).

Although the GDP ratio of fixed investments collapsed during the depression, R&D spending relative to GDP has continued to grow steadily in Finland. The share has tripled during the last two decades, amounting to 3.5 per cent in 2002, which places Finland in the forefront of all OECD countries with only Sweden showing higher R&D spending ratios.

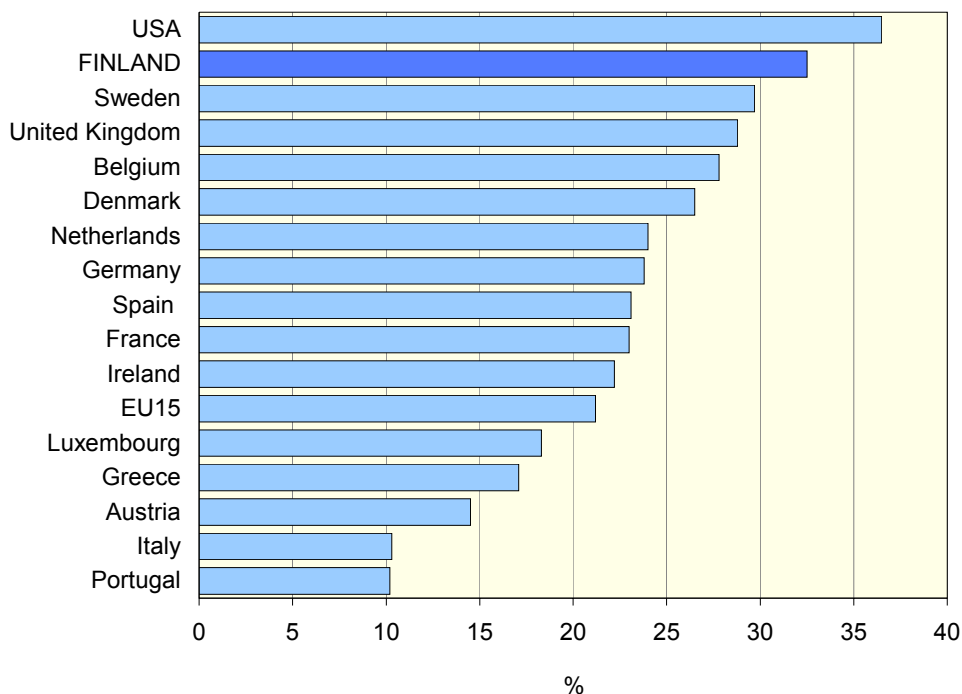
Figure 1.17. Private sector spending on R&D in 1981–2001, percentage of total R&D spending



Source: VATT (OECD).

The public sector share in research funding used to be larger in Finland than in the other OECD countries. Even during the depression public sector spending maintained the GDP ratio of R&D costs on an upward trend. After the depression business enterprises have improved their profitability at a fast pace and their share in the funding of R&D has risen to a level comparable to Germany. This change was largely due to heavy R&D spending in the ICT sector.

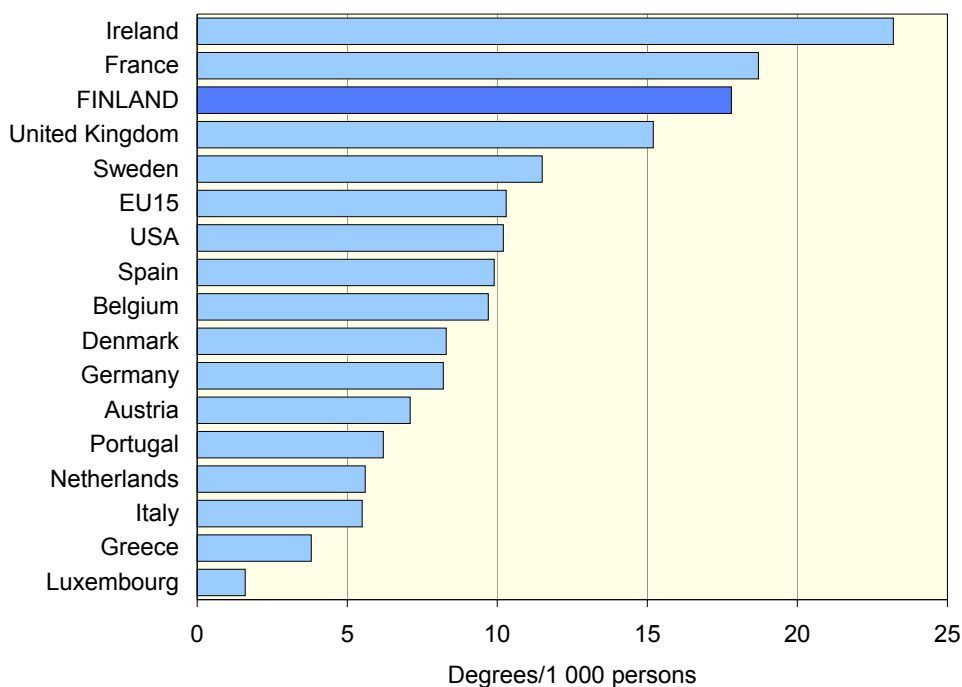
Figure 1.18. Population with tertiary education in 2001, percentage of 25–64 years of age class



Source: Eurostat.

Finland invests more in tertiary education than any other EU country. In Finland every third 25–64-year-old has received a tertiary degree, whereas the EU mean is one out of five. Differences among countries should, however, be interpreted cautiously. There are large discrepancies in educational systems and the level of attainment required to receive a tertiary degree varies across countries. This may partially explain the differences between Europe and the USA.

Figure 1.19. New science & engineering graduates in 2000, per thousand of 20–29 years of age class



Source: Eurostat.

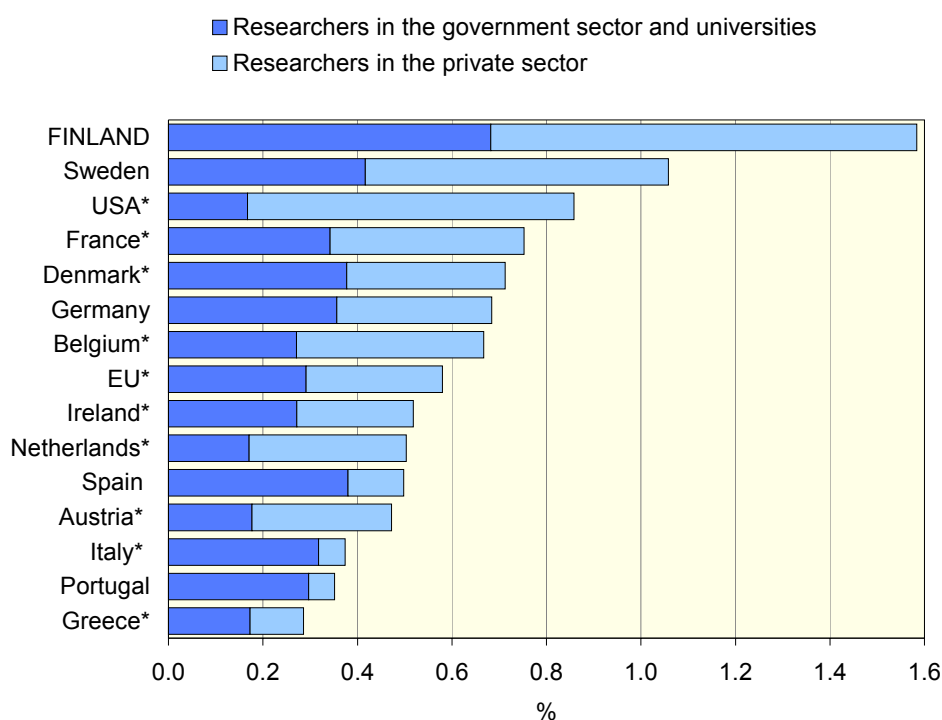
The labour force with qualifications in science and engineering is an important source for knowledge-based growth. A large part of R&D activities is carried out by personnel with technical education. Consequently, a broad student basis in tertiary education is important for ensuring the continuity of R&D activities.

Relative to population, the Finnish education system produces the third greatest number of S&E degrees in the EU. Finland invested extensively in engineering studies in the 1970s and 1980s, which resulted in a good network of technical universities.

The indicator covers all tertiary degrees in Science & Engineering (S&E) and therefore includes problems of comparability. Tertiary graduates in Science & Engineering (S&E) are defined as all post-secondary education graduates in

- life sciences (ISC42),
- physical sciences (ISC44),
- mathematics and statistics (ISC46),
- computing (ISC48),
- engineering and engineering trades (ISC52),
- manufacturing and processing (ISC54) and
- architecture and building (ISC58).

Figure 1.20. Private and public sector researchers in 2001, percentage of total employment



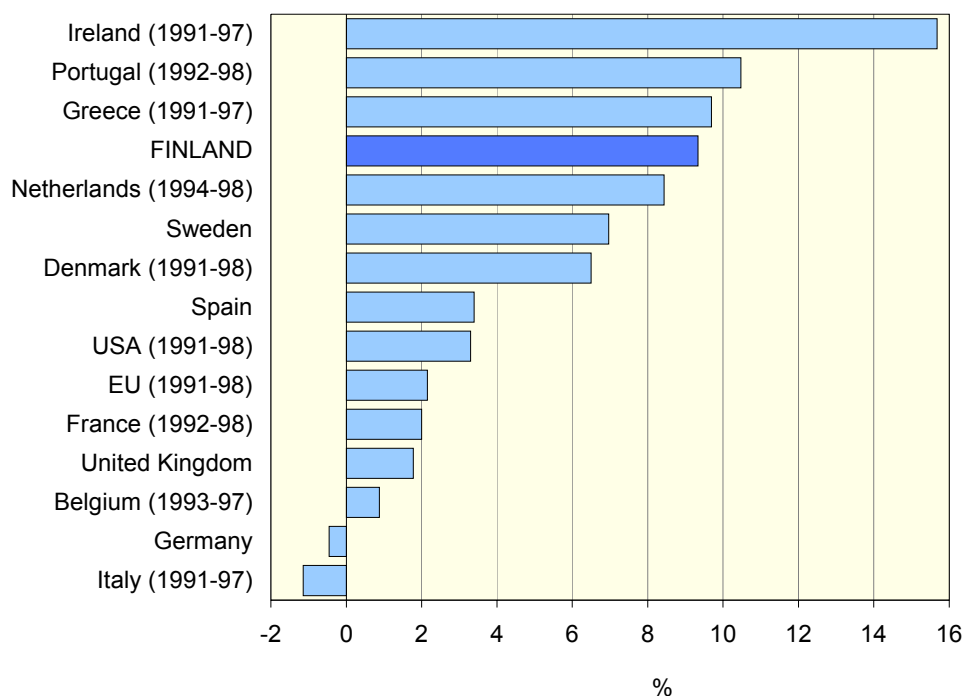
* Data from year 1998: Austria; from 1999: Belgium, Denmark, Greece and USA; from 2000: France, Ireland, Italy and the Netherlands.

Source: OECD.

In the EU, Finland has the highest number of researchers relative to the labour force, 1.6 per cent. The public sector mainly accounts for basic research, whereas the bulk of R&D is funded and carried out by the private sector. Hence, privately funded R&D forms the basis of the national innovation system. The share of private sector researchers in the national total varies considerably across countries. In the US, four out of five researchers work in the private sector, but only one out of two in the EU. In Finland over 40 per cent of the researchers work in universities and other public sector funded research activities.

Researchers are here defined as professionals engaged in the conception and creation of new knowledge, products, processes, methods and systems.

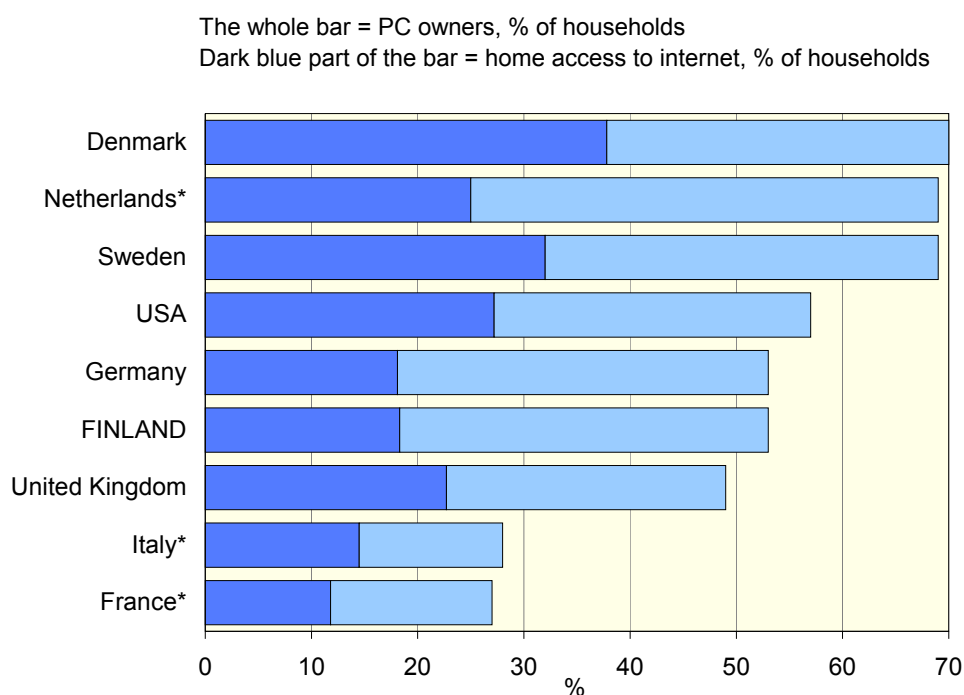
Figure 1.21. Average annual growth rate of private sector researchers in 1991–1999, per cent



Source: OECD.

Ireland fostered the strongest growth of private sector researchers in the 1990s. Next to Ireland, the number of R&D researchers has grown fastest in Portugal, Greece and Finland. Private sector investment in R&D conforms to investment in technological advances and improvement of productivity at a national level. In the most competitive countries of the EU, private sector accounts for the bulk of R&D activity. In Finland the R&D spending of the private sector grew considerably in the 1990s, mainly as a result of the move into new technologies, such as ICT.

Figure 1.22. PC owners and home access to the internet in different countries in 2001, percentage of households



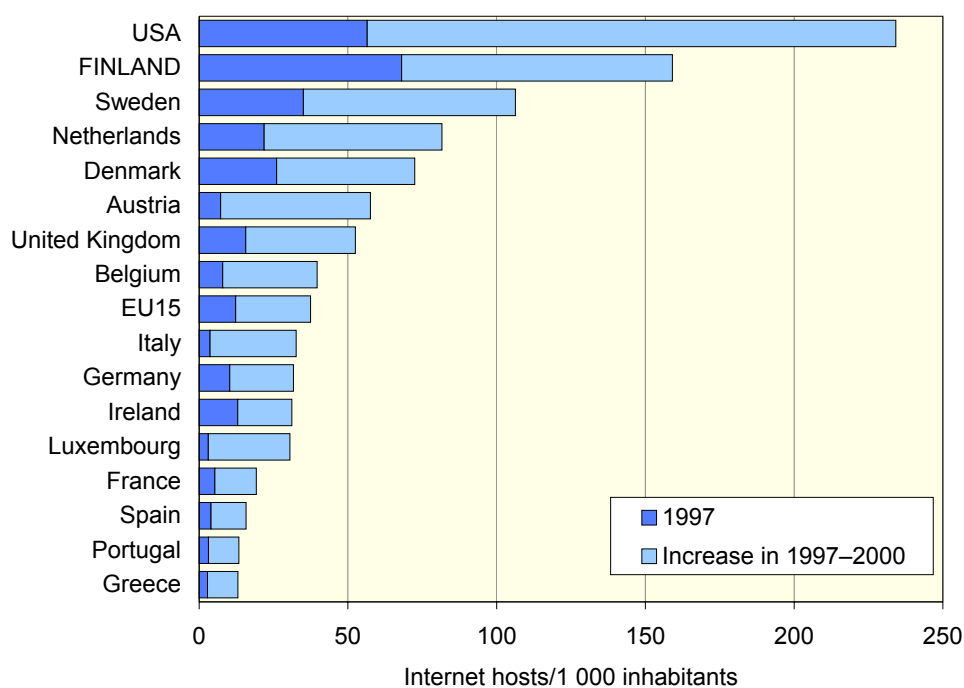
* Data from the year 2000.

Source: OECD.

In Denmark 70 per cent of all households owned a PC in 2001. In Finland the corresponding figure was 53 per cent. One reason for Finland having a lower density of PCs than the Netherlands or Denmark may be the easy access to public PCs in Finland.

Home access to the internet has increased explosively. With respect to PC ownership in households, the Finnish figure is close to the Dutch and German ratios.

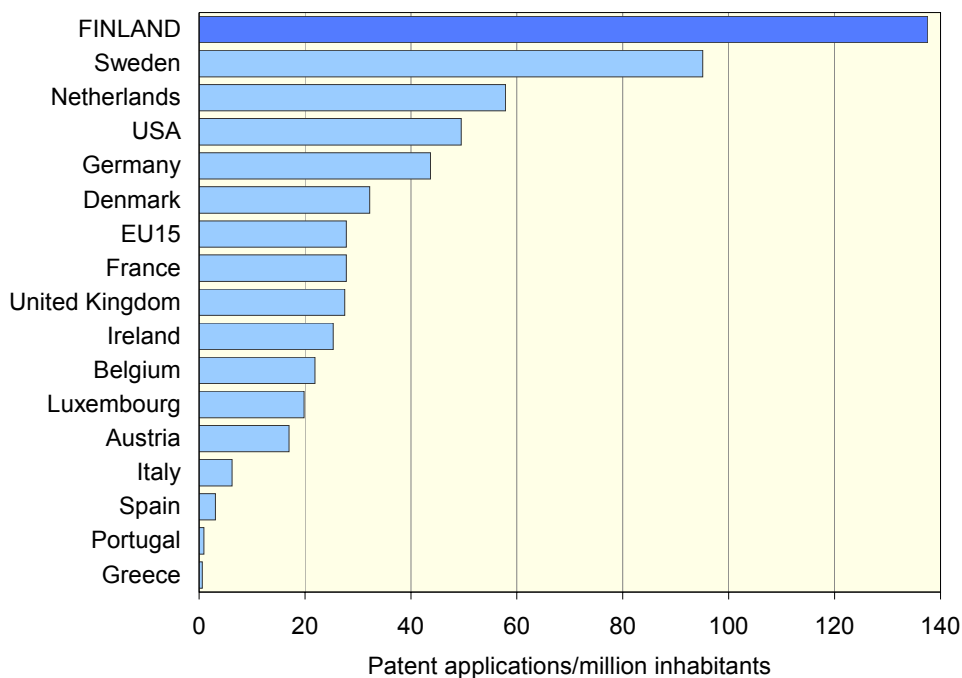
Figure 1.23. Internet hosts per 1 000 inhabitants in 1997 and 2000



Source: OECD.

The number of internet hosts reflects the size of the internet web in a country. With 234 internet hosts per 1 000 inhabitants the USA is by far the most advanced country in internet infrastructure. The EU, averaging 37.7 hosts per 1 000 inhabitants, lags badly behind the U.S. Finland and Sweden are the only EU countries to boast over 100 hosts per 1 000 inhabitants.

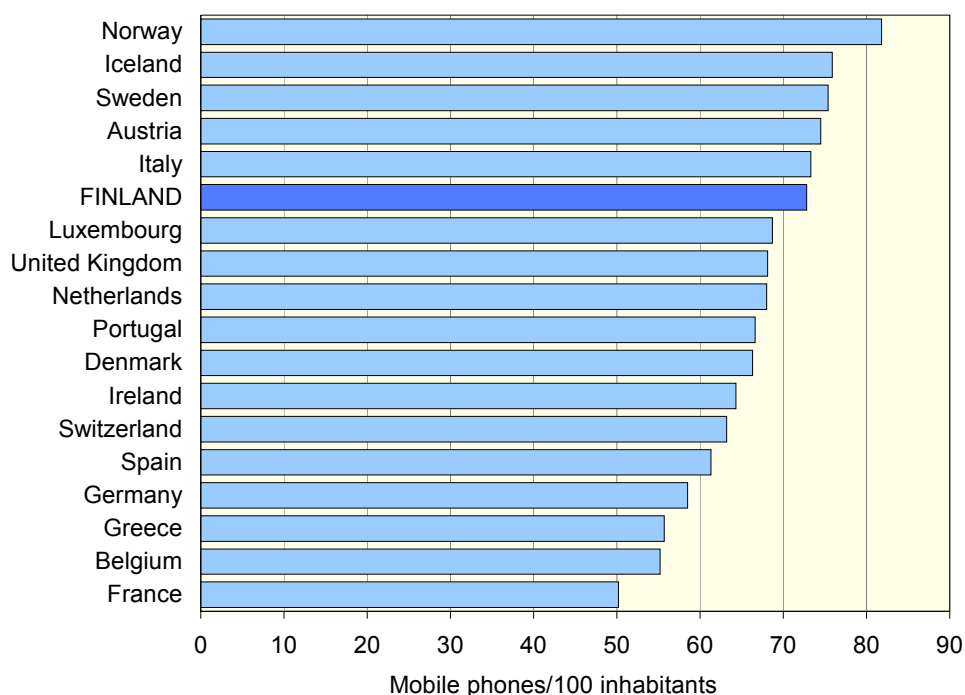
Figure 1.24. High-tech patent applications in Europe in 2000, per million inhabitants



Source: Eurostat.

In terms of high-tech patent applications, innovative activity in Finland is the most productive in Europe. The figure, however, does not say which of the applications are accepted or how the patents are put to use in business – a former problem that has been said to be typical in Finnish innovation management. Although the indicator fails to measure the end use of the patents, it captures new knowledge created on the firm level.

Figure 1.25. Mobile phones in European countries per 100 inhabitants in 2001



Source: Mobile Communications, Financial Times.

Finland ranks sixth in Europe in mobile phone density. Although the mobile phone frequency is above the European average, Italy, Austria other Scandinavian countries show higher figures in the use of mobile phones. Disparities between countries in the opening procedures of mobile subscriptions make international comparisons difficult. The total number of subscriptions seldom corresponds to the number of subscriptions in use.

2 Structure of the Finnish economy

The structure of the Finnish economy has changed rapidly during the last 40 years. The shares of agriculture and manufacturing in the total output – and even more clearly in employment – have declined, while the share of services has increased. In agriculture the structural change shows as a decreasing number of farms and the growth in the average size of farms. That change became faster after the Finnish EU membership in 1995.

Most notable changes in manufacturing have been the strong expansion of the electronics industry and the declining importance of the consumer goods industry in the 1990s. Expanding public services marked the development in service branches until the end of the 1980s. Since then the growth has centred on business sector, and in particular on business services.

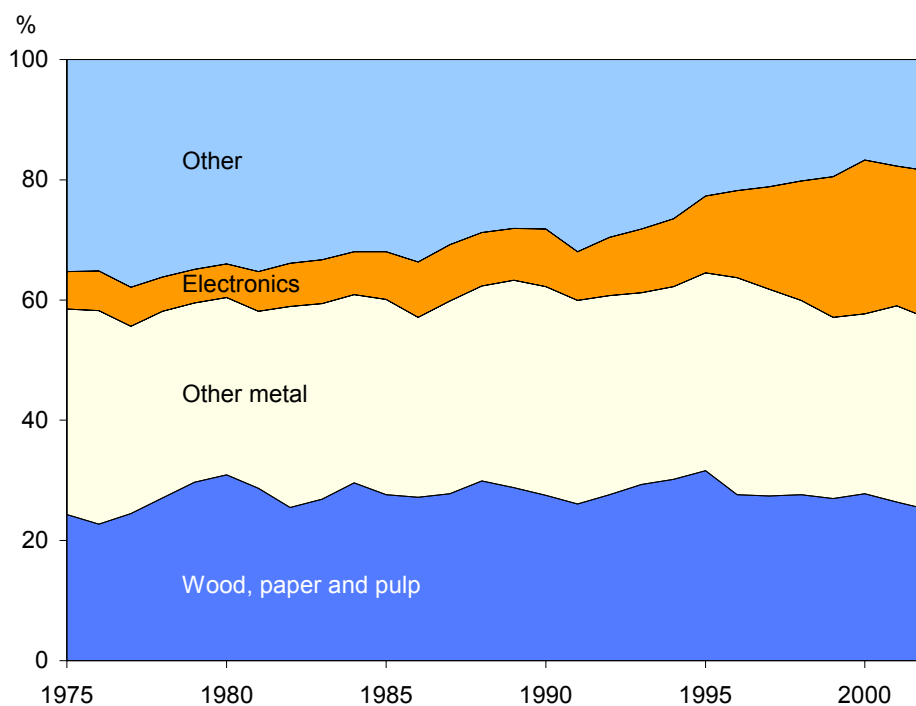
During the recession of 1990–1993 approx. 20 per cent of firms went bankrupt. The number of firms has recovered since, and the number of small enterprises has even exceeded the level of the early 1990s. In 2001 there were more enterprises than before the depression – 225 000 in all. However, the new firms were not in the same sector as the old ones.

The Finnish business sector has globalised fast. Outward investment of Finnish companies has increased markedly in the 1990s, and currently almost half of the labour force of the biggest companies is located abroad. Globalisation has become reality also in subsidiary companies and in business mergers. A large share of the equity of the Finnish listed companies has been sold to foreign owners.

The GDP ratio of exports rose to nearly 40 per cent in the 1990s. The regional distribution of exports changed significantly at the beginning of the 1990s, as eastern exports collapsed with the Soviet Union. The most significant change as regards industrial branches has been the decline of the relative export share of forest industries, mainly at the benefit of electronics exports.

2.1 Changes in the production structure

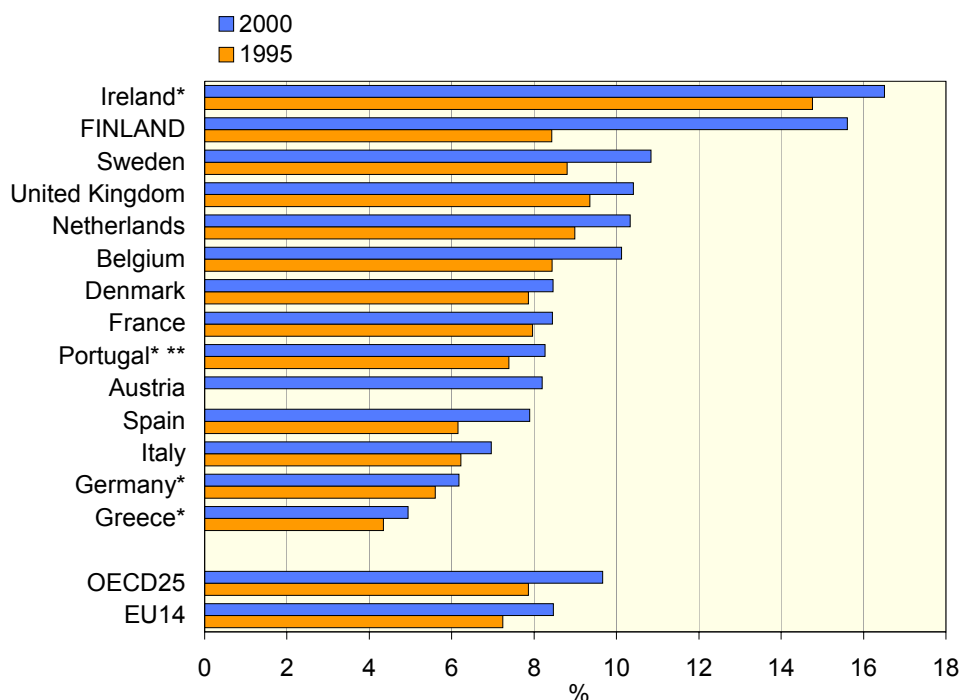
Figure 2.1. Main manufacturing branches in 1975–2002*, percentage of aggregate value added of the manufacturing



Source: Statistics Finland/National Accounts.

Of the main branches of manufacturing, electronics increased its value added rapidly during the 1990s. At the same time, the relative share of branches producing consumer goods shrank. The share of other metal products remained practically unchanged during the whole observation period and the share of the wood, paper and pulp declined.

Figure 2.2. Companies engaged in information and communications technologies (ICT) in 1995 and 2000, per cent of aggregate value added of the business sector



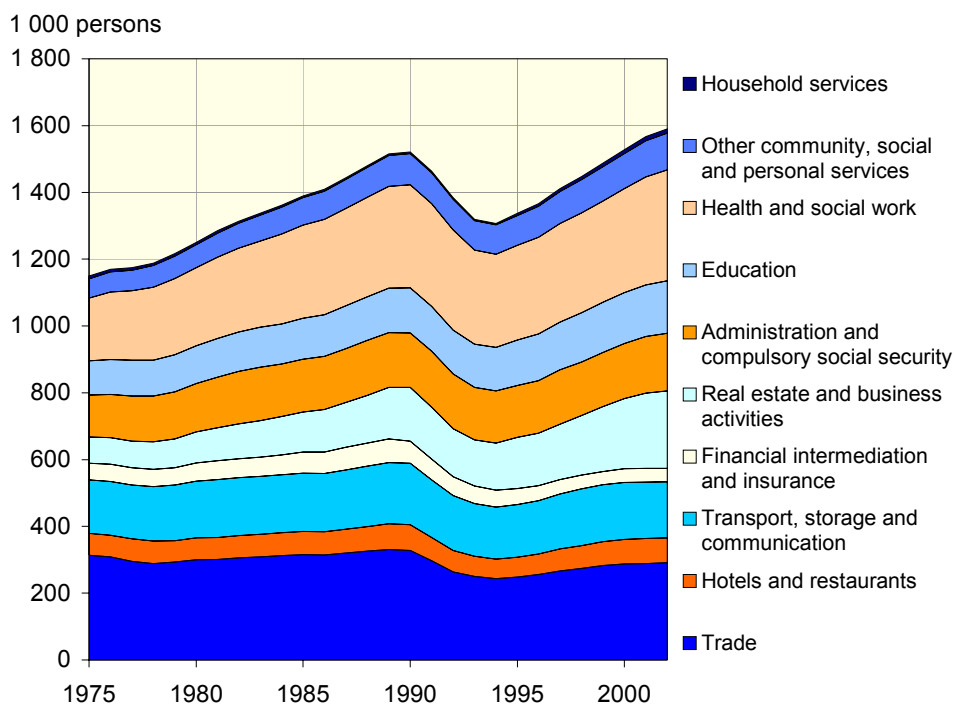
* Data from the year 1999, ** data from the year 1996.

Ireland, Belgium and Portugal: no information on leasing of ICT products. Germany and Greece: no ITC wholesaling. Austria: no data for 1995.

Source: OECD.

The share of companies engaged in information and communications technologies (ICT) in aggregate value added of the business sector varies across EU countries. In EU14 countries (Luxembourg excluded), their average share approached 9 per cent in 2000. In Ireland the share was nearly double compared with the average in EU14 countries. In Finland the share of ICT grew nearly twofold during the late 1990s and approached the Irish level. In other countries the growth in ICT was much slower.

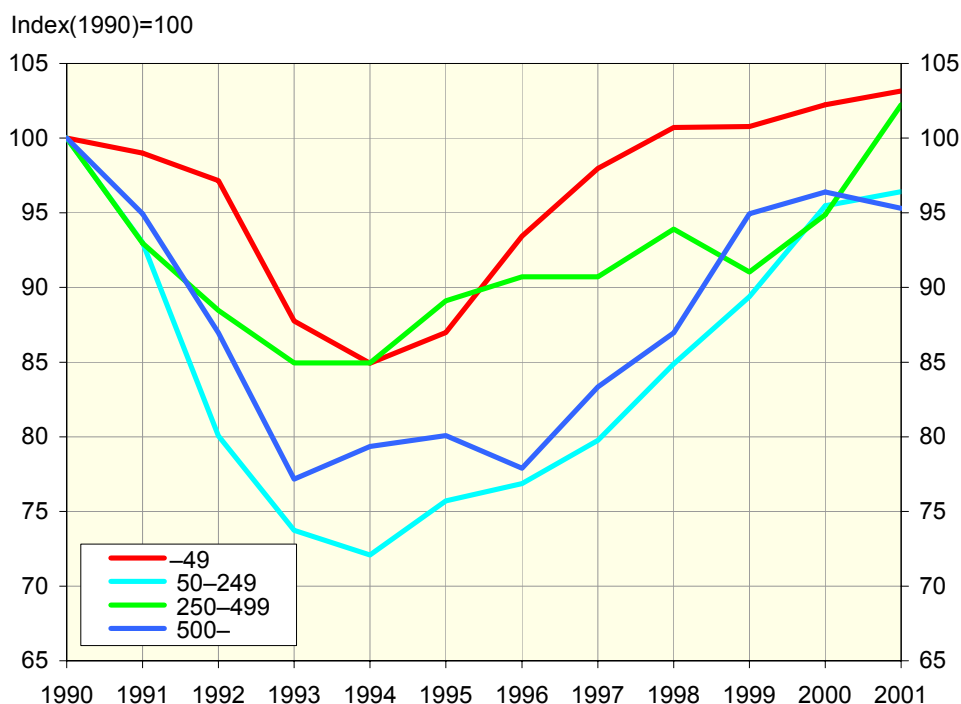
Figure 2.3. Employment in services in 1975–2002*, 1 000 persons



Source: Statistics Finland/National Accounts.

Employment in services grew strongly until the end of the 1980s. The growth was especially fast in public services. During the first half of the 1990s employment also collapsed in the service sectors, and the pre-depression level was only exceeded in 2001. In recent years, the number of employed persons has grown fastest in business services.

Figure 2.4. Firms by the number of personnel in 1990–2001, index(1990)=100

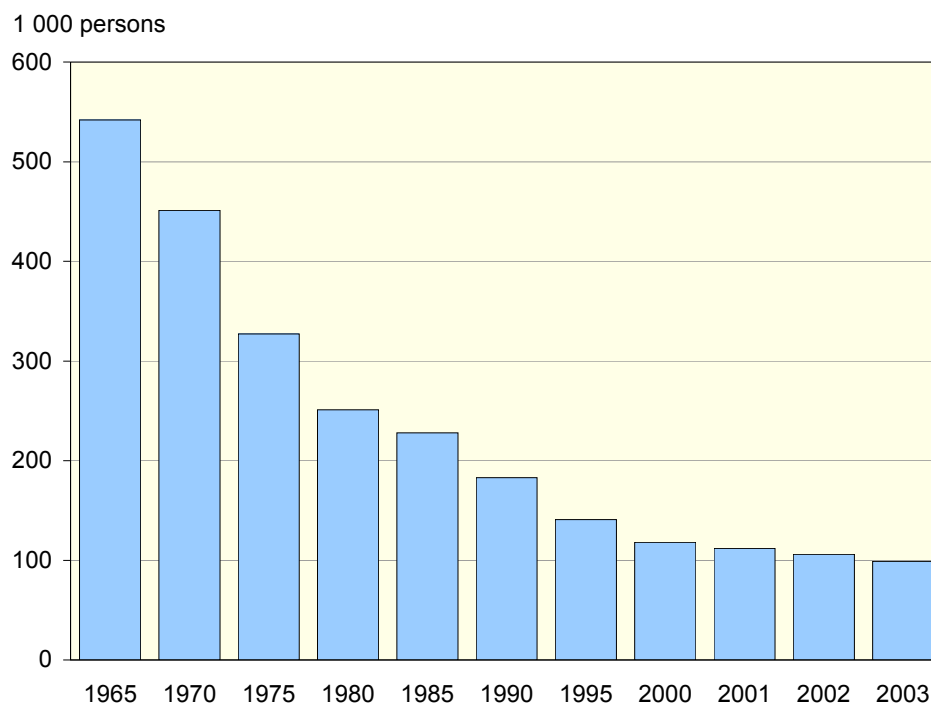


Source: VATT (Statistics Finland).

The wave of bankruptcies of the early 1990s decreased the number of firms by a fifth. Since then the number of small and medium-sized firms has recovered. During the time of high unemployment many of those who were out of work employed themselves by starting a business. Growing service demand and the outsourcing of activities in large companies further increased the number of small firms. The number of female entrepreneurs has increased as well.

Ninety-nine per cent of Finnish firms are small, employing less than 50 persons. In 2001 there were 222 000 firms in this size group, 2 300 medium-range firms with 50–249 employees, 3 190 firms with 250–499 employees and 263 firms with over 500 employees.

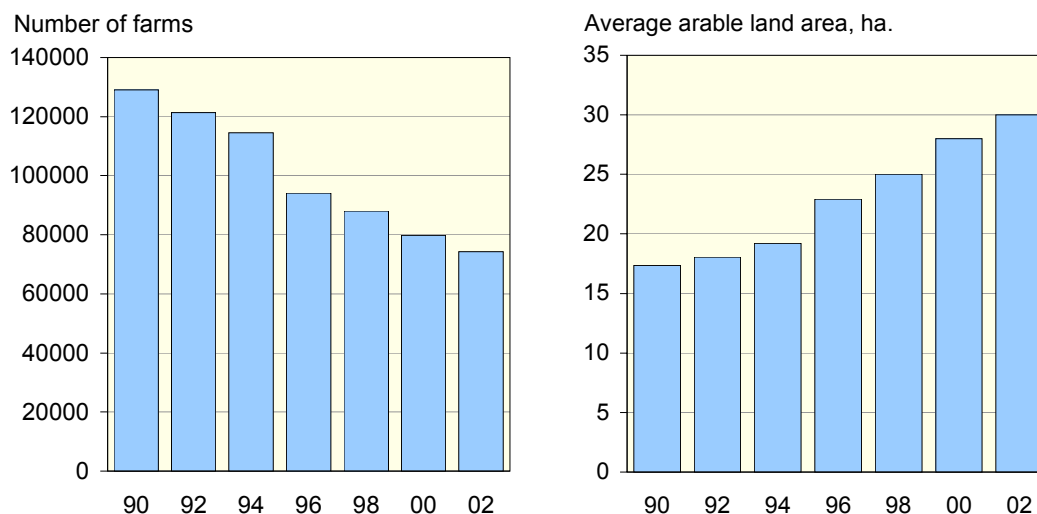
Figure 2.5. Employed in agriculture in 1965–2003, thousand persons



Source: Statistics Finland.

Structural change in the Finnish economy has taken place late and it has been fast. Employment in agriculture was very high until the 1960s. Since 1965 agricultural employment has decreased from 550 000 persons to a fifth of that number. In 2003 the employment in agriculture numbered 99 000 persons. However, in relative terms that was still more than in many other industrial countries.

Figure 2.6. Active farms and average farm size* in 1990–2002



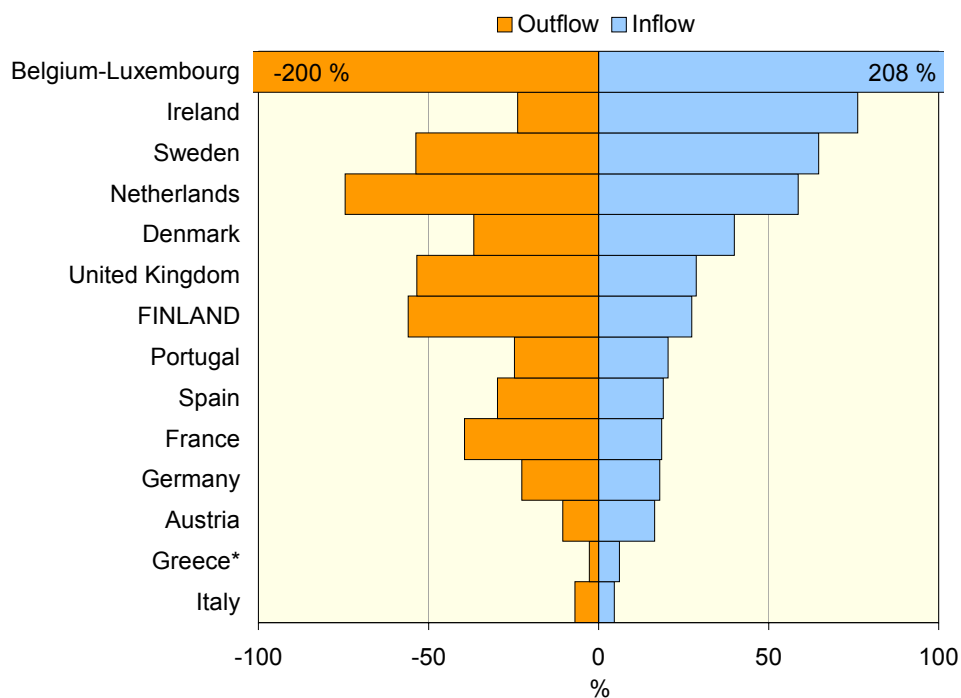
* Farm size = arable land area on the farm.

