Contribution of skills, productivity and employment on future growth in European growth and employment strategy. Impact analyses and it's methodology
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Abstract

This paper is under the theme ‘Further analysis of forecast results’ and also developing the framework. There is a well established literature on the sources of growth based on so called growth accounting which is used in EU KLEMS-project and there is also methodology for the contribution of education and skills as a part of growth accounting. On the other side in European Skills network (R. Wilson et al.) the approach is focussed primarily on the analyses of the skill needs and a demand and supply framework is used for medium term projections.

Now the very valuable results of European Skills Forecasting Framework can be used in conjunction with data from the EU KLEMS-project. The latter data is historical but when growth, skills and employment forecasts are calculated these can be used as a part in sources of future growth calculations. So these approaches can be integrated so that it’s possible to analyze sources of future growth at country level aggregated to country group, here to European, level. Growth contribution of labour input (including working hours when employment is multiplied by working time, and secondly quality of labour, here skills and education), capital, natural resources and multifactor productivity (MFP, other concepts used Total Factor Productivity TFP or Combined Productivity of production Factors CPF) is possible to quantify by using Growth Accounting Projections (GAP) methodology benefiting long term labour force and skill needs approaches. Central point here is that we not only analyse these issues only in history but can use this framework in analysing the future by benefiting the valuable results of skills network. This offers the possibility of exploiting the results of skills network and providing a stronger linkage with growth and employment analyses.

In this paper the methodology will be presented. Also some results will be presented so that the idea becomes understandable. We can show that basic issue for better growth and welfare is better employment based on skills and education. It’s also later possible to expand the analyses world wide cooperation with other countries. Cedefop’s very valuable forecasting work opens these possibilities but first preliminary calculations and data collection are needed. Also modelling work is needed so that the calculations can be made easily enough.

The growth and employment and skills need scenarios open very important possibility for using the results in analyses of the sources of European growth, productivity and employment development at medium and longer term Europe seen as part of world economy. In broader sense this is a part of impact analysis of the results which is a key part of further analysis of forecast results and use of forecast results by stakeholders. So the Cedefop’s demand and supply and skills need analyses can be used in developing European welfare, growth, employment and productivity strategy and this makes the result still more valuable from the viewpoint of developing European and global model of sustainable development.

Growth accounting projections analyses has it’s background in R. Solow’s, E.F. Denison’s, D. Jorgenson’s and other’s work and P. Tiainen’s index theoretical validation.
The employment and labour quality data enable the integration of the main results within a source of growth analysis. The contribution of different types of employment, distinguishing skills and education can be estimated as part of a source of growth analysis, adopting a general growth accounting framework. Although data for capital input is not directly available, there are also data on investment within E3ME which could be used to generate a perpetual inventory measure but there are also other possibilities future capital input calculations. However the main focus here will be on the contribution of overall employment levels and the quality of labour services. The longer term objective is to develop procedures that could be integrated within the overall Model Framework, and based around the E3ME macroeconomic model.

In particular, the results form the main Model Framework (employment and output data from the main E3ME database are needed) together with employment data by sector and level of education. can be used in conjunction with data from the EU KLEMs-project, where productivity and growth accounting analyses have been undertaken for nearly all EU countries and some other OECD-countries.

The methodology to be adopted is basically the same as that which is used in standard growth accounting and total factor productivity calculations. The origin is Solow’s (1957) growth model with treatment of technological change, as developed by Denison (1962), so that the quality of labour is included, as well as various other factors. The calculations are based on index theory so that so called Törnqvist indices are on yearly basis. That means that changes are computed using natural logarithms, and weights are income share averages of two successive years. This is the application which Jorgenson (1995) and others have used and which is also used in EU KLEMs-project. The work of Jorgenson et al. is replete with logarithmic approximation. Using the averages of new and old value shares as weights we obtain Divisia-Törnqvist indices which are useful here and very unbiased. After calculation logarithmic numbers are changed to indices. So we get basic indices which describe the contribution on growth of each variable. However, because full time series are not always available on a yearly basis, the calculations can be based on average growth rates and those weights which are readily available. In practical calculations we can also use calculation method developed by Edward F. Denison when we are calculating average growth rates. These methods will be described in broader presentation.

Skills upgrading is important issue because it contributes on economic growth and promotes labour supply so that its structure corresponds demand and quality of labour compensates quantity. Here proposed method produces index which measures education and skills contribution on growth. The basic idea is multiply shares of different education levels in employment by earnings levels in these same different education levels. When the shares of higher skills levels are increasing, the index which is as result is increasing. Relative chances in this index are multiplied by income share of labour as the part of total income (or production) and so the result is contribution on growth which can be presented as an index and percents. This kind of calculation can be made for the future and this is here basic task.

Here the basic point is also that the method used in calculation of education based index can be applied also in constructing same kind of skill based contribution index. Then skill levels are needed to measure as it’s done in Cedefop project and then earnings levels are needed, not as absolute figures but as relative figures in different skill categories (at least high, medium, low). We have some data so that modelling is possible to develop but next steps are then needed so that that earnings data becomes later better.