

Economic Growth Rate May Be High in Spite of a Decreasing Working-age Population in Finland

PEKKA PARKKINEN, Pol.Lic.

Chief of Research

The Government Institute for Economic Research, Helsinki, Finland

Abstract

This article examines the possibilities for the growth of real income in Finland in a situation where the population is aging at a record rate. In contrast to other European countries, no larger age groups were born in Finland after the 1940s. Therefore, the labor force will decrease in long run, even though an abundant amount of labor reserves still exist in Finland after the exceptionally deep economic depression experienced in the previous decade.

Finland's real income has been calculated as the product of the labor input and productivity per hour worked. The rate of change in productivity has been estimated on the basis of the historical development of labor productivity. On the basis of an analysis of labor input and productivity per hour worked, the real income of Finland per capita could rise to one-and-a-half times what it is now in one decade and a half, even if the working-age population decreased markedly and even if the number of hours worked per employed person declined at the traditional rate. Increasing immigration is not the only solution to the challenges of an aging and diminishing working-age population. By employing domestic labor reserves and improving productivity, reasonable economic growth rate can be achieved and at the same time the problems caused by uncontrolled immigration can be avoided.

Keywords: Population, Employment, Labor input, Real incomes, Finland

Introduction

The population age structures of Finland and Japan differ greatly from the age structures in the other countries. In both countries the largest age groups in the current population continue to be the cohorts born at the end of the 1940s. In other countries the population's largest age groups are at least 10 years younger. In the European Union, for example, the largest age groups are those born in the mid-1960s and in the poorest developing countries the largest population groups are the youngest cohorts.

In this article I will evaluate the growth rate of the real income of the Finnish economy in a situation where the population is aging very rapidly. Because all the cohorts born in 1945–1968 are still clearly more populous than any of the younger ones, there will be fewer people in the next few decades entering the labor force than there will be entering retirement age. This will happen, even if Finland's future migration gain were to continue at the same average rate as it has in the last two decades. What will then happen to economic well-being, which in this article is measured in the traditional manner by using the gross domestic product per capita?

In this article I use population projection by municipalities (Statistics Finland 2001) and its updated population projection for 2004–2050 based on same assumptions made in Statistics Finland in 2004. For a more in-depth view of the future, the history of the population over the past one hundred years has been added to the population projection by age groups (Figure 1).

It is easy to use the population to project the number of employed persons into the future by keeping constant employments rates by age, which are calculated by dividing the number of persons in employment by the total population of the same age. With the onset of the decline in the working-age population, the Finnish government is attempting to increase the employed labor force by raising the total (15–64-year-olds) employment rate from the current 67% to 75% by the beginning of the next decade (The Government Program of Prime Minister Vanhanen's Government).

Even if it is easy to grasp the meaning of the number of employed persons, it is not a good measure for the labor input, on which the real income of nation measured by gross domestic product (GDP) is strongly dependent. According to the Labor Force Survey (Statistics Finland 2004), a person is entered into the statistics as being employed, if he or she is doing gainful employment work, even if for only one hour a week. Thus numerous full-time students, pensioners and others who are doing gainful employment work on a sporadic basis are entered into the statistics as being members of the employed labor force. Employed persons even include people who are absent from work for months at a time, and who are not doing gainful employment work at all. They include women on maternity leave and persons on sick leave with a permanent job.

Labor input, measured by the number of working hours in gainful employment, is a better measure than employed labor force for the production factor of labor. In this article the labor input rate by age means working hours in gainful employment work per resident by one-year age groups from the age of 15 up to 74. Due to the high quality of Finland's statistics, even the number of working hours can be accessed by age group and separately for men and women using the unpublished basic data of Statistics Finland's sample-based Labor Force Survey (Statistics Finland 2004).

The population by age and labor input by age will be used later to analyze the size of the labor input available to the Finnish economy in the future.

Because the GDP (gross domestic product) can be determined as the product of L (the labor input) and GDP/L (labor productivity), we can calculate the future growth rate of the gross domestic product with the labor input and the labor productivity. When the nation's real income measured by the gross domestic product is divided by the size of the total population, the result is the traditional measure GDP per capita for the economic well-being of the nation.