Source: The Information Centre of the Ministry of Agriculture and Forestry, Statistics Finland/ Farm Register.

In 2002 the number of farms engaged in active production was 74 000, having declined by 54 000 since 1990. At the same time, the average size of a farm grew by 13 hectares to 30 hectares. Additionally, the average forest area owned by farms was 48 hectares in 2002. The declining number of farms has increased agricultural productivity.

2.2 Globalisation of the economy

Figure 2.7. Cumulative foreign direct investment of the EU countries in 1995–2001, percentage of the year 2000 GDP



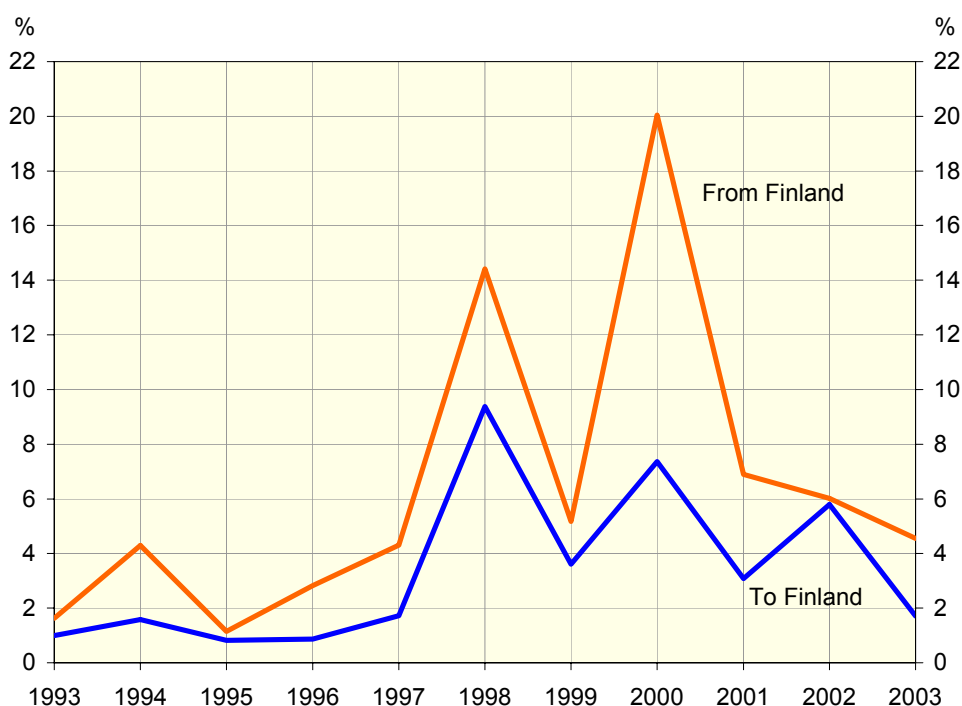
* Data on investments from the country missing 1995–1997.
Source: VATT (OECD).

Liberalisation of capital movements and the opening of economies led to increased movements of capital across countries in the 1980s. Better access to other countries encouraged foreign direct investment. Furthermore, tougher competition in international markets boosted international business mergers.

Belgium and Luxembourg attracted the highest rate of direct investments relative to GDP. Sweden and Ireland also received a great deal of investments relative to the size of their economies.

During a ten-year period Finland received a volume of foreign direct investments that amounted to a third of the GDP of the year 2000. In Finland the volume of investment abroad was the third highest in the EU. Cumulative direct investment abroad amounted to nearly 60 per cent of the GDP of the year 2000. So in net terms Finland was exporting capital.

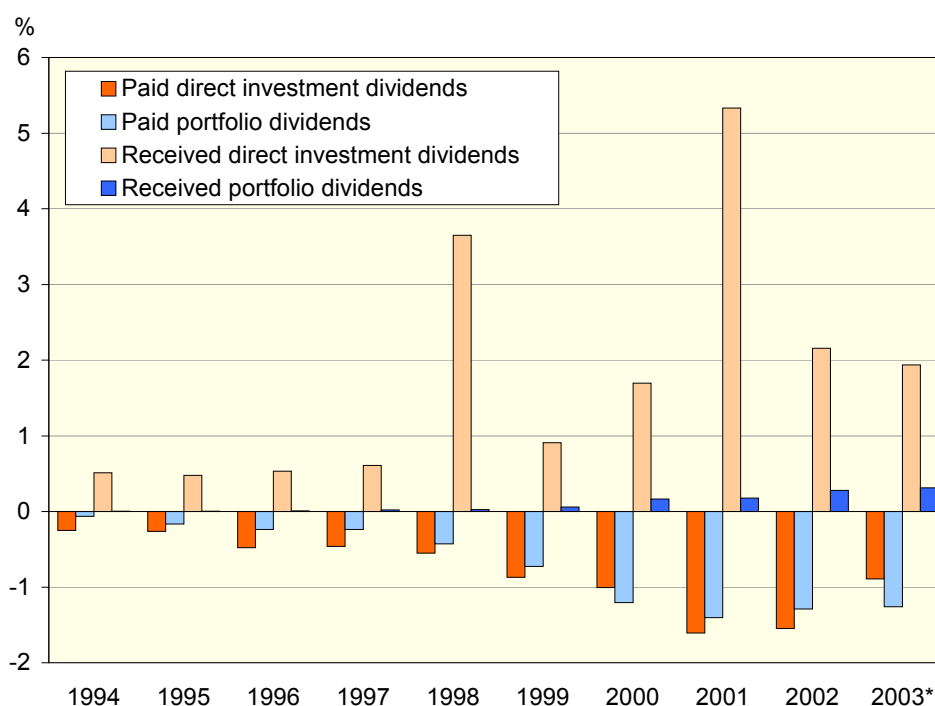
Figure 2.8. Foreign direct investments in and from Finland in 1993–2003, percentage of GDP



Source: ETLA and Statistics Finland.

Direct investments from Finland exceeded investments in Finland during the past decade. Mergers and acquisitions have strongly increased direct investments in the case of Finland. Nordic and Finnish-Swedish mergers, especially, have been important. In 2000, investments from Finland reached a record volume of nearly 20 per cent of the GDP, while investments flowing into the country showed clear growth from the year before, as well. Again, these large fluctuations resulted from a few big corporate reorganisations. In 2003 the foreign direct investment flows to Finland declined considerably. The investments from Finland were also at a lower level than before.

Figure 2.9. Dividend payments by direct and portfolio investment in and out of Finland in 1994–2003, percentage of GDP

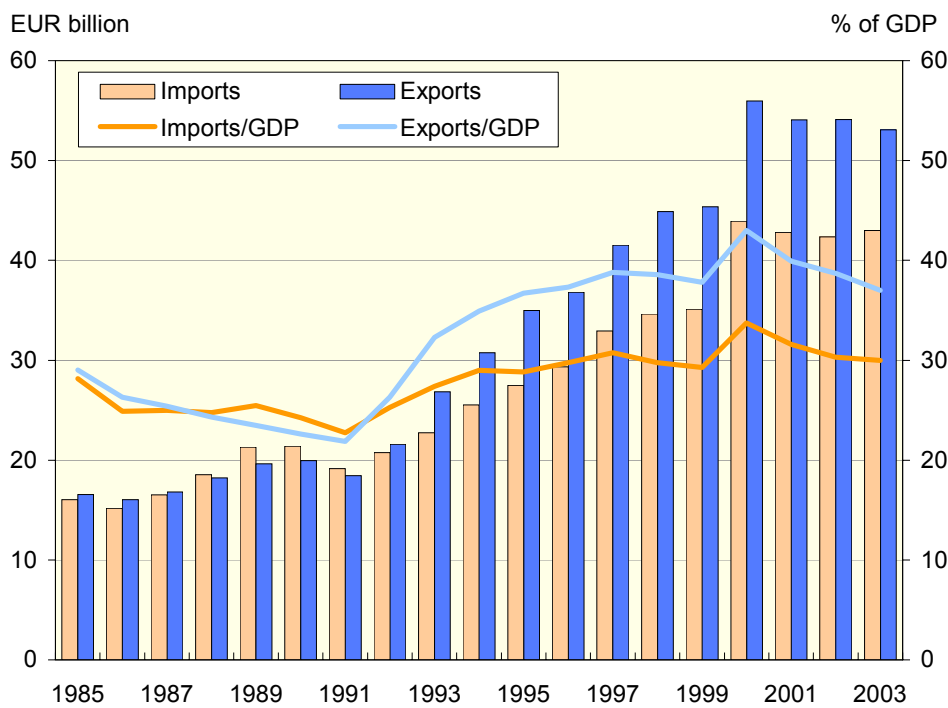


Source: VATT (The Research Institute of the Finnish Economy and Statistics Finland).

Dividend income from direct foreign investments of Finnish companies amounted to only 0.5 per cent of the GDP between 1994 and 1997, a share that has grown notably since. In 1998 and 2001 an exceptionally large dividend yield from direct investments was repatriated, their share growing to 4–5 per cent of GDP. Finland clearly derived more dividends from direct investments than those she remitted abroad. The yield from portfolio investments, on the other hand, is minor in Finland. The volume of remitted dividends from portfolio investments has clearly grown, their share exceeding that of dividends from direct investments in 2003.

The growth in Finnish foreign trade

Figure 2.10. Exports and imports in 1985–2003, EUR billion and as percentages of GDP

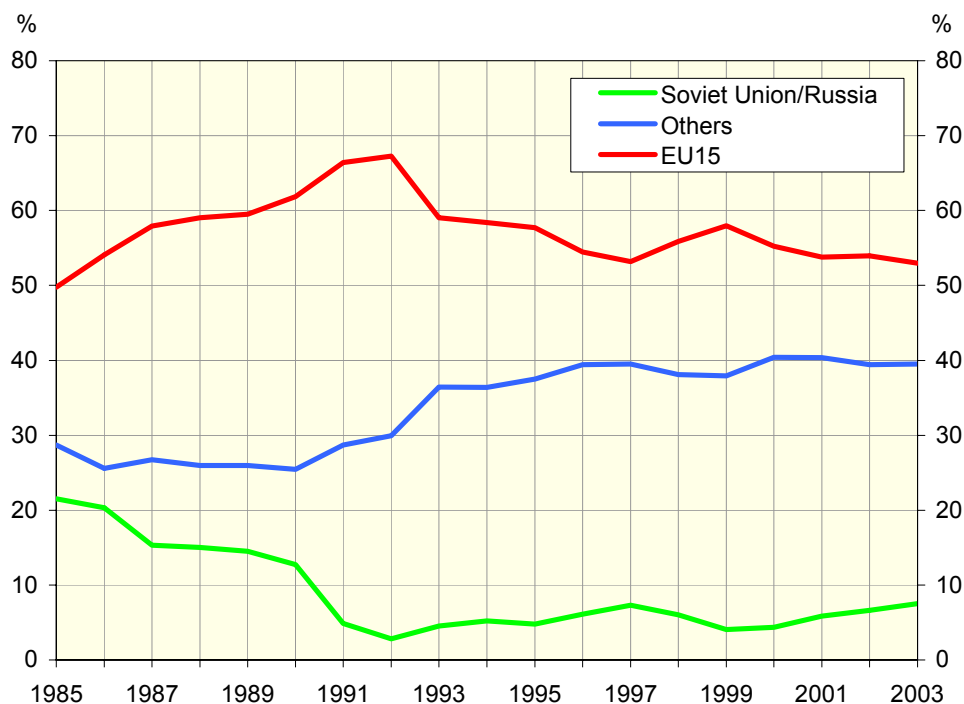


Source: VATT (Statistics Finland/National Accounts).

In the mid-1980s, the value of both Finnish exports and imports was a little over 16 billion euros, less than 30 per cent of GDP. In the late 1980s the growth in exports averaged only 3.5 per cent annually, while imports grew faster. This development led to diminishing GDP ratios both in exports and in imports and to a growing current account deficit.

As a result of improved competitiveness and economic policy that restrained domestic demand, rapid growth in exports began in 1992. In 1992–2000 export earnings grew by approximately 10 per cent annually, whereas the growth in imports remained slower at 7 per cent. The GDP ratio of exports rose in 2000 above 40 per cent and that of imports exceeded 30 per cent. In 2001–2003 the value of both exports and imports has somewhat diminished both in absolute terms and in relation to the GDP.

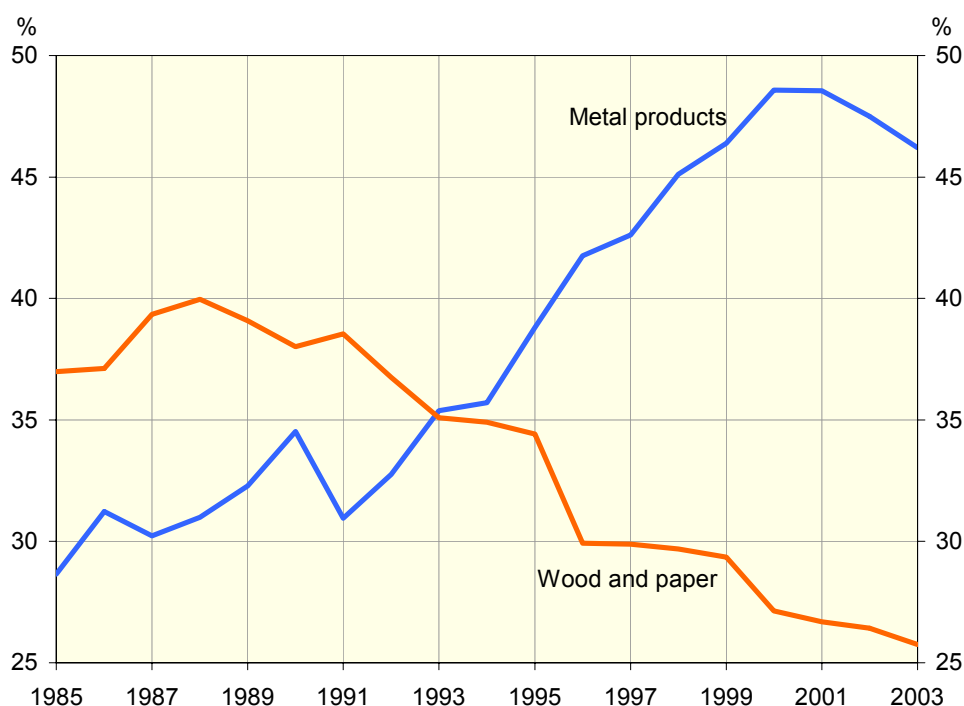
Figure 2.11. Exports by trading area in 1985–2003, per cent



Source: Finnish Foreign Trade Statistics.

The Soviet Union's/Russia's share in Finnish exports fell in the latter half of the 1980s. Due to the collapse of barter trade the share declined to 3 per cent of total exports. The importance of Russia as a market area has somewhat recovered since then, to 7 per cent of total exports. In spite of Finland's EU membership in 1995, exports to the EU have declined in relative terms during the 1990s. Only one third of the foreign trade is channelled to countries within the euro area. The importance of the rest of the world has increased. This reflects, in particular, the strong growth in exports to Central and Eastern European countries, China and the US.

Figure 2.12. Wood, paper and metal products in 1985–2003, percentage of total exports



Source: Statistics Finland.

During the period of strong export growth its structure has also altered. The share of the wood and paper industries in exports fell from 40 per cent at the end of the 1980s to about a quarter in 2003. Correspondingly, the share of the metal products (which include the production of electronic equipment such as mobile phones) has grown from about 30 per cent to cover nearly half of the exports. In the most recent years, the growth of metal industry exports ratio has stagnated.

3 Labour market

At the end of the 1980s Finland was a country of high employment and low unemployment. During the depression nearly half a million jobs were lost, some of which remain to be restored. Nevertheless, owing to the common participation of women in the labour force, the employment rate clearly stands above the EU average. At the end of the 1990s employment rapidly improved. A decrease in unemployment has been somewhat slowed down by the growing labour supply, and the unemployment rate still exceeds the EU average.

Full-time contracts have characterised the Finnish labour market. The annual working-time is, however, among the shortest in Europe. The share of part-time contracts has slowly increased among both men and women and remains at a clearly lower level than in other Nordic countries and Central Europe. On the other hand, fixed-term contracts are more common in Finland than in most of the EU countries except in Spain.

The education level of the labour force rises as new generations reach working age and old generations retire from working life. Nearly all labour market entrants have received professional training, and more and more of them have received tertiary education. Returns to education continue to be high in Finland. Education also pays in terms of employment: the lower the education level a person has, the higher the risk of unemployment is.

Until the mid-1990s long-term unemployment was a relatively rare phenomenon in Finland. Post-depression long-term unemployment is, however, becoming more and more persistent, since the average durations of unemployment have not shortened. Durations of completed unemployment spells, on the other hand, are rapidly shortening.

The recent developments in the labour markets were influenced by the strongly differing occupational structures and skill requirements between growth sectors and declining sectors. That, in part, explains why vacancies and unemployed job seekers do not seem to match particularly well. The number of vacancies has risen close to the late 1980s level, but the unemployment rate is over 5 percentage points higher than it was then.

The functioning of the labour markets is still influenced by a considerable increase in active labour market measures during the depression. Their volume has been reduced, but the share of participants in active measures in total unemployment (unemployed job-seekers and participants in ALMP) remained at approx. 21 per cent in 2002. The government programme of 2003 aims to raise this activation rate to 27–30 per cent. Circling from unemployment to ALMP measures and to short-term jobs is common and exit from this kind of repeated unemployment is difficult.

Many institutional factors, such as the wage bargaining system, the employment protection, and various incentive systems, affect the functioning of labour markets. In international comparisons Finland is typically classified as a country with high union density and centralised wage bargaining. Both employees and employers are highly organised and wage agreements are often bargained at the central union level or co-ordinated otherwise. In employment protection Finland belongs to the average range in comparison to other OECD countries.

3.1 Main indicators of the Finnish labour market

At the end of the 1980s the Finnish labour market situation was excellent. The employment rate was among the highest and the unemployment rate among the lowest in the world. A sharp fall in production at the beginning of the 1990s led to a fall of 15 percentage points in the employment rate and to the multiplication of the unemployment rate. The labour supply also contracted, mainly as a result of young people postponing their graduation. Although the economic growth has been rapid since the mid-1990s, return to the full employment of the late 1980s is not yet within sight. Roughly half of the fall in the employment rate and of the rise in the unemployment rate has been restored. Labour supply already exceeds the pre-depression level.

Table 3.1. Balance of labour resources (aged 15–64 years) in 1989, 1994 and 2003, thousand persons and per cent

	1989	1994	2003	Change 1994/89	Change 2003/94
Aged 15–64 years, 1 000 persons	3 344	3 403	3 484	59	81
Labour force, 1 000 persons	2 564	2 448	2 580	-116	132
Employed, 1 000 persons	2 483	2 040	2 345	-443	305
Unemployed, 1 000 persons	80	408	235	328	-173
Labour force participation rate, %	76.7	71.9	74.0	-4.8	2.1
Employment rate, %	74.3	59.9	67.3	-14.4	7.4
Unemployment rate, %	3.1	16.6	9.0	13.5	-7.6

Source: Statistics Finland/Labour Force Survey.

The statistics of the Ministry of Labour depict a more or less similar picture of the development of unemployment. It is noteworthy that exits to the unemployment pension did not lower open unemployment during the depression. Owing to the long “unemployment pension tunnel” the number of unemployment pensioners did not start to grow until after the depression. Unemployment was tackled mainly by increasing labour market measures. Since 1998 their volume has, however, been cut.

Employment rate = employed / working age population

Unemployment rate = unemployed / labour force

Labour force participation rate = (employed + unemployed) / working age population

Table 3.2. Unemployed job seekers, unemployment pensioners, participants in ALMP measures, and vacancies in 1989, 1994 and 2003, 1 000 persons

	1989	1994	2003	Change 1994/89	Change 2003/94
Unemployed job seekers	103	494	289	391	-205
Unemployment pensioners	65	45	53	-20	8
Participants in ALMP measures	50	95	88	45	-7
Vacancies	30	17	23	-13	6

Source: Ministry of Labour and Finnish Centre for Pensions.

According to the definition of unemployment used by Statistics Finland, the number of unemployed persons fell to 235 000 in 2003, but according to the Ministry of Labour there were 289 000 unemployed job seekers. Including unemployment pensioners and participants in ALMP measures, the volume of labour force reserves was some 430 000 persons.

The most important statistics on labour markets are the Labour Force Survey by Statistics Finland and the job seeker registers kept by the Ministry of Labour. The data contents and compilation criteria of these statistics differ from each other.

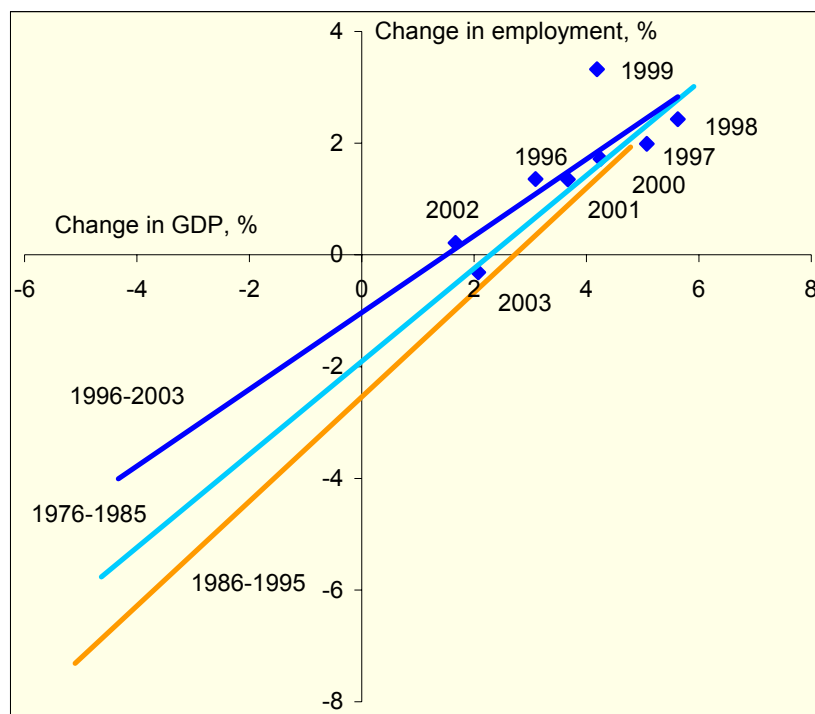
The statistics of the Ministry of Labour include information on vacancies reported in employment offices and on job seekers. Job seekers may, in addition to the unemployed, include job-changers, students and participants in labour market measures. Of the open labour market vacancies, public employment services cover only a part and the coverage varies according to the sector and business cycle.

The Monthly Labour Force Survey is based on a sample of the working-age population (15–74-year-olds), so it cannot be used in very detailed, e.g. municipality-level, analyses. To be classified as an unemployed person in the Labour Force Survey requires active job-seeking within the previous four weeks. Therefore, many elderly unemployed, especially those waiting for retirement on unemployment pension, fall outside the labour force.

According to the register on job seekers there were 62 000 unemployed persons aged 55 or over in 2003, but only 27 000 according to the Labour Force Survey. On the other hand, a student about to enter the labour market within a few weeks may be classified as unemployed in the Labour Force Survey. The job-seeker register included 35 000 unemployed persons under the age of 25 in 2003, but the Labour Force Survey included over 69 000. The picture of the structure of unemployment varies in different sources and with different specifications.

3.2 Development of employment

Figure 3.3. Impact of output growth on employment in Finland



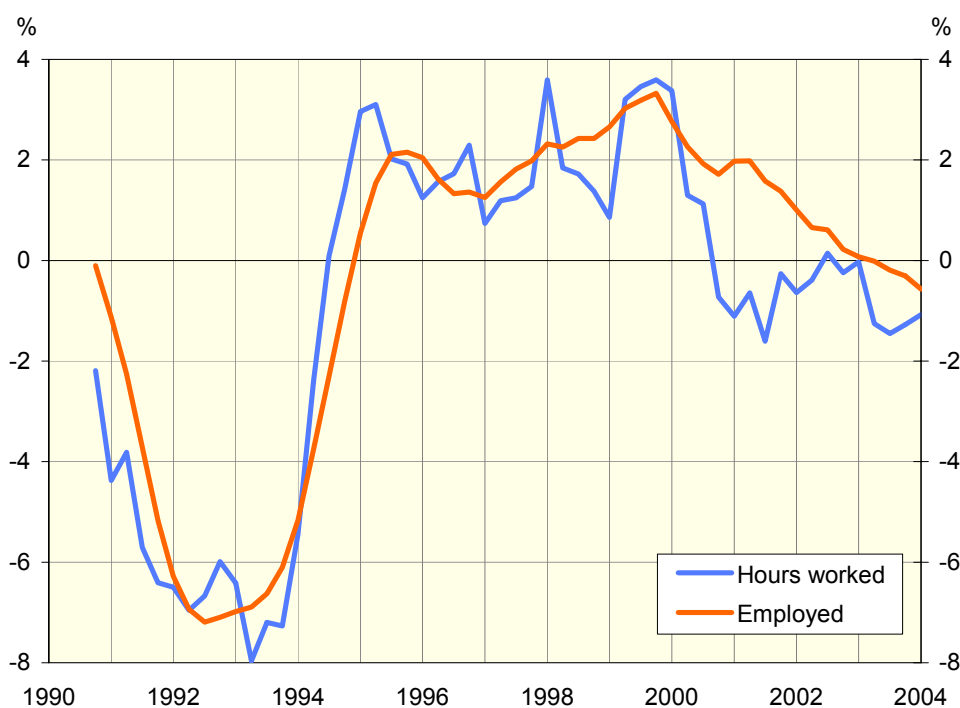
The change in GDP is a two year moving average of annual changes and the change in employment refers to the latter year.

Source: VATT.

In a ten-year period between 1976 and 1985, output growth of around two per cent was enough to sustain the level of employment. Between 1986 and 1995 a 3 per cent growth rate was needed to accomplish the same. This change was mainly caused by factors connected to the deep depression of the early 1990s and the recovery from it. Ineffective firms were put out of business and non-productive jobs were abolished. This sustained the growth in productivity during the depression years. Furthermore, the growth rate of productivity accelerated in the initial stages of recovery as labour force reserves were utilised and overtime working increased. These factors resulted in deterioration of the employment-output relationship.

Recent years show an improvement in the employment effects of economic growth. In 1999 the growth in employment was exceptionally fast in comparison to output growth. Employment increased by more than 3 per cent annually. During the recent years growth in both employment and output have clearly slowed down – in 2003 total employment started to decline.

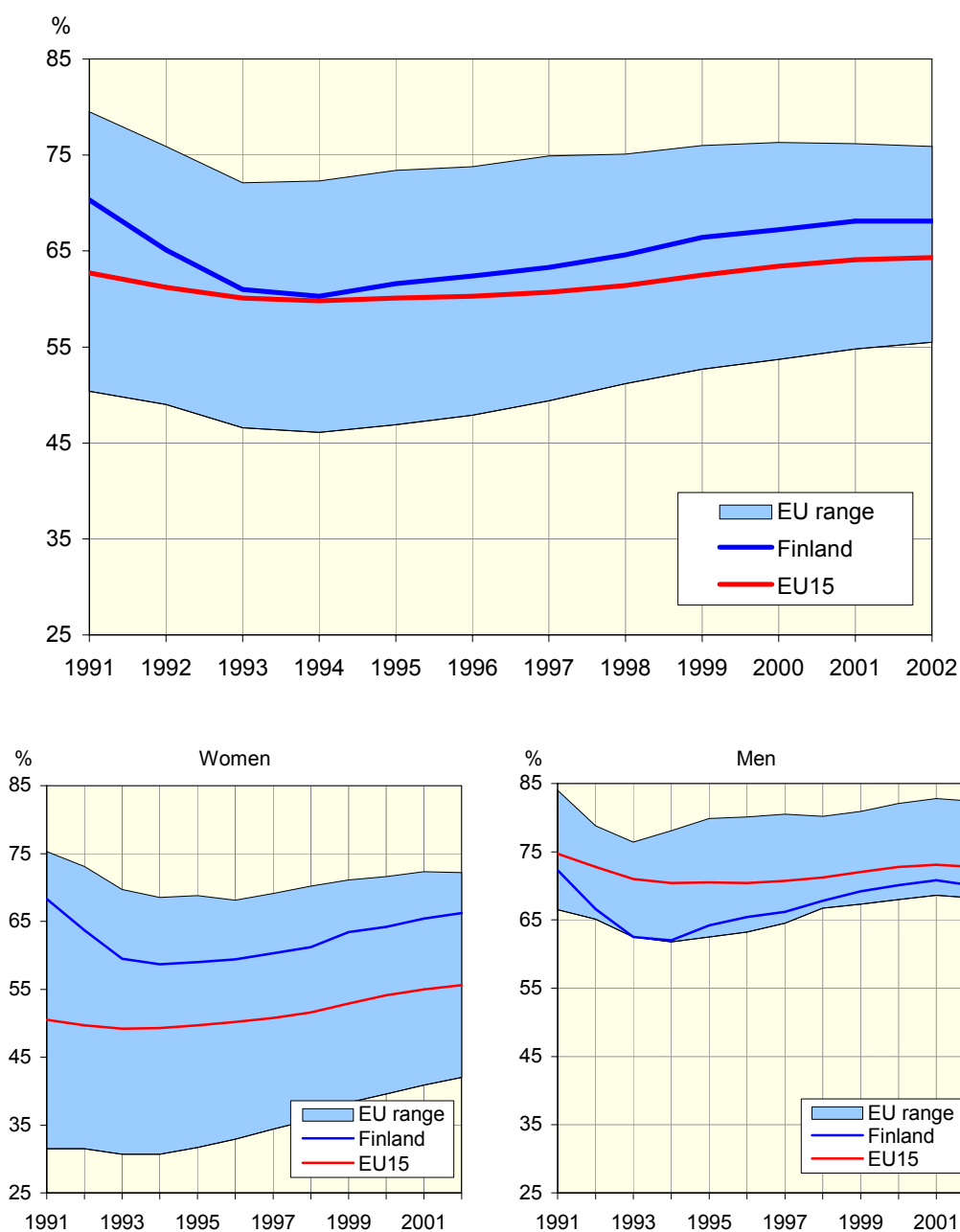
Figure 3.4. Annual growth of employment (moving average of quarterly observations) 4/1990–1/2004, per cent



Source: Statistics Finland.

The growth in hours worked has not been as steady as the growth in employment. This is partly due to the influence of Christmas and other holidays on annual working hours. During the recovery from the depression (1994–1995) hours worked grew fast, when those on reduced working time moved into full-time employment and overtime work increased. In 2000 the growth in hours worked slowed down. The growth in employment has steadily decreased during the last three years. Since the beginning of 2003, both the number of hours worked and the number of employed have started to decrease.

Figure 3.5. Employment rate in EU15 countries in 1991–2002, share of employed in working-age population, per cent

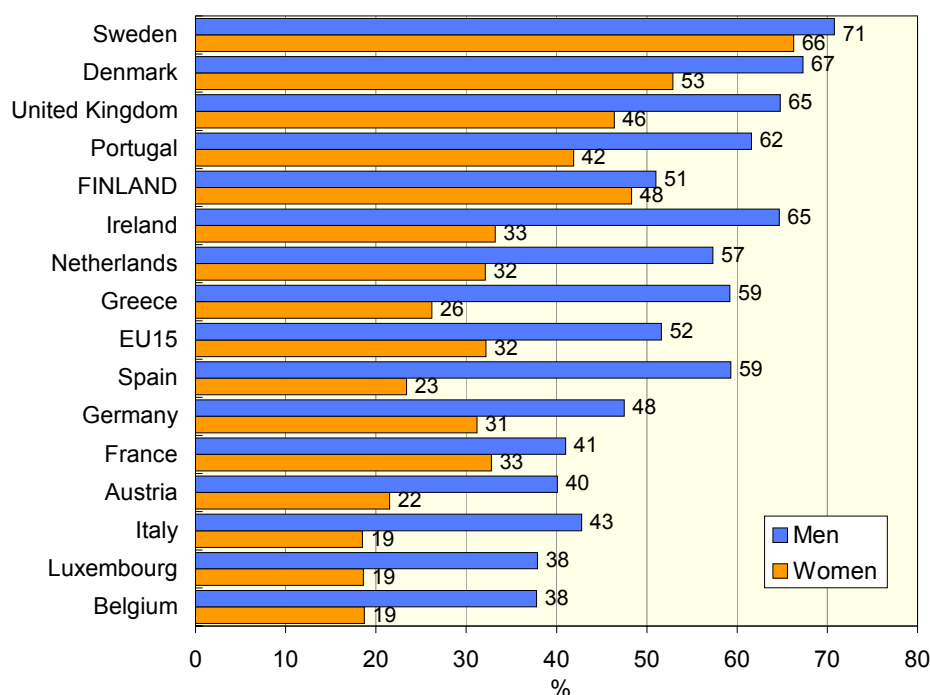


Source: VATT (EU/Employment in Europe).

As recently as the beginning of the 1990s, the employment rate in Finland was 10 per cent higher than the EU average. Employment rates collapsed in the depression of the early 1990s. As a result of the common participation of women in the labour force, the employment rate remained slightly above the EU average.

In recent years the employment rates in Finland have risen faster than the EU average, and even the employment rate for men is approaching the EU average. In 2002, Italy had the lowest employment rate in the EU. The highest employment rates were found in Denmark, the Netherlands and Sweden. With regard to the employment rate for women, Sweden and Denmark came out on top.

Figure 3.6. Employment rate for older (55–64-year-olds) workers by sex in the EU15 in 2003, per cent

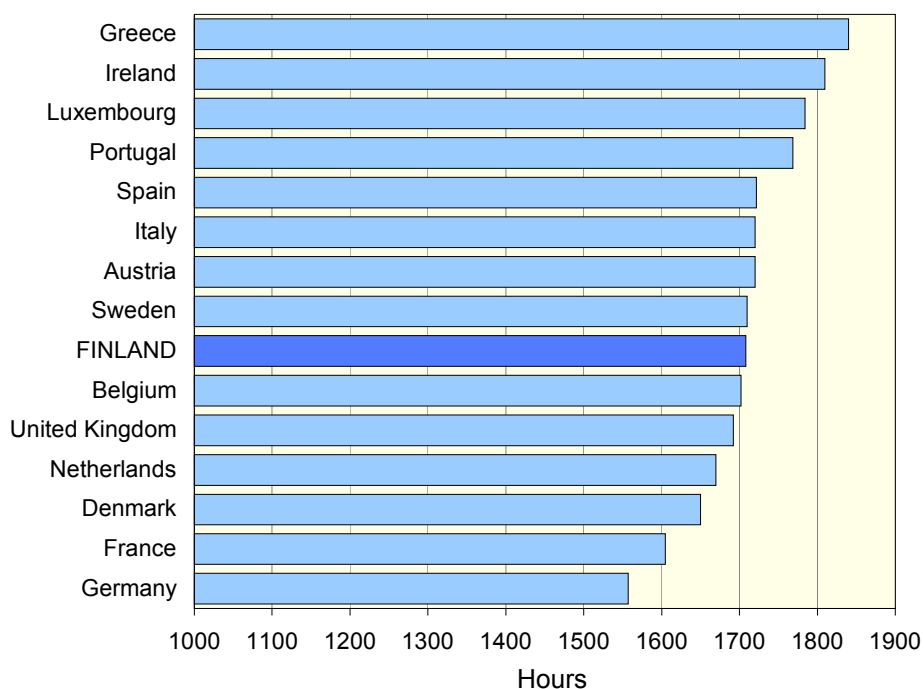


Source: VATT (Eurostat).

In 2003, a half of aged 55–64-year-old Finns were employed. The employment rate was clearly lower than in other Nordic countries, but higher than the EU15 average.

The aged Swedes kept on in employment more than in other EU countries. The other end of the scale is represented by Belgium and Luxembourg: there about one third of men and a fifth of women in this age group continue to be at work.

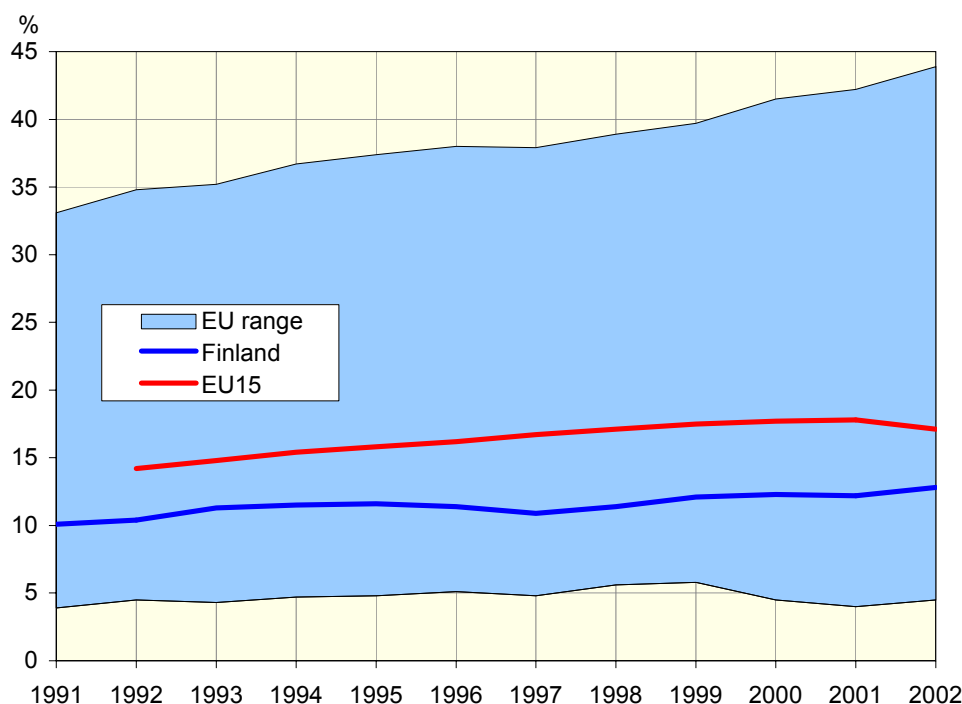
Figure 3.7. Average annual working time of an industrial worker in EU15 countries in 2002, hours



Source: The Confederation of Finnish Industry and Employers.

The shortening of working hours has been characteristic of the long-term development of labour markets. Annual working time has been halved during the last hundred years. Exact international comparisons of the length of working time are difficult to construe, due to sector-specific working time models and other particular factors that influence real working hours. Comparisons are usually carried out of working time in industry. In EU countries the average annual working time in industry ranges from about 1550 in the western parts of Germany to more than 1800 in Greece. Finland ranks a little below the average with its 1700 annual working hours.

