

A short introduction to the HEMAASU model

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1. What is the HEMAASU model?

The HEMAASU model is a model for reconciling supply of and demand for labour. It was developed in support of regional planning as part of a joint project between the Finnish Ministry of the Interior and the Regional Council of Pohjois-Savo. The abbreviation "HEMAASU" comes from the model's developer, Henrik Rissanen (HE), and a Finnish word meaning regional planning (MAASU).

The model was introduced to all 19 regions of Finland in spring 2005. Before that the model was used only in few regions. The HEMAASU model works on Microsoft Excel platform.

2. Why the HEMAASU model was developed?

The HEMAASU model was developed because regional councils needed a tool for making long-term (15–35 years) population and labour force projections. Tools that were used so far were either too complicated to use or too simple ("a RULER model"). The projections done by regional councils could not be properly compared in the Finnish Ministry of the Interior. Also, regional councils are regional developers not regional research organisations, so a new tool had to be easy to use and easy to understand otherwise it would not be used in all regions.

3. The structure of the HEMAASU model

The HEMAASU model has two parts: 1) demographic and 2) employment and economy. The demographic part of the model comprises anticipation of the population and the supply of labour. The employment and economy part of the model is made up of anticipation of demand for labour (jobs) and the gross regional product.

Demographic part

The demographic part is based on the population projection made by Statistics Finland (SF) in 2004. The HEMAASU model enables to make adjustments to the SF's projection. New regional population projections are assessed by increasing/decreasing the SF's estimated net migration in 5-year periods. The difference between the SF's estimated net migration and regional council's adjusted/desired net migration is divided into age groups by using the SF's estimated net migrations probabilities or region's own "desired" net migration probabilities.

The HEMAASU model does not enable to change projections for births and deaths, but the excess of births does change when the net migration is adjusted to the desired level. Increased net migration means also increased births and deaths and vice versa. Those changes are based on SF's estimates of fertility rate and survival ratio.

The model automatically calculates the supply of labour for each alternative population projection. This is accomplished through labour force participation rates (labour force / population). Labour force participation rates can be changed in the desired direction, thus increasing or reducing the amount of labour within the model.

Employment and economy part

Jobs and the gross regional product are presented with accuracy reflecting 28 industries. The model allows anticipation of jobs in two different ways:

- By first assessing jobs and productivity of labour per industry, after which the model automatically outputs the gross regional product per industry.
- By anticipating annual changes in the regional product and labour productivity in different industries over a 5-year period, in which case the model automatically calculates and outputs the number of jobs per industry.

When both parts of the model have been performed once, the model automatically outputs data on the total population, age structure, labour force participation rate among people aged 15–64, jobs, number of unemployed people, unemployment rate, employment rate, economic dependency ratio, the so-called cost of ageing, and added value for the target years. In other words, the model makes it possible to reconcile the supply of and demand for labour.

The model is a logical whole, where each change results in changes to all other indicators. In addition to numbers, the model also allows monitoring development of different variables by means of diagrams.

The cost of ageing (day care, elder care, health care etc.) is based on national statistics for each age group. Although the mean levels of the costs are adjusted to the regional levels, the HEMAASU model gives only a rough idea of the cost of ageing in the future.

4. Updating the HEMAASU

Employment and economy part can be updated in each year when the new employment statistics are published. Demographic part can be updated only, when Statistics Finland publishes their new population projection (usually every third year).

The regional councils have to update their own regional anticipations of population, labour force and jobs in every fourth year.

Further reading (only in Finnish):

Ennakointimalli maakuntasuunnittelun tueksi "HEMAASU" 2030 -hanke, Pohjois-Savon liitto, 2005

5. The anticipation of labour force in Southwest Finland

The HEMAASU tool has been used to analyse the future development of labour force in Southwest Finland. Since the number of population aged 15–64 starts to decrease after the year 2010, it is expected that the labour force will decrease as well. When we analysed the future development of labour force, we wanted to find out two things:

- How much the net migration has to be so that the labour force does not decrease?
- How much the labour participation rates effect on the labour force development?

In order to find answers to those questions we have compared two different populations projections and two different developments in labour force participation rates. The following results of the HEMAASU analysis are just examples.