The population of Finland from 1900 to 2050

In 2003 there were 5.2 million people living in Finland, equaling 0.08% of the world's population. The population has almost doubled in one hundred years. Ever since the beginning of the 1970s the total fertility rate has fluctuated around 1.75. In the population projection mentioned above the fertility rate is expected to remain at its current level.

In Finland life expectancy was 78½ years in 2003. In the Statistics Finland population projection the probability of death is expected to decline so rapidly that every year life expectancy will increase by 1.5 months. According to this forecast, the difference between the life expectancy of Finnish women and men, which was 6.7 years in 2003, will diminish in half a century to four years.

If immigration exceeds emigration by 5,000 persons a year, as it will according to the population projection, the population will be at its largest in the middle of the 2020s. At that time the population will be a couple of percent higher than it is now. If this population projection were to come true, then in 2050 Finland's population would be a few percent smaller than it is now.

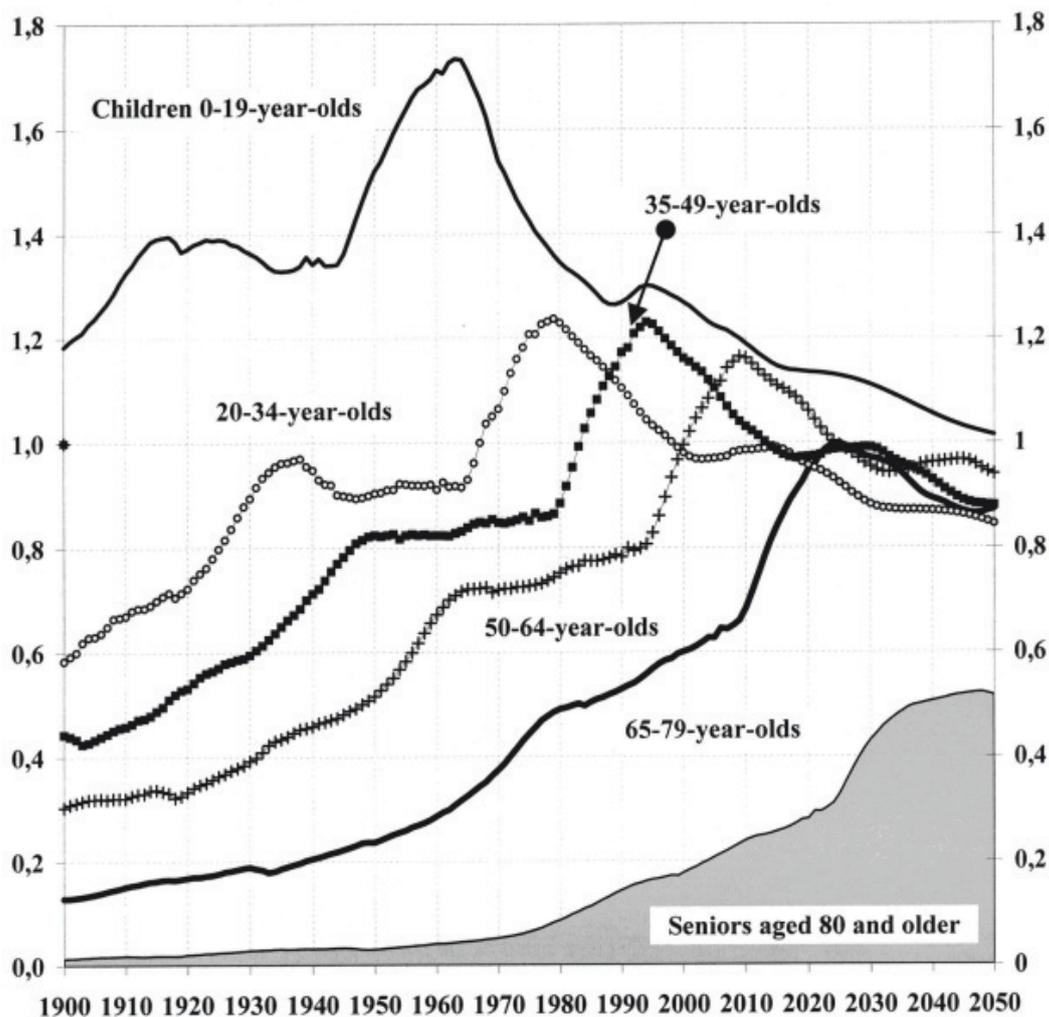
Even though it is believed that the total population will remain almost the same until the year 2050, the age structure of the population will change greatly. As shown in Figure 1, the number of children and soon also the size of the working-age population will decrease. An increasingly smaller number of women will be reaching the age of fertility, and thus the number of births will continue to decrease, even if fertility were to remain at the current level.