Figure 3.8. Part-time workers in EU15 countries in 1991–2002, per cent of the employed

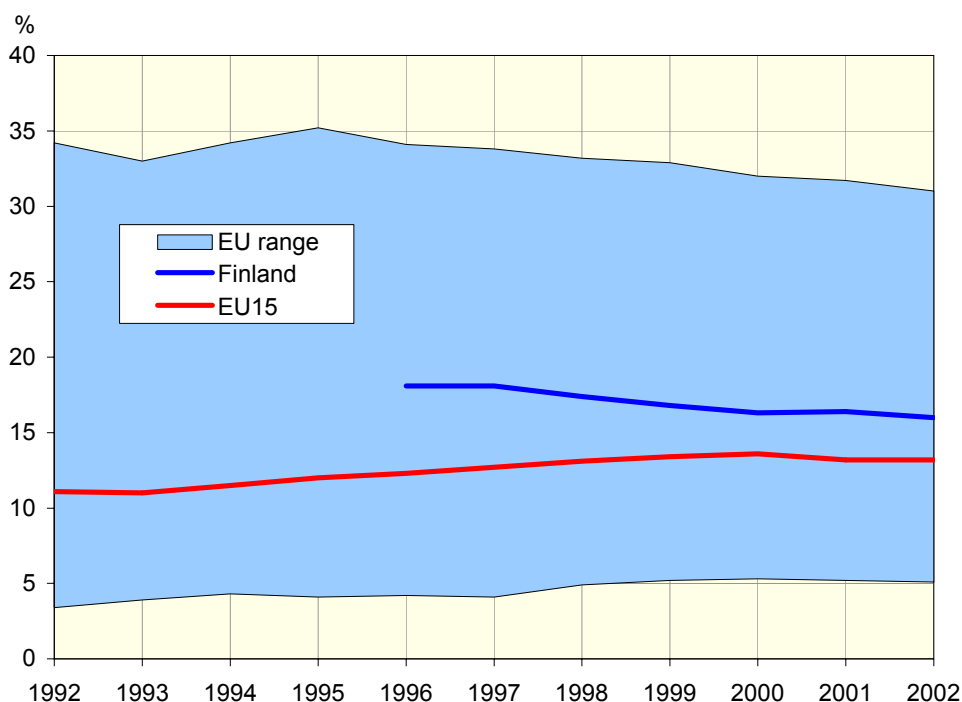


Source: EU/Employment in Europe.

The share of part-time workers varies a lot among EU countries. The Netherlands has the top share: 44 per cent of the employed work part-time. Greece has the lowest share of part-time work, only five per cent of the employed. Other Southern European countries also have low shares. In addition to the Netherlands, part-time jobs are common in Sweden, Denmark and Germany, where at least one out of five employed persons works part-time.

In Finland, the share of part-time workers has slowly grown to 13 per cent of the employed. Even though it is more than twice that of the lowest figures in the EU, it clearly remains below the EU mean. Every third woman in the EU countries holds a part-time job compared with only 6 per cent of men. Even in Finland part-time working is more common among women, the difference between sexes being, however, smaller than in most other EU countries.

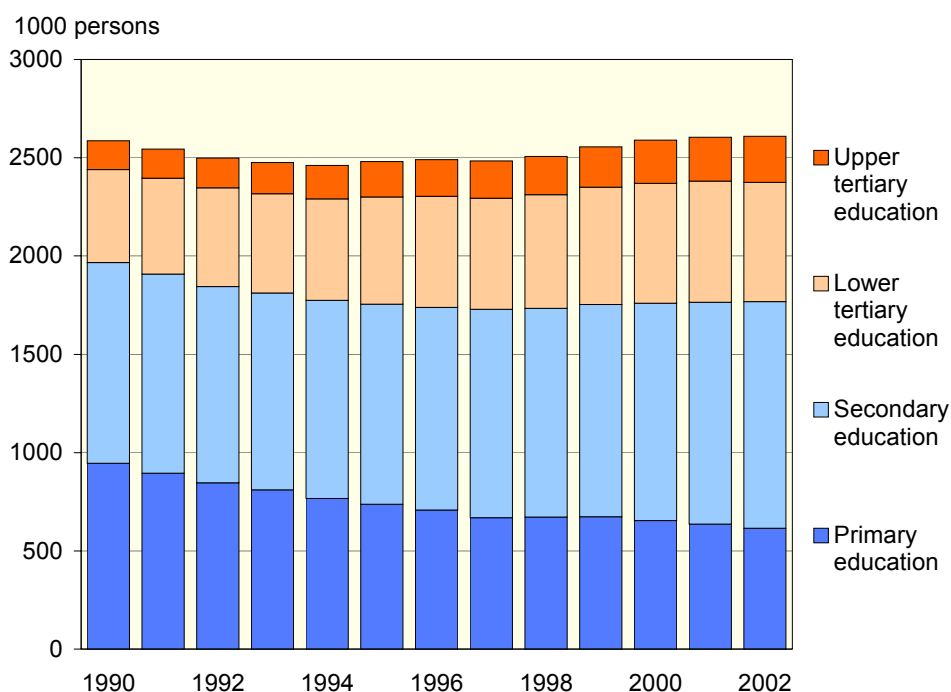
Figure 3.9. Fixed-term contracts in EU15 countries in 1992–2002, per cent of total employment



Source: EU/Employment in Europe.

The share of fixed-term contracts in total work contracts shows a slight increase in the EU area, the average figure for 2002 being 13 per cent. There are, however, large differences among countries. The highest share is in Spain, where nearly one third of the employment contracts are made for fixed periods. There, the job security of employees with permanent contracts is good, and employers turn to fixed-term contracts for flexibility. The share of fixed-term contracts is at its lowest in Ireland. In the EU countries, Finland's 16 per cent share is one of the highest rates.

Figure 3.10. Education level of the labour force in 1990–2002, thousand persons



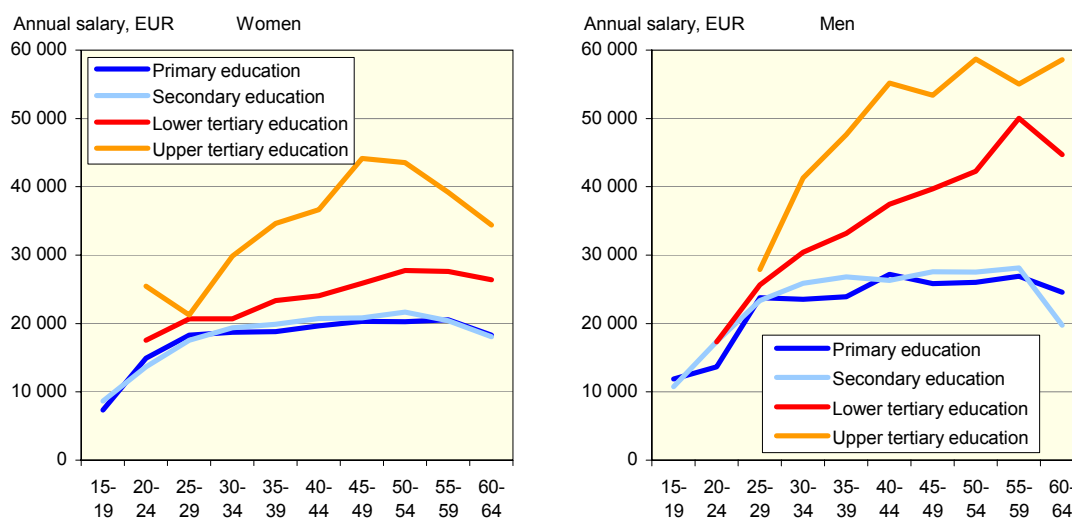
The definitions for the contents of the levels of education follow the ISCED 1997.

Source: Statistics Finland/Labour Force Survey and Register of Completed Education and Degrees.

The education level of the labour force is constantly improving. Since 1990 the number of people with primary education has decreased by more than 300 000, while the number of those with tertiary education has increased by over 250 000 and of those with secondary education by more than 100 000.

The number of upper tertiary degree graduates has shown the relatively greatest growth. This group has increased its size by 60% since 1990. During recent years changes in the education level of the labour force have been small. The number of persons with primary education has decreased, but at a slower pace than before.

Figure 3.11. Earnings of the employed by education level, sex and age in 2001, EUR

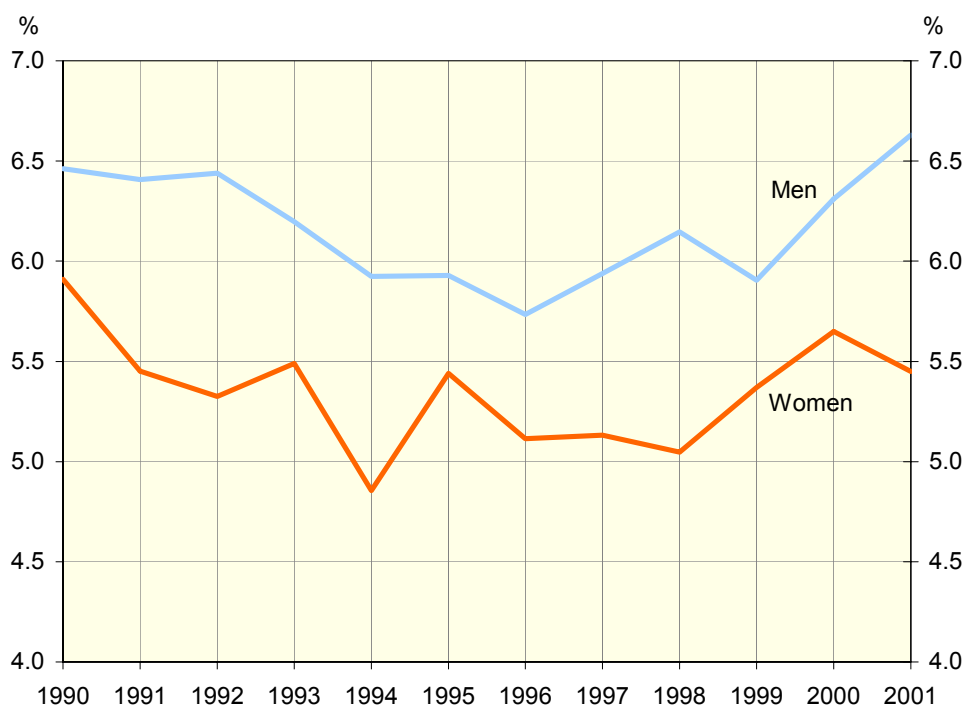


Source: VATT.

Education improves average wages. Wage differences between education levels grow with age. Both men and women reach the maximum wage level at the age of 50–54. In this age group, men with upper tertiary education earn up to 33 000 euros more than men with primary education.

Annual wages by education are calculated from the 2001 Income Distribution Statistics. The sample includes all those with at least 6 months of employment. In 2001 income from stock options is included in the wage concept, which causes deviation in the wages of the best-educated workers, in particular.

Figure 3.12. Returns to education in Finland in 1990–2001

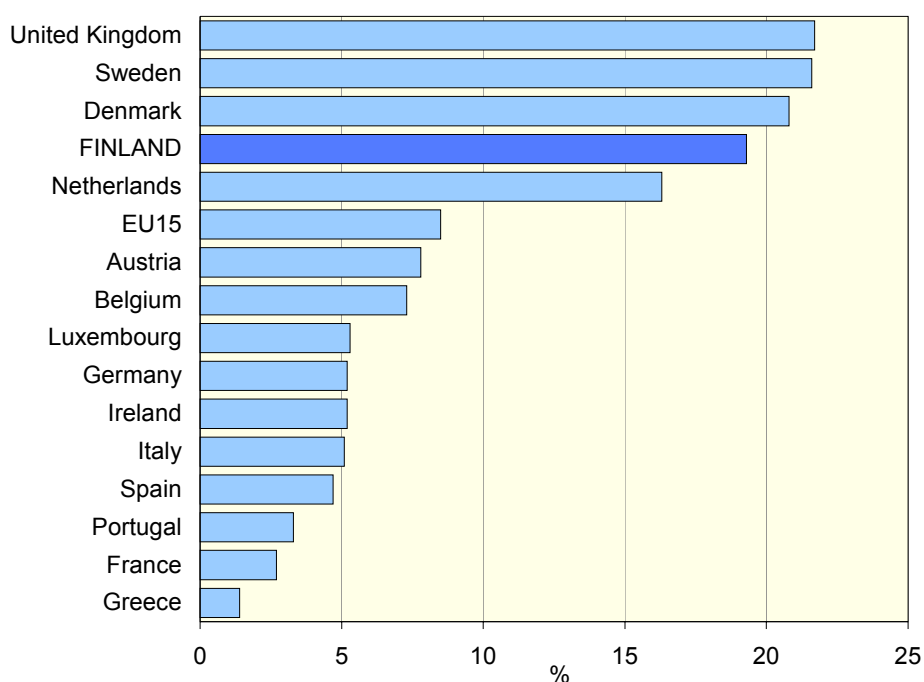


Source: VATT.

In the 1990s returns to education decreased slightly in Finland, but in 2000–2001 they returned to the level of the early nineties. In 1990 returns from one extra year of education were 5.9 per cent for women and 6.5 for men. In 2001 the corresponding figures were 5.5 and 6.6 per cent, respectively. Differences between the sexes in returns to education have remained more or less constant. The effect of one extra year of education on the income level continues to rank high in international comparisons.

In the figure, returns to education are measured through the coefficient of the education variable in a regression, where monthly wages are explained by education years, age and age square. Regression equations are estimated using data from the 1990–2001 Income Distribution Statistics. The sample includes all those with at least 6 months of employment. The education coefficient may be interpreted as the relative change in the wage level from one extra year of education. Thus, 6 per cent returns mean that one extra year of education increases wages by 6 per cent.

Figure 3.13. Participation in life-long learning in EU15 countries in 2001, per cent of 25–64-year-olds



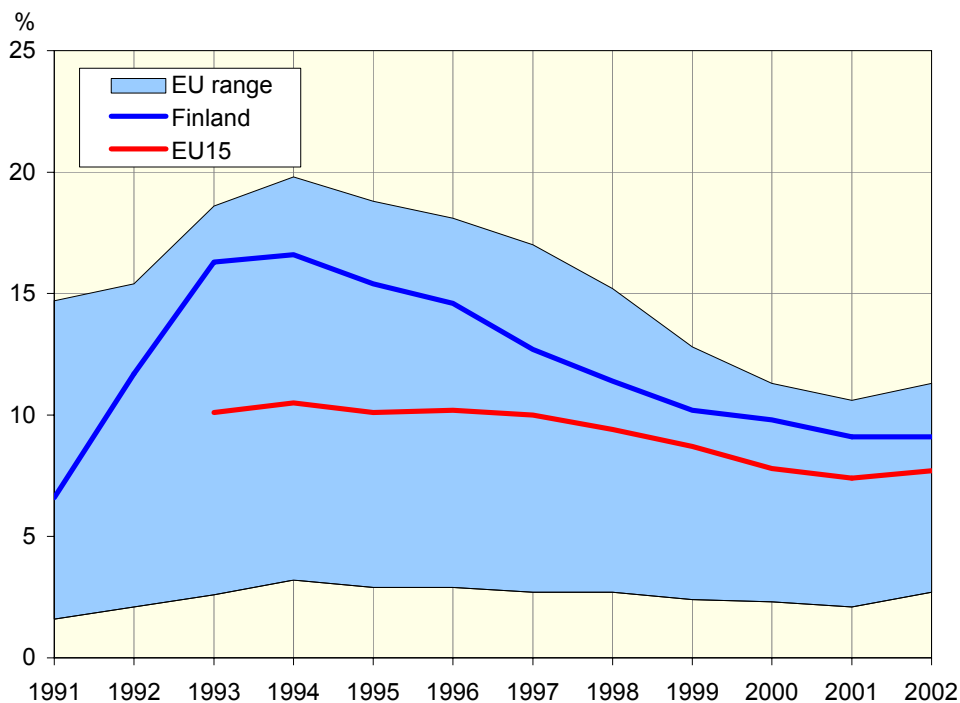
Source: Eurostat, Labour Force Survey.

An essential characteristic of a knowledge economy is technical development and innovation. Under these conditions, individuals need to renew their skills. Participation in life-long learning in Finland compares well in the EU. Employers arrange on-the-job training for their employees. The public sector offers good opportunities for further education at, for example, open universities and workers' institutes.

The information was gathered by a survey on participation in education. A relatively short reference period of four weeks preceding the date of the survey was chosen to avoid technical, such as recall, problems. For France, the Netherlands and Portugal, information on participation is based on whether education or training is under way on the date of the survey. Education includes initial education, further education, continuing or further training, on-the-job training, seminars, distance learning, evening classes, self-learning, etc. as well as other courses followed for general interest: language, data-processing courses etc.

3.3 Unemployment

Figure 3.14. Unemployment rate in EU15 countries in 1991–2002, per cent

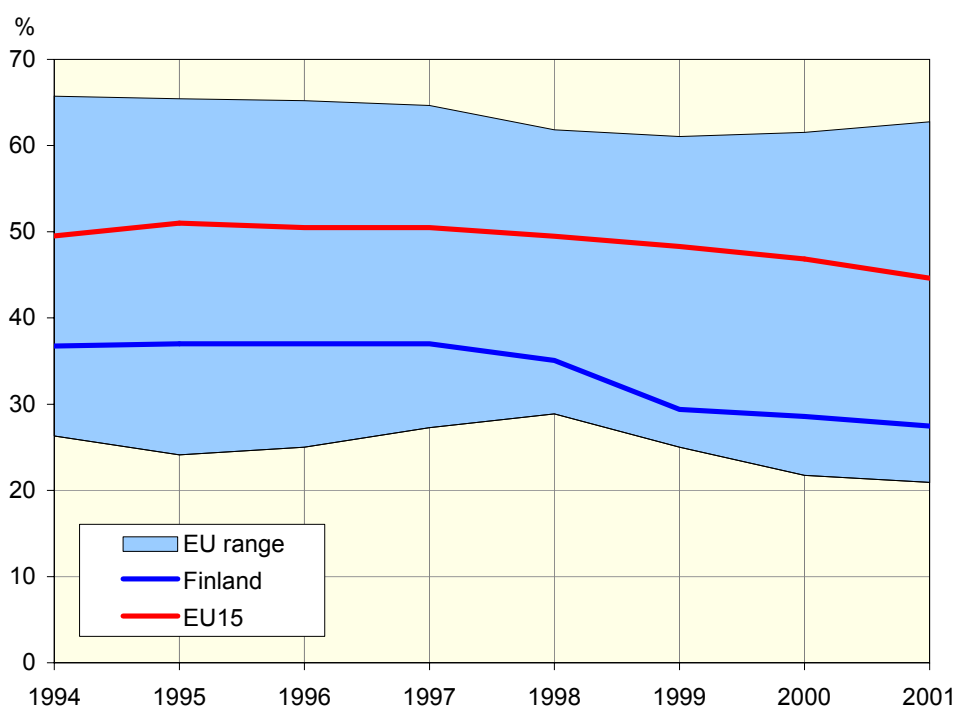


Source: VATT (EU/Employment in Europe).

In 1991 the unemployment rate in Finland was catching up with the EU mean and has since exceeded it. Since 1994, however, Finnish unemployment has rapidly decreased, while the EU average has diminished only slowly.

Unemployment rates vary greatly among EU countries. Spain has had the highest unemployment rate since 1993. In 2002, the Spanish unemployment rate was more than four times that of the Netherlands, the lowest in the EU.

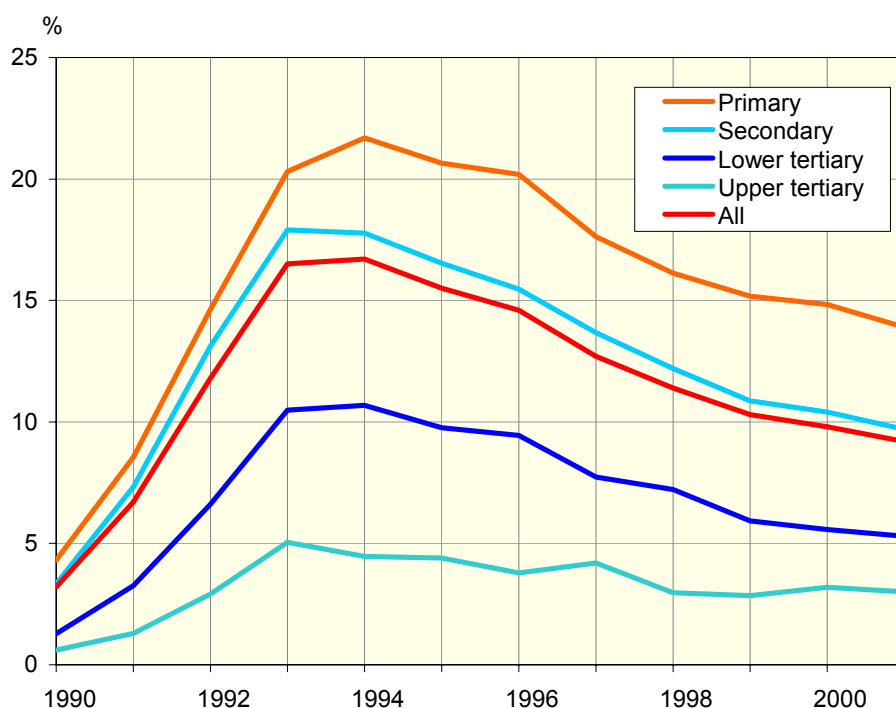
Figure 3.15. Long-term unemployed in EU15 countries in 1994–2001, per cent of unemployed



Source: VATT (EU).

In the EU, 40% of the unemployed persons, on average, have a history of more than a year of continuous unemployment. The share has lessened somewhat in recent years. At its highest, the share of long-term unemployed persons amounts to over 60 per cent in Italy. Belgium also has high long-term unemployment. The lowest shares are in Sweden and Denmark, while Finland ranks fifth lowest.

Figure 3.16. Unemployment rates by level of education in 1990–2001, per cent

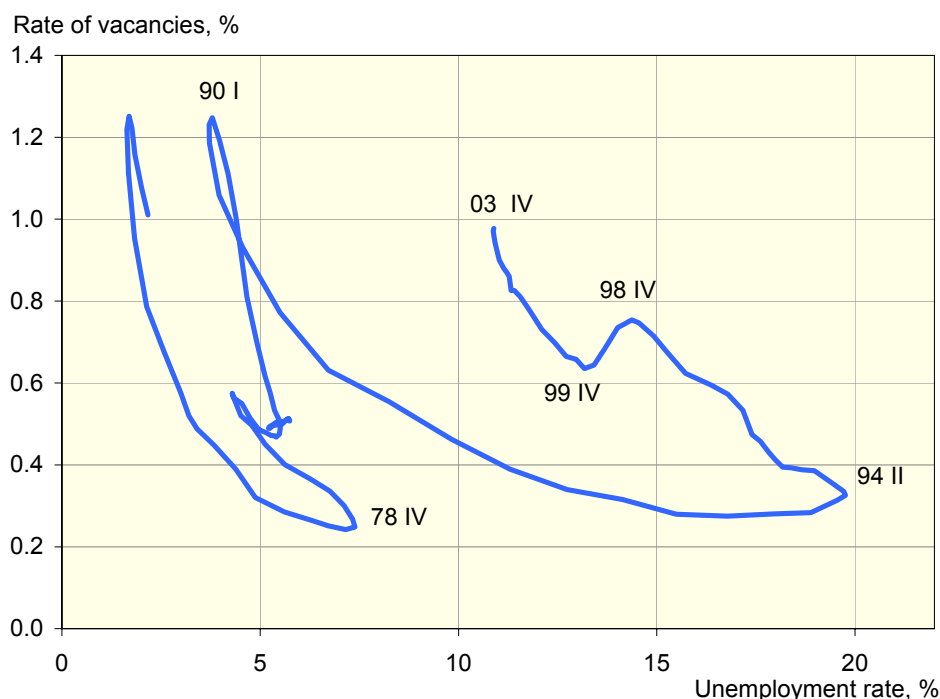


Source: Statistics Finland.

At the beginning of the 1990s unemployment rates were low at all education levels: around 5 per cent for persons with primary education but less than 1 per cent for upper tertiary graduates. During the depression the total unemployment rate grew fivefold. The unemployment rate of those with only primary education peaked at 22 per cent, from which it has come down to 14 per cent. Those with lower or upper tertiary education faced an eightfold increase in unemployment rates – up to 10 and 5 per cent respectively. From these levels their unemployment rates have gradually lowered to 3–5 per cent. The gap between the unemployment rates of the least and the most educated groups has widened from 4 per cent at the beginning of the 1990s to the current 11 per cent.

3.4 Functioning of labour markets

Figure 3.17. Rate of vacancies and unemployment rate in Finland in 1973/4–2003/4, moving average of four quarters



The vacancy rate corresponds to the ratio of vacancies in the public employment service statistics to the total of the vacancies and the employed. The unemployment rate is calculated as the proportion of unemployed job-seekers (compiled by the Ministry of Labour) to the total of the unemployed and the employed.

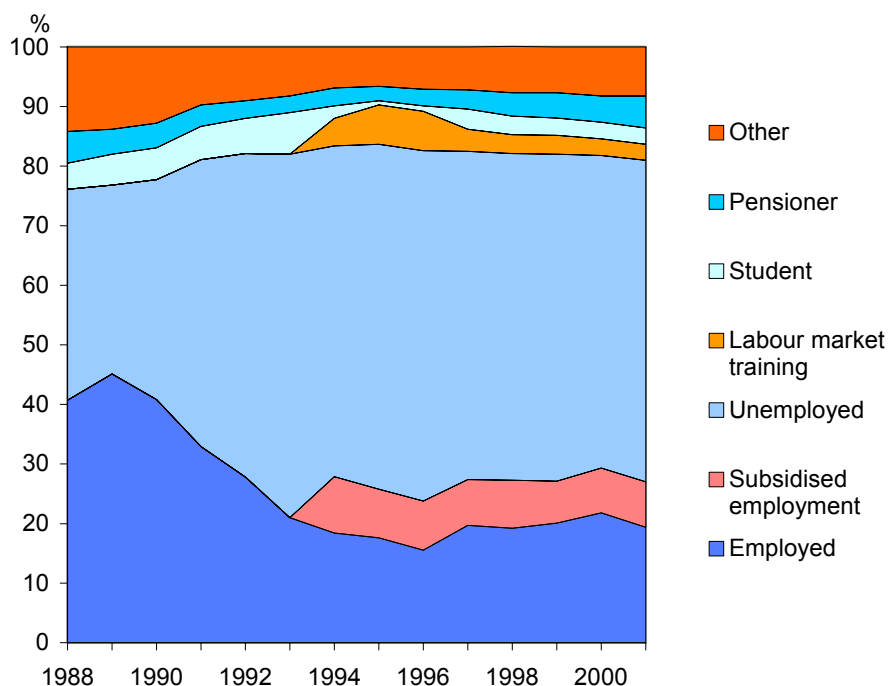
Source: Ministry of Labour.

The relation of the vacancy rate to the unemployment rate is considered as an indicator of structural labour market problems. If a certain vacancy rate couples with a higher unemployment rate than earlier (the curve moves further from the origin), structural problems have worsened. The figure shows this to have occurred both at the end of the 1970s, when unemployment fell after a recession, and in the mid-1990s, during the recovery from the depression of the early 1990s.

In 1999 the curve turned towards the origin, i.e. the unemployment rate diminished simultaneously with the vacancy rate. This reflects a faster fill-up rate of vacancies, which in turn implies that structural problems were, at least, not worsening. At the beginning of the year 2000, the direction of the curve

seems to have turned again as the durations of vacancies started to lengthen after 1999. In 2001 the market share of employment service also dropped.

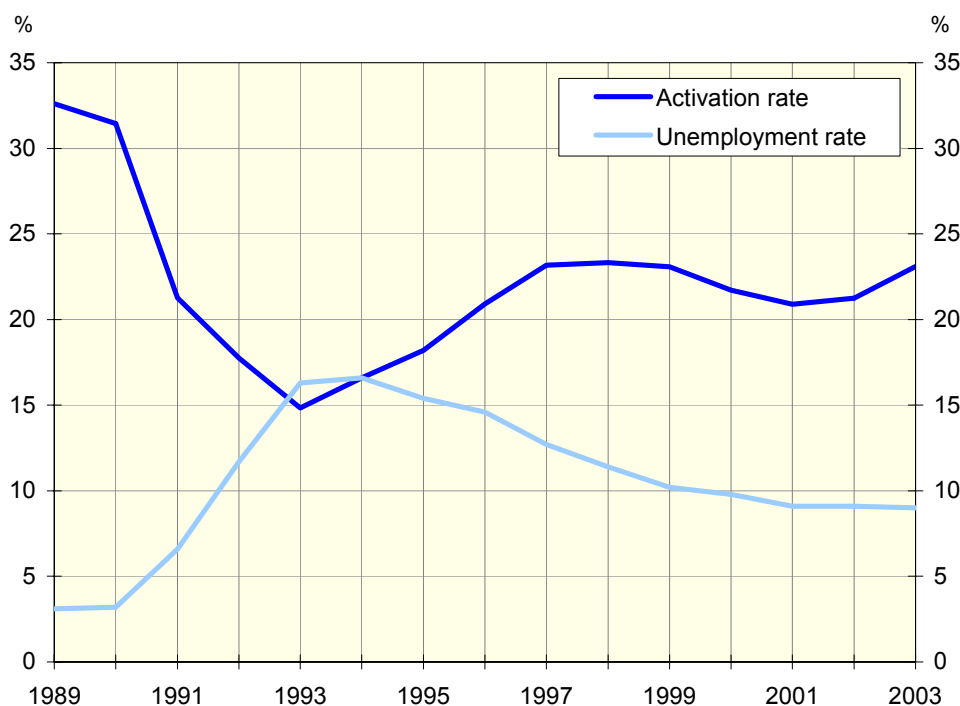
Figure 3.18. Labour market status at the end of the years 1988–2001* of those unemployed a year earlier, per cent



Source: Statistics Finland.

At the end of the 1980s the probability of exiting unemployment was high in Finland. More than 40 per cent of the unemployed found work in the open labour market within a year, and, in the case of 25 per cent, unemployment terminated owing to other reasons. During the worst years of the depression only 20 per cent of the unemployed exited to employment. Other reasons terminated unemployment for another 20 per cent. Even since then the probability of exiting unemployment has improved only a little. About half of the unemployed are still (or again) unemployed after a year, a fifth of them have found work in the open labour market, almost a fifth have left the labour market, and the rest participate in ALMP measures. Exiting to the open labour market became slightly easier at the end of the 1990s but grew more difficult again in 2001.

Figure 3.19. Unemployment rate and activation rate in 1989–2003, per cent



Source: Statistics Finland and Ministry of Labour.

The unemployment rate corresponds to the Labour Force Survey of Statistics Finland. The activation rate is the ratio of participants in active labour market (ALMP) measures to the total number of unemployed job-seekers and participants in those measures.

The activation rate of the unemployed fell during a period of rapid growth in unemployment at the beginning of the 1990s. After that it rose again to reach a level of 23 per cent by the year 1997. As unemployment fell at the end of the 1990s and the beginning of the 2000s the volume of ALMP measures was cut. In 2001 the activation rate was down to 21 per cent. As unemployment threatened to grow, the volume of measures was raised again.

When the labour market situation of the participants in ALMP measures is considered 3 months after the completion of a measure, 48 per cent of those in subsidised jobs were unemployed in 1998, and 52 per cent in 2003. Among the participants in labour market training, the share of unemployed persons fell from 48 per cent to 44 per cent. The figures may reflect changes in the effectiveness of the measures, as well as changes in groups of participants.

4 Taxation

In the 1980s the total tax revenue as a percentage of the GDP remained in Finland at the level of 40 per cent, i.e. at the EU15 average level. In the 1990s the ratio of tax to GDP rose to over 45 per cent. In 2003 it has fallen to 44 per cent. The Finnish tax to GDP ratio is still the third highest among EU15 countries and it exceeds the EU15 average by about five percentage points.

Personal income taxes and social security contributions form a considerably higher share of the total tax revenue in Finland than in the EU15 countries on average. This is partly a result of the fact that tax expenditures have been removed, or that they have been compensated for through transfers of income. The ratio of tax expenditures to the tax revenue has indeed halved in Finland since the end of the 1980s as a result of reforms. Most income transfers to households are also taxable, which raises the tax ratio.

In Finland the tax wedge of the labour costs is higher than the average of the EU15 countries. Especially the marginal tax rates are high.

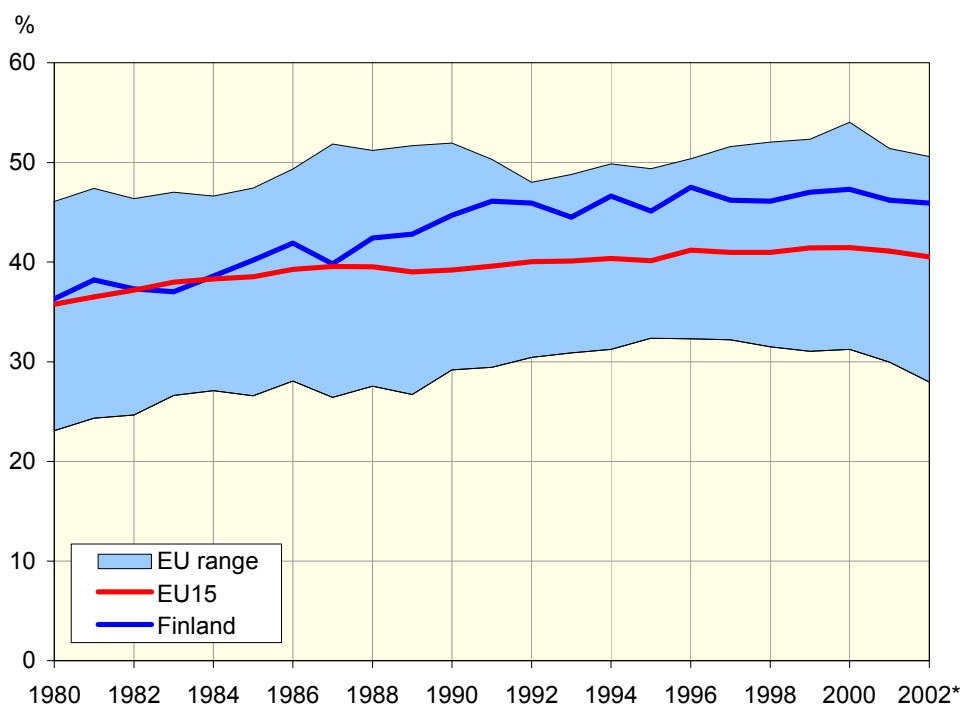
In Finland, personal income taxes are higher than the EU15 average for all types of families and various income levels. The difference is smallest in the taxation of single individuals on low incomes. It is biggest in those families with small children and only one wage earner with high income. The situation becomes more balanced if one takes into account transfers of income to households. If the benefits gained from services produced by the public sector are included, the net earnings of Finnish families changes for the better.

The taxation of profits and capital income in general varies a lot in the EU15 countries. The nominal income tax rate for corporations in Finland is one of the lowest among the EU15 countries. Owing to tax concessions the effective average tax rate in other countries can, however, be considerably lower than the statutory tax rate. Yet the Finnish marginal tax rate for corporate income is very competitive.

Indirect taxation through consumption taxes is record-high in Finland. The value added tax rates are among the highest in the EU15, as are the excise duties on alcohol, fuels and vehicles. On the other hand, taxation on property (incl. real estate taxes) is relatively light.

4.1 Level of taxation

Figure 4.1. Tax to GDP ratio in Finland and the EU15 countries in 1980–2002*, per cent



Source: VATT (OECD/Revenue Statistics and Statistics Finland/Economic Statistics).

In 2002 the total tax revenue as a percentage of GDP in Finland was 45.9 per cent, over 10 percentage points higher than in 1980. While the Finnish tax ratio in the late 1980s was at the EU15 average level, it is now clearly above it. In Finland the tax ratio began to rise faster from the end of the 1980s. At its highest it was 47.5 per cent in 1996, since then the tax ratio has decreased somewhat. Among the EU15 countries the Finnish tax ratio is the third highest after Sweden and Denmark. There remain large differences in the level of tax ratios among the EU15 countries.

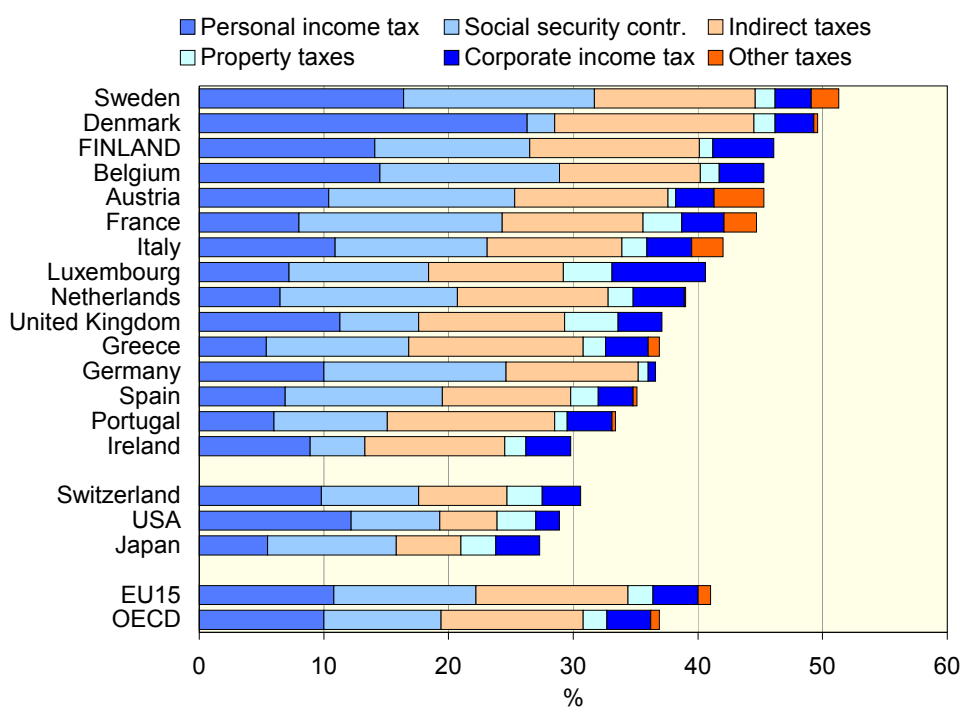
The fluctuations in the Finnish tax ratio reflect partly the changes in the timing of tax refund payments.

Tax ratio = cash basis tax revenue (incl. social insurance contributions) / gross domestic product.

Country-specific comparisons of tax ratios are difficult because of the differing subsidies to individuals and firms across countries. Support given in the form of tax deductions lowers the tax ratio, and a taxable income transfer or subsidy raises it. A general trend in the Nordic countries has been to substitute tax deductions for income transfers, which has led to rising tax ratios and increasing public spending, even though the economic position of taxpayers has not changed. In Finland, by the 1970s, income transfers were made taxable in most cases and in the 1994 family support reform, tax deductions for children were removed while the child and housing allowances were, respectively, increased.

4.2 Tax structure

Figure 4.2. Tax structures in 2001, per cent of GDP



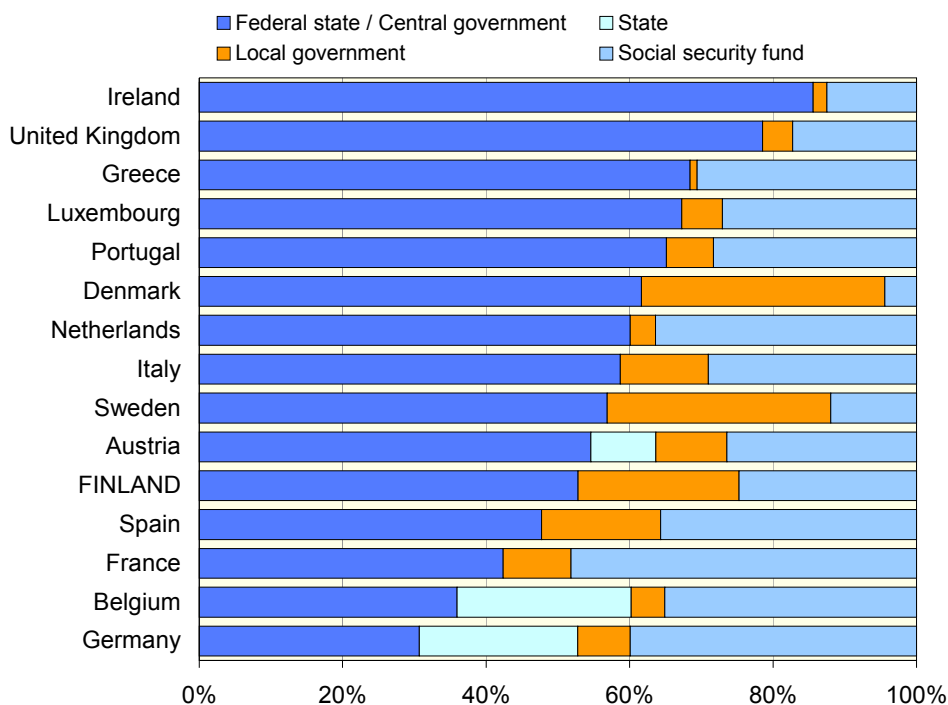
Source: OECD/Revenue Statistics.