Population projections (figure 1):

- Population projection made by Statistics Finland: the estimated net migration is 1500–1600 persons per year.
- Adjusted population projection made by Regional Council of Southwest Finland: the adjusted/desired net migration is set at the level of 1800–1900 persons per year.

Labour force participation rates (figures 2 and 3):

- Low labour force participations rates: the rates stay at the level of year 2004.
- High labour force participation rates: the rates rise gradually.

The labour force participation rates are calculated for both women and men. The results of the analyses performed using the HEMAASU tool are shown in figure 4.

Figure 1. The development of population aged 15–64 in Southwest Finland

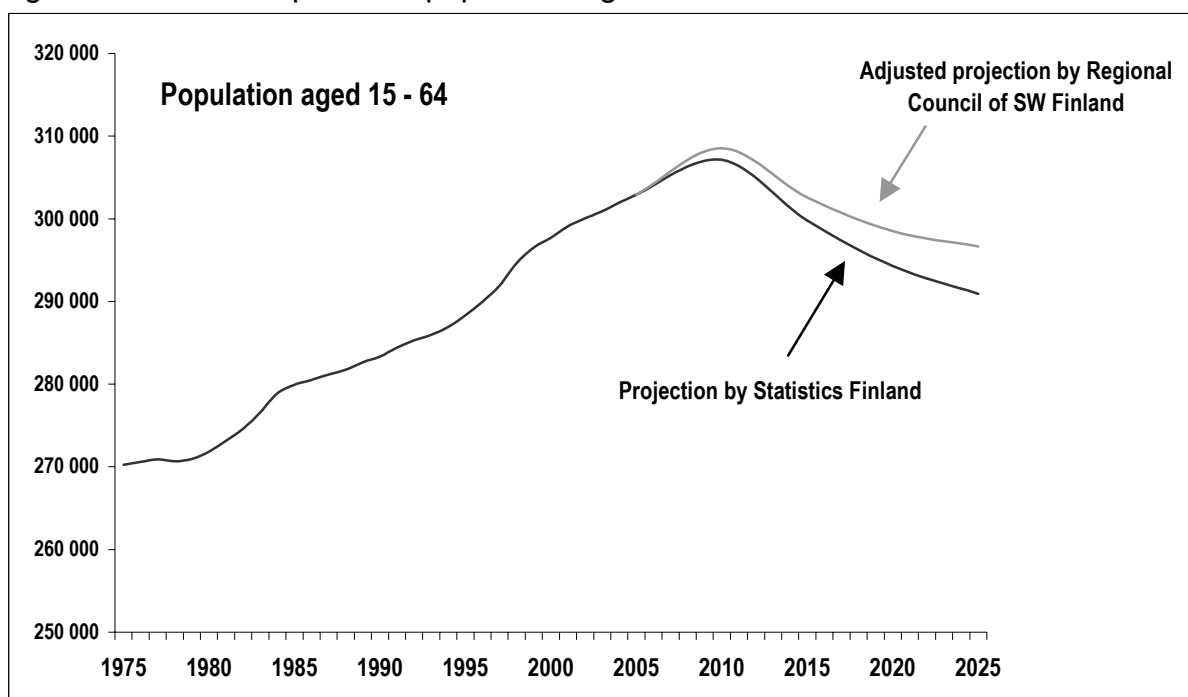


Figure 2. Low labour force participations rates in Southwest Finland (men)

