Analysis

The influence of age, gender and education on labour supply in Finland

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Bolstering the supply of labour has long been one of the most important objectives of economic policy in Finland. The impact of policy measures is typically greatest in those population groups who have available alternatives to paid work. Incentives and labour market structures are significant, particularly in influencing the decisions of the young in general, women of childbearing age and older workers and for furthering their chances of joining the labour market. When planning policy measures, we must be able to discern the extent to which observed employment developments are due to structural factors or to cyclical factors. Although the improved economic situation at present is attracting young people back to the labour market, improvements to the employment situation will require economic policy measures. In such measures, education is particularly important.



The motive of ensuring a sufficient supply of labour has long been the key factor shaping Finland's economic policy. Labour supply among older cohorts has been supported through incentives built into the pension system and the pension reform that has only recently come into force. Reforms aimed at a more even distribution of the costs of parental leave and parenthood in general are, for their part, designed to increase employment among women of childbearing age. In respect of the young, the focus has been on supporting education and directing social services to those in danger of exclusion.

The population groups targeted by these measures are those who have plausible reasons to be outside the labour market. The young, women of childbearing age and older workers are either compelled or choose more readily to leave the labour market in order to study, care for their children, retire or just take time out.

In this article we examine the factors that influence labour supply. We draw on data from research into incomes and living conditions to examine what background factors influence the probability of an individual transitioning from one labour market status to another. Under the spotlight are shifts between employment and unemployment as well as between being on the labour market and being outside it. In addition, we estimate the development of labour market potential by using cohort analysis to look at how those born in different years respond to the economic cycle. After all, from the perspective of policy measures aimed at structural reform, it is important to know to what extent observed trends in employment are structural or cyclical in nature.

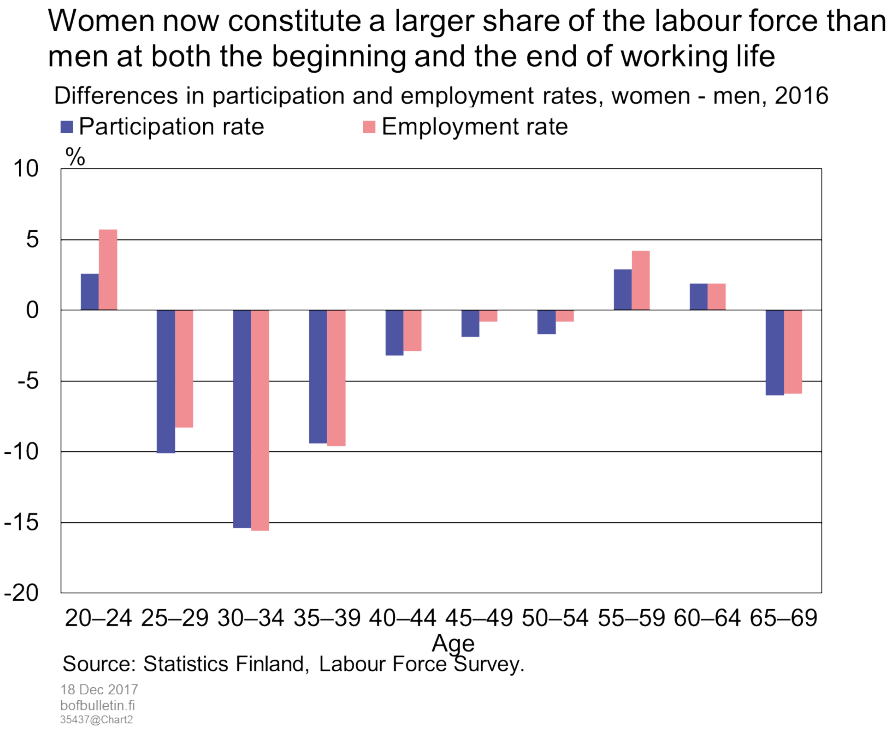
Development of labour supply by population group

Developments in the size of the labour force by gender and age group over the past 30 years reveal the long-term development of the labour market. The difference in participation rates between women of all age groups (15–64) and men has narrowed (Chart 1). In particular, for women close to 60, the trend participation rate has risen. While at the end of the 1990s the participation rate among women aged 55–64 was around 60%, by 2016 it was already 84%. The participation rate amongst men has also risen, but not so strongly.

A long-term evaluation of labour force shares can also tell us how the different groups respond to the economic cycle. The recession of the 1990s was reflected particularly in a reduction in the labour force participation rate of both men and women in their twenties.

Since 2008, the participation rate of women aged over 30 has particularly declined.[1] Young men also account for a much smaller share of the labour force than in 2008. In contrast, the participation rate of young women aged just over 20 remained more or less unchanged even during the recession.