The differences in tax to GDP ratios between EU15 countries are mainly due to the fact as to how heavily personal income is taxed. The highest income tax plus social security contribution in relation to GDP is in Sweden (32 per cent) and the lowest is in Ireland (13 per cent). Finland ranks fourth in this comparison, after Sweden, Belgium and Denmark. The share of corporate income tax in GDP in Finland is (after Luxembourg) the second highest in the EU15, at 4.9 per cent. Taxes on property (i.e. taxes on wealth, real estate tax

and inheritance tax), on the other hand, form the fourth least share of GDP in Finland.

4.3 Tax recipients

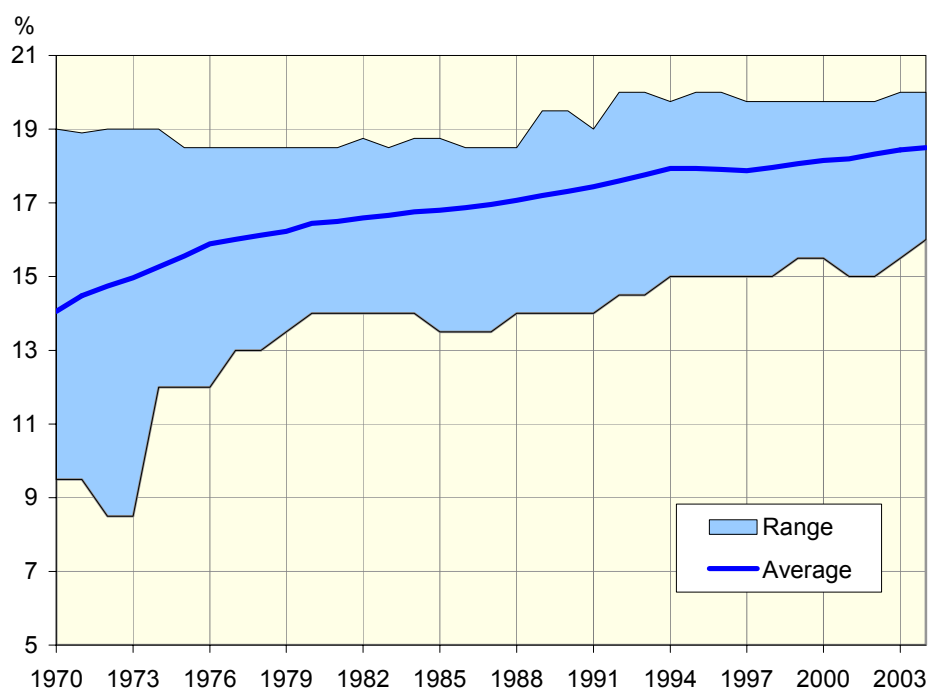
Figure 4.3. Shares of tax revenue by tax recipients in EU15 countries in 2001, per cent



Source: OECD/Revenue Statistics.

The EU15 countries have organised the administration of tax collection and the use of tax revenue in different ways. In Finland and other Nordic countries decision-making regarding large share of taxation and public spending has been decentralised to the lower levels of administration. Municipalities take care of welfare services to a large extent and are, at the same time, important tax collectors. In other EU15 countries the share of local government is smaller. In some federal states, however, individual states are responsible for collecting a part of the taxes. In some countries the social security funds are the biggest tax recipient.

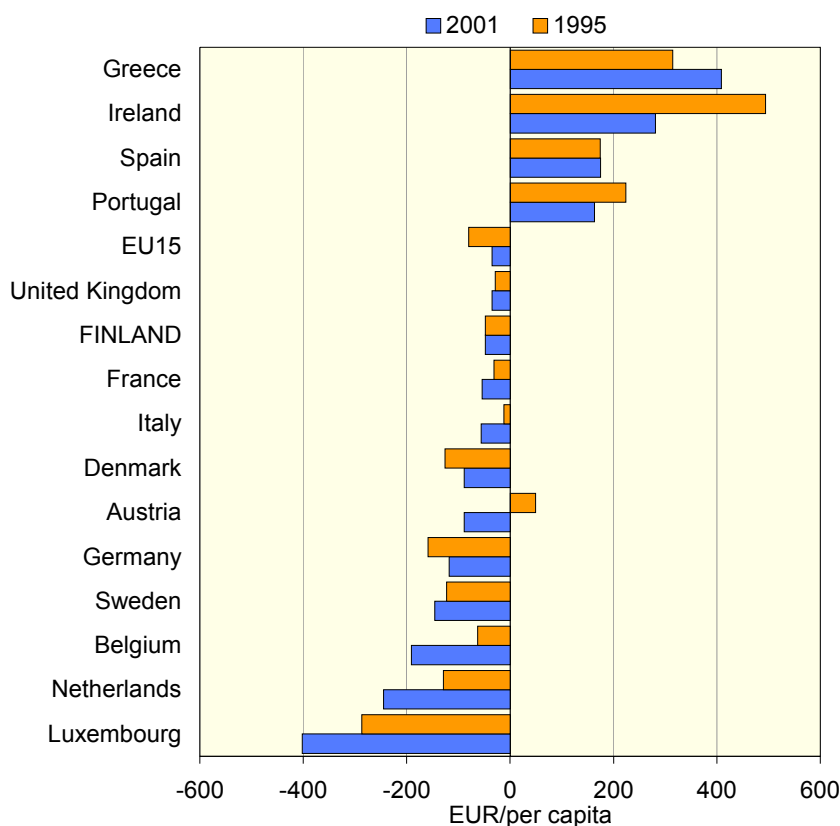
Figure 4.4. Range of municipal tax rates and average tax rate in Finland in 1970–2004, per cent



Source: VATT (Statistics Finland/Municipal Accounts).

The average municipal tax rate rose by over 4 percentage points between 1970 and 2002. The strong rise in the tax rate in the 1970s may be explained by the rapid extension of tasks given to municipalities during the decade. In the early 1980s, on the other hand, the rise in tax rates was quite modest, apparently owing to the state grant system, which was favourable for the municipalities. From the end of the 1980s, tax rates started to rise again with increasing municipal expenditure. The depression in the early 1990s forced the municipalities to raise their tax rates to compensate for the diminishing tax base. After the mid-1990s the average tax rate even decreased slightly, owing to the fast growing tax base and tight management of finances, especially by curbing expenses. At the beginning of the 2000s the average tax rate has risen again, in connection with the halt in the growth in corporate tax revenue as well as the influence of earned income deduction upon tax revenue.

Figure 4.5. The net contributors (-) and net recipients in the EU15 budget in 1995 and 2001, EUR per capita



Source: VATT (Annual reports of Court of Auditors from the budget years of 1995 and 2001, EU)

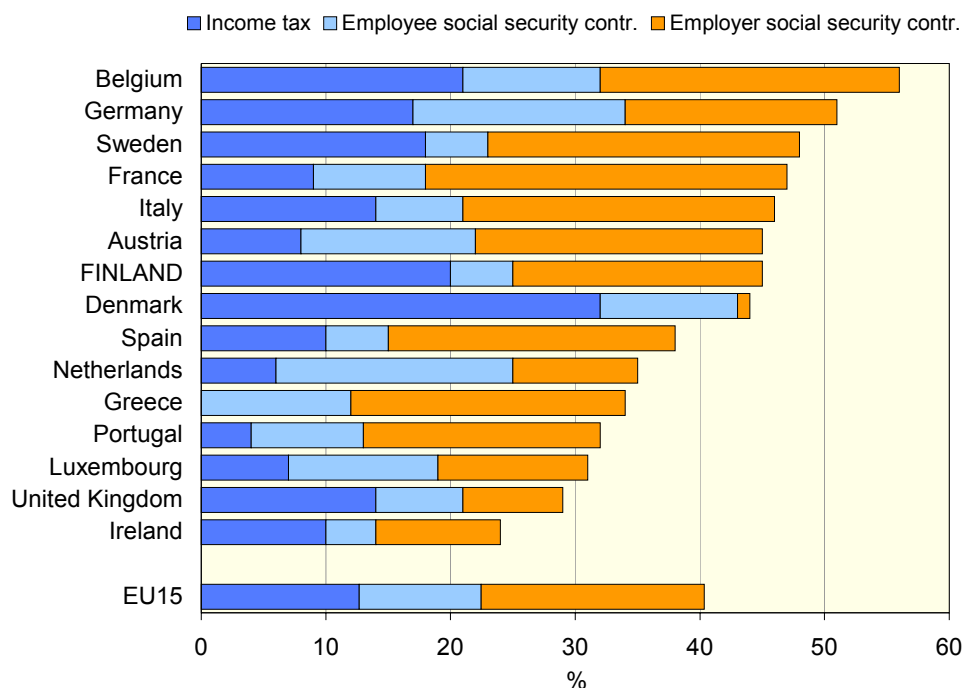
In 2001 the EU15 net recipients were Greece, Ireland, Spain and Portugal. These countries received more in subsidies than what they paid to the EU15 budget. The EU15 membership fees are shared between member countries about in proportion to their GDP. For example, the shares of the total payments to the EU15 budget are only slightly higher in Portugal and Greece than in Finland, although the total population in both of these countries rises to over ten million. Payments per capita are smallest in Portugal and Greece.

Ireland's large net income is mainly due to the large subsidies from the EU15. The country receives both agricultural subsidies and subsidies from the structural fund in considerably greater amounts than the member countries on average. This is also the case in Greece and Spain. The large net income in Portugal is explained by both the large subsidies from the structural fund and small payments to the EU15 budget.

4.4 Taxation of earned income

Tax wedge of earned income

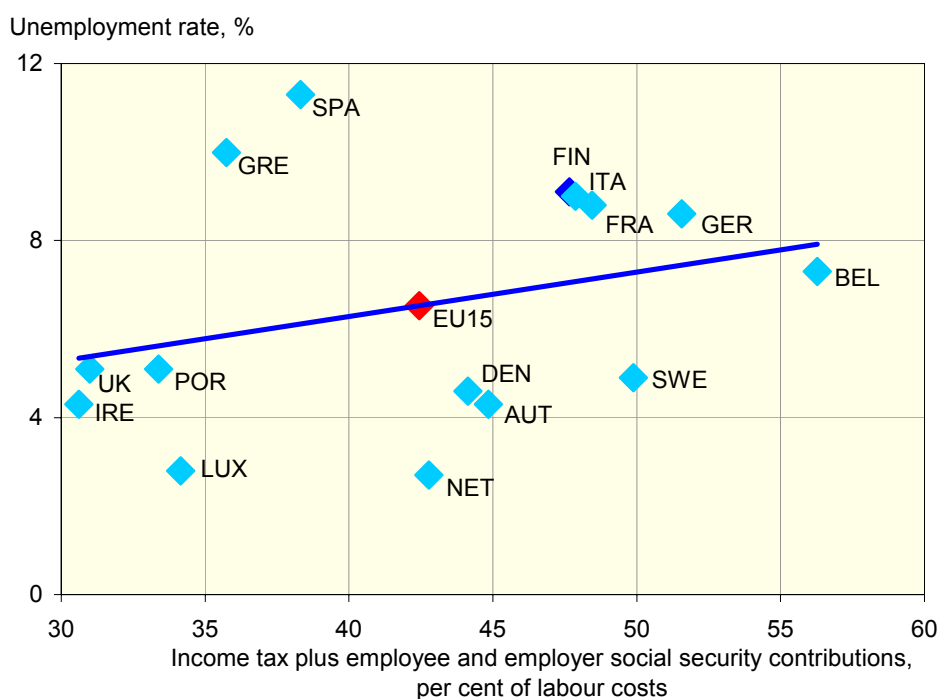
Figure 4.6. Income tax plus employee and employer social security contributions of a single average production worker (APW) in 2002, per cent of total labour costs



Source: OECD/Taxing Wages.

The Finnish taxation of earned income (gross wages and employer's social security contributions) ranks the sixth highest in the EU15 and the tax wedge is 4 percentage points higher than the EU15 average. The lowest tax wedge is in Ireland and United Kingdom and the highest is in Belgium. In Finland, income taxation without the employee's social security contributions is the third highest, as social security contributions are higher in many countries than in Finland. Income taxation of APW is lowest in Greece and Portugal.

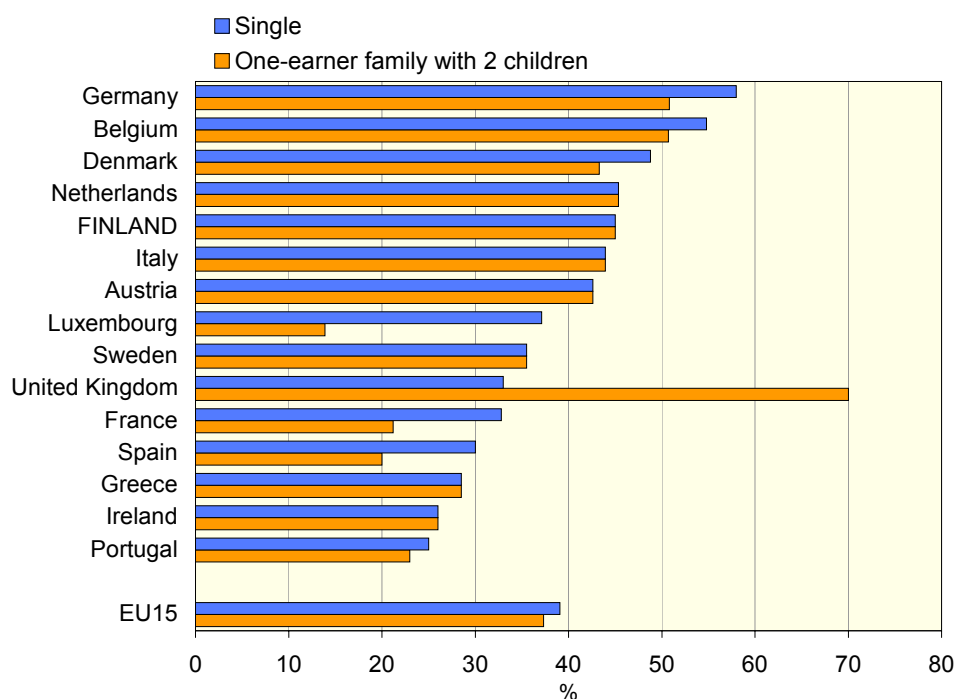
Figure 4.7. Unemployment rate in 2002 and the taxation of earned income at the APW wage level in 1996–2002 on average, per cent



Source: OECD.

In some studies the extent of the tax wedge of the total labour cost has been regarded as explaining the differences in unemployment rates or, at least, structural unemployment rates across countries. However, the tax wedge seems not to have a clear connection to the unemployment rate in the EU15 countries. Nevertheless, the unemployment rate is often lowest in the countries that have a narrow tax wedge. Clear exceptions to this are Spain and Greece, where the unemployment rate should be lower than the actual one because of the fairly narrow tax wedge.

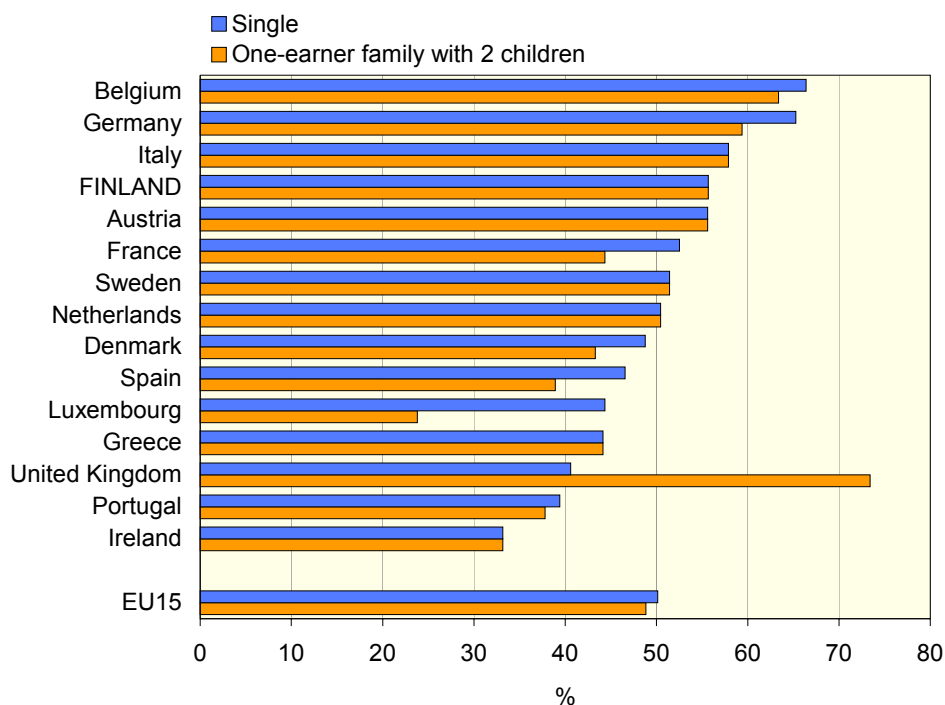
Figure 4.8. Marginal tax rate of gross wages (income tax and employee social security contributions) at the APW wage level in 2003



Source: OECD/Taxing Wages.

In Finland the marginal tax rate of earned income in 2003 was 45 per cent for a single person – 6 percentage points higher than the EU15 average. The EU15 average marginal tax rate for a family with two children and one wage earner was about 2 percentage points lower than for a single person. Support for families via taxation is given in eight of the EU15 countries. In Luxembourg, France and in Spain families with children were given most support. In United Kingdom family support depends on the income and diminishes gradually as the income rises. This system raises the marginal tax rate of a family with children to 70 per cent.

Figure 4.9. Marginal tax rate of the labour costs (income tax, social security contributions for both employee and employer) at the APW wage level in 2003

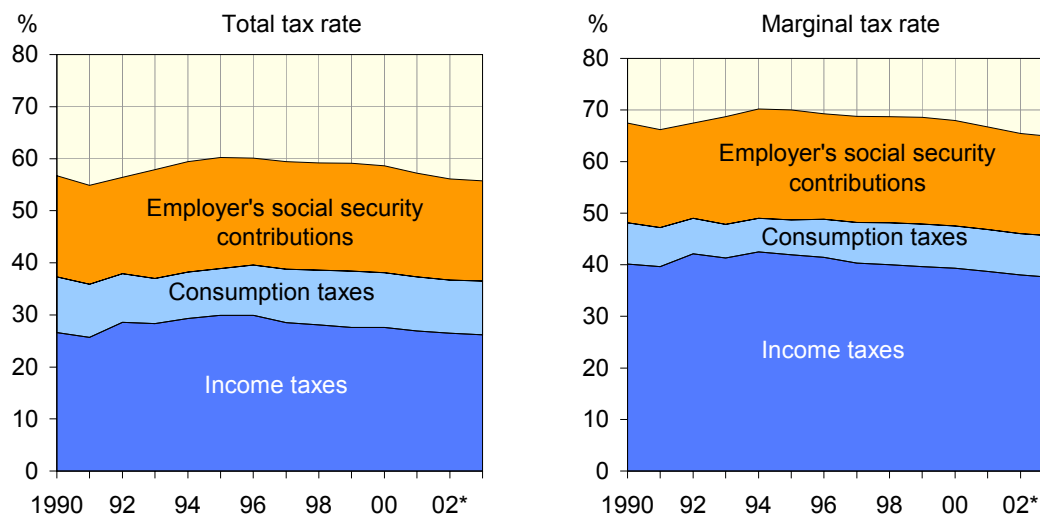


Source: OECD/Taxing Wages.

The marginal tax rate of labour costs is higher than the marginal tax rate for wage costs only because of the employer's social security contributions. In Finland the marginal tax rate of labour costs is 56 per cent, whereas the EU15 average is 50 per cent for single persons and somewhat lower for families.

Tax wedge in Finland

Figure 4.10. Total and marginal tax rates of an average production worker (APW) in Finland 1990–2003*, per cent of labour costs



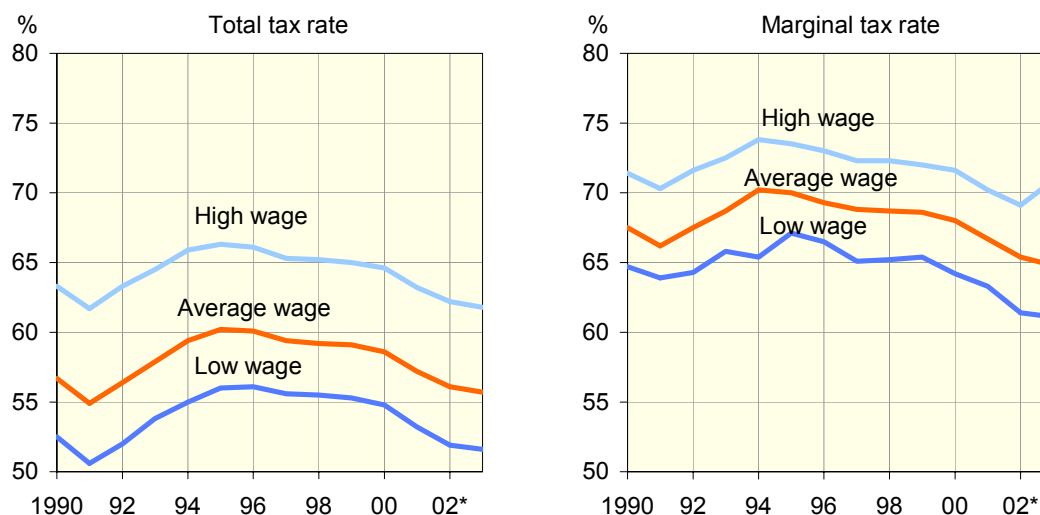
Source: VATT.

The total tax wedge, i.e. the sum of income and consumption taxes plus the employer's social security contribution as a percentage of the total labour costs, grew in Finland until 1995. Since then the wedge has slowly diminished. Changes in the tax wedge are influenced by both a rise in the income level and changes in the tax rules. In most years the average wage level has risen in real terms. Owing to the progressive taxation, the real wage increase raises the income tax rate as such, even if inflation adjustments were made to the income tax schedule and tax deductions.

The tax wedge of the wage increase, i.e. the marginal tax rate, is higher than the income tax rate in the progressive income tax system. A bigger income tax share in the tax wedge, on the other hand, diminishes the net wages disposable for consumption and, consequently, the share of indirect taxes in the tax wedge. The share of the employer's social security contributions of labour costs is the same in both the marginal and the total tax wedges.

The tax wedge of the APW wage increase was about 65 per cent in 2003. During the whole period under consideration it has been about 10 percentage points higher than the respective total tax wedge calculated from the annual income.

Figure 4.11. Total and marginal tax rates of low, average (APW) and high wage production workers in Finland in 1990–2003*, per cent of labour costs



Source: VATT.

The tax wedge of the high wage earner (2 x APW wage) is about 6 percentage points higher than the tax wedge of the APW. The tax wedge of the low wage earner (67% of the APW wage) is about 4 percentage points lower than the tax wedge of the APW. In 1991 the tax wedge was at its lowest in all income levels. Between 1991 and 1995 the total tax wedges rose by 4.6–5.4 percentage points, but after that they began to decrease in all income levels. Marginal tax rates at average and low wage levels are already lower than in 1991.

Tax rate by family type

Figure 4.12. Average income tax rate (taxes and social security contributions, % of wages) by family type and income level in 2002



100 = Average production worker's (APW) wage.

67 = Wages 67% of APW wage.

167 = Wages 167% of APW wage.

100-0 = One spouse employed with APW wage, the other at home.

100-33 = One spouse earns APW wage, the other 33% of it.

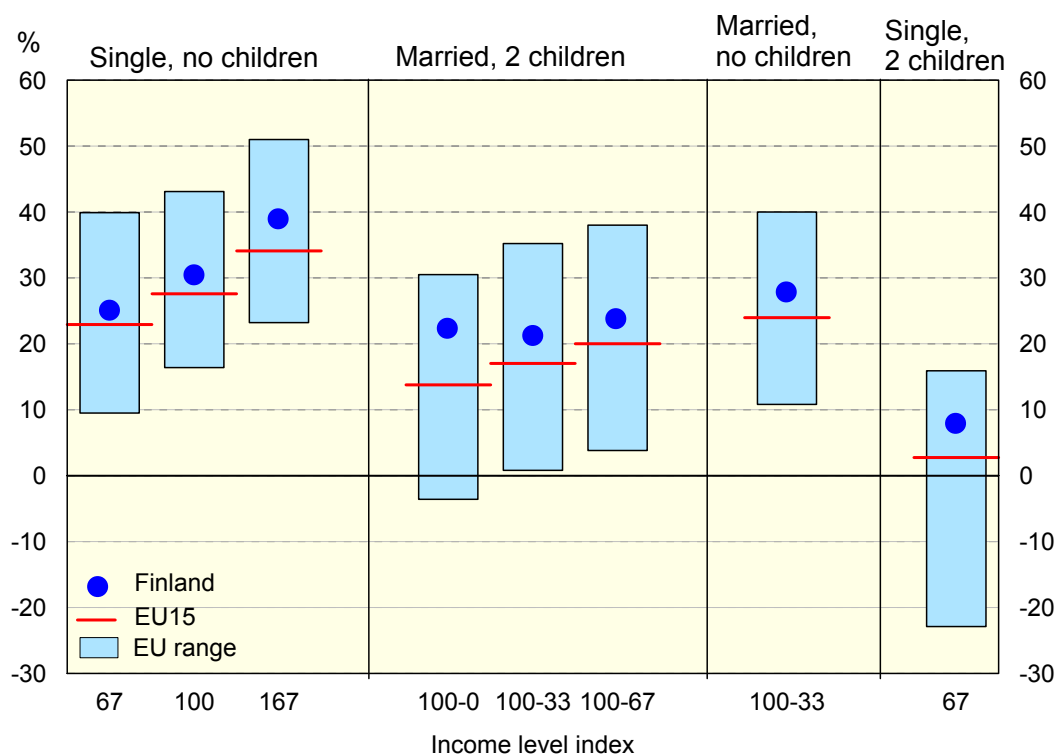
100-67 = One spouse earns APW wage, the other 67% of it.

Source: OECD/Taxing Wages.

Taxation varies in all countries according to both income and type of family. In Finland the tax rates for both single and married persons are higher than in the EU15 on average. The tax rate is calculated as a weighted average of the spouses' tax rates. Finland applies a separate assessment of spouses, which means that the tax rate of the spouse who earns less decreases the couple's tax rate. A corresponding situation obtains in Austria, Greece and Sweden. In countries where joint assessment applies, the effect depends on the configuration of the system. Many countries support low income earners and families by non-wastable tax credits, which are paid to taxpayers in cash to the

extent that the deduction exceeds the tax payable. For this reason the tax rate can be negative.

Figure 4.13. Income tax plus social security contribution less cash family benefits by family type and income level in 2002, as percentage of gross wages



100 = Average production worker's (APW) wage.

67 = Wages 67% of APW wage.

167 = Wages 167% of APW wage.

100-0 = One spouse employed with APW wage, the other at home.

100-33 = One spouse earns APW wage, the other 33% of it.

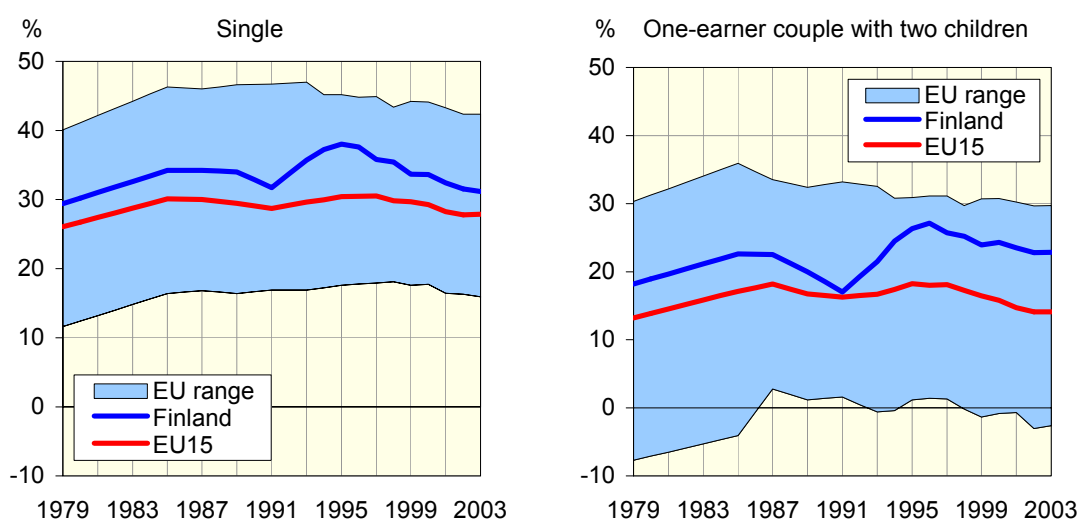
100-67 = One spouse earns APW wage, the other 67% of it.

Source: OECD/Taxing Wages.

The position of different types of family changes somewhat when the cash family benefits are also taken into consideration. Finland's position in relation to the EU15 average remains the same, except for an improvement in the relative position of single parents. Their net tax burden is 5 percentage points higher than the EU15 average, but much heavier in gross terms.

The tax burden of a single person is nearly 10 percentage points higher than that of a married person with children, although the gross tax burdens are equal. This is caused by family benefits, which in Finland are granted as income transfers.

Figure 4.14. Income tax plus social security contribution less cash family benefits of a single person and of a one-earner couple with 2 children at an APW wage level in Finland and the EU15 in 1979–2003, as a percentage of gross earnings



Source: OECD/Taxing Wages.

Although Finland's tax to GDP ratio ranked near the EU15 average until the end of the 1980s, the net tax burden of wage earners (taking the income transfers into account) has been constantly higher. In the case of single persons the difference from the EU15 average has grown except in the recent years. In 2003 the net tax rate of a single person exceeded the EU15 average by 3 percentage points. The tax burden was at its highest in Denmark and at its lowest in Ireland.

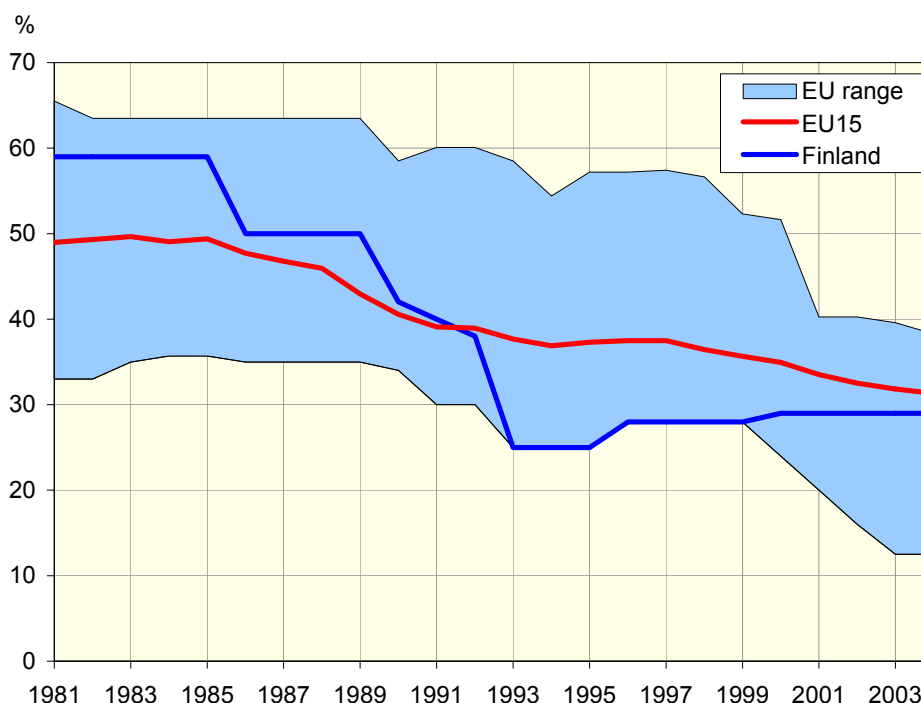
The net tax burden of persons with families is also heavier than in the EU15 on the average and in their case the difference from the EU15 average has grown particularly strongly. At the beginning of the 1990s Finland nearly reached the EU15 average, but in 2003 the gap was 9 percentage points. Differences within the EU15 are wide, and have narrowed little during the last ten years. The tax burden is at its highest in Denmark and at its lowest in Luxembourg, where received income transfers exceed taxes that have been paid. In Ireland the tax rate is also negative. The EU15 average net tax rate for persons with a family is

nearly 14 percentage points lower than that of a single person. In Luxembourg the gap is 25 percentage points.

In part the differences reflect the different roles of public services across countries, as net tax revenue is mainly used for these services. In addition the structure of taxation is shown in the differences. In some countries the bulk of tax revenues accrues from sources other than personal income tax.

4.5 Corporate and capital income taxation

Figure 4.15. The statutory corporate tax rates of retained profits in the EU15 countries in 1981–2004, per cent

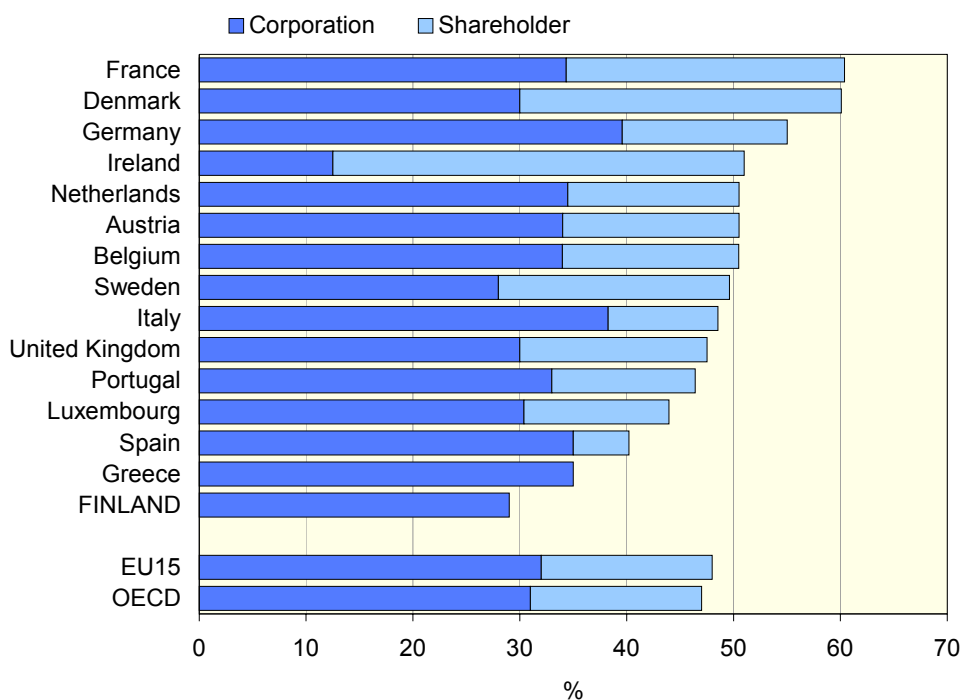


Source: KPMG.

In 1981 the Finnish corporate tax rate was the 3rd highest (59 per cent) in the EU15 after Germany and Austria and 10 percentage points higher than the EU15 average. In a couple of decades the statutory tax rate has fallen most in Finland after Ireland, i.e. 30 percentage points. During 1993–1999 the Finnish corporate tax rate was lowest in the EU15, even though it was raised from 25 to 28 per cent in 1996. In 2000 the tax rate was further raised to 29 per cent, while most other countries had decided to lower their corporate tax rates. The Finnish corporate tax rate is still 3 percentage points below the EU15 average. The

average EU15 tax rates have fallen by 18 percentage points but the difference between the highest and the lowest rate is still about 25 percentage points.

Figure 4.16. The highest marginal tax rate for distributed profits in 2003, per cent

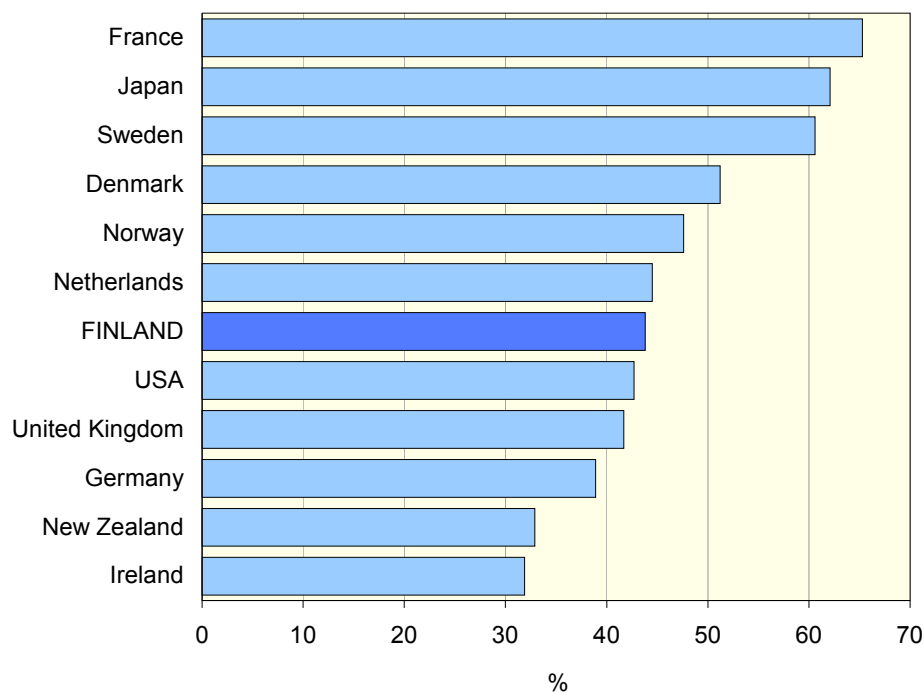


Source: VATT.

Finland had the lowest total tax burden for distributed profits among the EU15 countries in 2003. The profits are taxed only once, whereas both corporation and shareholder are eligible to pay taxes on distributed profits in most EU15 countries. In corporations other than listed corporations the Finnish shareholder can also become liable to pay taxes if a part of the dividend income is taxed as earned income. Finland applies the dual income system, whereby the dividend income is divided into capital income and earned income on the basis of the firm's net wealth. The pure statutory tax rates do not give the right picture of the effective tax burden. Several countries have a varied range of tax concessions that lower both the statutory corporate tax rate and the shareholder's dividend income tax rate. The concessions for shareholders often concern smaller dividend incomes. The highest marginal tax rate mainly describes the high income shareholders' tax burden.

In the Netherlands dividend income is tax-exempt and the taxation of capital income is replaced by taxation of the imputed rent on net wealth in personal taxation. A withholding tax is, however, yet imposed on dividend income but it is credited against the tax in the taxation of net wealth. This withholding tax is included in the calculations.

Figure 4.17. The effective marginal tax rate for domestic real investments in some countries in 2003, per cent

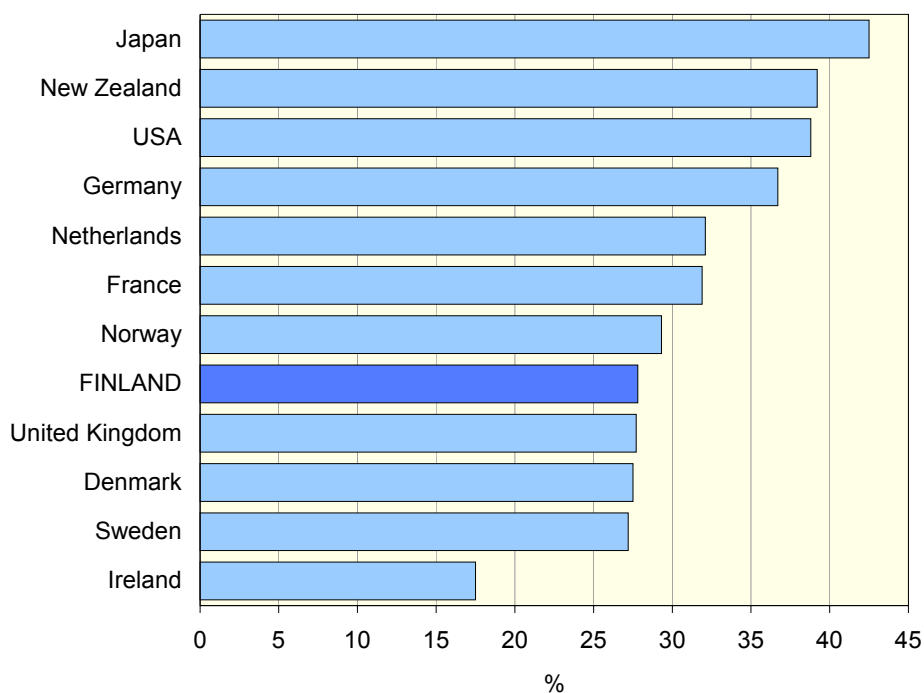


Source: VATT (Hietala).