Finland's largest age groups will be reaching the traditional pension age of 65 already in the coming decade. With these largest age groups the pension-aged population's share of the whole population will rise from the current 15.6% to 27% over a period of 30 years. If the life expectancy lengthens according to the population projection

used in this article, there will be no decline later either in the proportion of the entire population having reached the age of 65.

There will be an especially rapid increase in Finland in the size of the care-aged or senior population having reached the age of 80, for the life expectancy is increasing and starting in the 2020s, the most populous age groups will be reaching this age. In less than four decades the proportion of the population over 80 years of age will triple to 10% and it appears that this will not be diminishing later either. The fact that the proportion of the population composed of seniors is multiplying will increase the demand for labor-intensive health and social services. Because labor productivity in these services has improved at a very slow rate up till now, this change in the population's age structure may even effect the growth rate of the labor productivity of the entire economy.

Figure 1. The Finnish population by age group in 1900–2003 and projection to the year 2050, millions of persons.



Employed labor force will begin to diminish

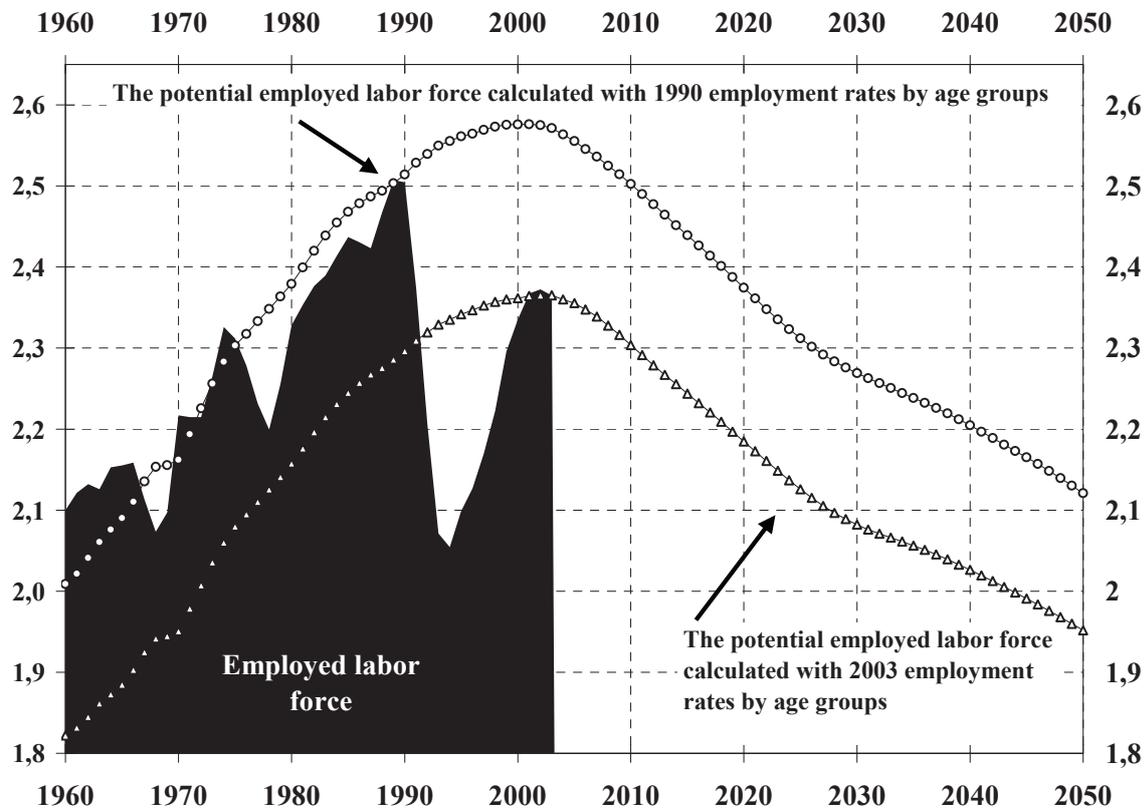
Estimates of how the employed labor force will develop can be made on the basis of the population by using employment rates by age. In this article the employment rates have been calculated using the basic data of the Labor Force Survey (Statistics Finland 2004) in one-year age groups from the age of 15 all the way to 74. A simple way to estimate the number belonging to the employed labor force is to assume that the all employment rates will remain unchanged in the future and to use the above-mentioned population projection as a basis.