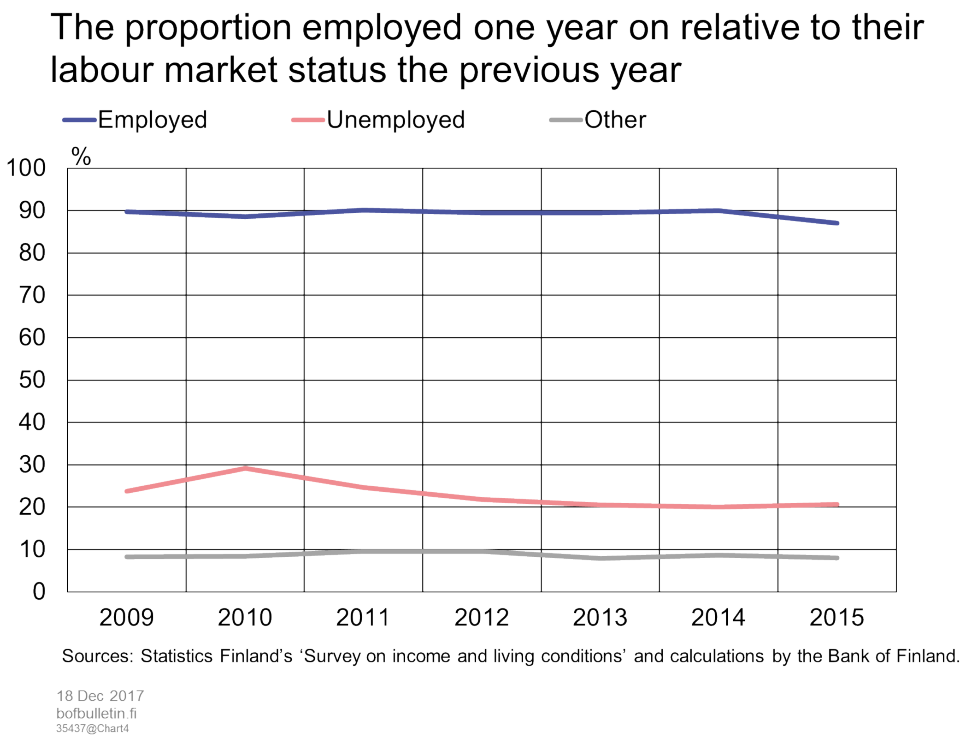
Chart 1.



The gender-related trends in labour force share and the different responses of the different population groups to the weak condition of the economy have produced a situation in which

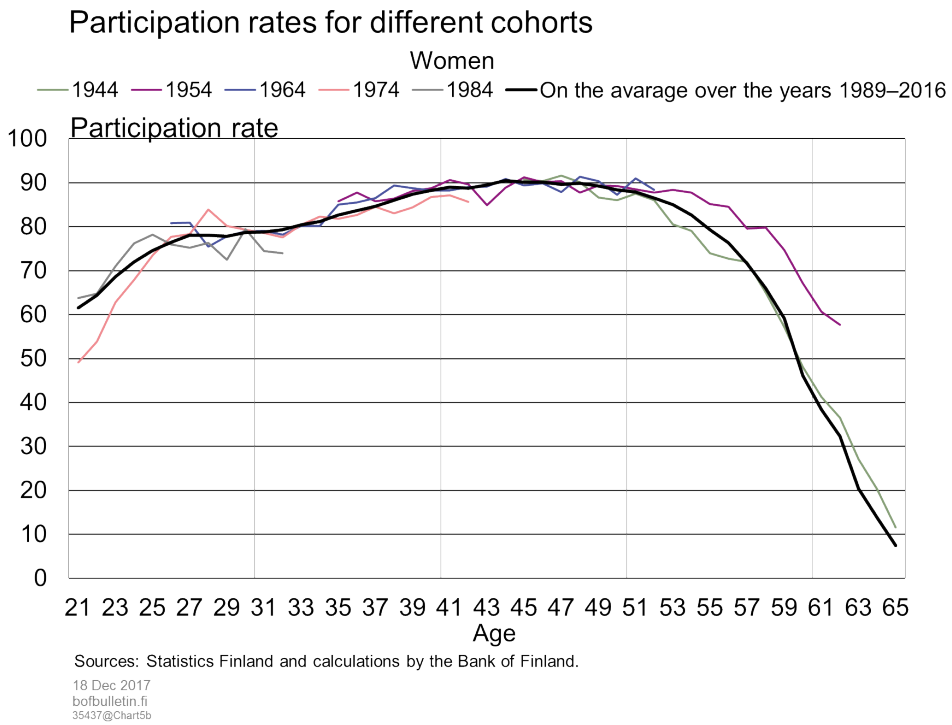
within the age groups 20–24 and 55–64 a larger proportion of women than men are now participating on the labour market (Chart 2). Differences in participation and employment rates in favour of men are at their largest in the age group 30–34, when many women are having children.

