

KURT SCHMID

Educational flow projections

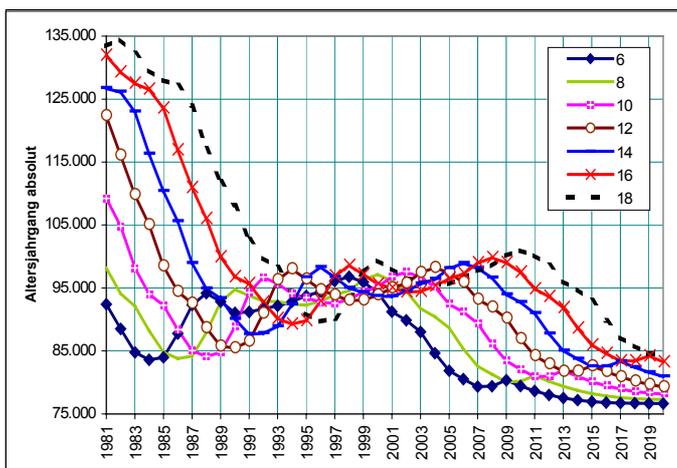
Results of the *ibw*'s model to analyse educational flow (changes in school attendance figures according to school types) for both compulsory schooling and upper secondary level until the year 2020

We can see from calculations on the basis of the *ibw*'s model to forecast educational flows that future student numbers in compulsory schooling will depend primarily on demographic developments and only to a very limited extent on what type of school pupils choose on lower secondary level. Student numbers on upper secondary level will, however, be characterised by demographic influences, the participation in education, as well as gender-typical choices of school.

Basic data concerning the demographic development

Figure 1 shows that the 1980s brought about a sharp demographic decline in the age groups which received first education. The 1990s, however, saw an increase of these age groups. The future will bring yet another significant drop.

Figure 1:
Development of Austria's population in selected age groups from 1981 to 2020 (main variant of projection)



Source: Population extrapolation and projection of Austria Statistics, as well as analyses by the *ibw*

To be able to predict student numbers, it is also essential to take into account the differences in time regarding the drop of the age group numbers. In primary schools (6 to

9 years), children numbers are already decreasing. On lower secondary level (10 to 14 year-olds), this is yet to come (the number of 14 year-olds, for example, will only begin to plummet after the year 2006). In upper secondary level, we expect rising numbers until the second half of the decade – yet, these will start to fall thereafter, too.

What influence do the various population projection models exert, i.e., how much do the age groups differ according to which model we base our research on?

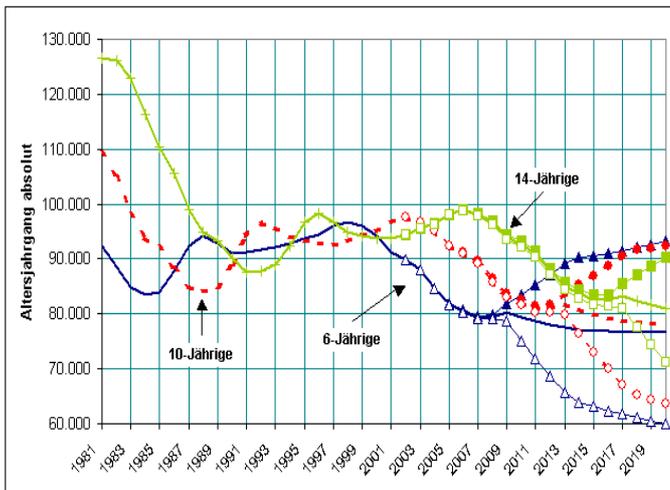
In order to shed some light, the following figure 2 shows the absolute development of some age groups (6, 10, and 14 year-olds) on the basis of the main variant (moderate fertility and moderate immigration), the top variant (high fertility and immigration), as well as the bottom variant (low fertility and immigration). This shows the spectrum in which the future age group figures could develop.