In evaluating the size of the employed labor force in future, the employment rates of both 2003 and 1990 are used in addition to the population projection. In composing this article, the most recent employment rates available concern the year 2003. In Finland the year 1990 represents a year of what could be called full employment, when unemployed persons composed only 3.2% of the labor force and the total employment rate was 74%.

At the end of 1990 Finland began, mainly due to serious mistakes in domestic economic policy (Kiander and Virtanen 2002), to fall into the deepest depression of peace time known in Finnish economic history, on which statistics have been gathered since the year 1860. In three years the number of unemployed grew to five times what it had been and the employed labor force plummeted downwards by almost one fifth (Figure 2). Even though Finland's economy has grown after the depression by an average of 3.6% per year, there were still three times as many unemployed persons in 2003 and the number of employed persons was still 6% less than in 1990.

If the employment rates by age groups were not to change at all in the future and the population projection mentioned above were to come true, then the employed labor force would shrink continuously as shown in Figure 2. In one decade already one hundred thousand fewer persons would be employed and in half a century almost one half million persons or one fifth less than now would be employed. When measured with the employment rates of 2003, Finland has already become a country with a decreasing labor force, unless immigration increases markedly from what has been assumed in the population projection.

Figure 2. The employed labor force in 1960–2003 and the potential employed labor force up to the year 2050 calculated with 1990 and 2003 employment rates by age groups, millions of persons.



Also when measured with the employment rates by age groups of 1990, the potential employed labor force will decrease at about the same rate as when measured using the employment rates of 2003. However, in 2003 there would have been a total of 2.57 million or 200,000 more persons employed than there actually were, if Finns would have been employed as high at different ages as they were in 1990. When calculated in this way, Finland still has an 8% labor force reserve of the unemployed as a result of the depression.

Labor input rates still at a low level

The unpublished basic data in the Finnish Labor Force Survey has been used to calculate the amount of hours worked by both males and females by one-year age groups from the age of 15 to 74. In 2003, according to the statistics in Figure 3, 30–46-year-old men did the most gainful employment work per the resident. Their gainful employment work totaled over 1,600 hours per male resident. The fluctuations in the labor input rates of adjacent age groups in the figure are explained by sampling errors in the Labor Force Survey.

Also in Finland women do less gainful employment work than men of the kind that is covered by the statistics, but women do more home work such as caring for their own children, which is not entered at all into the labor force survey statistics or into other regularly published official statistics. Women's gainful employment work increases as their children grow older and need less of their mother's care. In 2003 the amount of gainful employment work carried out by women was highest among 37–51-year-old women. According to the unpublished data of the Labor Force Survey they completed over 1,300 hours of gainful employment work per female resident.

Figure 3 also shows the gainful employment work input per resident from the last "full-employment year", the labor input by age of 1990. At that time men of prime working age completed over 1,800 hours of gainful employment work per resident and women over 1,500 hours. Also in the other age groups under 50, the labor input rates of both women and men were definitely smaller in 2003 than before the depression.

In contrast, the labor input rates of those over 50 had almost returned to the level preceding the depression. This can probably be explained by the fact that in the past few years a variety of programs have been used in Finland to encourage people to continue working to a later age than previously and, at the same time, legislation has been passed that makes it more difficult to be granted an unemployment pension or a disability pension.