The effective marginal tax rate (EMTR) of distributed profits – taking into account the taxes of both the corporation and the shareholder – can be calculated as a tax burden on a certain real investment. The lower the EMTR is, the more capital is invested. In Finland the effective marginal tax rate is not particularly low compared with other countries.

The assumptions used in the calculations are as follows: The investor is a private person. The investment is financed by 55% on retained profits, 35% debt and 10% new share issues. The investment consists of machinery (50%), buildings (28%) and inventories (22%).

Figure 4.18. The effective average tax rate of inbound investments from certain countries in Finland in 2003, per cent



Source: VATT (Hietala).

The tax incentives for direct investments are often described by the effective average tax rate (EATR) on investment. The tax burden for the investment made in Ireland is 18 per cent, and it is clearly the most advantageous investment country. For almost half of the countries described above, Ireland would be the best place as an investment location. Finland does not especially invite foreign direct investments more than other countries do.

In the calculations the tax burden of investment made by a foreign parent company in a subsidiary in the destination country is described. The tax burden in the figure is calculated as the average tax burden of the investments (EATR) made from other countries to the destination country. The investment is financed by retained profits (1/3), debt (1/3) and new share issues (1/3) from the subsidiary. The investment consists of machinery (50%), buildings (28%) and inventories (22%).

4.6 Indirect taxation

Table 4.19. Value added tax rates in the EU15 countries 1.5.2003

	Standard rate	Reduced rate	Super reduced rate ¹⁾	Zero rate	"Parking rate" ²⁾
Minimum tax	15	5			12
Denmark	25	-		X	
Sweden	25	6 and 12		X	
FINLAND	22	8 and 17		X	
Belgium	21	6		X	12
Ireland	21	13.5	4.3	X	13.5
Austria	20	10		X	12
Italy	20	10	4		
France	19.6	5.5	2.1		
Netherlands	19	6			
Portugal	19	5 and 12			
Greece	18	8	4		
United Kingdom	17.5	5		X	
Germany	16	7			
Spain	16	7	4		
Luxembourg	15	6	3		12

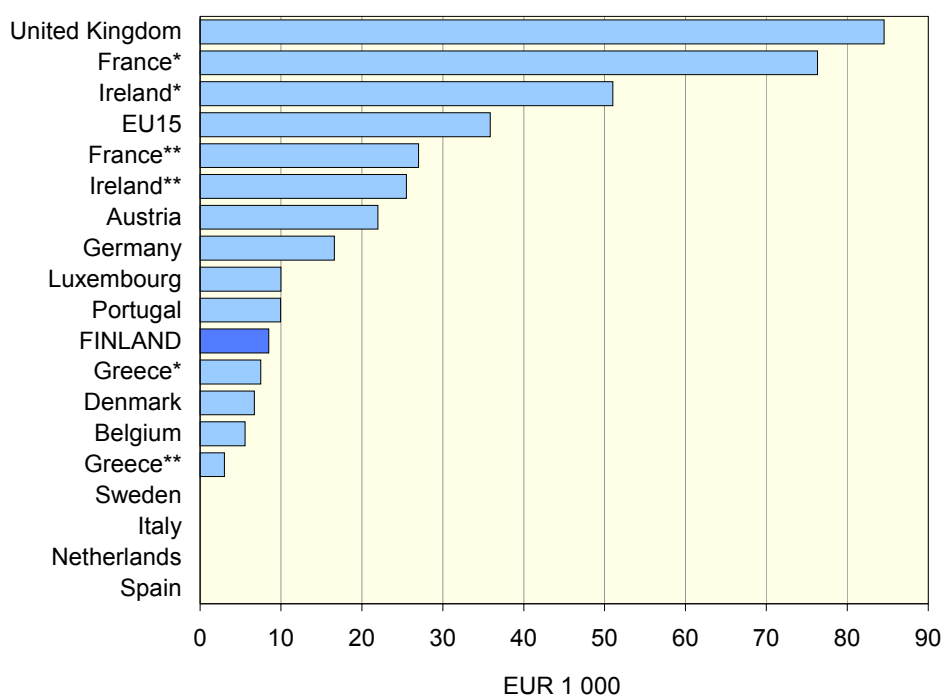
1) Allowed by the Access Treaty

2) Temporary tax rate for articles moving to the new tax rate

Source: EU.

The Finnish standard value added tax rate is the 3rd highest among the EU15 countries. The reduced tax rates are also fairly high in Finland compared with other countries. According to the value added tax directive in the EU15, only two reduced rates are accepted. Belgium, Denmark, Ireland, Finland, Sweden, Austria and the United Kingdom have zero rates for certain articles, which means that the goods or services are sold to the end user without tax, but the tax, included in the factor input, is refunded to the seller.

Figure 4.20. The lower limit of the turnover in the value added taxation in the EU15 countries in 2002, EUR 1 000



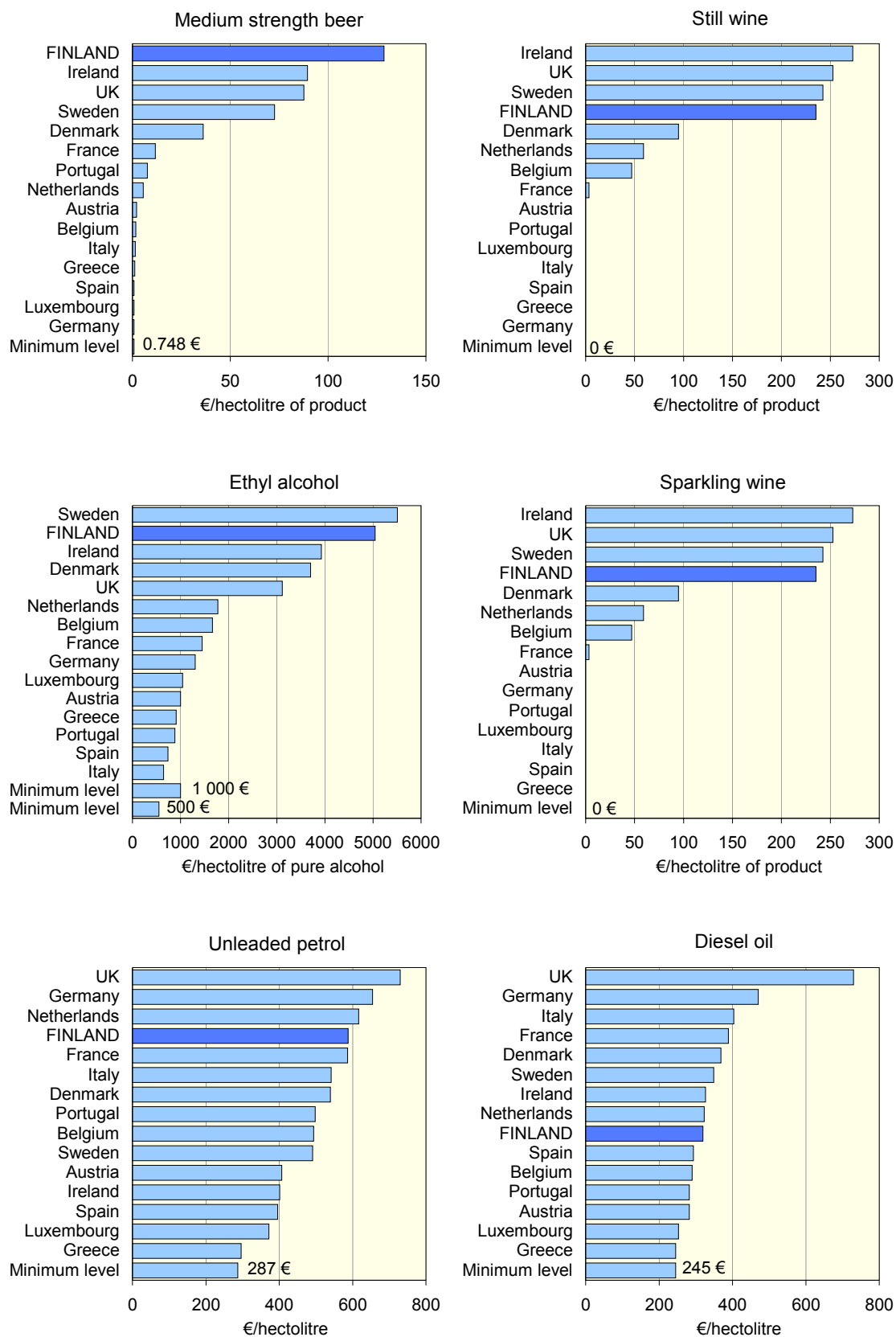
* The lower limit for goods.

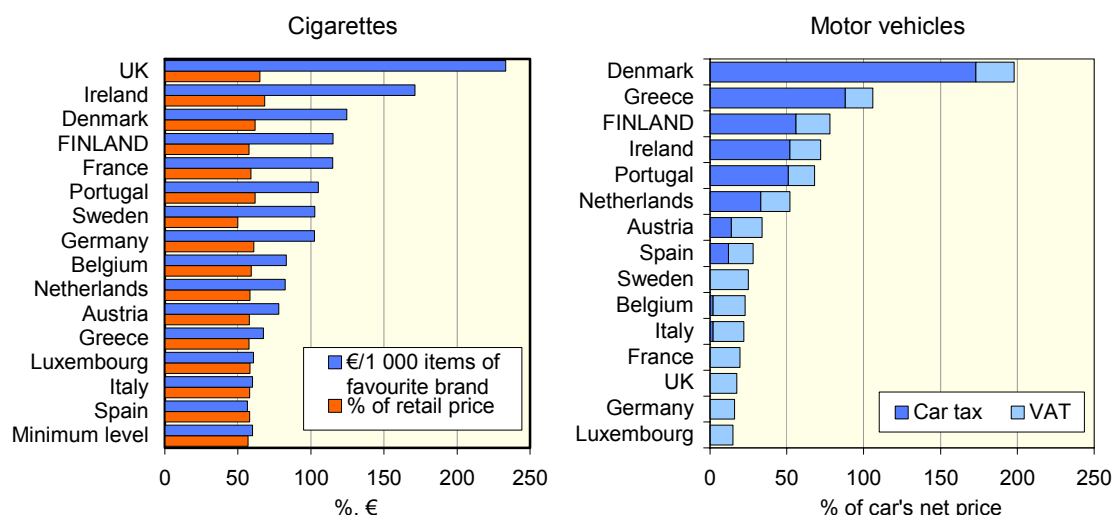
** The lower limit for services.

Source: BDO International.

In most countries that apply value added taxation the enterprise becomes liable to this taxation when the turnover exceeds a certain limit. A part of the smallest enterprises is tax-exempt for administrative reasons. The limits for the turnover are on different levels across countries. In the EU15 countries the limit for the taxable turnover varies from zero to 84 500 euros. The highest limit is in the United Kingdom. Even those countries which have no special turnover limits give small firms value added taxation relief in some other way. In Finland the limit for the taxable turnover is one of the lowest in the EU15.

Figure 4.21. Excise duties in the EU15 countries in 2003





Source: European Commission. ACEA. Figures for motor vehicles are from the year 2002.

Ethyl alcohol: EUR 1 000 is the minimum level for countries where the tax level exceeded EUR 1 000 in 1992. Even the countries where the tax level at that time was lower than 1 000 are no longer able to lower the tax level.

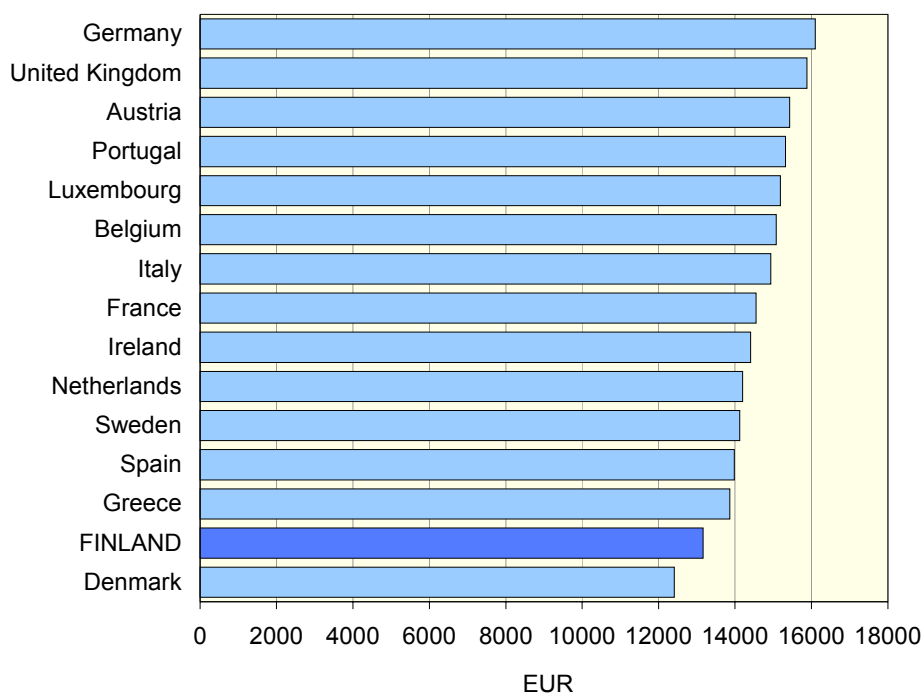
Cigarettes: According to Directive 2002/10/EC the minimum excise duty is 57% of TIRSP (Retail selling price, all taxes included) and at least EUR 60/1 000 items, or EUR 95/1 000 items. If the member state applied a tax level of less than EUR 60/1 000 items on 1 July 2001, the directive may be adopted as late as the end of 2004. Spain and Greece are permitted to postpone the adoption until 31.12.2007.

Unleaded petrol: The comparison is based on the cheapest 95 octane petrol.

Motor vehicles: Car tax must be paid when a new vehicle is purchased (which does not include the annual vehicle use tax).

With the exception of diesel oil the excise duties of Finland are above the EU15 average. The taxation of beer and ethyl alcohol is especially stringent. Motor vehicle taxation became lighter at the end of 2002.

Figure 4.22. The average before-tax prices of certain* passenger cars in the EU15 in 2003, EUR



Source: European Commission.

*The comparison includes the same car models as in Table 4.23.

Figure 4.22 presents a comparison of the average before-tax prices of ten car models in EU15 member states. The highest prices are in Germany and the UK, where car prices include the extra costs of right-hand steering. The lowest before-tax car prices are found in Denmark, Finland and Greece – that is to say, in member states where the taxes on acquisition of the car are the highest. Most manufacturers set their prices low in these countries in order to keep the retail price of the car within reason. High car taxation seems to reduce the manufacturer's prices, but the effect of light taxation is not as obvious. In Germany and the UK the taxes are low but before-tax car prices are high; in France and Luxembourg car prices are on the level of the EU15 average in spite of light taxation. In Sweden both taxation and before-tax car prices are fairly moderate while both are high in Portugal.

Table 4.23. Before-tax prices of various private cars in the EU15 countries in 2003; index(lowest price in the euro area)=100

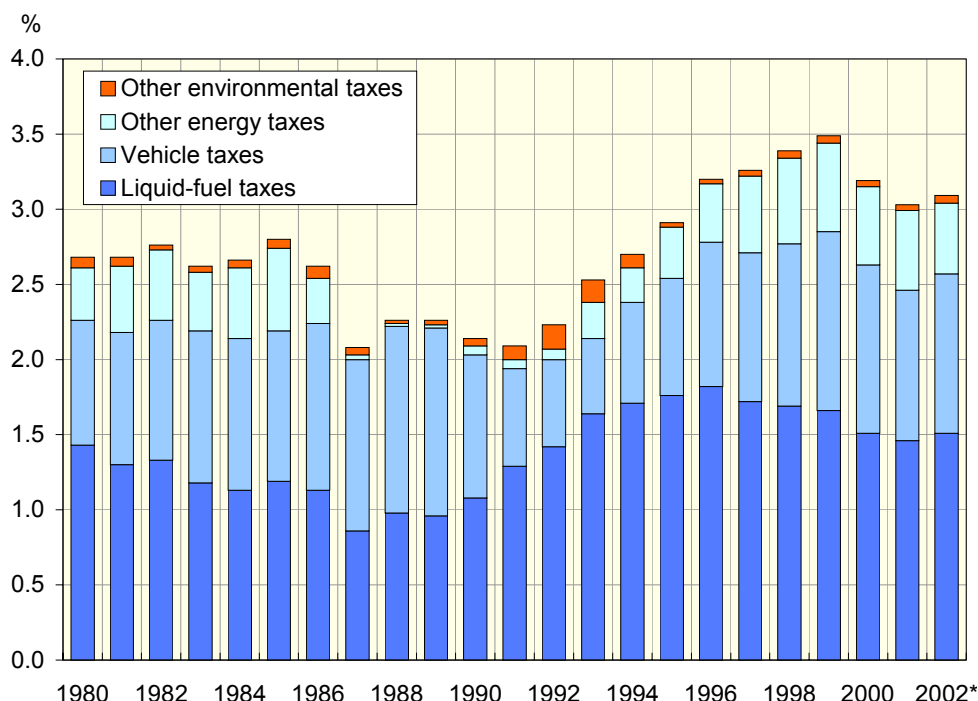
	VW Golf	Opel Astra	Toyota Corolla	Nissan Almera	Ford Focus	Peugeot 406	Renault Laguna	Volvo S40	Saab 9-5	Mercedes E 220
Euro area										
Austria	121	123	118	118	115	133	118	114	135	100
Belgium	124	110	111	114	117	135	122	103	133	100
Germany	132	119	120	132	127	142	127	115	135	100
Spain	125	100	105	109	100	118	112	103	121	101
France	121	102	111	119	102	126	116	101	132	100
FINLAND	100	104	100	114	106	104	110	106	100	102
Greece	103	102	107	100	104	100	107	104	139	102
Ireland	111	109	122	124	116	106	100	100	135	101
Italy	126	101	107	110	108	136	117	110	137	102
Luxembourg	132	110	111	114	117	135	122	104	133	100
Netherlands	123	113	106	113	106	114	109	101	125	102
Portugal	121	126	118	113	105	119	120	122	138	103
Other EU15 countries										
Denmark	102	99	90	97	94	88	95	83	124	101
Sweden	122	123	107	123	109	107	113	103	112	97
United Kingdom	126	117	126	146	131	131	128	102	132	100

Source: European Commission.

The pricing policy of car manufacturers differs greatly in member states. The biggest price range is in Peugeot and Saab. The latter delivers cars to Finland at particularly low prices. Mercedes-Benz has the smallest price difference. The price profiles of cheaper makes hardly deviate from one another. The comparison includes car models in all size classes.

4.7 Environmentally related taxes

Figure 4.24. Revenues from environmentally related taxes in Finland in 1980–2002*, per cent of GDP

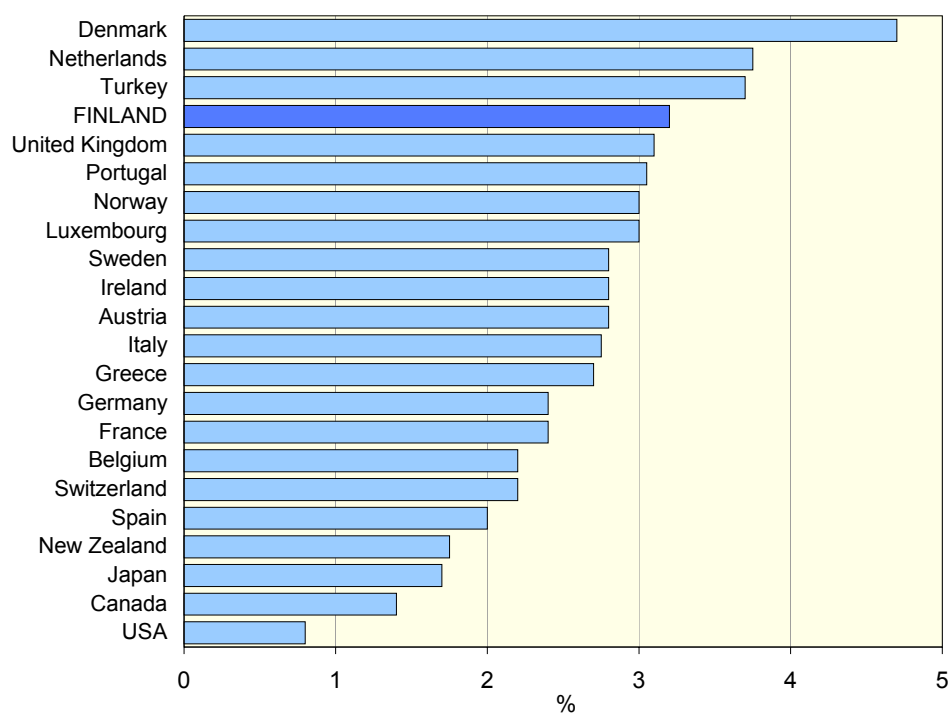


Source: Statistics Finland.

The ratio of environmentally related taxes to the GDP increased in Finland throughout almost the whole of the last decade. Despite the increase in traffic and the number of cars, sales of petrol, however, fell by 3.5% in 2000. One of the reasons was the reduced fuel consumption of new cars, as well as the increase in the share of private cars using diesel fuel. In 2000 income from environmentally related taxes fell, and this trend continued in 2001. In 2002 sales of petrol and diesel oil increased again by about 2%.

In 2002 the ratio of environmentally related taxes to GDP was 3.1%, that is, slightly more than in the previous year. 4.3 billion euros were raised in tax, which was over 4% more than in 2001. Of this amount 2.1 billion was from motor fuel and 0.65 billion from other energy taxes. 64 million euros came from other environmental taxes. Taxes based on vehicles brought in 1.4 million euros.

Figure 4.25. Revenues from environmentally related taxes in some OECD countries in 2000, per cent of GDP



Source: OECD.

The significance of environmentally related taxes varies considerably from country to country. Denmark, the Netherlands and Turkey have their own levels in the use of environmentally related taxes. In countries outside Europe the share of environmentally related taxes is clearly lower.

5 Welfare state and public expenditure

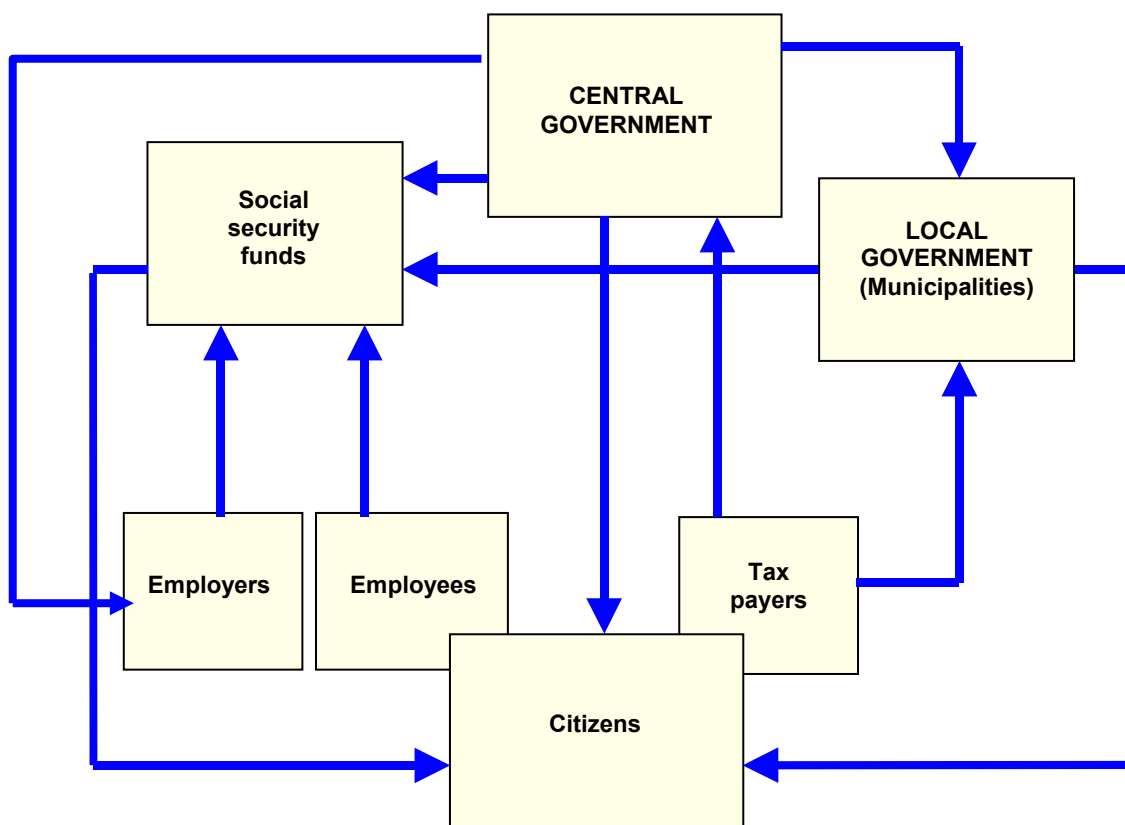
Finland's public sector consists of three pillars: the state, the municipalities and social security funds. The state is the most prominent of the three. Through the state flow the greatest amounts of money, and it transfers part of the revenues that it has collected for the use of municipalities. The state has the main responsibility for adjusting to economic cycles, and for this reason the balance of the central government varies a lot according to business cycle. The development of local government and the social security finances is more stable. In 2003 the central government had a surplus of 0.3 per cent of GDP, and the whole public sector had an EMU surplus of 2.5 per cent of GDP. The social security funds have continued to show a surplus because of the public pension system is partly funding.

The economic crisis of the early 1990s was followed by a period of fiscal consolidation. The real growth in non-cyclical public expenditure was moderate in the 1990s. Expenditures on public consumption and investment now represent a smaller part of the total demand than at the start of the 1990s. The growth of pension expenditure stems from ageing of the population and maturing of the employment pension system. The unemployment expenditure grew at the start of the 1990s, but since then progress has shown a downward trend, following the trend in unemployment. The share of the GDP of public expenditure was 50% in 2003, which was approximately three percentage points more than the EU15 average. There are, however, great differences among the EU15 countries. In Sweden the share was 57%, whereas in Ireland it was 35%.

In Nordic countries welfare services and transfers of income to households are relatively high. Their share of public expenditure is almost two thirds. The welfare services in Finland are primarily produced by the local government.

For many reasons, it is difficult to make an international comparison of financial support to households. In some countries support is given in the form of free services, in some as taxable transfers of income, and in some countries as tax-free transfers of income or as forms of tax relief. In addition, social security systems are managed in some countries by means of a collective insurance system, whereas in others by means of an individual insurance system.

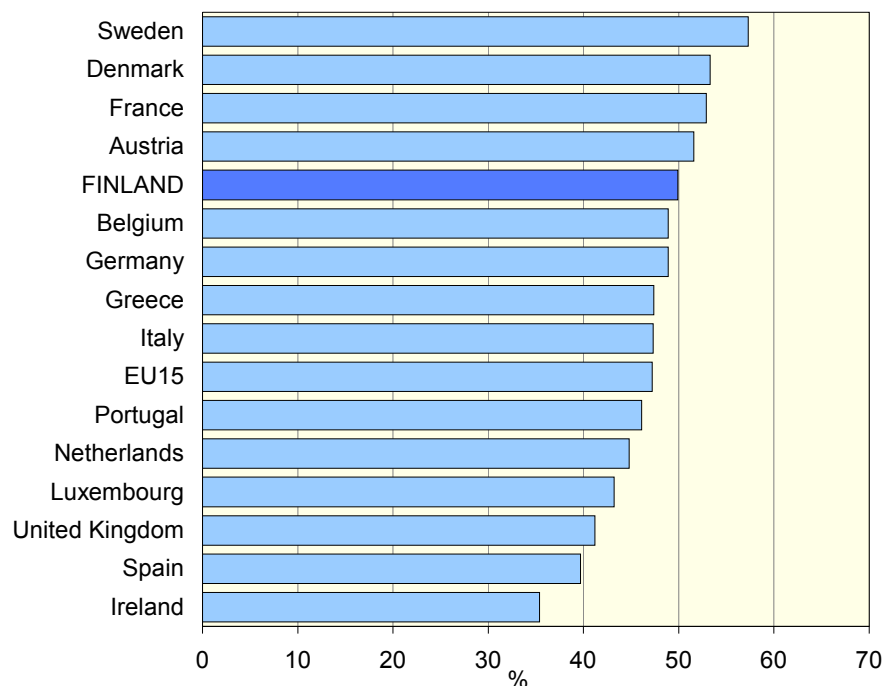
Figure 5.1. Public sector in the Finnish economy



The state and municipalities receive income from taxes and payments. The social security funds, which are the Social Insurance Institute (KELA), the employment pension insurance institutions and the unemployment insurance fund, receive income from social security contributions. The social security funds and the municipalities also receive grants and contributions from the central government. Transfers of money between various organs of the public sector as well as citizens and enterprises are, therefore, manifold and complex.

5.1 Total public expenditure

Figure 5.2. General government expenditure in EU15 countries in 2002*, percentage of GDP

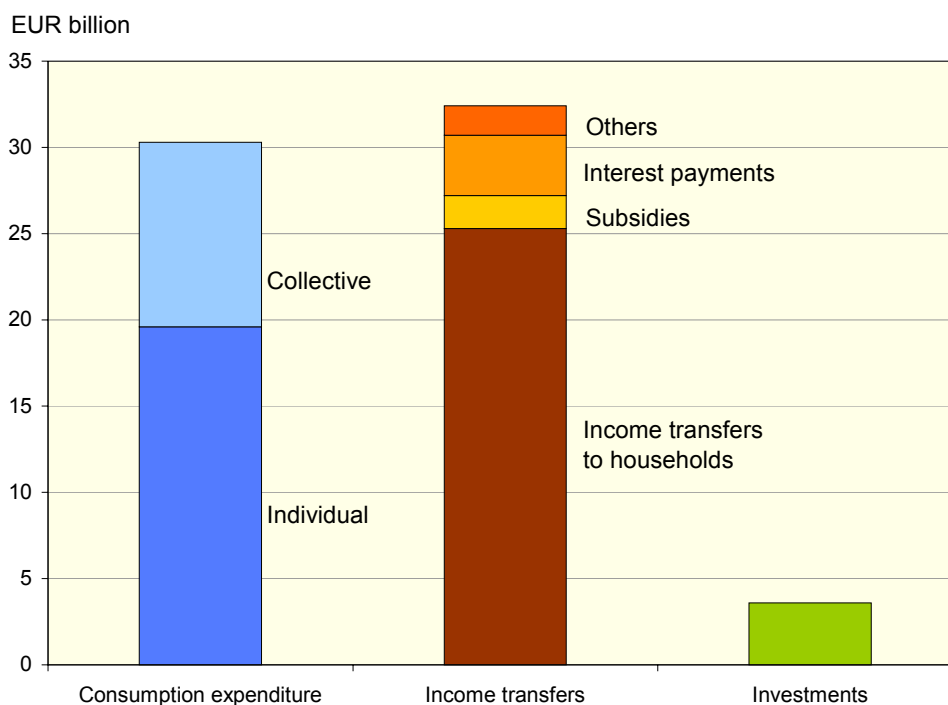


Source: European Commission/Statistical Annex of European Economy/Spring 2002.

The size of the public sector is often depicted by the total public expenditure's share of the GDP. The practice is justifiable when the public sector is examined specifically from the point of view of the costs. In Europe the share of public expenditure has traditionally been higher than in the non-European OECD countries.

In the EU countries an average of 47% of the GDP was spent on public expenditure in 2002. The share varied from 57% in Sweden to 35% in Ireland. Finland's share was about three percentage points higher than the EU average.

Figure 5.3. General government expenditure in Finland in 2002*, EUR billion



Source: Statistics Finland/National Accounts.

In 2002 public expenditure in Finland amounted to well over 66 billion euros. Of this sum, public consumption expenditure was over 30 billion, income transfers and interest payments 33 billion, and public investments 3.6 billion euros.

Public consumption expenditure consisted of costs of collective public goods such as general government, administration and national defence. Almost two thirds of public consumption expenditure was used for individual services provided mainly by the municipalities. Individual services include educational, health care and social services. The municipal welfare services are funded mainly by taxes, although the share of user-fees, which vary from service to service, has increased.

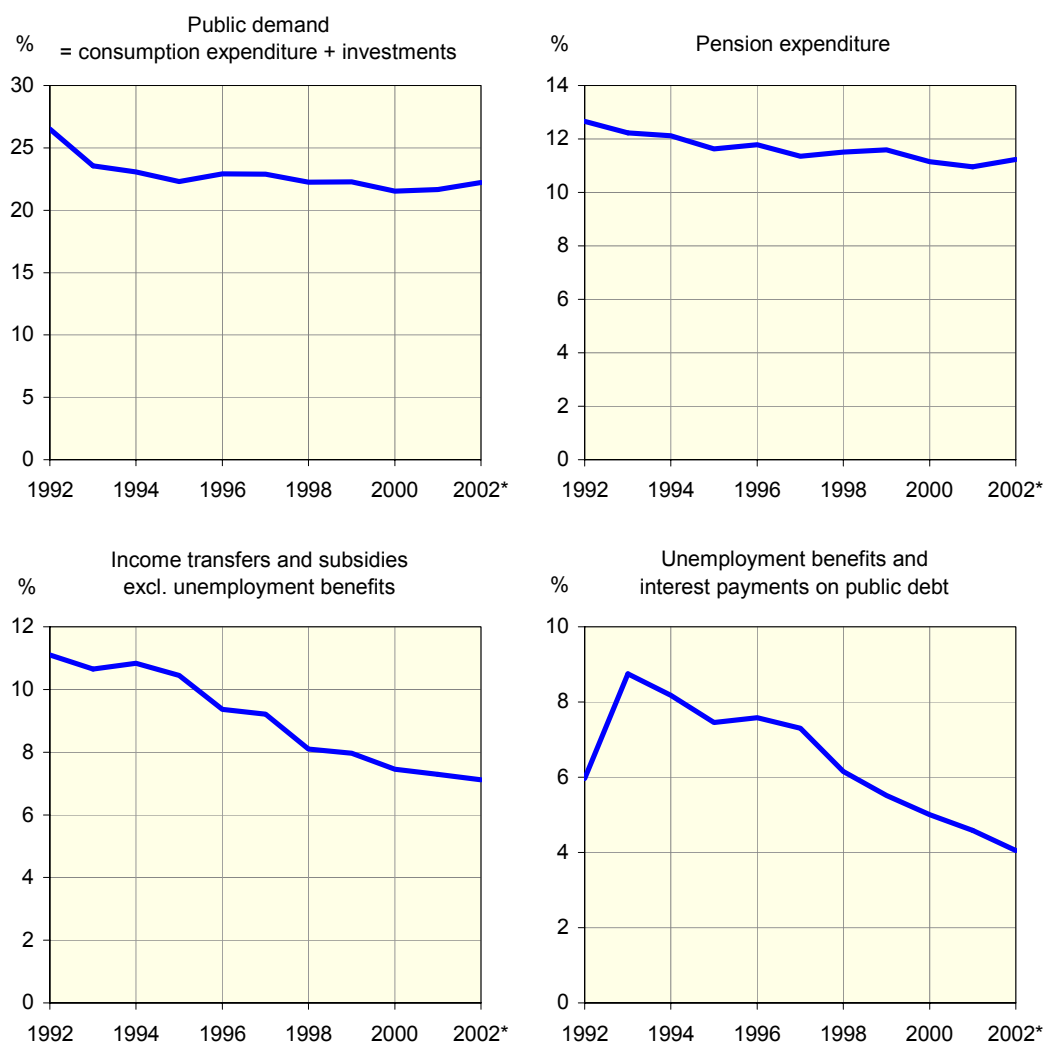
With regard to income transfers, the share of social income transfers is clearly the greatest: over 25 billion euros. The share of subsidies is 2 billion and the share of interest costs is 3.5 billion euros. The other transfers of income consist of, among other things, the costs of development aid.

Public consumption expenditure is the running costs incurred by the provision of goods and services such as the compensation to public sector employees, purchases of goods and services and rental expenses.

Income transfers are the benefits given as money to households via public social security systems, support directed to industry, agriculture, traffic and other enterprises, costs of interest on public loans and, among other things, income transfers paid to foreign recipients such as development co-operation.

The public investments include the investments connected with all public activity such as the provision of welfare services and the construction of communications.

Figure 5.4. The items of general government expenditure in 1992–2002*, percentage of trend GDP

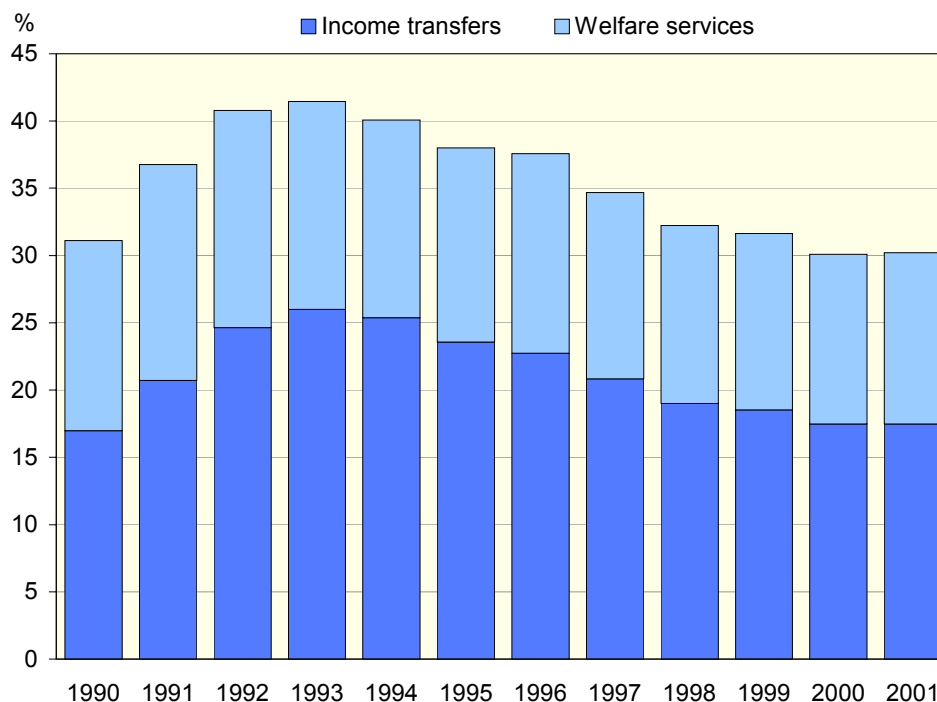


Source: Statistics Finland/National Accounts.

The volume in public demand was noticeably reduced in the years 1993-1994, from about 26% of the trend output to about 23%. After that, public demand has been stable as a ratio of trend-GDP. Since 1992 the relative costs of pensions have been slightly reduced. Income transfers without the cyclically varying unemployment benefits have steadily been reduced in relation to trend output since 1994. As one may expect, the greatest variation is in expenditure on unemployment benefits and interest costs. They rose steeply in 1993. Since 1997 these expenditures have been steadily reduced in relative terms due to decreasing unemployment and lower interest rates.