Chart 2.



Education supports both male and female employment. This is clearly visible if we examine how the employment rate for both men and women varies at different ages according to educational background (Chart 3). The employment rate among women with only basic education[2] is as much as 30 percentage points lower than for those with a post-comprehensive education.[3] As women's educational level rises, their employment rate also rises and the difference relative to men is also eroded. Data based on employment statistics from 2015 show that the employment rate for women with only basic education is at around the age of 45 much lower than for similarly educated men. Thereafter the difference in employment rates almost disappears. As their level of education rises, employment differences decline strongly also for women of childbearing age. For women with higher education[4] the difference is only marginal. It is interesting that after around 50 years of age the proportion of women in employment is actually higher than for men, irrespective of educational level.

Chart 3.

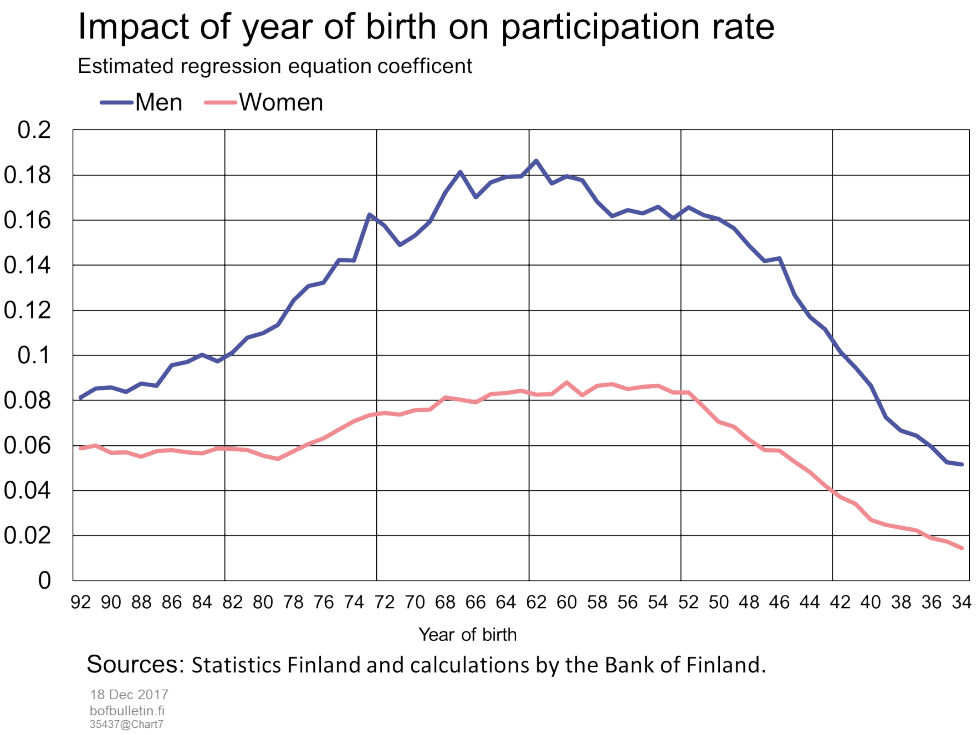


Background factors influencing employment

Age, gender and education all affect a person's opportunities and willingness to enter and leave the labour market. In addition to personal qualities, institutional factors such as the flexibility of the labour market and employment incentives also affect people's decisions over whether to be on the labour market or outside it. Institutional factors also influence opportunities to find employment or the risk of becoming unemployed. Many institutional labour market factors, for example incentives to work, can be influenced by economic policy measures.

Chart 4 illustrates the probability that someone in employment, unemployed or otherwise outside employment will be in employment one year ahead. The household data in Statistics Finland's 'Survey on income and living conditions' allows comparison of the same person's labour market status in the December of succeeding years. The status of someone who has entered the labour market is fairly stable insofar as approximately 90% of those in employment in any given year are still in employment one year later. Unemployment is also fairly permanent, or at least repeated, as only around one fifth of those unemployed are in work one year later. Of those outside the labour market altogether, only around one in ten is employed a year later.

Chart 4.



The factors lying behind changes in labour market status can be examined more closely using logit models.[5] Our first model examines the probability of transferring between employment and unemployment, while the second examines the transition between labour market participation and exiting the labour market. The dependent variable is the subject's labour market status in December of the year under examination, and this is compared with their labour market status in December of the following year. As the time gap between the periods being compared is one year, at least some of those still unemployed will have been so without a break, and they are therefore classified as long-term unemployed. In this respect, the model also points up people's transition from simple unemployment to long-term unemployment.