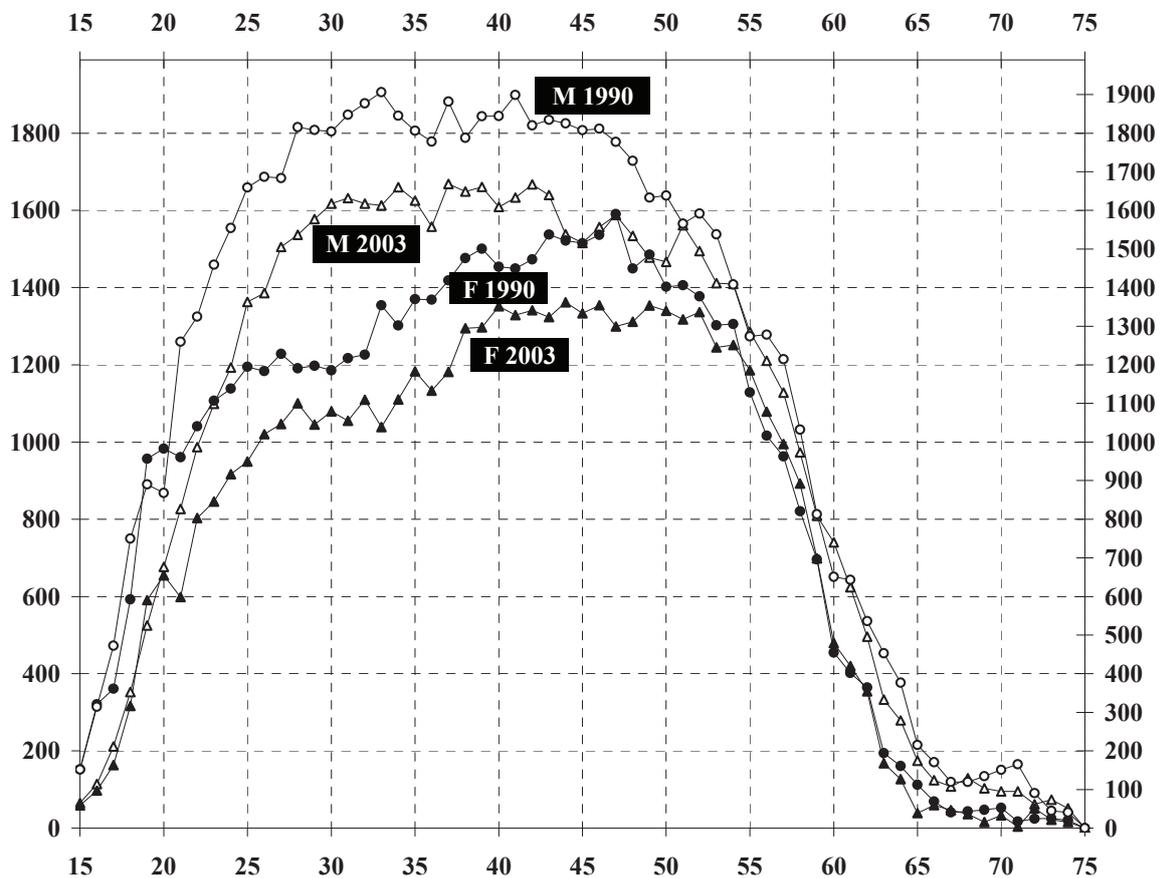
Using labor input rates by age and the population of corresponding age, it is simple to estimate the future amount of labor input. When the number of working hours per male resident is multiplied by the corresponding number of males in the population aged from 15 to 74, this gives a product sum of 2.25 billion hours for the year 2003. Correspondingly, the labor input of women comes to 1.75 billion hours. Together these make a total of 4.0 billion working hours, or the amount of gainful employment work in the Finnish economy in 2003.

If the labor input rates of the "full-employment year" of 1990 are used in these working hour calculations instead of 2003, the product sum will, of course, be bigger. Using the labor input rates by age for 1990 and the population by age for 2003, the product is 2.56 billion male working hours and 1.97 female working hours or a total of 4.53 billion hours.

Thus, if in 2003 working-age women and men would have worked for exactly as many hours per age group per person as in 1990, the labor input in the Finnish economy would have been 13% or over one half billion hours greater than it actually was. When calculated using working hours in 1990, the labor reserves are thus about 5% larger than when labor reserves are calculated using the number of employed. It

was shown earlier that when calculated using 1990 employment rates, the size of the work force in 2003 would have been 8% greater than that shown by the statistics.

Figure 3. The working hours completed by men (M) and women (F) per resident and by age groups in 1990 and 2003, hours.