5.2 Public support to households

Figure 5.5. Income transfers to households and welfare service costs in 1990–2001, percentage of GDP

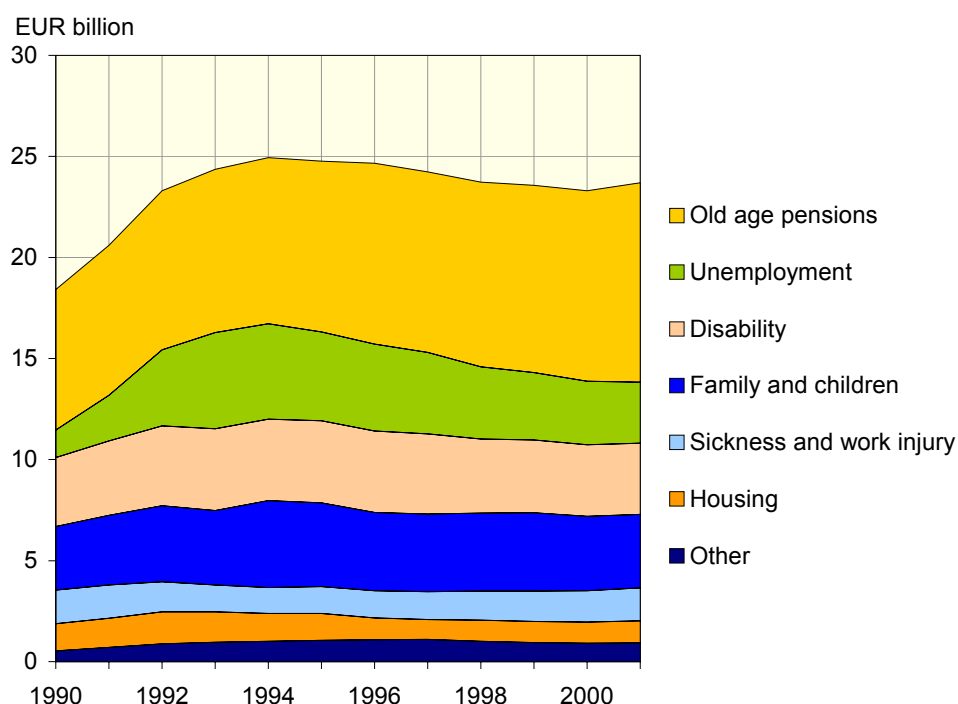


Source: VATT (Ministry of Social Affairs and Health, Ministry of Education, National Board of Education, The Social Insurance Institution of Finland, State Treasury).

The total public support to households in relation to the GDP rose to its highest level to well over 40% in 1993. Since then the share has fallen to the pre-recession level, to about 30%. The share rose strongly in the years 1991–1992, when income transfers were increased and there was a significant fall in the GDP. Since 1993 the GDP shares of both income transfers and welfare services have been falling owing to the recovery of the economy. In real terms, however, public support to households has not decreased.

5.3 Income transfers to households

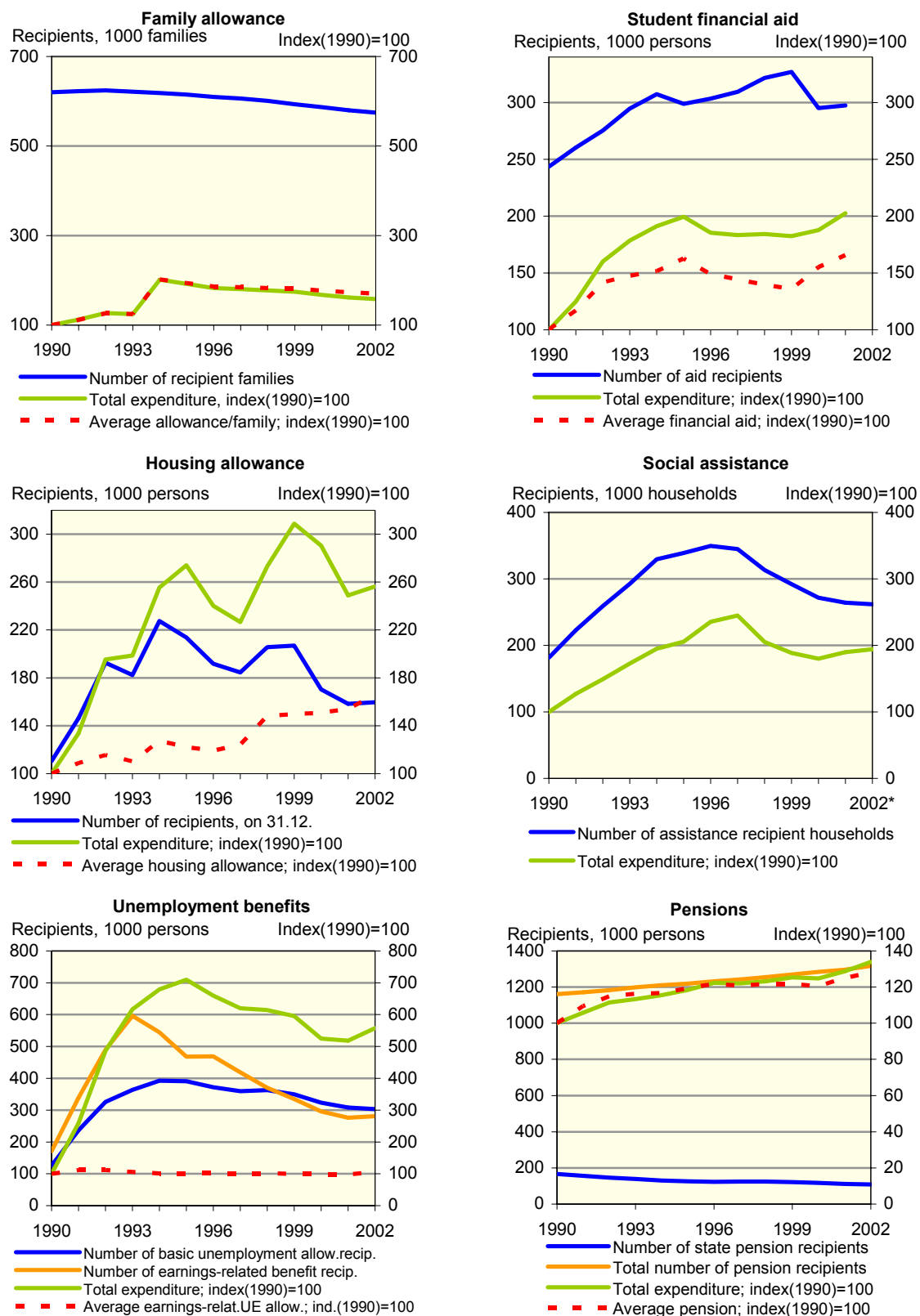
Figure 5.6. Income transfers to households in 1990–2001, EUR billion at 2001 prices



Source: VATT (Ministry of Social Affairs and Health, The Social Insurance Institution of Finland, State Treasury).

Old age pensions are the most important part of the income transfers to households. Pension expenditure has grown since 1990, in real terms, by almost 3 billion euros. In 1993 about 4.8 billion euros (in 2001's money) was paid in unemployment benefits; since then they have steadily decreased. The disability expenses grew slightly in the years 1991–1993. Since then they have slightly decreased in real terms. Benefits received by families with children increased in 1994, owing to the reform of the family allowance system, when, correspondingly, tax deductions for families with children were cut. The reduction in the housing support mainly originates from the structural change in the tax deductibility of interest expenses on house loans that was brought about in the 1993 capital tax reform.

Figure 5.7. Certain social expenditures 1990–2002



Source: The Social Insurance Institution (KELA), The National Research and Development Centre for Welfare and Health (STAKES), The Insurance Supervisory Authority (VVV).

The number of families receiving family allowances has decreased by almost 10% since 1990. This is due to the fall in the birth rate. Family allowance expenses and the average allowance doubled from 1990 to 1994. Since then they have fallen slightly. The expenses, however, are almost 60% higher, and the average allowance about 70% higher, than what they were in 1990.

The number of recipients of student financial aid has grown by about a fifth since 1990. The fastest increase occurred during the years of the recession at the start of the 1990s. As the average level of aid has also risen, so has the total sum of aid expenditure risen faster than the number of students. The rise in the level of aid has been influenced, above all, by the broadening of housing supplement and other benefits. The standard study grant has not risen as quickly.

The number of recipients of housing allowance doubled during the years of recession at the start of the 1990s. Since then the number has dropped by almost a third and at the end of 2002 there were about 160 000 recipients. The average housing allowance has risen evenly and in 2002 it was about 65% higher than in 1990. The expenditure on housing allowance has grown fast, although it has slightly fallen in recent years. Expenditure was at its highest at the end of the 1990s.

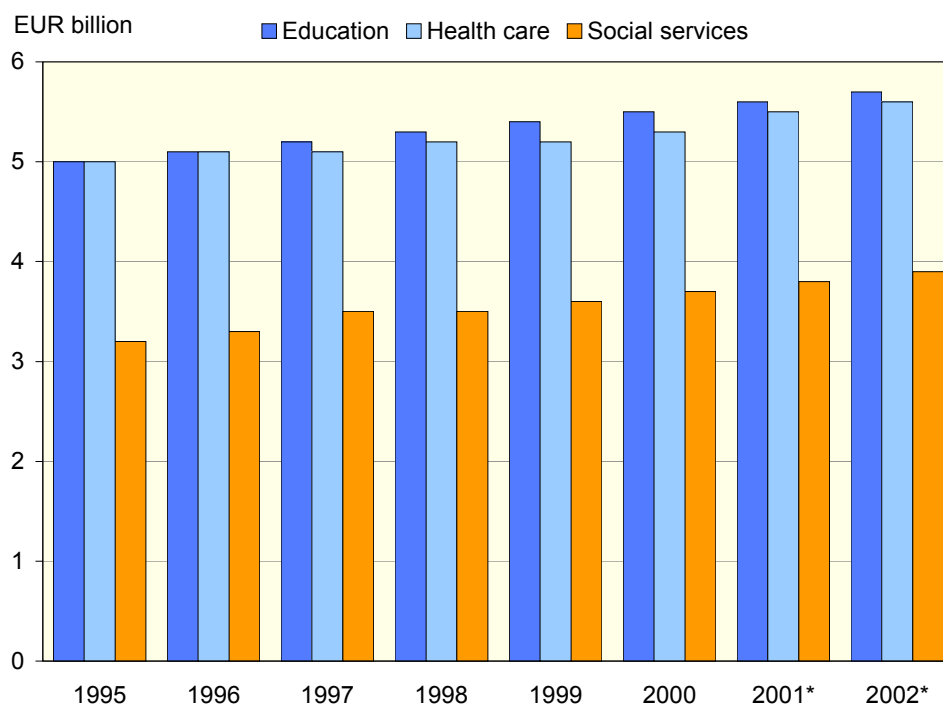
The number of recipients of social assistance almost doubled and expenditure on social assistance increased 2.5 times as a result of the recession of the 1990s. The number of recipients grew until 1996 and so did the expenditure until 1997. In the last few years the decrease in the number of recipients of support has slowed down, and expenditure has risen again. The average amount of social assistance has increased.

Unemployment benefit expenses increased sevenfold from 1990 to 1995, after which they decreased until 2001. In 2002 they again increased. Progress follows the quantitative and structural progress of unemployment. The average earnings-related unemployment allowance has remained more or less the same.

The number of recipients of a pension has steadily grown. In 2002 there were more than 1 300 000 persons who received some kind of pension, which is about 13% more than in 1990. The average pension has risen by almost 30% since 1990.

5.4 Welfare services

Figure 5.8. Value added of the public welfare services in 1995–2002*, EUR billion at 2000 prices



Source: Statistics Finland/National Accounts.

The volume of the public education, health care and social services rose by about 15% from 1995 to 2002. The social services grew most strongly, by over a fifth.

In Finland municipalities have the main responsibility for arranging and providing welfare services. The share of private enterprises and non-profit-making corporations increased, however, in the 1990s in the provision of social and health care services.

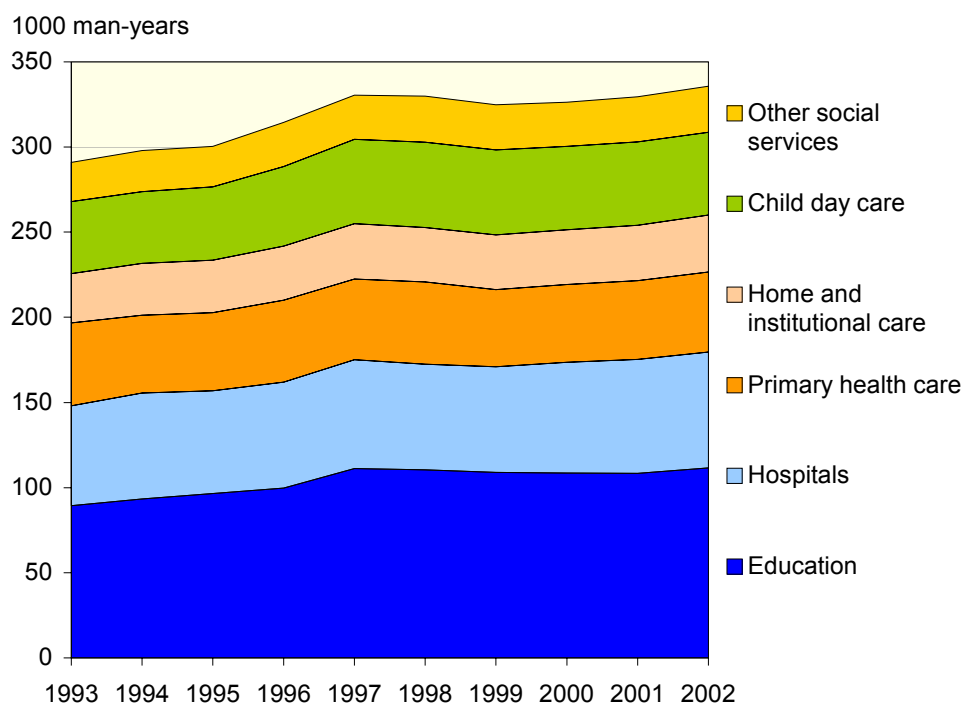
Municipalities are responsible for basic education and upper secondary school education, in addition to the bulk of vocational education. The state, on the other hand, is responsible for university education.

Public health care is chiefly the responsibility of the municipal sector. Health centres provide basic health care services, and hospitals belonging to hospital districts provide specialised hospital services. In 1998 there were over 10 000

private providers of health services, and they represented 16% of the total provision of health services.

The most significant of the social services are institutional and outpatient services for the elderly, and day care services for children. The share of public services, for example in home services and day care services, has decreased slightly in recent years, and they have been complemented by private commercial services. In 2000 nearly 1 500 social service enterprises were in operation.

Figure 5.9. Personnel in municipal welfare services in 1993–2002, 1 000 man-years



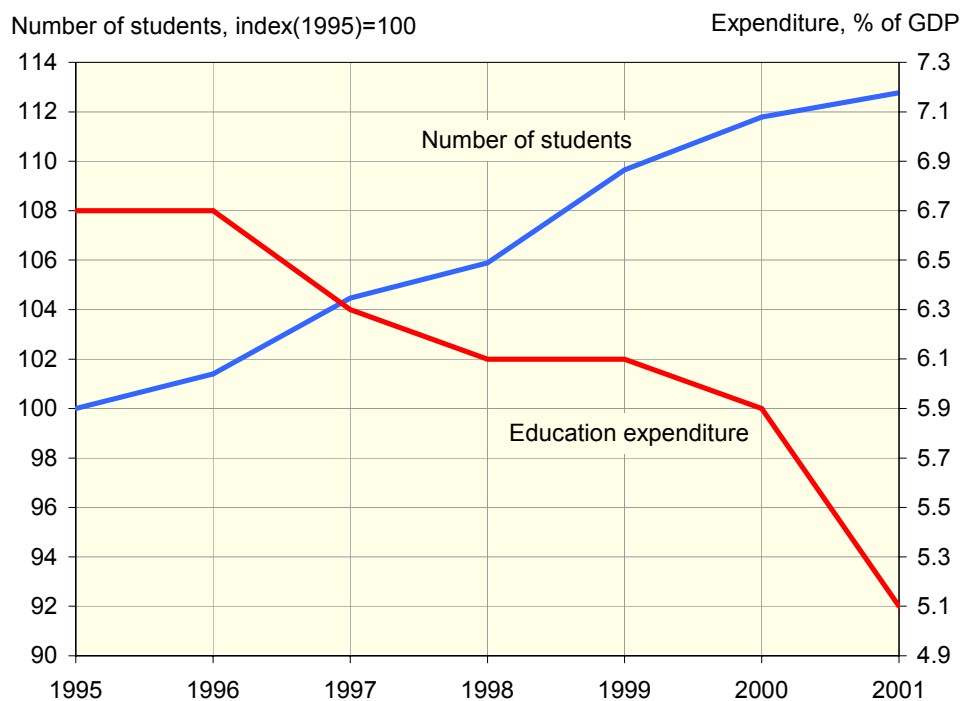
Source: Statistics Finland.

The number of personnel in municipal welfare services calculated as annual full-time employees was about 335 000 in 2002, which was about 15% more than in 1993. Two thirds of them were working in social and health care. From 1993 to 2002 the number of personnel grew most rapidly, however, in education, by 22%.

In 2002 the number of full-time employees in children's day care was over 48 000. There were 33 000 employees in home services and institutional care for the elderly. There were about 47 000 employees in primary health care and about 68 000 employees in hospitals. The professional structure of health care employees has changed considerably in the last ten years. The number of doctors and nurses has greatly increased, while the numbers of auxiliary hospital personnel and carers and other auxiliary personnel have clearly decreased.

Education

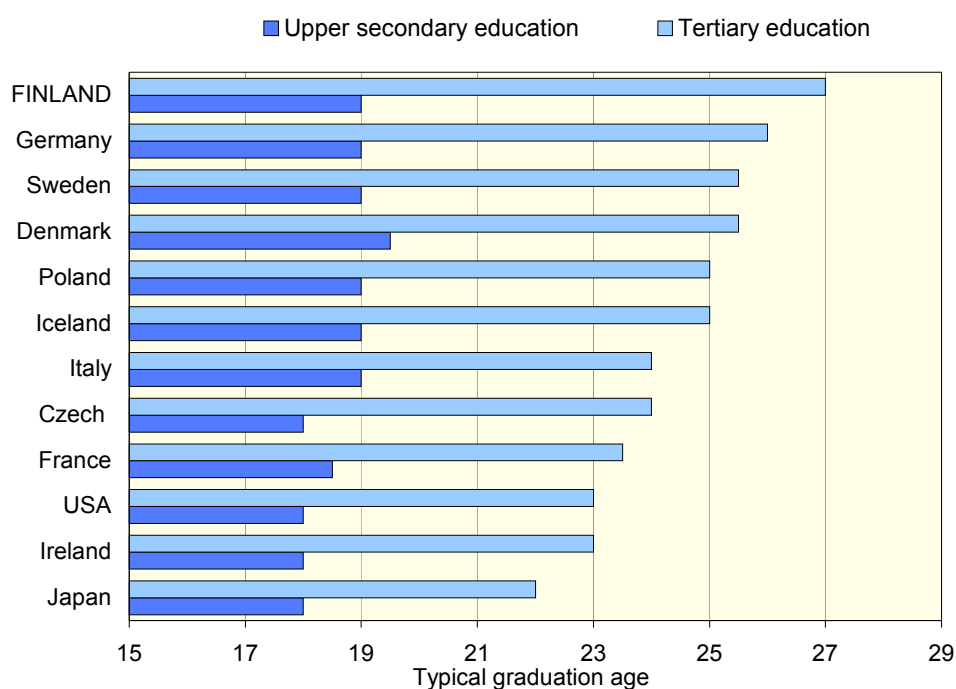
Figure 5.10. Education expenditure (as percentage of GDP) and number of students (index(1995)=100) in 1995–2001



Source: Statistics Finland.

The number of students in primary, secondary and tertiary educational institutions grew steadily from 1995 to 2000. In 2001 a total of almost 1.1 million pupils and students were attending primary and secondary schools, upper secondary schools, vocational institutes and universities. From 1995 the number had grown by about 12%. The public education expenditure share of the GDP fell over the whole period. In 2001 it was 5.1%. The fall in the share stems from the rapid growth in the GDP. Educational expenditure has grown in real terms.

Figure 5.11. Typical graduation ages in upper secondary education and in tertiary education in some countries



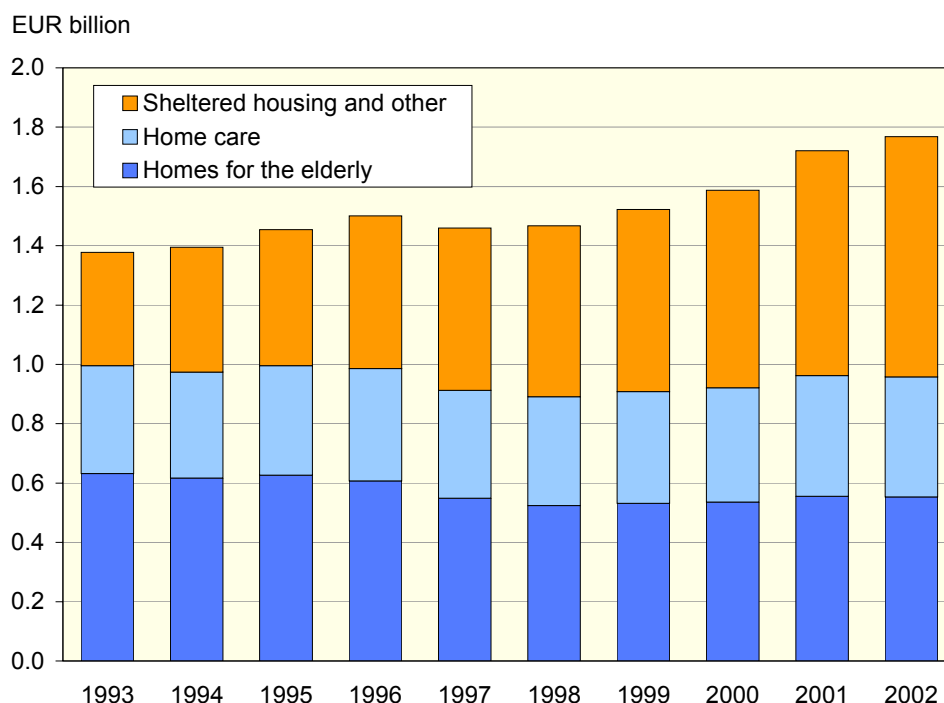
Source: OECD.

Students receive a MA degree in Finland at a clearly older age than in other countries that were compared. There are, on average, eight years between graduating from upper secondary school and gaining a degree. Of this period two to three years are spent on substitute courses or as gap years while students are waiting for the study place they desire. In Japan a university degree is gained in half the time.

Social services

The largest groups of those who use the social services are the elderly and families with children. Social services are provided as both institutional and non-institutional services. The most significant of the institutional services are care in homes for the elderly and sheltered housing. Home care supports families with children and helps elderly and disabled people to live at home. Families with children are provided with municipal day care services or private day care through agreed financial subsidies provided by municipalities.

Figure 5.12. Net expenditures of long-term care for the elderly in 1993–2002
EUR billion at 2000 prices

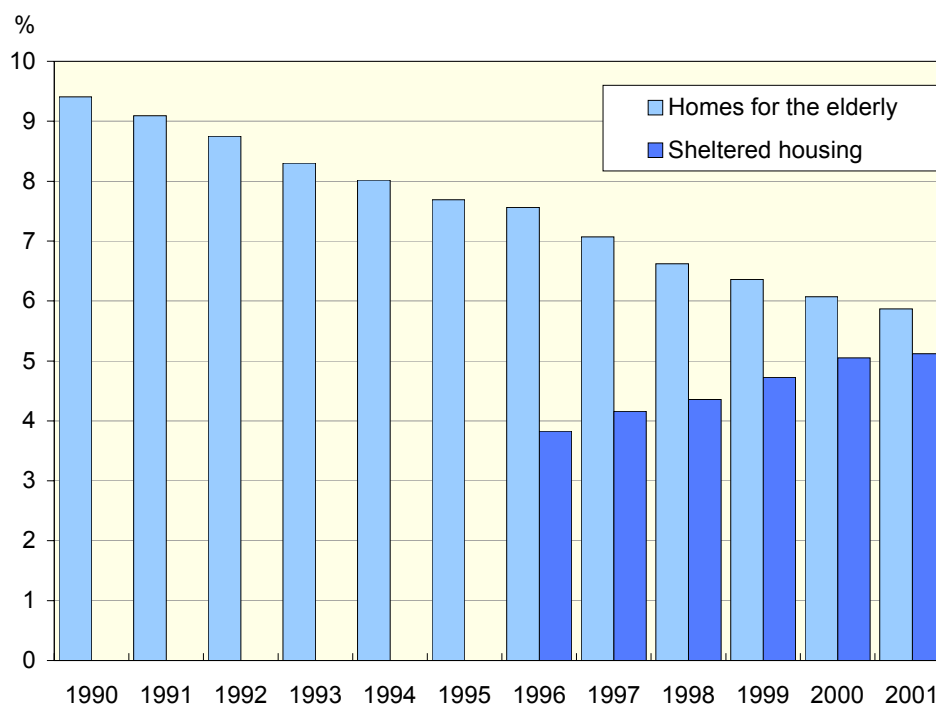


Source: VATT (SOTKA database of the National Research and Development Centre for Welfare and Health STAKES and Statistics Finland).

In 2001 the net running costs for homes for the elderly were approximately 0.5 billion euros and the net costs for home care were about 0.4 billion euros. Expenditure on other services, in which there are costs of sheltered housing as well as costs of services for the disabled, was about 0.7 billion euros. The total net expenditure on long-term care of the elderly, excluding the costs of long-term care at health centres, was over 1.6 billion euros in 2001. The costs of long-term care for elderly patients at health centres were estimated to be about 0.6 billion euros in 1999. So the net cost of long-term care for the elderly rises

to about 2.2 billion euros. This means care costs of over 6 000 euros for each elderly person of 75 years of age or more.

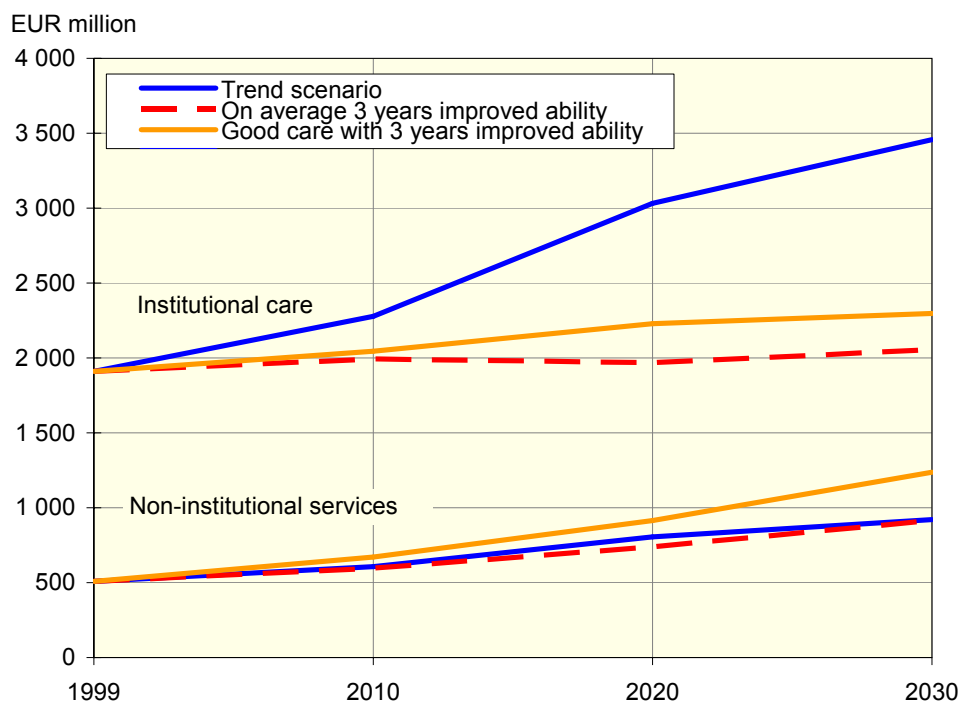
Figure 5.13. The share of all persons of 75 years and above living in homes for the elderly and sheltered housing 1990–2001, %



Source: The National Research and Development Centre for Welfare and Health STAKES/SOTKA database.

At the beginning of the last decade almost a tenth of all persons more than 74 years of age lived in homes for the elderly, but the share fell to 6% until 2001. The share of elderly people living in sheltered housing, on the other hand, rose extremely rapidly in the 1990s. The total share of those aged 75 years or more living in homes for the elderly and sheltered housing has remained stable, at around 11%. The share of those aged 75 and over receiving long-term care at health centres has not changed, but the share of those receiving long-term specialised hospital care decreased from 3% to 0.3% in the 1990s.

Figure 5.14. Estimates on operating costs of institutional care and non-institutional services for the elderly by 2030 assuming that the physical ability of the clients improves by 3 years and a higher quality of care, EUR million at 1999 prices



Source: VATT Research Reports no.99 and the Finnish National Fund for Research and Development (Sitra).

It is expected that the number of people over 64 years of age will increase by 81% between 1999 and 2030. Without any changes in the physical ability of the elderly or in the quality of care, this would mean at least a corresponding rise in expenditure, in real terms, in non-institutional services and institutional care for the elderly. Raising the quality of care to the level of “good” as put forward by Kuntaliitto (the Association of Finnish Local and Regional Authorities) and the Ministry for Social Affairs and Health would raise the level of expenditure even more, together with the greater need of personnel. In calculations carried out by VATT (the Government Institute for Economic Research), however, it has been estimated that improvement in elderly people’s functional ability would significantly lower cost pressure.

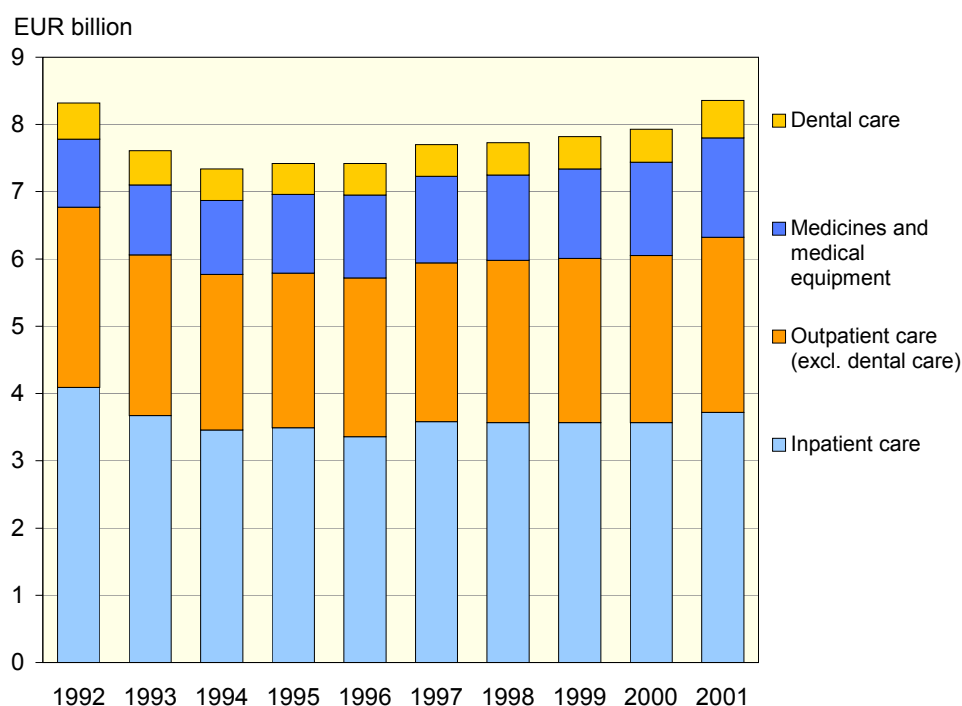
Improvement in elderly people’s ability to function, so that the need to receive services is delayed by an average of three years, has only a slight effect on expenditure in non-institutional services. Improvement in the quality of care, on the other hand, would raise the costs of non-institutional services from the 1999 level by about 140% (from 508 million euros to 1 240 million euros). A

corresponding improvement in the ability to function would almost stop the upward pressure in the institutional care costs. Indeed, by raising the quality of care, the costs in institutional care would rise by only about 20% (from 1.9 billion euros to 2.3 billion euros). At the present level, the costs of non-institutional care are only a quarter of the costs of institutional care. Therefore the total costs of care services for the elderly with a better quality of care, but improving elderly people's ability to function, would rise by just under 50% by 2030.

Health care

In Finland, municipalities have the main responsibility in arranging health care for their inhabitants. Municipalities are also mainly the providers of health care services. Formerly, the state played a prominent role in deciding how resources should be used and where they should be directed. Centralised planning and control decreased in the 1990s, and the power of municipalities to influence decision-making increased.

Figure 5.15. Health care expenditure in 1992–2001, EUR billion at 2001 prices

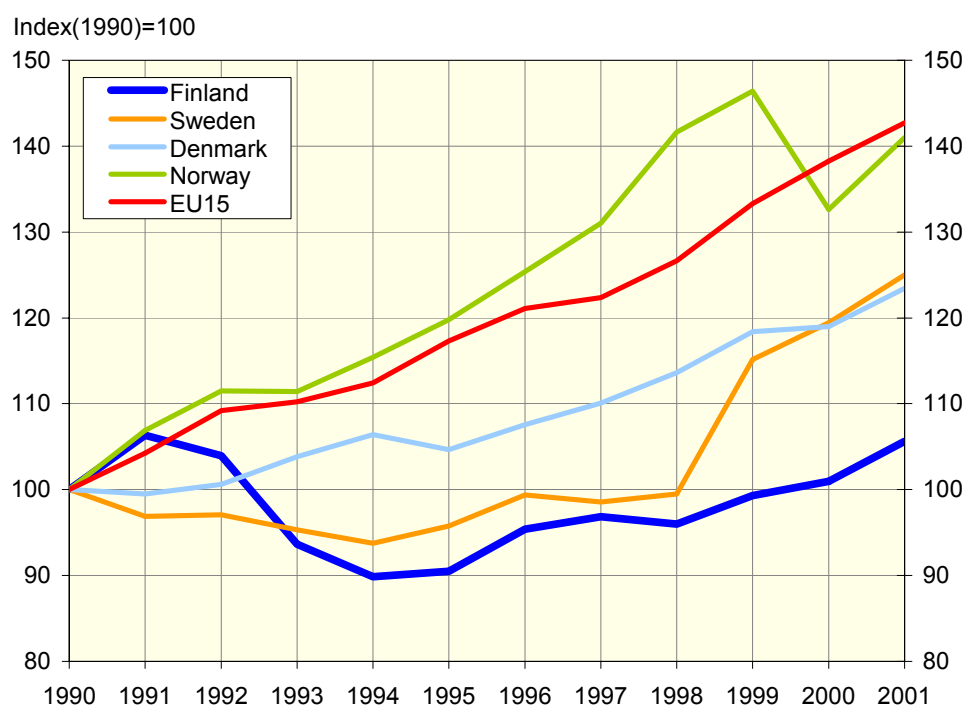


Source: The National Research and Development Centre for Welfare and Health STAKES.

Reforms in the system of funding and control have been carried out in social care and health care, and these reforms significantly changed the role of the state and the municipalities in the arranging of services. One of the most important changes of the 1993 reform was that the state grants were changed from earmarked matching grants to formula based general grants. At the same time, the deep recession in the national economy forced health care to become more efficient. Expenditure on health care and the numbers of personnel employed within it began to fall at the beginning of the 1990s after a long period of growth.

International comparison of health care

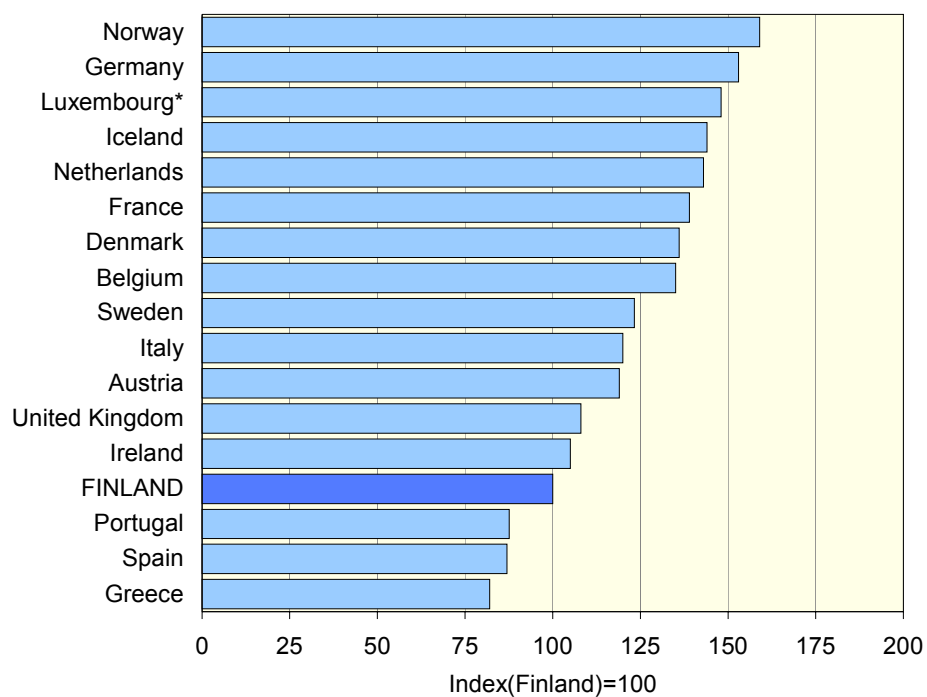
Figure 5.16. Real per capita expenditure on health care in some countries in 1990–2001, index(1990)=100



Source: OECD.

In international terms, the development in health care expenditure in Finland during the last decade has been quite exceptional. In the 1990s, health care expenditure per inhabitant, in real terms, rose in the EU countries by an average of almost 40%, but in Finland this expenditure had only reached the 1990 level by 2000. From 1991 to 1994 fixed-price health care expenditure fell by about 16%.

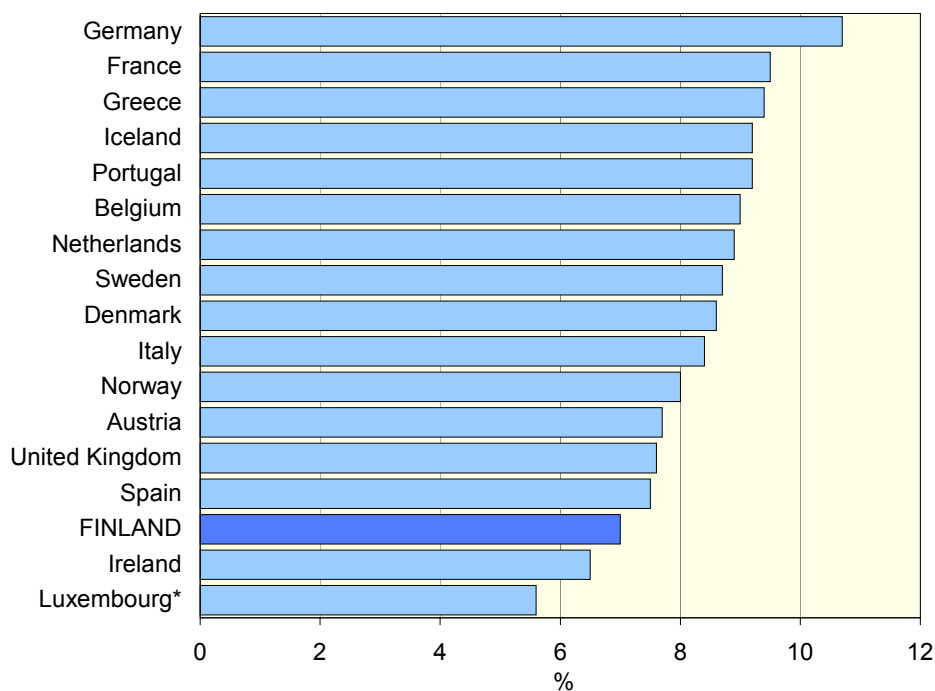
Figure 5.17. Total expenditure on health care in EU15 and Nordic countries in 2001, per capita (PPP), index(Finland)=100



* Data from the year 2000.