The dependent variable indicates the probability of a transition from one labour market status to another between the two comparison years. It receives the value 0 when the labour market status is unchanged, and the value 1 when it changes. A number of independent background variables generally assumed to influence labour market status and changes therein have been selected as explanatory variables in the model.

As material for the study we have selected household data from Statistics Finland's annual 'Survey on income and living conditions' for the years 2006–2015. The research sample changes in part from year to year, but some of the individuals surveyed can be followed for two successive years, as approximately half the households covered by the annual sampling were also present in the

previous year's sample. From the successive two-year observation periods we gathered material that contained a total of 77400 observations. The survey, which also contains information on the subjects' labour market status, is based on register data.

One value of each explanatory variable has been selected as a benchmark (given the value 0 in the model), to which the transition probability for the other values of the explanatory variable (given the value 1 in the model) is compared. The explanatory variables are:

- Age groups 16–34 and over 55; benchmark, those of prime working age (35–54 years)
- Gender
- Level of education (post-comprehensive, higher);
- point of comparison those with only basic education
- Marital status
- Does the subject have children aged under three or seven?
- Place of residence by region; benchmark, Helsinki–Uusimaa
- Type of housing (owner-occupied or rental)
- While unemployed, has the subject received earnings-related unemployment benefit
- Low pay (disposable income <60% of median income)
- An indicator of material deprivation

The results indicate the effect each variable has on the probability of a shift from one labour market status to another when the values of the other explanatory variables remain unchanged (average marginal effect). We have separately estimated models to explain the probability of transition from employment to unemployment and from unemployment to employment.

The probability of transition from unemployment to employment is best explained by an individual's age and educational level (Table 1). The probability an unemployed person aged over 55 will make the transition to employment is 15 percentage points lower than for someone of prime working age. On the other hand education, particularly higher education, improves an unemployed person's employment prospects. A person with higher education has a 16 percentage point higher probability of finding employment than someone with just a basic education.

The gender differences are minimal, but women's probability of finding employment is on average around 1 percentage point lower than for men.

Table 1.

Probability of transition between employment and unemployment		
	From unemployment to employment	From employment to unemployment
16–35-year-olds	0.02	0.07***
over-55s	−0.15***	0
Women	−0.01***	0.03
Post-comprehensive education	0.10***	−0.01**
Higher education	0.16***	−0.02***
Married	-0.01	-0.01***
Children under 3 years	0.05	0.01***
Children under 7 years	0.04	0.01*
Employed in public sector	−0.01	0
Southern Finland	0	0
Western Finland	0.02	0
Northern and eastern Finland	0.02	0.01**
Åland	0.32	−0.02***
In rental accommodation	−0.04	0.00

Probability of transition between employment and unemployment		
In receipt of housing allowance	–0.04	0.02**
* = Statistically significant at 10% significance level.		
** = Statistically significant at 5% significance level.		
*** = Statistically significant at 1% significance level.		
Sources: Statistics Finland and calculations by the Bank of Finland.		

A previous study[6] showed that employment incentive traps can explain unemployed people's probability of re-employment. The observed incentive traps relate particularly to housing allowance. The results we present here also give tentative support to the assumption of a connection between housing allowance and employment, as the probability of finding employment is 12 percentage points lower among those who received housing allowance in the previous year.[7] The model is less useful in explaining the probability of becoming unemployed, as the variables' impact on the risk of unemployment is generally 1–2 percentage points. The results nevertheless lend force to the idea of the connection between age and educational level and a person's labour market status. The risk for under-35s to become unemployed is 7 percentage points higher than for those of prime working age. Education, for its part, reduces the risk of unemployment. The unemployment risk among those with higher education is around 2 percentage points less than for people with only basic education, while post-comprehensive education reduces the risk of unemployment by around 1 percentage point.

Of the other background factors, the probability of becoming unemployed is explained by e.g. family relations. For married people, the probability of becoming unemployed is 1 percentage point lower than for unmarried people. On the other hand, for parents (particularly with children aged under three) it is higher by the same amount.

Table 2.

Probability of transition into and out of the labour force		
	In	**Out**

Probability of transition into and out of the labour force		
16–35-year-olds	–0.10***	0.07***
over-55s	–0.15***	0.01***
Women	–0.08***	0.04***
Post-comprehensive education	0.03	–0.01**
Higher education	0.09**	–0.02***
Married	0.0228	0.005
Children under 3 years	–0.03	0.02***
Children under 7 years	–0.01	0
Employed in public sector	0.04**	0.00*
Southern Finland	0.04**	0.003
Western Finland	0.02**	0.002
Northern and eastern Finland	0.03**	0.01**
Åland	0.153	0
In rental accommodation	–0.04	0
In receipt of housing allowance	–0.04	0.01**
* = Statistically significant at 10% significance level.		
** = Statistically significant at 5% significance level.		
*** = Statistically significant at 1% significance level.		