Labor input is also starting to decrease

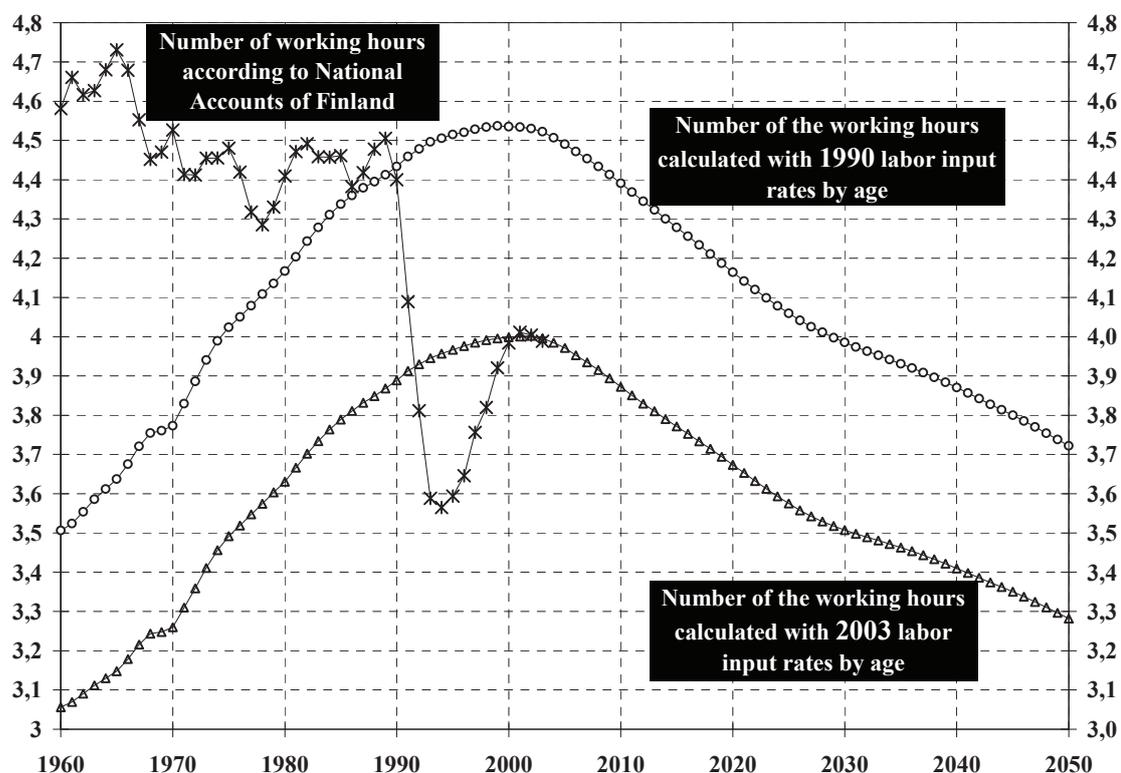
Figure 4 shows the number of working hours according to the statistics of the national accounts, starting in the year 1960. Just four decades ago the average annual rate was 4.6 billion hours of gainful employment work. At that time the number of annual working hours was substantially higher than it is now also because, at that time, more than one fourth of all the employed persons were agricultural entrepreneurs, whose annual number of working hours in the statistics was exceedingly high.

When the number of agricultural and forestry entrepreneurs with a very full work year declined drastically and the working hours of other employed persons decreased considerably, the annual labor input diminished to 4.4 billion hours. During the depression years the gainful employment labor input fell drastically to somewhat over 3½ billion hours per year, from where it has again risen to four billion hours.

The amount of working hours would go down in the future, if the labor input rates calculated per resident were to remain at its current level in each age group. In a couple of decades the labor input would decrease by one tenth and in half a century by one fifth, if the above-mentioned population projection were to come true. Finland's labor input has thus begun a decline, be it measured by the labor input rates by age of 2003 or of 1990.

If, in 2030, the same amount of gainful employment work were completed in each age group for each man and woman living in Finland at exactly the same rate as in 1990, the labor input would then be a total of 4.0 billion hours. In Finland the labor input in the economy would not decrease for a quarter of a century, if the labor input rates by age were to return to the average levels they were on before the depression. According to Figure 4, however, the labor input in 2050 would be almost one tenth smaller than it is now, even if Finns then worked the same number of hours in gainful employment work per resident and by age group as they did in 1990.