Source: OECD/Health Data 2003.

Figure 5.18. Health care expenditure in EU15 and Nordic countries in 2001, percentage of GDP

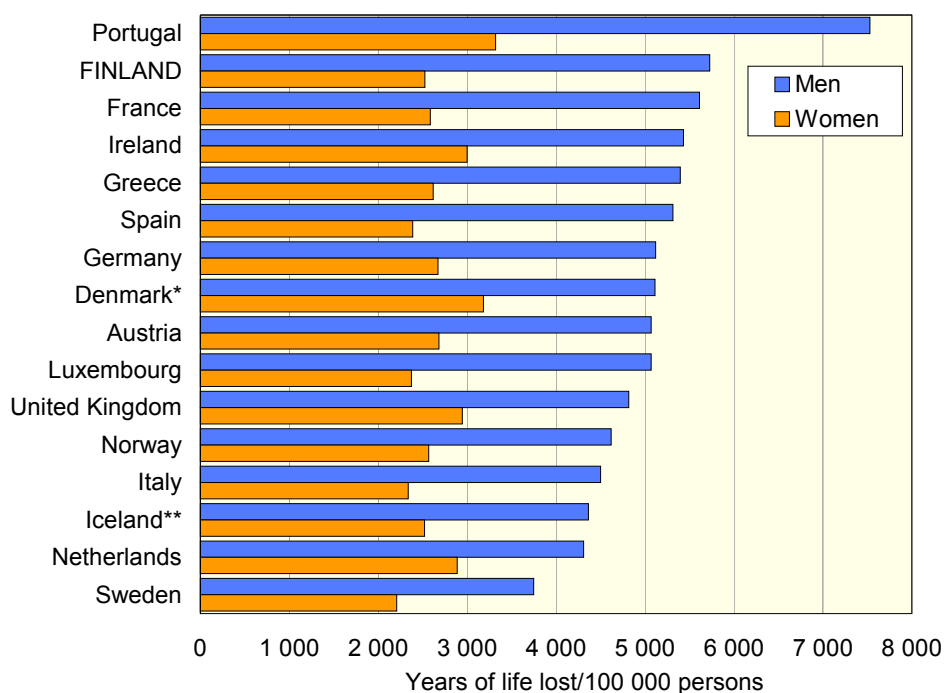


* Data from the year 2000.

Source: OECD/Health Data 2003.

In relation to both the population and its GDP, Finland's health care expenditure is very moderate. In Finland, health care expenditure per inhabitant, adjusted for purchasing power, is clearly below the EU countries' average. Among the Nordic countries Finland uses least money in relation to the population and GDP.

Figure 5.19. Potential years of life lost in EU15 and Nordic countries in 1999, per 100 000 persons



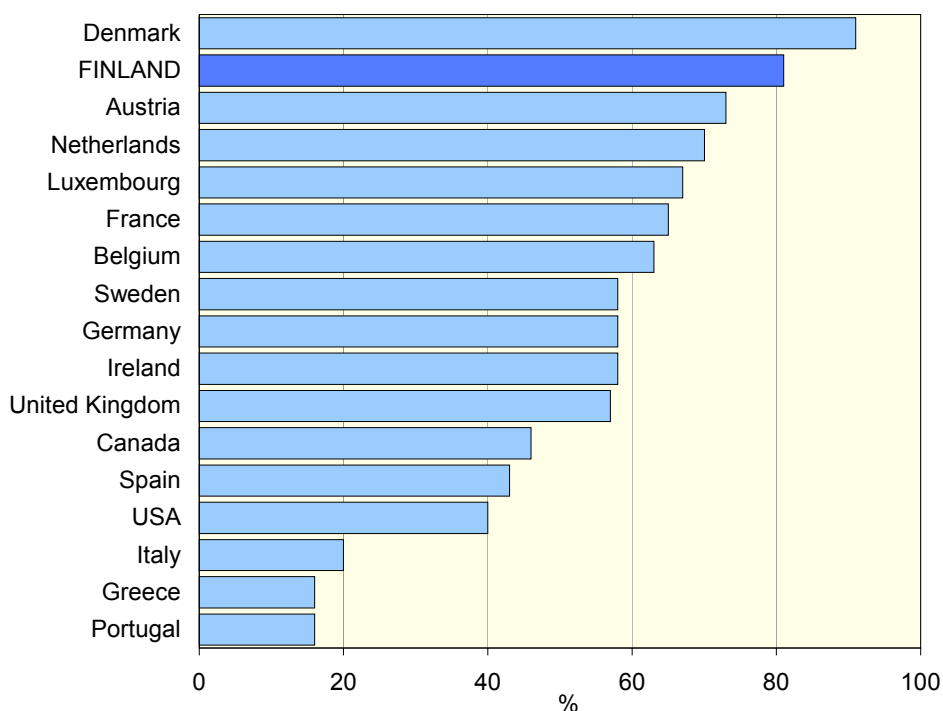
* Data from the year 1998.

** Data from the year 1997.

Source: OECD/Health Data 2003.

The effectiveness of the health care of various countries is often compared by means of the life expectancy of the population. An alternative measure is the estimated number of years of life lost by those who have died before the age of 70. According to this latter measure Finnish women's risk of premature death is among the lowest in the EU countries. In contrast, the risk for men is second highest in the EU countries.

Figure 5.20. People's satisfaction with their own health care system in EU15 countries in 1998, USA and Canada in 2000, per cent



Source: OECD/Health Data 2003.

The effective functioning of the health care system can also be compared by means of people's level of satisfaction with their own country's health care. In comparison with other EU countries the share of those in Finland who are satisfied with health care is exceptionally high. Only in Denmark is the share of those who stated they were extremely or quite satisfied with their own country's state of health care higher than that of Finland.

6 Demographics and income distribution

The Finnish life expectancy rate has risen rapidly during the last 30 years. At present, women may expect to live until they are 82 years of age, and men until 75.

Despite the lengthening of the lifespan, the population growth has slowed down, and it is expected that the number of births will decrease over ten per cent during the next fifty years. The share of old people in the population is increasing, and so is the number of deaths. In the long run, the population can increase only if there is a surplus of immigrants.

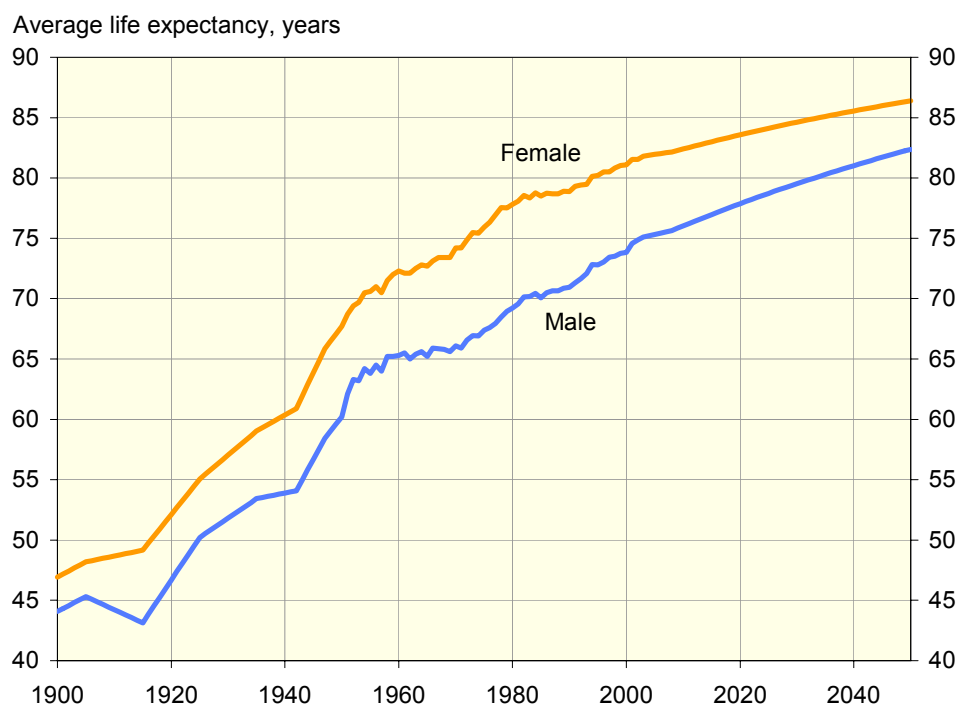
During most of its history Finland has been a land of emigration. Not until the 1990s have immigrants annually outnumbered emigrants. Most emigrants from Finland move to the EU countries and Norway. The majority of immigrants come from outside the EU.

Income differences between Finnish households narrowed until the 1990s. After the recession years 1991–1993 the differences in income became larger. Real incomes of the richest tenth of the population have increased the most, whereas the incomes of the poorest tenth of the population have remained as before, and decreased in relative terms.

Regional differences in income and consumption narrowed dramatically from the 1960s until the 1980s. Since then, narrowing has slowed down.

6.1 Demographic change

Figure 6.1. Average life expectancy for a newborn Finn by sex in 1900–2003 and a forecast for 2004–2050, years



Source: Statistics Finland and VATT.

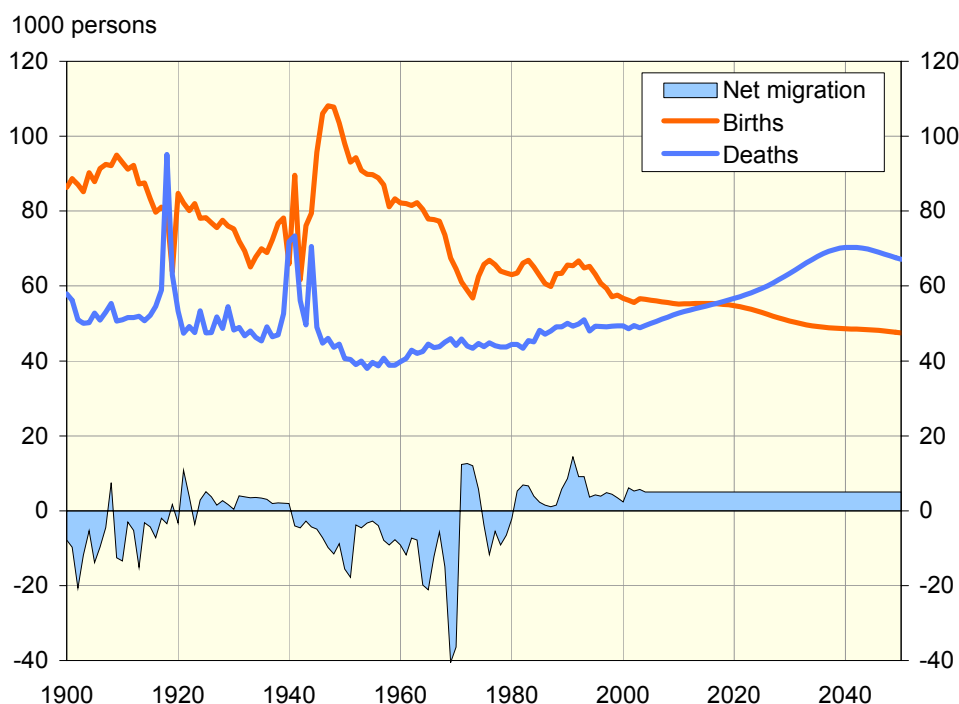
In 2003 a girl born in Finland had a life expectancy of 82 years and a boy 75 years. An average Finn's lifespan lengthened during the last hundred years by more than 30 years. The notable reduction in infant and young people's mortality rates remarkably increased the lifespan. At present, only 1% of those born alive die before they reach the age of 22. According to the mortality statistics of 2003, 91% of females and 80% of males reach the age of 65.

A Finnish female nowadays lives longer than females, on average, in other rich countries. The lifespan of a Finnish male, on the other hand, does not reach the average lifespan in other rich countries, although a Finnish male's life, during the last decades, has rapidly lengthened when compared internationally.

Because the risk of dying, even of the oldest, has constantly decreased in nearly every prosperous country, population forecasts assume that the lifespan will lengthen in future decades, too. According to the most recent population forecast from Statistics Finland, the life of a Finn will lengthen by more than a year during each future decade. Because infant and young people's mortality is

already low at present, lengthening of the lifespan can be explained even more by the reduction in adults' risk of dying.

Figure 6.2. Number of births and deaths and net migration in Finland in 1900–2003 and a forecast for 2004–2050, 1000 persons



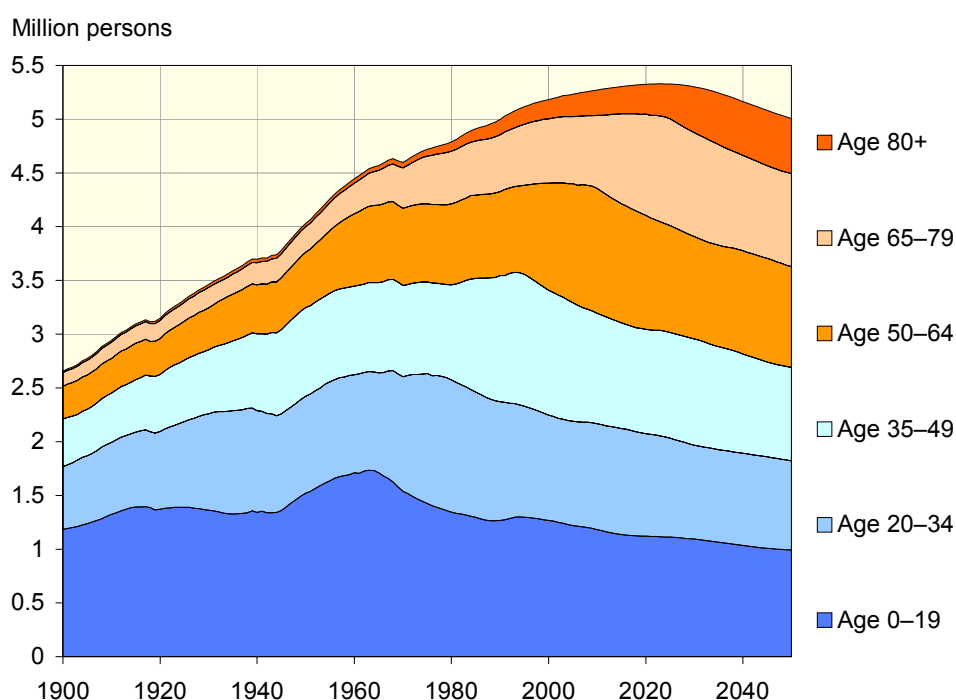
Source: Statistics Finland/Population Statistics and VATT.

In the years 1946–1949 over a hundred thousand children were born in Finland every year. After the post-war baby boom, the birth rate fell until the early 1970s. At that time fewer than 60 000 children were born annually. In the last few years the number of births has again fallen below 60 000, for the small age groups of the 1970s are now at the best age of reproduction. The annual number of births is likely to decrease further over ten per cent during the next fifty years, because the number of women of fertile age will decrease.

In the past few years almost 50 000 Finns have died every year. Although the life span is estimated to lengthen by over a year for each future decade, the number of deaths will increase to 70 000 by 2040. Because considerably more old people will be living in Finland in the future than there are now, the number of deaths will also increase. After 2010 the number of deaths will overtake the number of births, after which the population can increase only through a surplus of immigrants.

During the last hundred years emigrants have outnumbered immigrants by a quarter million persons, although during the last two decades there have been over a hundred thousand more immigrants than emigrants. In its latest population forecast Statistics Finland assumes that this kind of surplus will also continue in the future. It is expected that every year 5 000 more people will come to Finland than those who leave for abroad.

Figure 6.3. Population by age groups in Finland in 1900–2002 and a forecast for 2003–2050, million persons



Source: Statistics Finland and VATT.

The current population of Finland is 5.2 million. According to the population projection by Statistics Finland, the population will increase by a total of one hundred thousand people until the early 2020s, but it will then start to decrease despite the annual immigration surplus of 5 000 people. The population forecast has, in addition, assumed that the birth rate will remain as now and that the lifespan will lengthen by more than a year for every future decade.

The number of children under 20 years of age was, at its highest, more than 1.7 million four decades ago. There are now fewer than 1.3 million children living in Finland, and in half a century there will be only a million, if the current demographic trends will be continued.

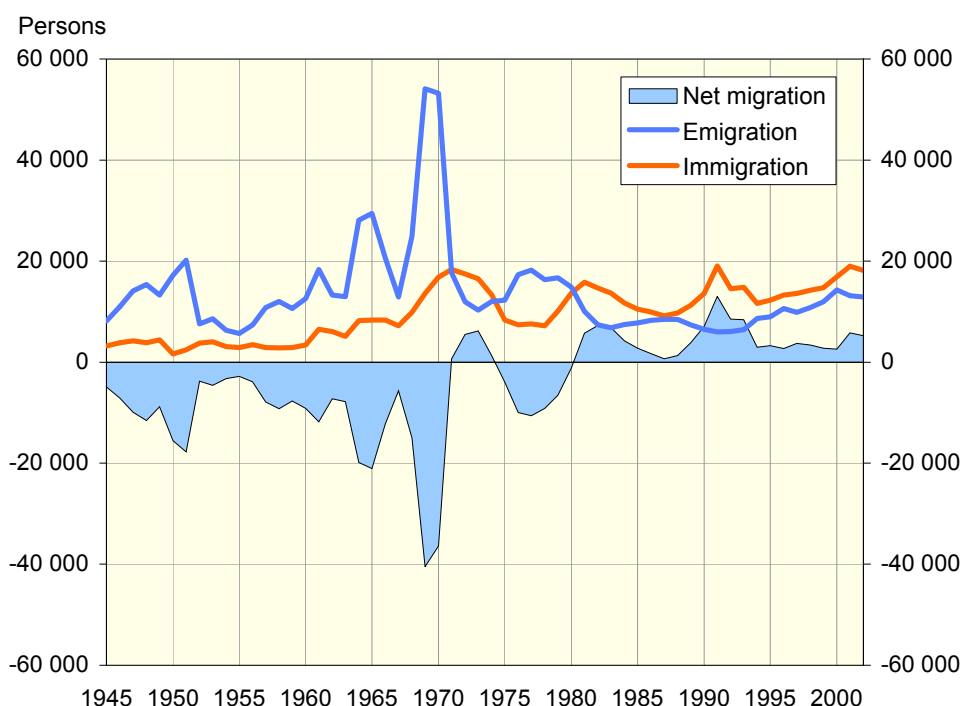
The number of 20–34-year-olds was at its highest in the 1980s, but since then it has fallen by over 400 000 to under a million. At the end of the period in 2050 there will be still more than 800 000 of them. The number of middle-aged people (from 35 to 50 years of age) took a downturn during the 1990s, and the downward trend is expected to continue until 2050.

The number of old-age-pensioners is currently about 600 000. Their number will grow to one million within a quarter of a century. From then onwards, only the number of people in their eighties and above will increase. In 2040 there will be as many as half a million old people (80 years and more), that is, a tenth of the population at that time.

If the new population forecast from Statistics Finland proves to be right, the population of Finland will be at its greatest in the early 2020s.

6.2 Migration

Figure 6.4. Immigration, emigration and net migration in Finland in 1945–2002, persons



Source: VATT (Statistics Finland).

During the greater part of its history Finland has been a land of emigration. Both the number of emigrants and the characteristics have, however, changed over

the years. The earlier permanent emigration of unskilled labour force has recently been replaced by a short period of work or study abroad by highly educated Finns. The probability of emigrating is most common among 25–29-year-olds who are unmarried and childless. In addition, the probability of emigrating increases at both extremes of the education and income level.

Table 6.5. Immigration to Finland by country of departure and emigration from Finland by country of destination in 1985–2002

	1985	1990	1995	2000	2002
Immigrants	10 465	13 558	12 222	16 895	18 113
Sweden	68 %	44 %	26 %	19 %	18 %
Western Europe*	16 %	14 %	19 %	25 %	28 %
Other European countries		19 %	33 %	30 %	28 %
Other countries	16 %	23 %	22 %	26 %	26 %
Emigrants	7 739	6 477	8 957	14 311	12 891
Sweden	62 %	62 %	34 %	27 %	28 %
Western Europe*	27 %	23 %	39 %	41 %	45 %
Other European countries		4 %	9 %	12 %	8 %
Other countries	11 %	11 %	18 %	20 %	19 %

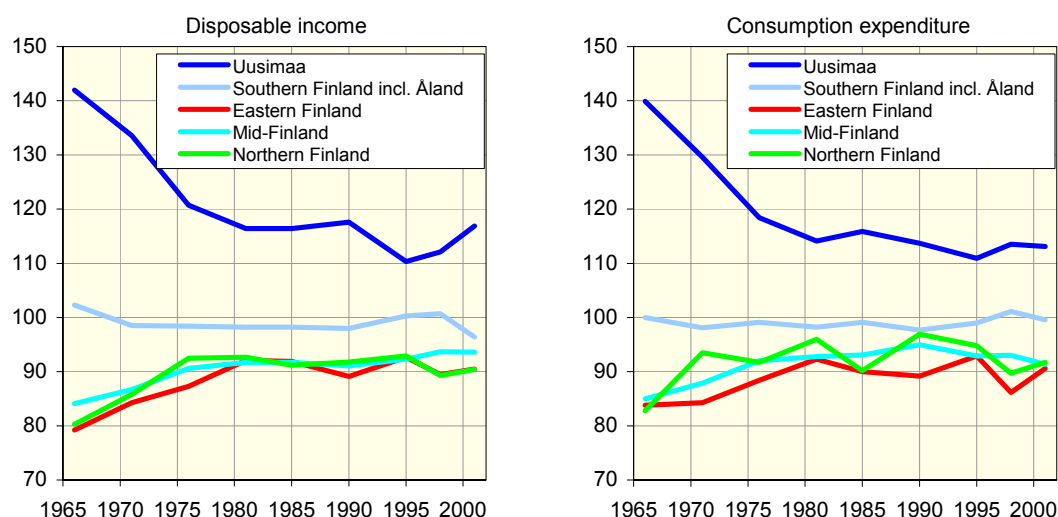
*= EU countries (excl. Sweden) + Norway and Iceland. Year 1985 data comprises the whole of Europe except Sweden.

Source: VATT (Statistics Finland).

Finns have traditionally emigrated to North America, Australia and, above all, Sweden, which is still the most popular single destination. The number of emigrants to Sweden decreased, however, at the beginning of the 1990s, and remained stable at around 3 000 a year. The number of emigrants to other Western European countries, especially Norway, rose throughout the 1990s. Until the first half of the 1990s immigrants to Finland chiefly consisted of returning emigrants and the spouses of Finnish citizens.

6.3 Standard of living differences within and between regions

Figure 6.6. Average disposable income and consumption expenditure by major regions (NUTS 2) in 1966–2001, index(Finland = 100)



Source: VATT (Statistics Finland/Consumption Expenditure Surveys).

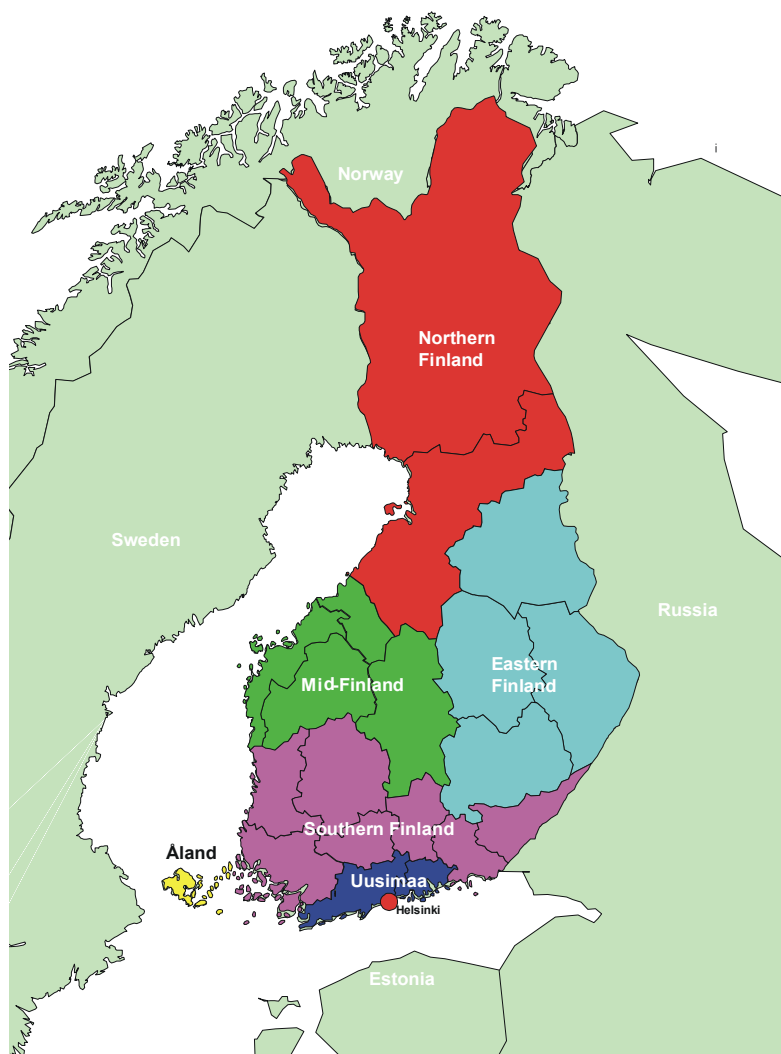
Still in the mid-1960s there were extremely wide differences in living standards between different regions. Traditionally, the Southern Finland has been the most affluent while the Eastern and Northern parts of country have suffered from poverty.

Differences between the major regions in average consumption expenditure have moved in the same direction as differences in disposable income. There has been a long-run tendency for income and consumption to converge, especially before the 1980s. During this period the relative position of Uusimaa worsened, while the relative position of Eastern Finland, Mid-Finland and Northern Finland improved. After the slight convergence in the early 1990s, the last years indicate some divergence in income, mainly because of the improved position of Uusimaa.

Regional income and consumption trends are studied in relation to the average development in the whole country. Finland has been divided into the five regions according to EU's NUTS 2 category. Åland is included here in Southern Finland. The analysis has been done using Consumption Expenditure Survey from the years 1966, 1971, 1976, 1981, 1985, 1990, 1994–1996, 1998 and 2001. In the figures the 1995 values are based on the average value for the years 1994–1996. Disposable income and consumption expenditure per OECD unit have been weighted by the number of members in households and by sample weights. The OECD

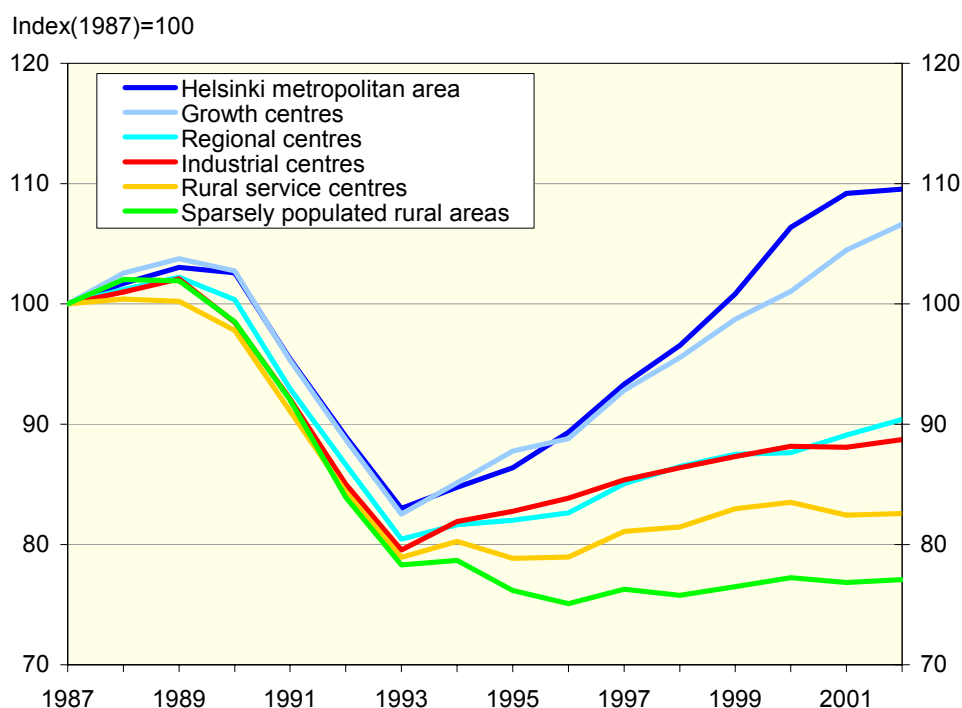
consumption unit is formed in the following way: the first adult is given a weight of 1, the following over 17-year-olds a weight of 0.7 and under 18-year-olds a weight of 0.5. A household consisting of two adults and two children is then 2.7 consumption units.

Major regions (NUTS 2) in Finland



Source: VATT (Statistics Finland/Regional accounts).

Figure 6.7. Jobs in groups of sub-regional units by degree of urbanisation in 1987–2002, index(1987)=100



Source: VATT (Statistics Finland/Regional accounts).

The Helsinki metropolitan area covers Helsinki and its neighbouring municipalities.

Growth centres denote four university sub-regional units: Oulu, Tampere, Turku and Jyväskylä.

Regional centres include fifteen other central sub-regional units.

Industrial centres are sub-regional units specialising in industry.

Rural service centres are the strongest municipal centres in rural areas.

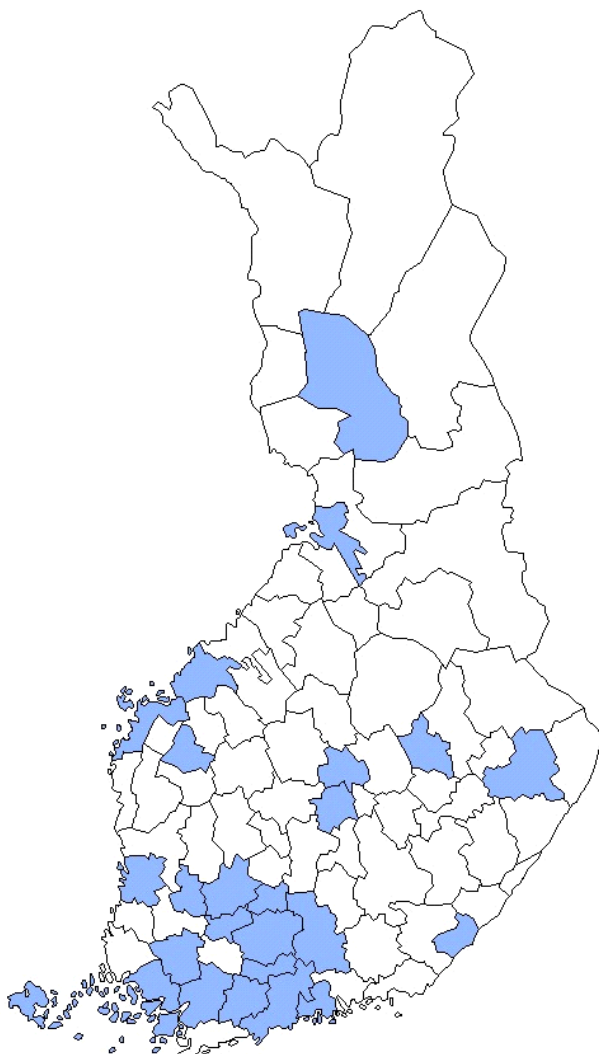
Sparsely populated rural areas include the most sparsely populated sub-regional units.

When the recession hit Finland at the beginning of the 1990s, the number of jobs fell fairly evenly throughout the country and reached its lowest level in 1993, when there were, on average, 20% fewer jobs than in 1987. If the fall in the years 1990–1993 was steep, so was the rise in the years 1996–2000. The sharp rise only occurred, however, in growth centres and, particularly, in the Helsinki region, where the number of workers in 2002 was already 10% higher than it was in 1987. The growth centres were also at a higher level than the 1987 level.

The number of jobs in regional centres and industrial centres has also been rising since 1993. In 2002 they had reached about 90% of the pre-recession level. The situation has remained worse in regional service centres and, in particular, in sparsely populated rural areas.

The number of jobs in sparsely populated rural areas has remained at 75% of the 1987 level and in rural service centres at 83% of the 1987 level. The development of the number of jobs shows how regional inequality has increased in Finland since the mid-1990s. This development is reflected also in regional population growth differentials.

Figure 6.8. Sub-regions (NUTS 4) with growing population in 2003

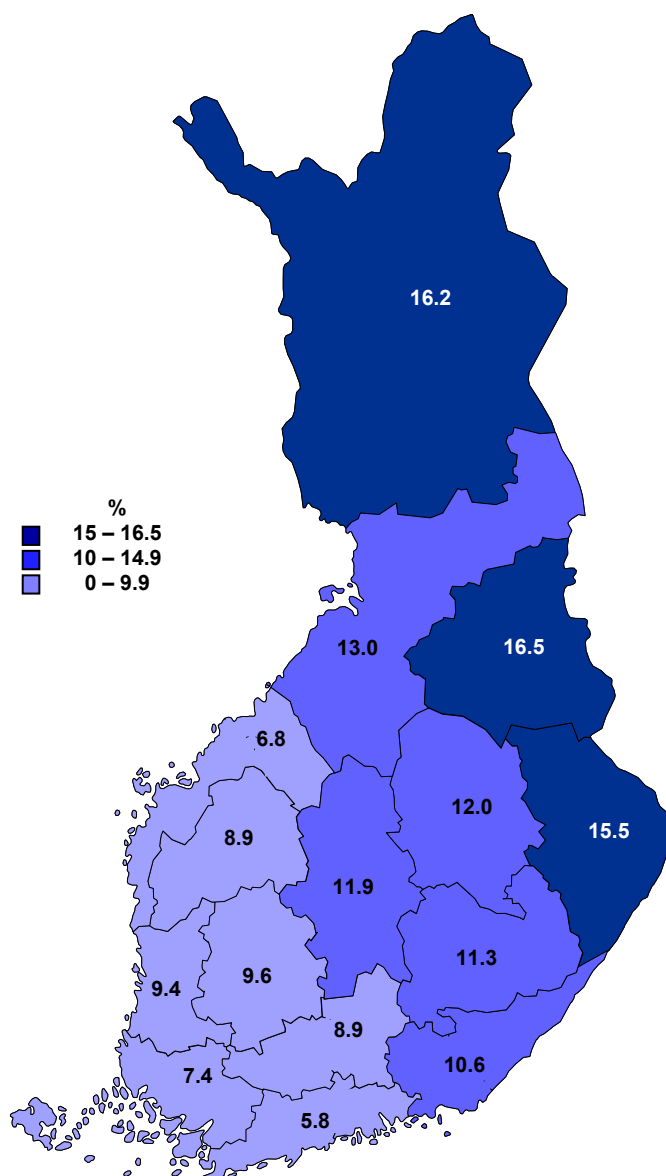


Source: VATT (Statistics Finland/Population Statistics).

In 2003 the population rose in 27 sub-regional units, that is, in only every third sub-region. The growth in population was fastest in sub-regions formed by

growth centres and their neighbouring municipalities. In Finland, population and production seem to be concentrating on some centres, as in other countries. Especially in the areas that are losing population the age structure of the population is inevitably deteriorating and services are declining, and this further increases the flow of migrants to other areas.

Figure 6.9. Unemployment rates by districts* in Finland in 2002



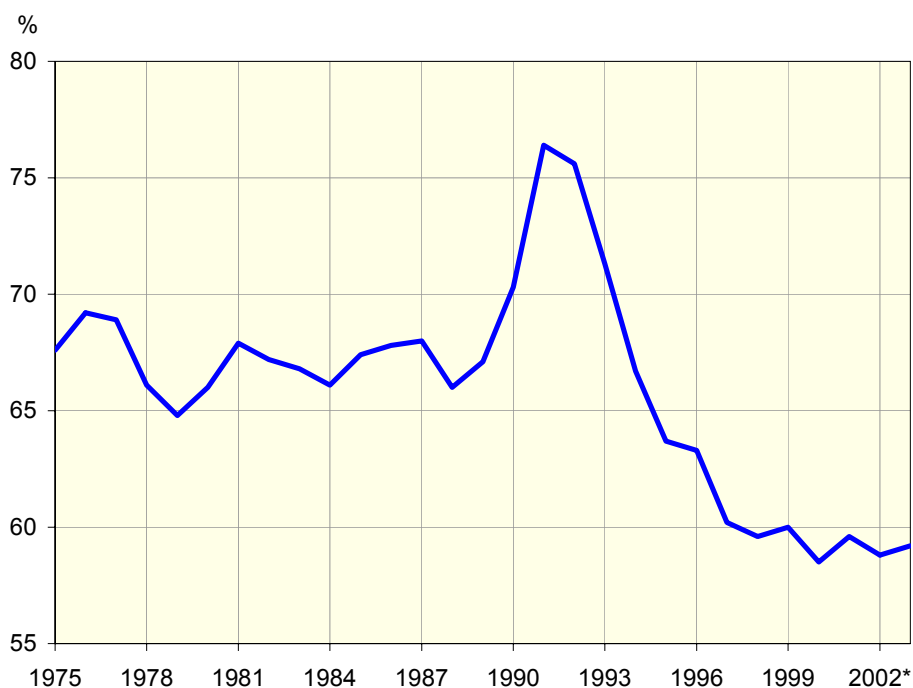
* Employment and Economic Development Centres.
Source: Statistics Finland/Labour Force Survey.

Traditionally, there are great differences in unemployment among the country's various regions. Although the number of unemployed persons is certainly greatest in urban areas in Southern Finland, the number of unemployed persons in relation to the labour force (the unemployment rate) is highest in sparsely populated areas in Eastern and Northern Finland.

The lowest unemployment rates can be found in Uusimaa, Ostrobothnia and Varsinais-Suomi. Elsewhere in Southern Finland and Mid-Finland the unemployment rates were around 9–12% in 2002. The unemployment rates have been highest in North Karelia, Kainuu and Lapland, as high as over 16%.

6.4 Income distribution and inequality

Figure 6.10. Labour share in the Finnish national income in 1975–2003*, %



Source: Statistics Finland/National Accounts.

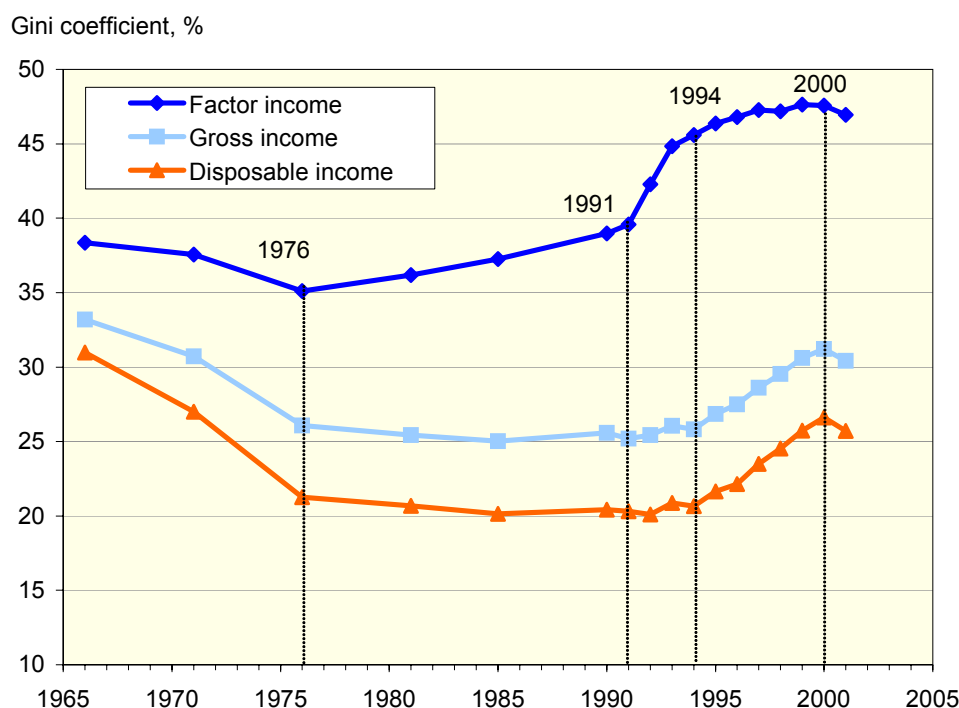
The distribution of labour and capital income means the division of value added between labour and capital. Value added is obtained by deducting the value of intermediate products used in production from the value of production. A part of this is distributed to the workers as compensation for their labour and a part remains with the enterprise to be used for investments or to be distributed to the owners. Labour share equals the fraction of wages and salaries and employer's social contributions of the national income.