Probability of transition into and out of the labour force
Sources: Statistics Finland and calculations by the Bank of Finland.

The on-average weaker employment situation in northern and eastern Finland relative to the rest of the country is reflected in our results, as the unemployment risk of people living in this region is 1 percentage point higher than for those in the Greater Helsinki area.

Our results give further support to assumptions of a connection between incentives to work and unemployment. The statistical risk of unemployment among those in receipt of housing allowance is 4 percentage points higher than for other people.

We separately examined streams into and out of the labour force (Table 2). Included in the category 'in the labour force' were all those who in December of each year were either employed, unemployed or self-employed entrepreneurs. 'Outside the labour force' were students, conscripts performing their military service, people on disability pension and those caring for their home full-time or looking after infirm relatives. Retired pensioners were excluded from the examination, as only a very small proportion of retired people return to the labour market.

In addition to employment and unemployment, age and education also explain movement into and out of the labour force. People of prime working age are much more firmly rooted in the labour market than other age groups. The probability of leaving the labour market is greater among both older and younger age groups. Similarly, the probability of re-entry is lower than for those of prime working age.

The probability of those with a higher education degree entering the labour market is 9 percentage points higher than for those with just basic education. This outcome does, however, probably overestimate the general impact of education on labour market entrance, as our material includes students who graduated the preceding year and went on directly into working life. Acquiring an education does also to some extent reduce the probability of becoming unemployed. The effects of education in this regard are, however, less significant.

Women's probability of finding themselves outside the labour force is approximately 4 percentage points higher than men's, and the probability of a return to the labour force as much as 8 percentage points lower. This outcome could reflect the greater willingness and opportunities for women of all ages to transfer from working life to the home, for example to care for their children. However, the impact on labour market status of being a parent of children under school age has been taken into account with the help of several background variables. Of these variables, having children aged under 3 years of age increases slightly the risk of leaving the labour market.

Age groups and labour supply

Long-term changes in the population's educational level and age structure are key to the future development of labour supply. Young people's educational level was rising through to the end of the 1970s, which boosted the average educational level of the entire working-age population. The population's average educational level is, however, estimated to begin to fall in the near future,[8] which in turn threatens to reduce labour supply over the long term. On the other hand, the significance to the size of the labour force of an unfavourable age structure[9] is compensated by increased labour supply among older cohorts. A very important question for the future development of labour supply is whether the participation rate of older people can rise further still. Of particular interest is also the significance of the economic cycle for developments in labour supply among different age groups. For example, could the participation rate among young men and women of childbearing age rise during a cyclical upswing?

We next examine these questions through a cohort analysis, i.e. an examination of the labour-market status of people born in different years. The analysis was performed separately for men and women. Our year-of-birth (or cohort) model is an updated version of a model that was estimated for the first time in 2013.[10]

Possible explanatory variables for the different levels of participation between different cohorts include differences in lifetime living standards, health, educational opportunities and structural and cyclical factors in the economy. Higher-educated younger cohorts who have also benefited from better health care have in Finland typically participated more actively on the labour market than older cohorts. This trend has also been influenced by the progressively lighter nature of work nowadays as the amount of physically heavy work has steadily declined.

Chart 5 depicts some example cohorts, of which the oldest was born in 1944 and the youngest in 1994. With our material being from the years 1989–2016, the 1944 cohort is in working life during this period from 45 years of age. Similarly, we have data on the 1994 cohort only for ages 15–22. The trends in participation rates for individual cohorts show how differently those born in different years have participated in working life at the same age. For example, we can see that women born in 1974, who were on average slightly over 20 during the 1990s recession, were much less on the labour market than those born in 1984, for example. At the other end of the age spread, we can observe the different statuses of the 1944 and 1954 cohorts towards the end of their working lives.

Chart 5.