Figure 4. Number of working hours in 1960–2003 and up to 2050 calculated on the basis of labor input rates by age of 2003 and of 1990, billions of hours.



It may be difficult to reach the labor input rates of 1990, because it is most likely that the work week will continue to shorten also in the future. In regular full-time work, the annual number of working hours per the employed person decreased in Finland by one half over a period of one hundred years and trade union will strive to reduce the work year of their full-time working members also in future. Part-time work will probably continue to become increasingly common, because a clearly smaller portion of Finnish employees is now working part time compared to other EU countries. Raising the total employment rate will also decrease the yearly number of working hours, for this will mean that, compared to now, the employed labor force will include relatively more pensioners, students and not so able-bodied people who will not be able to or want to work as many hours per year than people now do on the average.

If some day the employment rates by age are successfully raised to the same level as in the "full-employment year" of 1990, the number of working hours per employed person may remain smaller than they were in 1990, for the reasons stated above. Therefore, the assumption is then made in this article that the average labor input rates of the "full-employment year" of 1990 have decreased since then and will continue to decline by 0.25% per year.

If the 1990 labor input rates that have declined in this manner were reached in 2016, people in Finland would then work 4.0 billion hours. Thus even then the same number of working hours would be available as were completed in 2003.

Economic growth is possible at a rate of three percent

If the labor input rates of 1990 were attained, then the same amount of gainful employment work would still be done in the year 2030 in Finland as in 2003. However, if these labor input rates were to decrease by one fourth of a percent per year, people in Finland would still be doing the same amount of gainful employment work in 2016 as in 2003. In the latter case, the growth rate of the total production from 2003 to 2016 would have been exactly the same as the growth rate of labor productivity during this 13-year period.

As it is useless to make guesses about how labor input will change in the future, I have looked for support for the labor productivity estimates in the history of labor productivity, with Figure 5 as a guide. The figure shows the change in labor productivity per working hour during Finland's period of independence for each consecutive 13-year period. The first of these starts from the year 1917, when Finland gained its independence, and ends to the year 1930. At that 13-year period labor productivity improved by an average of 3.0% a year.

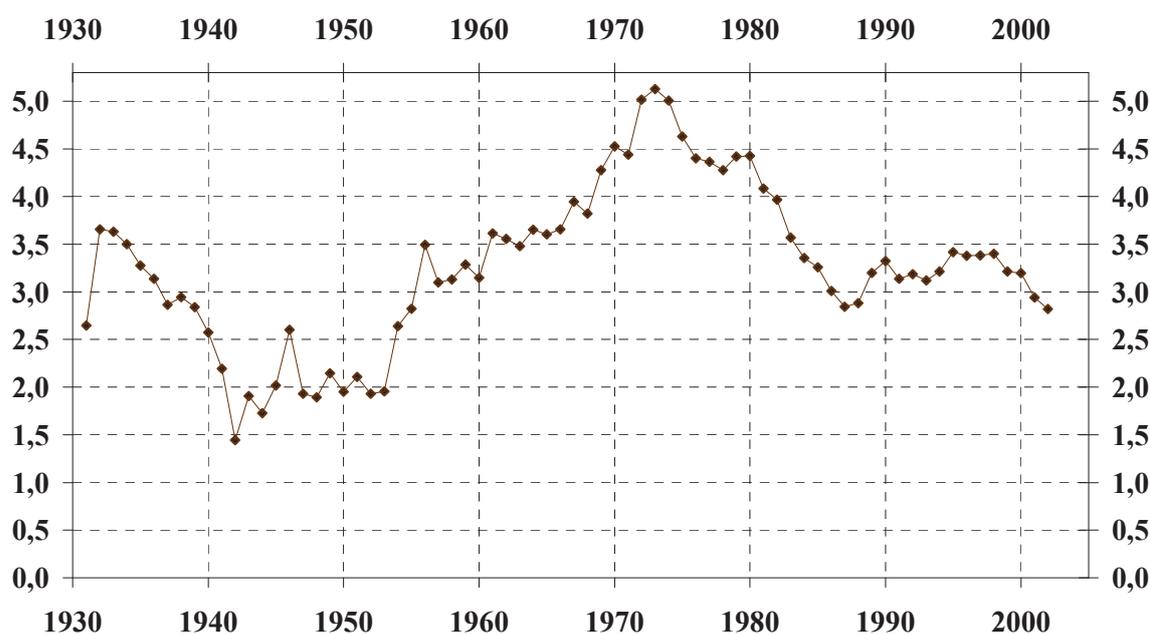
The average annual growth rate of productivity calculated per working hour over