In the national economy the distribution of income between labour and capital was quite stable for a long time right up to the end of the 1980s. During the years of recession at the start of the 1990s the income share of labour at first grew at an unprecedented rate in the years 1991 and 1992, but it then decreased in a few years to a level for which one would have to go back to the 1950s for comparison. The Finnish national economy went through a period of considerable changes during the whole of the 1990s.

The deepest recession of the industrialized countries, the period of recovery that followed it with its emphasis on exports and the sharp rise of the technology sector have left their traces in the structures of the economy. During the years of recession the entrepreneurial structure underwent a vigorous change when the weakest enterprises were forced into bankruptcy and those enterprises that were capable of surviving were obliged to become more efficient. A considerable part of the reduction in the labour share of the national income can be explained by the structural change on the plant level. On the plant level the distribution of labour and capital income has remained more stable.

Although the years of recession are now history, the income share of labour has not risen to its previous level. Unemployment, which has remained high, has had a contributory influence on this, and it has curbed the rate at which salaries have risen. On the other hand, the pre-recession period cannot automatically be taken as a suitable point of comparison, for powerful globalisation has signalled a permanent change in the environment of economic activity.

Figure 6.11. Gini coefficients based on different income concepts in 1966–2001, %



Source: VATT (Statistics Finland/Consumption Expenditure Surveys, Income Distribution Statistics).

Inequality measured by the Gini coefficient from factor income, decreased from 1966 right up to the mid-1970s. During the following fifteen years inequality increased steadily, but it began to rise much more at the beginning of the 1990s, when Finland experienced a deep recession. Unemployment increased and many salaried employees had to claim unemployment benefit. When the economy recovered from the recession, the growth in the inequality of factor income stopped. Like factor income, inequality in gross income and disposable income lessened until the mid-1970s. The decrease in inequality was even larger with these income concepts, because the received transfers of income and taxation effectively evened out disparities in income. After that, inequality remained the same for two decades. Inequality in gross income and disposable income did not begin to increase until the recession had passed, at the end of the 1990s. In 2001 inequality decreased.

Factor income consists of income received from markets (wages and salaries, entrepreneurial income and income from property). When transfers of income (e.g. pensions, unemployment benefits, social assistance allowances) received by households are added to factor income, gross income is obtained. By deducting from it transfers of income paid by households (e.g.

state and municipal income tax and social security contributions), one obtains households' disposable income.

By definition

$$\text{disposable income} = \underbrace{\text{factor income} + \text{received transfers of income} - \text{paid transfers of income}}_{\text{gross income}} + \underbrace{\text{net transfers of income}}_{\text{received transfers of income} - \text{paid transfers of income}}$$

A household's income and consumption per OECD unit of consumption is weighted by the number of members in the household and by sample weights.

Income inequality as measured by the Gini coefficient

The Gini coefficient is generally used to measure inequality. It can be illustrated by the Lorenz curve drawn inside the (1x1) square. The horizontal axis depicts the cumulative proportion of income recipients, when they have been lined up in ascending order of incomes, and the vertical axis corresponds to the cumulative proportion of income. Point c on the Lorenz curve states how great a part of the whole population's income share p of the population gets. In the case of perfectly equal distribution of incomes the Lorenz curve coincides the 45-degree line. The farther away the Lorenz curve is below the 45-degree line, the less evenly incomes have been distributed. The Gini coefficient is determined as the ratio of the area (A) lying between the 45-degree line and the Lorenz curve, to the half of the square, i.e. $A/(A+D)$.

In the case of perfect equality Gini = 0. In a completely unequal case, in which one gets all and the others get nothing, Gini = 1. The Gini coefficient is often stated as a percentage.

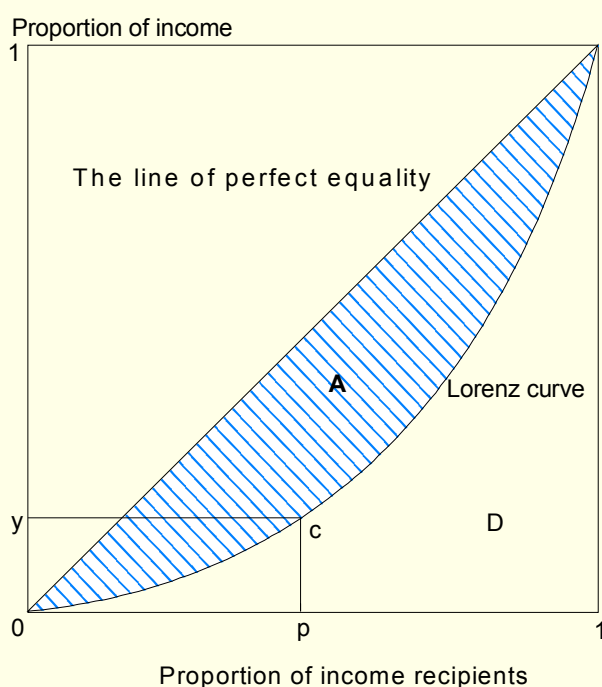
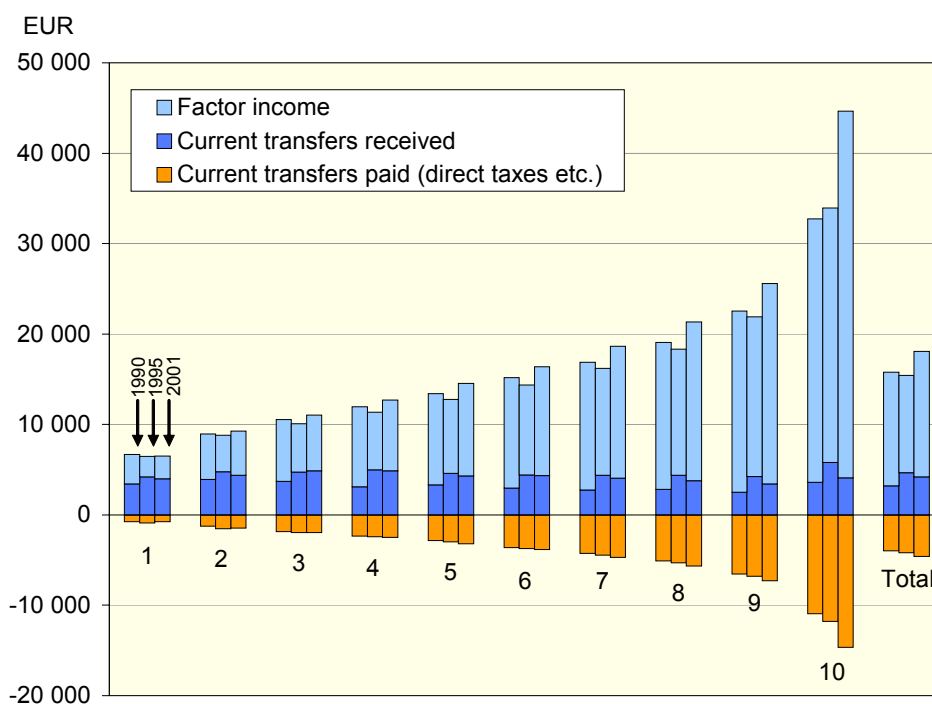


Figure 6.12. Average income items by disposable income deciles in 1990, 1995 and 2001, EUR



Source: VATT (Statistics Finland/Income Distribution Statistics IDS).

In the first decile (the lowest income earners, which form 10% of all income earners) income transfers received by households were more than half of their disposable income. Because the received income transfers hardly change when the factor income increases, the relative significance of transfers decreases in the higher deciles. The internal structure of transfers is, however, different in various income groups. Social and housing allowances are directed towards the lowest deciles. Family allowances, on the other hand, are not dependent on income, and occupational pensions are directed towards the upper income deciles. The relative share of received income transfers was exceptionally large after the recession in 1995. After that, the growth in factor income was rapid and was especially visible in the highest decile. Direct taxes paid by those belonging to the highest decile did not, however, rise as rapidly as factor income. This was partly due to the growth in the share of capital income, taxed at a flat tax rate.

7 Energy and environment

Energy costs make up about three per cent of Finland's gross domestic product. The highest energy intensities can be found in heavy industry. For example, in the basic metal industry energy costs can be over 10% of value added. In contrast, the energy cost shares of many service sectors remain below 1% of value added. Households spend almost 7% of their income on energy, half of which goes to transport fuels.

Fossil fuel use, for whatever purpose, contributes to the reinforced greenhouse effect and to acidification of the soil, while it is also detrimental to the local air quality, especially in cities. Environmental policy objectives have a large influence on energy policies. For example, the use of polluting fuels is discouraged by means of energy taxes. Higher energy prices motivate users to step up energy saving or to switch to cleaner fuels. The energy cost shares vary over sectors, and the possibilities to save energy vary as well, but they are not always commensurate to the cost shares. Increases in energy prices or, conversely, the investment cost of savings cannot always be included in the sale prices of final commodities. For these reasons the impacts of energy-pricing policies on the structure of the energy economy unfold over a larger time span.

The European Union has agreed on an emission trade system, which will become operational from the year 2005 onwards in all (25) member countries. The energy conversion sector, the mining industry, the paper and pulp industry, the iron and steel industry, and the building materials industry will participate in the EU emission trade system (EU ETS). The emission trade system is meant to help the energy-intensive sectors to achieve their emission reduction targets at lower costs than would be the case in the absence of the EU ETS.

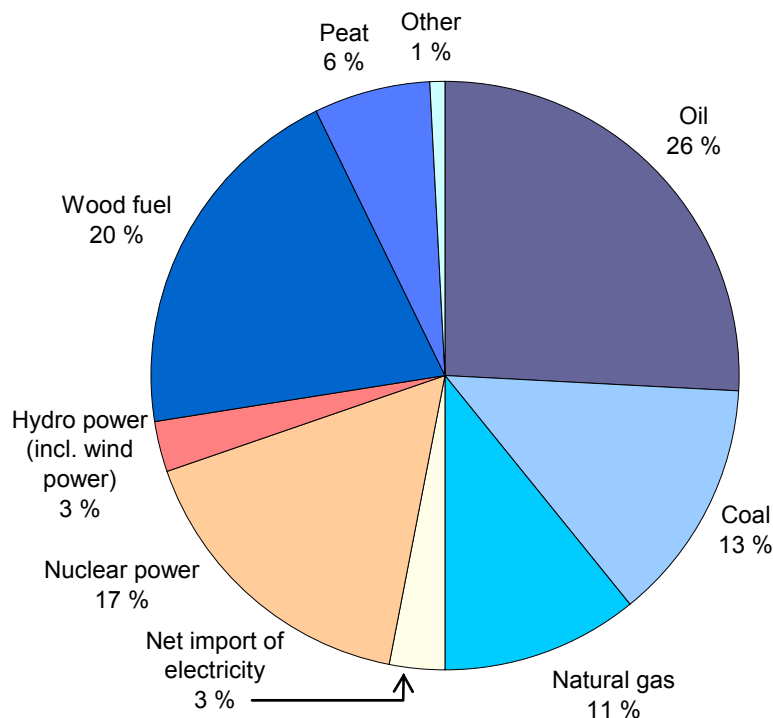
One of the challenges during the preparations of the emission trade system is to find a justifiable way to divide the overall national emission reduction task between sectors inside the trade system and other sectors. Furthermore, the adoption of the emission trade system requires co-ordination with the energy tax and other taxes.

7.1 The structure of energy supply and demand

Gross domestic consumption of energy in Finland amounted to 1 402 petajoules (PJ) in 2002. Half of this was covered by fossil fuels, whereas renewable energy sources covered almost a quarter. The share of nuclear energy was about one-sixth.

The Finnish energy supply structure is more diverse than in most other OECD countries. This large diversity improves the security of supply and attenuates the economy's sensitivity to energy price variations. Renewable energy sources, such as biomass and hydro power, are relatively abundant in Finland when compared to the OECD and EU average. Oil and oil products are mainly used in the transport sector and for space heating. Coal, biomass, peat and natural gas are used in power and heat production, especially but not exclusively in so-called combined heat and power units. Nuclear power and hydro power are used purely for electricity production. Last but not least, a part of the electricity supply is covered by imports from Russia, Sweden and Norway.

Figure 7.1. Primary energy use in Finland by energy source in 2002, per cent

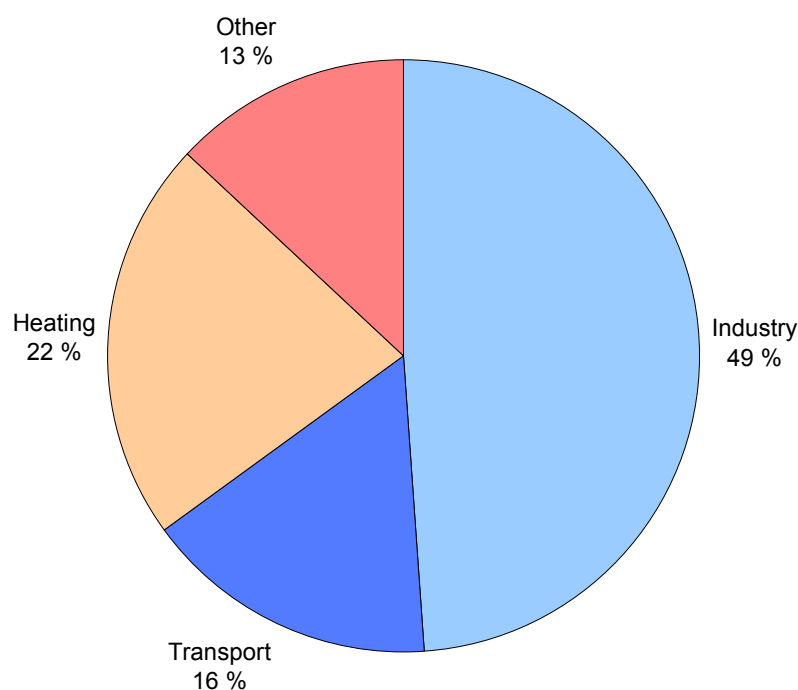


Source: Statistics Finland/Energy Statistics.

In 2002 the hydropower reservoirs were far below their average filling levels, after an already relatively dry 2001. As a consequence, imports from Norway and Sweden diminished. This decrease was compensated for by increasing the use of coal power and by expanding the electricity imports from Russia.

PJ = petajoule = 1 000 000 000 000 000 joule; 1 kWh = 3 600 000 joule

Figure 7.2. Final energy consumption in Finland by sector in 2002, per cent



Transport does not include energy consumed by international shipping and air traffic.

Source: Statistics Finland/Energy Statistics and Adato Energia Oy (owned by the Finnish Electricity Association, the Finnish Energy Industries Federation and the Finnish District Heat Association).

Of the entire final energy consumption (1 085 PJ) in Finland almost half is used in industry. Within industry the paper and pulp industry accounts for about 50% of the final energy use. In Finland the industry is overall more energy-intensive than in most industrialised countries. In Sweden and Belgium, industry accounts for about 35% of the total final consumption, whereas this share is still lower in many other industrialised countries.

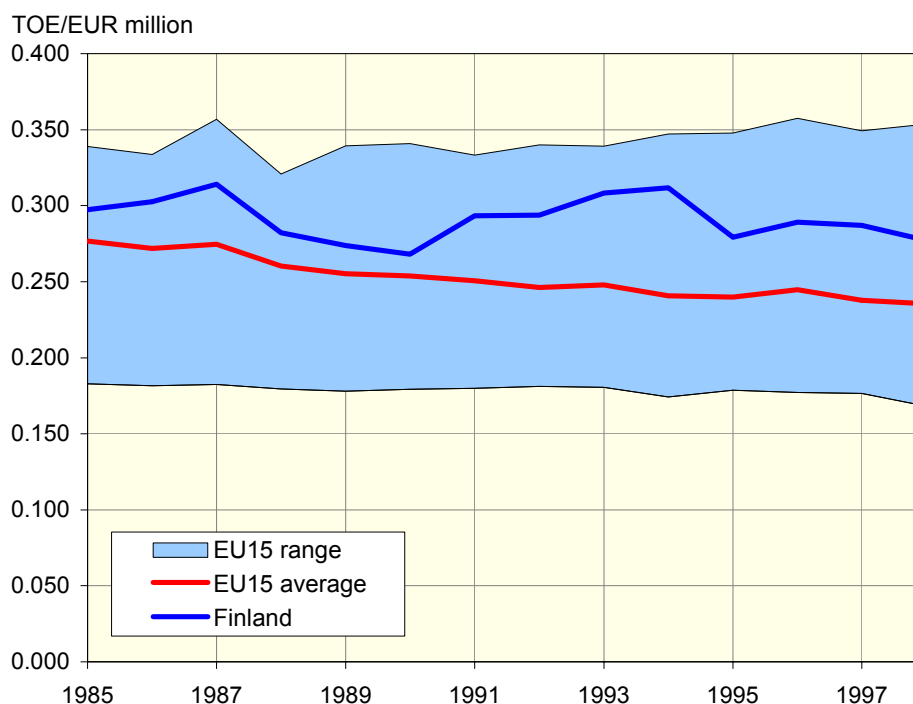
About one-fifth of the final energy consumption is meant for space heating. Domestic transport has a similar share.

The EU has agreed with the European car industry in the so-called ACEA agreement that the average new car sold in Europe in the year 2008 should have a CO₂ emission level of less than 140 g/vkm (gramme per vehicle kilometre). This limit translates as approximately 5 litres per 100 km. Despite this target, emissions from road traffic are expected to grow, owing to the increasing number of cars and the still rising average size of newly bought cars.

The remaining segments of final energy use comprise agriculture, construction electricity use in services and households. The residential sector represents the biggest part of the remaining segments. Energy saving in these sectors is either expensive in comparison to other sectors or, for all kinds of reasons, not easy to realise. However, some policies, such as the EU-mandated energy-labelling scheme for domestic appliances, do help to improve energy efficiency in these sectors.

7.2 Energy intensity and economic development

Figure 7.3. Energy intensity in EU15 countries 1985–1998, TOE/GDP



EU15 range and average excl. Luxembourg. Source: Eurostat/Sirene data base and VATT.

The energy intensity of the Finnish economy is and has been well above the EU average. Although at the level of specific industrial processes energy intensity in Finland is often low compared to other countries, at the sector and national levels energy intensity (in relation to value added and GDP respectively) is relatively high. The location at high latitudes obviously raises the energy requirements for space heating and thereby also the overall national energy intensity. Also, the prominent presence of heavy industry raises energy intensity.

The common trend in the past decades has been that in mature economies a further increase of the GDP per capita came along with a decrease in the energy consumption per unit of GDP. In some EU countries with below-average income levels such as Greece and Portugal, an increase of the GDP per capita was still accompanied by an increase of energy use per unit of GDP. The energy intensity of Sweden has been reduced more than that of Finland, even though the countries have rather similar economic structures. During the economic crisis of the early nineties in Finland energy intensity rose, temporarily due to under-utilisation effects in heavy industry. In 1999 the least energy-

efficient countries were Greece, Portugal and Belgium. The most energy efficient countries were Denmark, Italy and Austria.

Energy intensity = (gross) energy consumption (in PJ or TOE) divided by purchasing power corrected GDP. This ratio is an indicator of the efficiency with which an economy uses energy. The smaller the intensity, the less energy is needed to create a unit of GDP, i.e. the more energy efficient the economy is.

TOE = tonne of oil equivalent, meaning that for all used energy sources, their energy content has been measured with the energy content of oil as the unit.

Table 7.4. Energy intensity in 1985, 1990, 1995 and 2000 in EU15 countries, TOE/capita

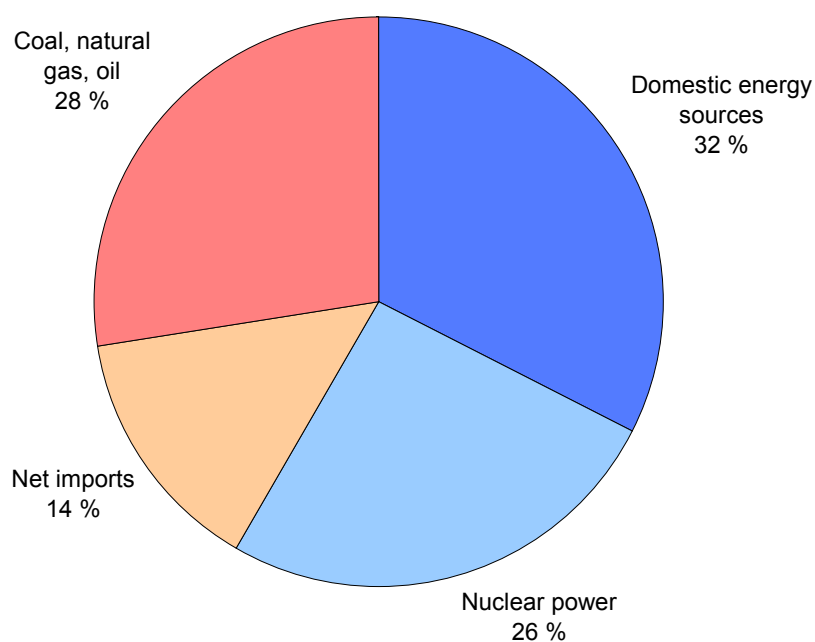
	1985	1990	1995	2000
Luxembourg	8.5	9.3	8.1	8.3
FINLAND	5.4	5.7	5.6	6.3
Belgium	4.4	4.7	5.0	5.6
Sweden	5.6	5.5	5.7	5.4
Netherlands	4.3	4.5	4.7	4.7
France	3.7	3.9	4.1	4.2
Germany	4.6	4.5	4.1	4.1
United Kingdom	3.6	3.7	3.7	3.9
Denmark	3.8	3.5	3.9	3.7
Ireland	2.5	2.9	3.1	3.7
Austria	3.1	3.3	3.3	3.5
Spain	1.9	2.3	2.6	3.1
Italy	2.4	2.7	2.8	3.0
Greece	1.8	2.2	2.3	2.7
Portugal	1.2	1.7	2.0	2.4

Source: Eurostat/Sirene data base and VATT.

The energy intensity per capita of Finland is well beyond the average of the EU countries. In the year 2000 only Luxembourg had a higher figure than Finland. Since 1985 the energy intensity per capita was remarkably reduced in Germany. The main reason for this is the refurbishment of the former East German energy sector. In Sweden, Luxembourg and Denmark intensity went down slightly, whereas it went up by about 10% in the UK, the Netherlands, Austria and France. The intensity per capita in Finland increased by 17% between 1985 and 2000. Most of this increase occurred after 1995. The increase of the per capita energy intensity in Belgium and Italy is remarkably large, and even more so in Spain, Greece, Ireland and Portugal. In the latter four countries this can be attributed to a relatively larger growth in industrial output as well as substantial increases of domestic appliance ownership.

7.3 Import dependency of electricity supply

Figure 7.5. Import dependency of the Finnish electricity supply in 2002, per cent



Source: Adato Energia Oy.

The dependency on imports is here distinguished along temporal lines, meaning that the easier and the quicker an import flow can be cut or its price changed, the higher the degree of explicit dependency is. Applying the most strict criteria, only the domestic energy carriers, such as biomass and hydro power, imply no dependency. As these sources cover 32% of the electricity supply, the import dependency of the electricity supply would be 68%. Nuclear power production is not instantly dependent on foreign supplies, and therefore counting it as a domestic source reduces the – short term – import dependency to 42%. Allowing for the fact that the imported fossil fuels for power production are to some extent stored or ensured, it could be interpreted that the – instantaneous – import dependency is further reduced to 14%. This figure equals the share of imports of electric power. The import dependency could easily be reduced, at least technically. Commercially, this is not attractive. In years with reasonable to good availability of hydropower in Nordic countries, imports are cheap. In addition, there is now a continuous flow of rather low-priced imports from the Russia power system. Nevertheless, the flip side of the coin is that in years with

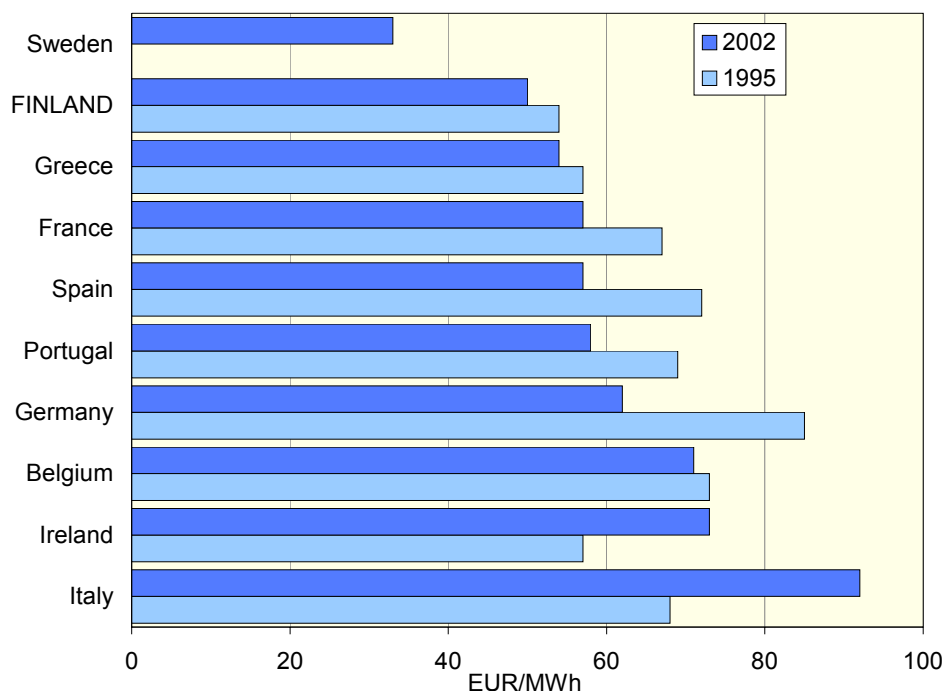
scarce availability of hydropower in the Nordic countries import prices and also electricity trade prices in general go up considerably.

Last but not least, the import dependency of transport fuels is high (95%), just as in most other EU countries.

OECD classifies nuclear energy as a domestic source, even though for most countries the raw material or even the processed material is imported.

7.4 Energy prices

Figure 7.6. Electricity prices for industrial users at 24 GWh/year in selected countries in 1995 and 2002, EUR/MWh



Source: Statistics Finland/Energy Statistics.

Electricity prices vary considerably between countries, as the primary fuel mix and the dominant conversion technologies differ substantially from country to country. In Finland the electricity price for large industrial users is the second lowest in the Union. Only similar users in Sweden get electricity for a still lower price, thanks to a large share of hydropower, next to nuclear capacity.

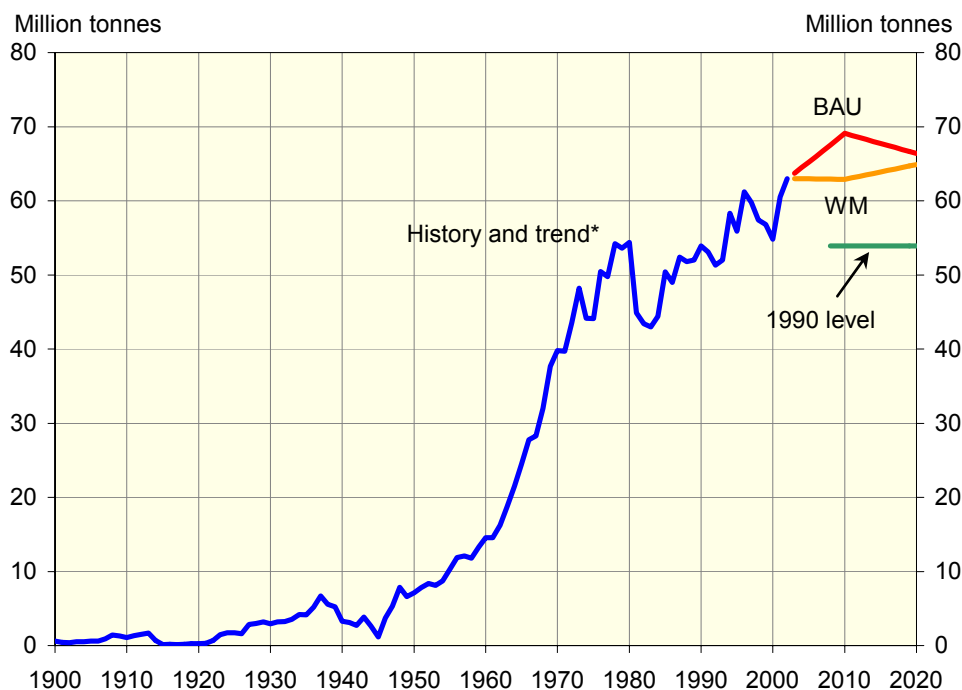
The liberalisation of the electricity markets leads to lower electricity prices, if there is overcapacity in generation capacity and no collusion of large generators. This price reduction effect was clearly operative in the Nordic power markets. When the overcapacity fades away after a couple of years, prices start to rise. In many countries the electricity markets still have strong monopolistic features and, consequently, prices appear to go up much more easily than they go down.

A low electricity price is regarded as very important by heavy industry, in particular by the basic metal and the paper industries. Energy cost can be lowered by optimising the use of industrial waste as fuel and by using wood (or other biomass)-based material as an energy source. For example, the paper industry applies such technologies. Of course, optimising the overall energy use by introducing combined heat and power production where feasible and optimising end-use efficiency are important as well. Last but not least, in various member states very large industrial energy users can purchase electricity and/or natural gas at specifically reduced prices. With the progress of regulatory reform in EU energy markets the obligations regarding transparency might help to abandon or at least reduce these implicit subsidies.

VATT published a research report on the Finnish and Nordic electricity markets: VATT Research Report no. 97, Adriaan Perrels, Heikki Kemppe (2003), *Liberalised Electricity Markets – Strengths and Weaknesses in Finland and Nordpool*.

7.5 Greenhouse gas emissions and the cost of climate policy

Figure 7.7. CO₂ emissions in Finland in 1900–2002* and trend until 2020, million tonnes



* Estimated by the Ministry of Trade and Industry. BAU = Climate strategy business as usual baseline. WM = With measures baseline.

Source: VATT (VTT Technical Research Centre of Finland, Statistics Finland and the Ministry of Trade and Industry).

With the growth of Finnish total output energy consumption also expanded substantially. The growing energy requirement of the past decades was predominantly met by an increase of fossil fuel use, leading to an almost tenfold increase of Finnish carbon dioxide emissions in the second half of the 20th century.

The introduction of nuclear power considerably reduced the emission level in the 1980s. The establishment of a common Nordic electricity market and some favourable hydro power years contributed to the reductions in the second part of the nineties. In the most recent years, 2002 and 2003, the Finnish carbon dioxide emission level increased substantially due to growth in electricity demand and very unfavourable hydro power years.

In the national climate strategy, it was estimated that the carbon dioxide level would increase up to an average of 70 million tonnes for the period 2008–2012, if no further measures were taken (BAU). With measures it is now expected that emissions remain somewhat lower. In a longer run however, they will start raising again (WM). Within the frameworks of the Kyoto Protocol and EU Burden-sharing agreement Finland has agreed that the average greenhouse gas emission level of the years 2008–2012 will not exceed the 1990 level.

The most important greenhouse gas is carbon dioxide (CO₂), which made up 84% of the Finnish greenhouse gas emissions in the year 2000. Other greenhouse gases are methane (CH₄), di-nitric oxide (N₂O), and the so-called 'new gases', several kinds of halogens such as HFC, PFC and SF₆.

The dominant source of carbon dioxide emissions is the incineration of fossil fuels in the energy conversion sector (refineries, power stations) and in engines in means of transport, notably road transport. Energy conversion, in particular power generation, can also be done with carbon-free energy sources such as hydro, wind and nuclear power. Furthermore, in Finland biomass-based fuels are important. Biomass is a so-called climate neutral fuel, as the carbon dioxide emissions from burning are compensated by the uptake of carbon dioxide during growth of the plant or tree. Other greenhouse gases are emitted by waste processing (methane), agriculture (methane and di-nitric oxide) and industrial processes (di-nitric oxide and the 'new gases').

Table 7.8. Greenhouse gas emissions in the years 1990 and 2000, as well as the target level for the 1st commitment period 2008–2012 in selected countries, million tonnes

Country	Emission level 1990	Emission level 2000	Emission target 2008–2012
Norway*	52	56	52
Denmark	70	69	55
Sweden	70	69	72
Finland	77	74	77
Netherlands	216	217	203
Ireland	54	66	61
Austria	77	80	67
Portugal	65	85	82
Greece	105	130	132
Belgium	142	152	131
<i>Small EU15 countries + Norway</i>	<i>926</i>	<i>941</i>	<i>932</i>
Spain	306	386	352
Germany	1 207	991	953
France	546	524	546
Italy	518	544	485
United Kingdom	742	649	649
<i>Large EU15 countries</i>	<i>3 318</i>	<i>3 112</i>	<i>2 984</i>
Poland* (1999)	565	400	565
Czech*	188	142	173
Estonia* (1999)	32	11	32
Russia* (1999)	2 999	1 926	2 999
USA* (1999)	5 963	6 746	5 546

The Polish reduction target has the year 1988 as its reference base. The USA has not ratified the Kyoto Protocol. The figures for the Czech Republic are expected figures as published in the country's third national report.

Source: EEA year 2002 report to the European Commission and 3rd national reports (for countries marked with an asterisk).

In 1988 formal global deliberations started concerning climate change in the Intergovernmental Panel for Climate Change. In 1995 the United Nations Framework Convention for Climate Change was established, thereby allowing the world community to start to make decisions on internationally co-ordinated policies. This culminated in the Kyoto Protocol.

In that Protocol the industrialised countries (often referred to as the Annex B countries) have committed themselves to reducing their average greenhouse gas emissions in the period 2008–2012 to the level of 1990 or somewhat lower, depending on the country under consideration. The USA and Australia have, however, not ratified the Protocol. The EU member countries have, apart from a country-specific commitment, also agreed on an overall EU target of -8%

(compared to the 1990 level). The target for Finland is to arrive at the emission level of 1990 (or lower).

Some member countries, such as Germany and the UK, had rather large potentials of easily reducible emissions. By the time the reduction was agreed upon, these countries still possessed substantial amounts of old coal-fired power stations, which could be easily replaced by modern more efficient gas-fired power stations. For Italy, Belgium and the Netherlands the targets were more difficult to achieve, right from the start. Spain, Portugal, Greece and Ireland were granted some space for growth in total emissions between 1990 and 2010 (15%–25% depending on the country). However, these countries' emissions have been growing strongly in recent years, thereby obliging these countries in the remaining years to reduce emissions from current levels in order to fulfil their obligations.

As a consequence of strong economic growth in Denmark and the Netherlands between 1990 and 1998 the greenhouse gas emissions grew substantially in those countries. In Spain, in particular, road transport has been expanding its emissions enormously. In Sweden and Finland emissions were reduced between 1990 and 2000. The former centrally planned economies such as Poland, Estonia and Russia have experienced reductions in emission levels, due to the economic crisis and changes in the economic structure. As a consequence of this, these countries can sell their surplus emissions to other (Annex B) countries. However, the criteria for admission to the emission trade system are rather strict and not so easy to fulfil for these countries.

Table 7.9. Marginal reduction cost of greenhouse gas emissions per CO₂ equivalent, and achieved and required GDP elasticities of emissions (% emission reduction per % GDP growth)

	Marginal cost (€/tonne CO ₂)	Achieved elasticities (1990–1999)	Required elasticities at 2% annual GDP growth	Difference of elasticities*
Netherlands	105.8	0.24	-0.63	0.87
Belgium	91.8	0.36	-0.72	1.08
Ireland	32.1	0.29	-0.38	0.67
Austria	52.8	0.13	-0.84	0.97
Greece	11.1	0.79	0.33	0.46
Portugal	23.1	0.83	0.17	0.66
Sweden	41.4	0.11	0.11	0
Finland	53.1	-0.04	0.06	-0.10
Denmark	53.0	0.16	-1.37	1.53
Spain	12.0	1.00	-0.39	1.39
Italy	34.5	0.31	-0.55	0.86
France	1.3	-0.01	0.01	-0.02
Germany	11.5	-1.20	-0.15	-1.05
United Kingdom	11.5	-0.75	0.09	-0.84
EU15	20.3			

* In case of a difference near zero or even negative, the target seems to be easy to achieve.

Source: VATT.

The marginal cost of emission reduction is based on a simulation study carried out by Blok et al. (2001). For all EU member countries the marginal abatement cost (= reduction cost of the last unit needed to achieve the target) was assessed on the assumption that countries were fulfilling their Kyoto reduction targets.

Blok, K. D. de Jager, C. Hendriks, Economic Evaluation of Sectoral Emission Reduction Objectives for Climate Change, Parts 1 and 2, Study for the European Commission, Ecofys/AEA Technology/NTUA, Utrecht, 2001.

The Dutch and Belgian reduction targets are relatively large and the marginal reduction costs are rather high in those countries; consequently, it seems quite a challenge for those countries to achieve their reduction targets.

It is also possible to judge the ease of reduction by means of the GDP elasticity of emissions, meaning how much a country's greenhouse gas emission level has changed (in %) compared to the relative change (in %) of its GDP. This is done in Table 7.9. In the 1990s both GDP and emission levels grew. If the elasticity is low, economic growth causes relatively few extra emissions. If the elasticity is negative, it indicates that (for the observed years at least) economic growth was accompanied by a reduction in emission levels. In Finland, France,

Germany and the UK an increase in GDP was accompanied by a (small) decrease in emissions. In Spain the picture has been quite the opposite during the 1990s. Emissions and the economy even grew at the same pace.

In Table 7.9 the column depicting required elasticities gives an indication of the gravity of the emission reduction task, from the point of view of the speed at which the energy economy has to be transformed. It is assumed that all countries will have an annual economic growth of 2% between 2000 and 2010. The larger the difference between the required and achieved elasticity (in the period 1990–1999), the harder it will be to achieve the reduction target. When these differences are used as benchmark indicators, it seems that the most dramatic changes are necessary in Spain, Denmark and Belgium. Austria and the Netherlands also face considerable transformation tasks. Obviously, the gravity of the challenge will change when the introduction of the European emission trade system (EU ETS) is taken into account, especially when new member states with surplus emissions will take part in the system.

After 1999 the situation worsened in Finland, owing to the increased use of fossil fuels, notably for power generation. An improvement in the hydropower capacity availability (assuming normal precipitation in the coming years) and containment of the growth in electricity demand would already attenuate the current situation. In addition, emission trade, increased biomass use and a fifth nuclear power unit will also contribute to achieving the reduction target at a reasonable cost.

VATT researchers made several publications on the cost of climate policy and the economic effects of emission trade. See, for example:

VATT Discussion Paper 329, Juha Honkatukia (2004), *Päästöoikeuksien jakotapojen kustannusvaikutukset (The cost effects of the initial distribution of emission permits)*.

VATT Discussion Paper 328, Pekka Mäkelä (2004), *Kariutuneet kustannukset ja omaisuudensuoja päästökaupassa (Stranded cost and protection of ownership in emission trade)*.

VATT Research Report 102, Juha Honkatukia, Juha Forsström, Eero Tamminen (2003), *Energiaverotuksen asema EU:n laajuisen päästökaupan yhteydessä – loppuraportti (The role of energy taxation in the case of a European Union-wide emission trade system – final report)*.

VATT Discussion Paper 282, Juha Honkatukia, Esa Joutsenvirta, Heikki Kemppe, Adriaan Perrels (2002), *EU-laajuisen päästökaupan toteuttamisvaihtoehdot ja vaikutukset Suomen kannalta (The implementation options for EU-wide emission trade and their impacts for Finland)*.

VATT Research Report 82, Adriaan Perrels, Heikki Kemppe, Antti Lehtilä (2001), *Assessment of the Macro-Economic Effects of Domestic Climate Policies for Finland*.

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