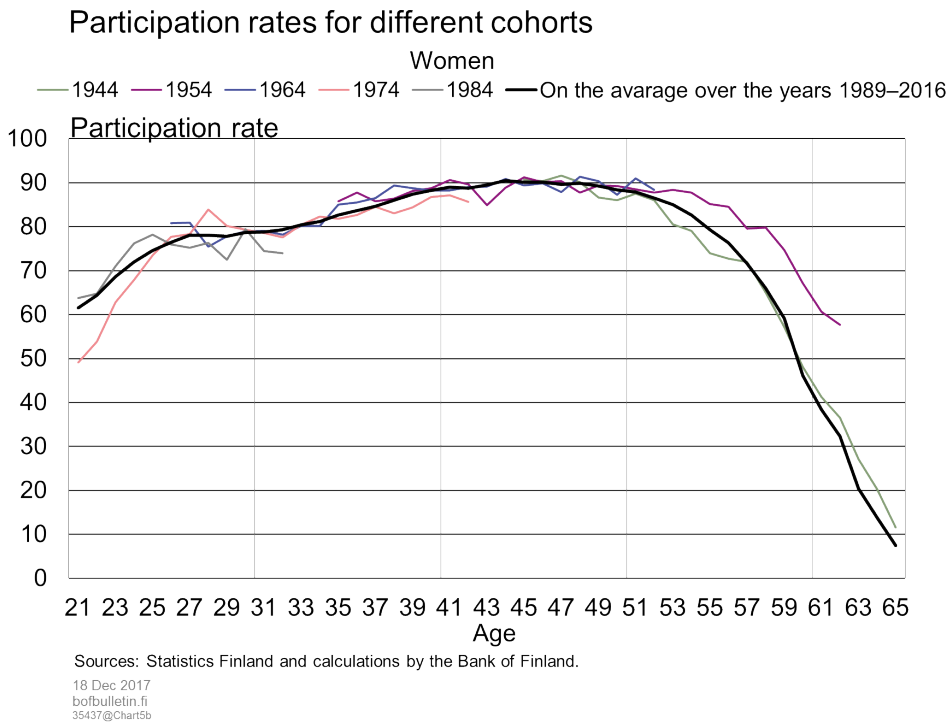
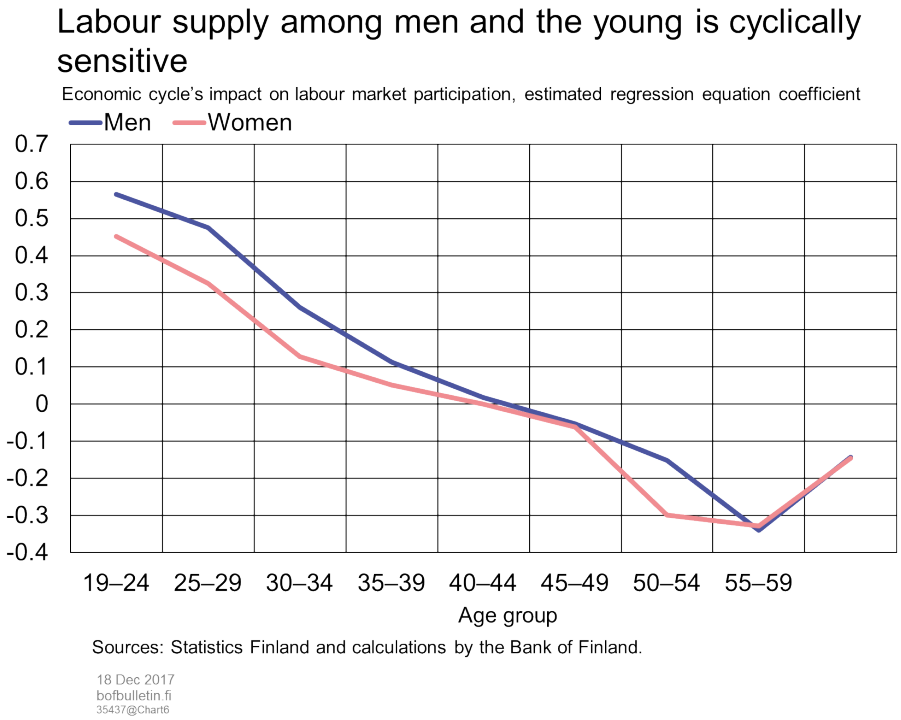


Chart 6.