One can clearly see that for the age group in compulsory schooling, all three projection variants forecast decreasing numbers until the end of the decade and that they hardly differ at all. Yet, after this point, prognostic uncertainty sets in, i.e., the three variants expect age group numbers that differ considerably. The main variant sees a certain stabilisation of the age groups in the second decade. The high variant, however, expects a sharp rise for this period, which will in 2020 again reach today's level. The bottom variant finally predicts plummeting numbers in the age groups mentioned.

As regards upper secondary level, all three variants draw roughly the same picture for the 14 year-olds until 2015. Only after this, prognostic uncertainty sets in.

Figure 2:

Development of Austria's population of 6, 10, and 14 year-olds according to different projection variants



Source: Source: Population extrapolation and projection of Austria Statistics, as well as analyses by the *ibw*

Digression: the *ibw*'s projection model'

The below forecasts of educational flows were carried out with the aid of a specific model that allows for a projection of school attendance figures of the respective types of schools. This involves extrapolating either the current figures (scenario: choice of school), or trends in the choice of schools (since 1990/91) on the basis of the forecast development of the population in the relevant age groups. The *ibw* model made separate projections for all grades according to the type of school (in vocational middle schools and advanced schools also according to specialisation) and the sex. After that, the isolated results were aggregated and the total sum of assumed students according to their school type could be found.

At this point I would like to refer to the explicit warning at the end of this research brief concerning the interpretation of the projection results.

Forecast for the field of compulsory schooling

Scenario No. 1:

Fixed choice of school type & and trends in the choice of school types on the basis of the main variant of population projection

If one extrapolates the present, school type-specific attendance figures for the future (it is assumed that the choice of schools will not change in the future), and relates these school attendance figures to the forecast development of the population, the influence exerted by the demographic development (given the same choice of

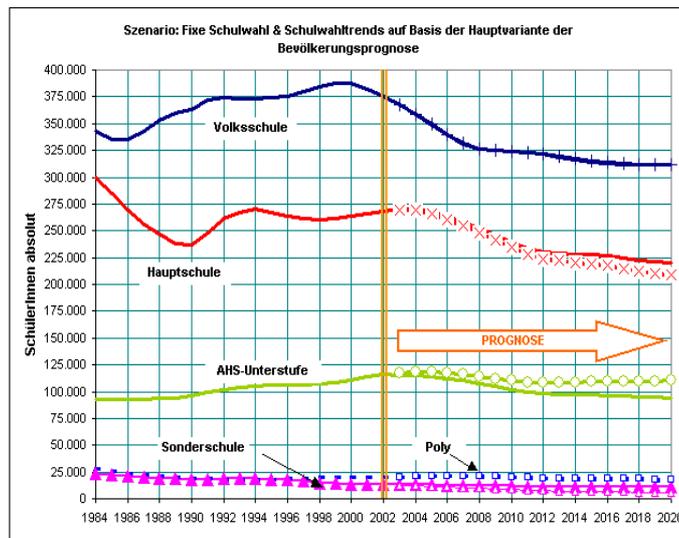
schools) on the future educational flows can be revealed (cf. figure 3: continuous lines).

Already today, pupil numbers in our primary schools are going down. This trend is going to continue until 2008 in much the same way as today. After 2008, we assume that there will be a further drop in the numbers of primary schools pupils, but the drop will lose momentum. As regards main general secondary schools, the decrease in student numbers due to demographic circumstances is about to set in. The numbers are going to plummet from presently 270,000 each year to 230,000 by the 2012. After that, the decrease is expected to slow down². As far as the lower secondary level of advanced general secondary schools is concerned, student numbers are expected to drop from the year 2005 to 95,000 students by the end of the forecast horizon. Also special needs schools as well as polytechnic schools³ will probably see a decrease in student numbers, according to this projection variant.