a period of 13 years was less than two percent at its slowest because of the Second World War and over five percent at its most rapid, during the periods ending in the early 1970s just before the global energy crisis. Labor productivity improved both over the entire period of 86 years and during the 13-year periods ending in the previous decade by an average yearly rate of over three percent. During the 13-year periods ending in recent years, labor productivity has improved somewhat more slowly in Finland's economy .

The history of labor productivity appears to show that a three-percent growth in productivity could also be reached in the future, if labor policy were successful in promoting economic growth. This point is supported by European Union statistics (Eurostat 2004) showing that labor productivity is now at a markedly higher level in many countries than it is in Finland. On the other hand, the growth in labor productivity may be slowed down by the increasing service-intensiveness of the production structure, for productivity in the service sector has traditionally improved at a slower pace than in industry and in other goods production.

If in the future, labor productivity really were to rise at the rate of three percent per year, then real income would also grow at three percent per year during the 13-year period ending in 2016, if the same number of hours of gainful employment work were done in Finland in 2016 as in 2003. In this case, the real income of the nation would increase by one and a half times per resident by the year 2016, and Finland's economy would produce the same amount of real income per resident as the economies of the world's richest nations do now.

Figure 5. 13-year average annual growth in labor productivity from period 1917–1930 to period 1990–2003, %.



Summary and discussion

In Finland the working-age population will begin to decrease at an accelerating rate in just a few years, when the largest age groups born after the Second World War reach retirement age and when the average size of the age groups reaching working age is about one fourth smaller. However, a successful labor force policy would make it possible to keep the nation's labor input at its current level up until the latter portion of the next decade. In Finland there are still substantial labor reserves left over after the deep depression of the previous decade. This continues to be visible as high unemployment and low labor input rates, meaning the number of working hours by age done per resident.

If the labor policy were to succeed this well and labor productivity were to improve at the traditional rate of three percent a year, then the real income of Finns would increase one and a half times for one and a half decade. If, however, the labor input rates were to remain on a permanently low level, the material well-being of the Finns would improve more slowly. Greater real income can only be reached by improving labor productivity or by attracting a substantially greater number of foreigners onto the Finnish job market than what is assumed by Statistics Finland in its population projection.

In the more service-intensive production of the future, where the most rapid increase will be in social and health services for the elderly, it will certainly be difficult to improve labor productivity even more rapidly than in the material goods-intensive production of the past. Attracting masses of immigrants to the Finnish job market is probably no easier because of the country's Northern location and strange language. Even though Finland has had an abundant migration gain for a couple of decades, only three percent of the population is foreign born.

In 2004 EU got 10 new member countries, what in time may ease some of the labor market problems of Finland's aging population. It takes only a couple of hours to go to work from Tallinn, the capital of Estonia, to Helsinki. Because the Estonians understand Finnish and their wage level is only one fifth of the Finnish wage level, the number of Estonians coming to work in the Helsinki region may increase greatly. Already in the near future, Finnish wages and Estonian living costs may be a reality for numerous Estonian families.

References

Eurostat. 2004. Eurostat New Cronos database.

The Finnish Government. 2003. The Government Program of Prime Minister Vanhanen's Government. Available at <http://www.valtioneuvosto.fi/tiedostot/pdf/en/39357.pdf> (21.5.2004).

Kiander, Jaakko and Sari Virtanen (editors). 2002. *1990s Economic Crisis. The Research Programme on the Economic Crisis of the 1990s in Finland. Final Report*. Government Institute for Economic Research, VATT-Publications 27:7. Helsinki.

Statistics Finland. Population projection by municipalities 2001-2030. Population 2001:10 (and an unpublished population projection for 2004–2050). Helsinki.

Statistics Finland. The Finnish Labour Force Survey 2003. Labour Force 2004:3. Helsinki.