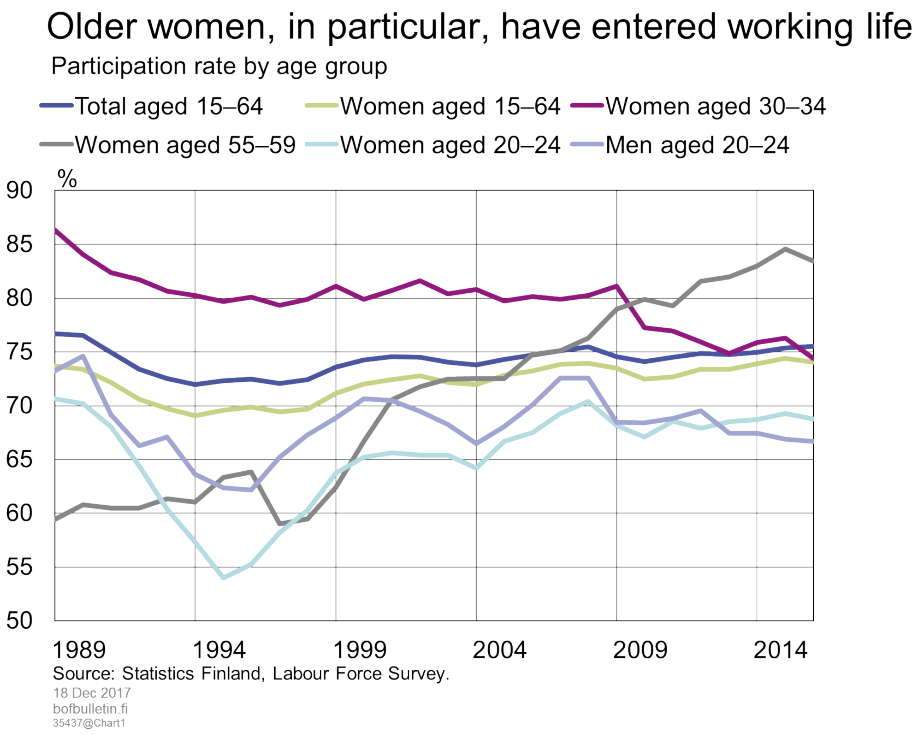


The cohort data helped us examine how the labour market participation of different age groups

varies in different cyclical situations. First, the cohort-specific variation was controlled for the effects of both age and year of birth. In addition, we used year dummies to take account of the recession years in the early 1990s and the right of access to the fast track to an unemployment pension and actual receipt of such a pension. The cyclical situation on the labour market was described according to the level of vacant jobs as a proportion of the labour total force.

As in previous estimations, cyclical flexibilities exhibited a clear age profile (Chart 6). A cyclical upswing most benefits the labour market participation of men and the under-30s in general. The cohort model does not suggest that the low participation rate among 30–40-year-old women can be explained primarily by the economic cycle. For that age group, the cyclical situation on the labour market does not appear to exert a particularly strong influence on labour market participation.

Chart 7.



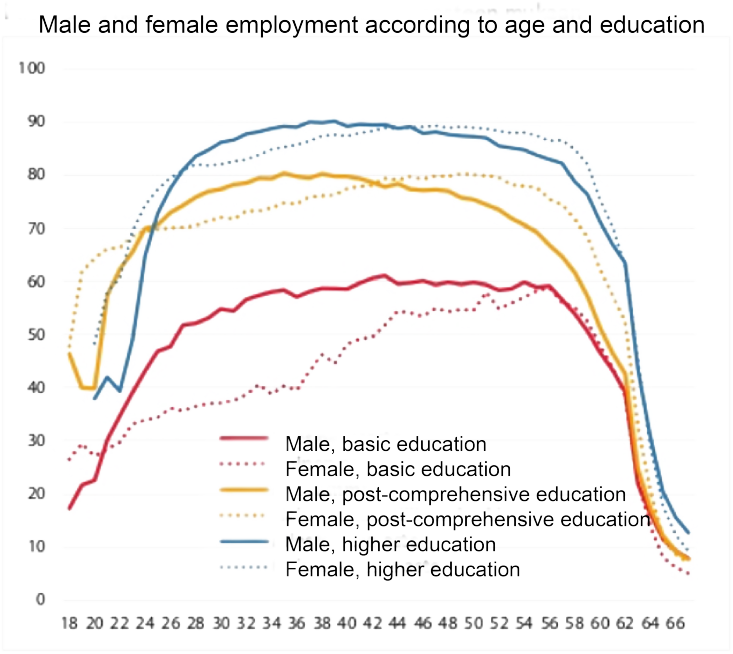
Based on cohort-specific constants, we can also estimate whether there are any visible age-group-linked factors that support growing participation rates at the older end of the age distribution. Such factors would particularly include the general development of educational level as the age structure of the population changes.

For labour supply among men, year of birth would appear to have a short-term positive impact towards the older end of the age distribution (Chart 7). When in the near future those born in the

1950s leave working life, they will be replaced by an age group with a higher participation rate. This outcome would seem intuitively sound when we know that educational levels are continuing to rise. The position among women at the upper end of the age spectrum is somewhat different. The cohort effect does not appear to bring a positive increase in labour supply anymore over the longer term at the upper end of the age distribution. The cohort-specific constant for those born in the 1960s is more or less the same as for those born in the 1950s.

Chart 8.

Employment much weaker among women with just basic education than among similarly educated men



Source: Pekka Myrskylä, Katoavat työpaikat, Työllisten määrän ja rakenteen kehitys Suomessa 1987–2017 ('Disappearing jobs, Trends in the number of employed and structure of employment in Finland 1987–2017'), SAK 3/2017.

The most concerning feature with regard to labour supply is the weakening cohort effect among the young, and particularly among young men. The cohort-specific constant is much smaller among men born in the 1980s than among those born in the 1970s. The same phenomenon is discernible among young women, if not to nearly the same extent as with young men. The participation rate at a young age among those born after the 1960s has presumably been affected by a lengthening of study times. However, this does not seem to explain the lower participation rate among men born after the 1970s. It is worth noting that for the youngest cohorts the number

of observations is relatively small. Thus our estimates contain a high degree of uncertainty.