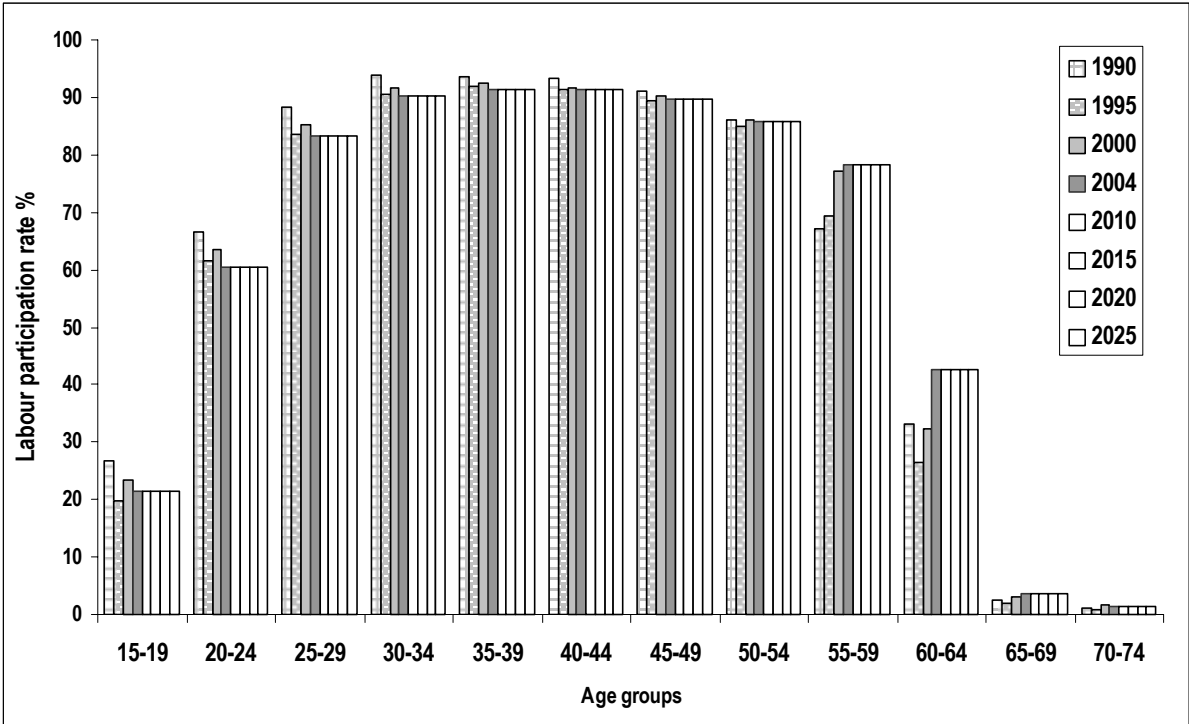


Figure 3. High labour force participation rates in Southwest Finland (men)

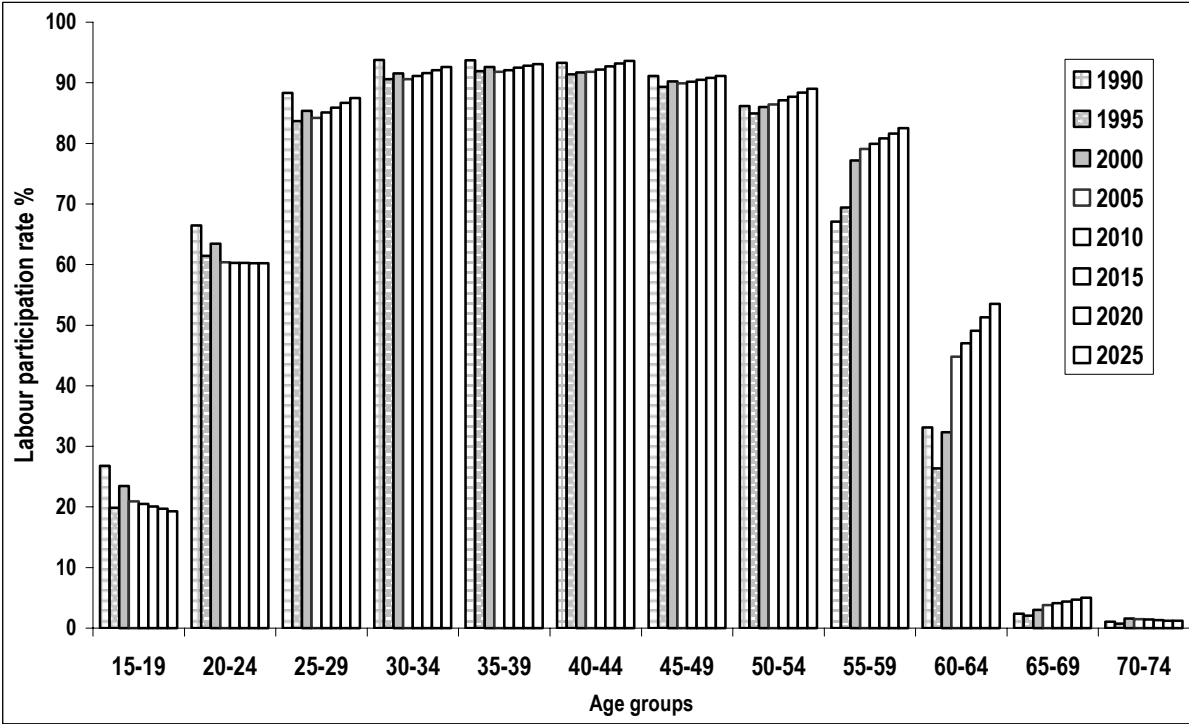
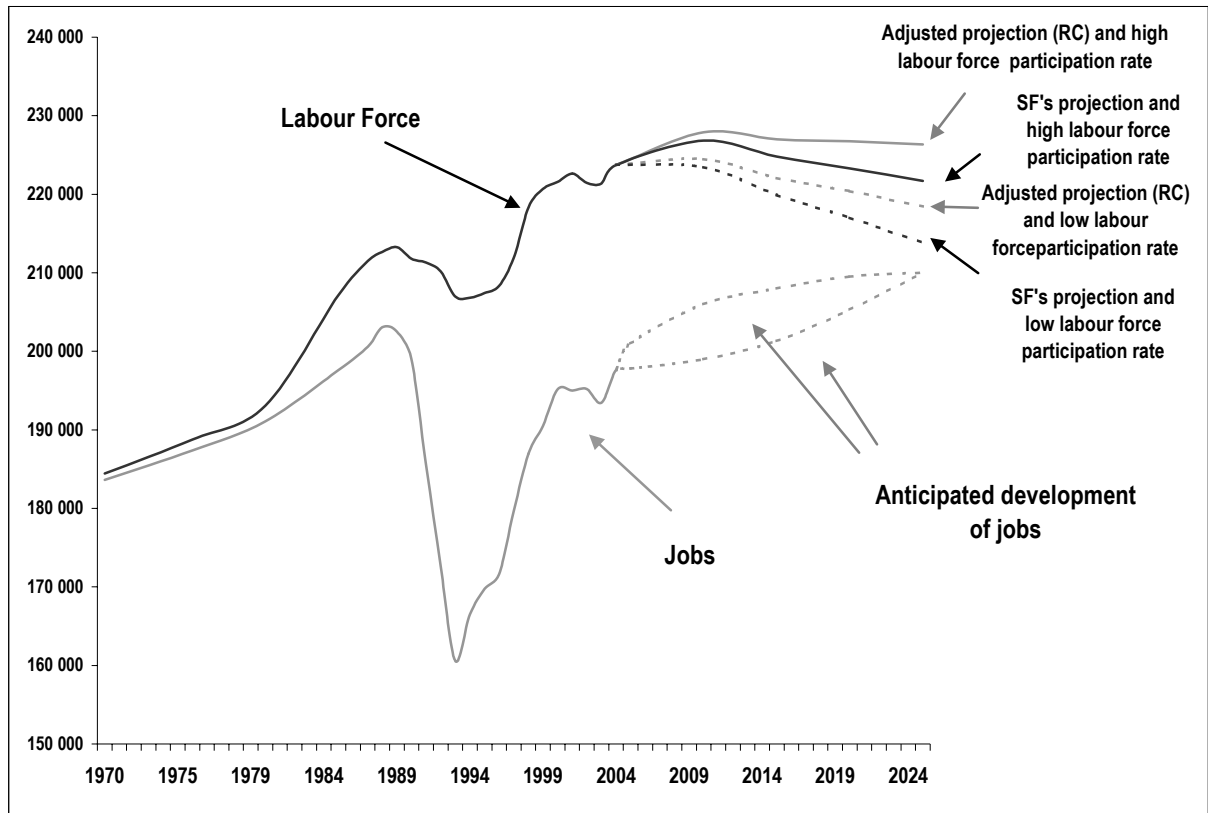


Figure 4. Development of labour force in 1970–2025 in Southwest Finland



The HEMASU tool gives a rough idea of the labour force development in the future. These analyses show that the lack of labour force may not be so unavoidable after all if the labour force participation rates continue to rise.

The HEMAASU tool has not been used to analyse development of jobs by anticipating annual changes in the regional product and labour productivity.