Measures to boost employment are important

As the population is ageing, a larger proportion of working-age people need to be attracted to the labour market. Economic policy measures should continue to be directed at population groups that have a natural alternative to labour market participation. On the other hand, when planning policy measures, it is important to be able to discern to what extent the observed employment trend is due to structural factors and to what extent it is cyclical in nature.

The lengthening of working careers among older cohorts will inevitably continue, if only because of the pension reform. It is, however, hard to assess whether older cohorts' labour market participation will increase more than estimated purely on the basis of the effects of the pension reform. It is highly possible that, as public health improves and life expectancy consequently rises, working careers could continue beyond the period estimated in the pension reform. The analysis presented here reinforces the picture derived from employment statistics, according to which among the cohort effects a higher educational level is a particularly good predictor of labour market participation. The average educational level of people of working age will continue to rise through the next couple of decades as the less well-educated cohorts leave the labour market. The population's average educational level will, however, eventually decline, as those born in the mid-1970s remain the best-educated age group in Finland's history.[11]

Turning to the young, it is clear that a cyclical upswing will attract a greater share of the age group on to the labour market. There is nevertheless a substantial risk that an increasing proportion of the young and young adults will remain for a longer period outside the labour market, meaning improvements to employment will still also require economic policy measures.

The labour market status of women of childbearing age would naturally be supported by measures to divide family leave more evenly between the sexes. In the youngest cohorts, the proportion with only basic education has begun to grow, which will serve to reduce the supply of labour. Particularly problematic is the position of young men. The proportion of young men in higher education is also lower than that of women. The deterioration in their position is already visible in a rapid increase in low pay among young men. When, in addition to this, we know that demand for poorly educated labour is receding as digitalisation progresses, education policy will come to occupy a key position in Finland. Besides the implications for labour supply and hence the long-term growth outlook for the economy, it will also have an impact on income differences and the risk of poverty.[12]

Notes

1. The rapid decline is partly due merely to a change in statistical practices, according to which those on parental allowance or home childcare allowance are no longer entered in the statistics as belonging to the labour force, as they used to be. Since 2008 only those on family leave of a maximum of 3 months and who have a job to return to are recorded as employed. ↑
2. Under the current education system in place in Finland, this term covers primary and lower secondary education, also referred to as the comprehensive stage. ↑
3. The term 'post-comprehensive' refers to qualifications taken after from 1 to 3 years of study after completing the basic, or comprehensive level of school. The term covers e.g. high school (upper secondary) graduation, 1–3-year vocational qualifications and vocational first degrees. ↑
4. The term 'higher education' covers, according to the educational classifications of Statistics Finland, bachelor's and higher degrees (including those achieved at a polytechnic) and the lowest level of higher education qualifications, e.g. technician, business college and nursing qualifications. ↑
5. As an example of this type of analysis, see e.g. BYRNE, Stephen; O'BRIEN, Martin D., 'Understanding Irish Labour Force Participation', The Economic and Social Review, [S.l.], v. 48, n. 1, Spring, p. 27–60, March 2017. ↑
6. An investigation into incentive traps and geographical mobility in Finland conducted under the leadership of the Ministry of Finance (Ministry of Finance, 2017) highlights the weak employment incentives for families with children and people with a lower level of education. In addition, the participation tax rate, used to evaluate incentives, is higher for people in receipt of earnings-related unemployment benefit. ↑
7. According to the working group set up to investigate incentive traps, the benefit from accepting a job offer is lowest for families with children living in rental accommodation, and particularly for single parents. ↑
8. On the question of educational level see Aleksi Kalenius (2014) Suomalaisten koulutusrakenteen kehitys 1970–2030 ('Structural development of Finnish education, 1970–2030'). Ministry of Education and Culture, 2014. ↑
9. Kinnunen, H. and Orjasniemi, S. (2013) 'Työvoiman tarjonta - tilastoluvut ja väestörakenteen muutos' ('Labour supply – the statistics and structural demographic change'), in the journal Kansantaloudellinen aikakauskirja 2013/2, p. 226–233. ↑
10. Kinnunen, H. and Mäki-Fränti, P. 'Labour supply and population cohorts: impact of the business cycle on labour market attachment' Bank of Finland Bulletin 2013/3: Economic outlook, p. 61–69. Bank of Finland 2013. ↑
11. See e.g. Aleksi Kalenius (2014) Suomalaisten koulutusrakenteen kehitys 1970–2030 ('Structural development of Finnish education, 1970–2030'). Ministry of Education and Culture, 2014. ↑
12. On the connection between education and income development, see the box 'Higher education is a good investment in Finland' elsewhere in this edition of the Bank of Finland ↑

Bulletin.

Keywords

cohort analysis, education, employment, labour supply, recession