Figure 3:

Projection of the educational flow for the field of compulsory schooling

Scenario No. 1: Fixed choice of school type & and trends in the choice of school types on the basis of the main variant of population projection



Source: the *ibw*'s projection of educational flows

Instead of assuming stable school attendance percentages, one can also carry forward the development in trends observed in the last ten years (cf. figure 2, tagged lines). The results of the fixed scenario are unchanged as regards *primary schools*. Yet, lower secondary level sees slimmer student flows towards main general secondary schools and increasing flows into lower advanced general secondary schools, compared to the fixed variant. Here the long-known trend towards increasing attendance of advanced general secondary schools can be seen; this is especially prominent in urban areas. The forecast figures for polytechnic schools are more or less

identical, whereas student numbers in special needs schools would be lower.

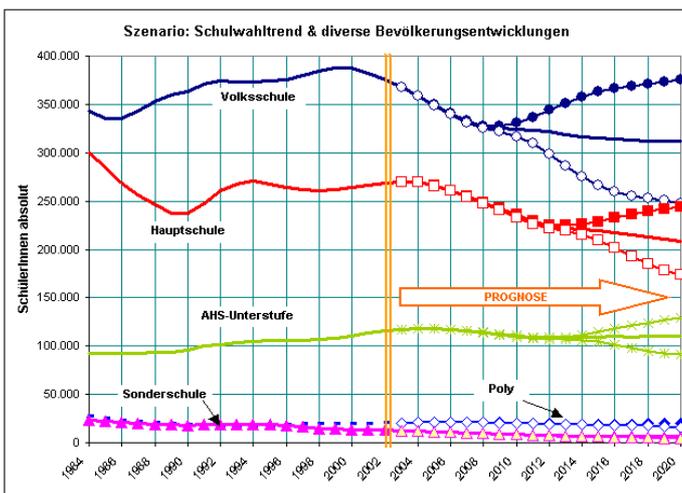
Scenario No.2:

Trends in the choice of schools under different assumptions regarding the development of the population

What future student numbers can one thus assume, considering the trends in the choice of school over the last decade and extrapolating them according to the three different population projection variants? Figure 4 shows the results.

Figure 4:

Projection of the educational flows for compulsory schooling Scenario No.2: trends in the choice of schools under different assumptions regarding the development of the population



Source: the *ibw*'s projection of educational flows

One can clearly see that all three variants suggest considerable changes in pupil numbers in primary schools only in the second decade (beginning in 2010); if the population develops according to the high variant, the numbers of primary school pupils will increase sharply at the end of the decade and finally almost reach today's level in 2020. Yet, if the bottom variant turns out to be right, student numbers in primary schools will continue to decrease significantly (and reach 250,000 by 2020).

On lower secondary level, the three development variants will only exert influence after 2015. Here too (in main secondary public schools as well as in lower secondary level advanced general public schools) the significantly different influences on the calculated student numbers which were already shown for primary schools can be seen. As regards special needs schools and polytechnic schools, absolute changes in student numbers will be marginal.

Comparing the corresponding values of figure 3 to those of figure 4, one can clearly see that the **upcoming changes in pupil numbers in the field of compulsory**

schooling depend primarily on the demographic development rather than trends in the choice of school on lower secondary level; the latter will only play a minor role.

Forecast for upper secondary level⁴

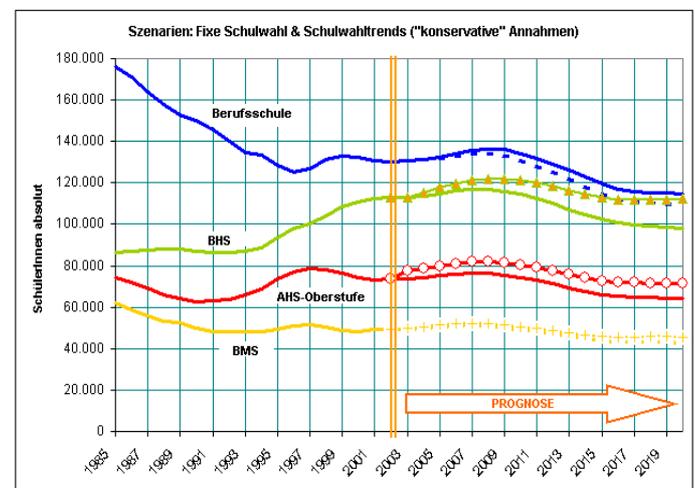
Scenario No.1:

Stable trends in the choice of schools (conservative assumption) on the basis of the main variant of population projection

The basic scenario assumed unchanged choice of schooling in the future for upper secondary level – analogous to the assumptions for compulsory schooling (this means extrapolating the present school form-specific attendance figures). According to this variant, student numbers in all school forms of upper secondary level would display a slightly rising trend both in a short-term and a mid-term perspective. Beginning in the year 2008, however, a clear drop is going to take place (cf. figure 5, continuous lines)⁵.

Figure 5:

Projection of educational flows for upper secondary level Scenario No1: Stable trends in the choice of schools (conservative assumption) on the basis of the main variant of population projection



Source: the *ibw*'s projection of educational flows

Instead of assuming stable school attendance figures, we shall now also extrapolate from the trends over the last few years. Yet, this is problematic for upper secondary level, because there occurred striking changes in student flows as well as attendance figures for the respective school forms in the 1990s, which were especially due to a massive extension of advanced vocational or technical colleges. Thus we tried to picture the trends with the help of two different scenarios. Let us first consider the scenario that assumes trends in the choice of schools on the basis of a 'conservative' assumption:

Student numbers in vocational schools are lower than in the "base scenario" (stable trends assumed) – compare

figure 5, tagged lines. Higher student numbers are expected for all other school forms of upper secondary level, though. These will be especially prominent for advanced vocational or technical colleges, as well as upper secondary level of advanced general schools. The differences between the two scenarios are, however, quite marginal in medium vocational schools.

Scenario No.2:

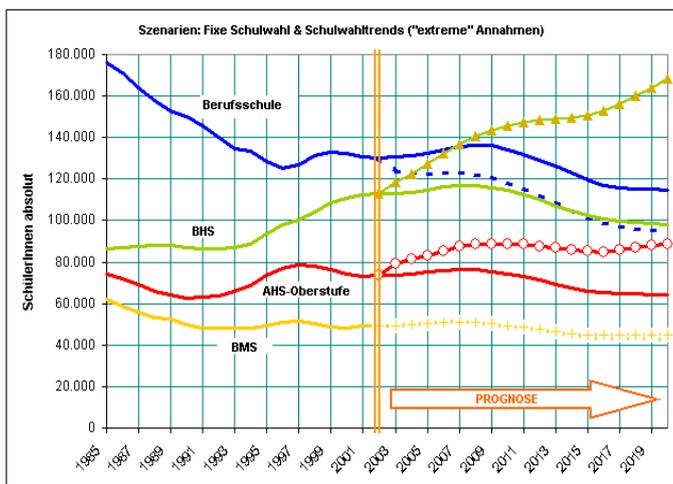
Stable trends in the choice of schools (extreme assumption) on the basis of the main variant of population projection

If one bases the school type-specific attendance figures on exponential trend functions, even more explicit shifts in the predicted flows of students have to be expected. Resulting from the specific dynamics of this trend function, the results of this projection variant should/have to be interpreted as “wishes” concerning educational choices. Its purpose is therefore not to predict realistic future developments, but to show up the dynamics of trends in the choice of schools⁶.

Figure 6 clearly shows that the decrease of pupils attending vocational school would be much more prominent in this scenario. Contrastingly, student numbers in upper secondary level of advanced general schools as well as advanced vocational or technical colleges would be significantly higher. As regards medium vocational or technical schools, the forecast differences would be marginal.

Figure 6:

Projection of educational flows for upper secondary level Scenario No.2: Stable trends in the choice of schools (extreme assumption) on the basis of the main variant of population projection



Source: the *ibw*'s projection of educational flows

As the scenarios of projection show, **future student numbers in upper secondary level will not only be determined by the demographic development, but also depend largely on the (gender-specific) trends in the choice of school types.**

At this point I should like to **warn explicitly of any wrong interpretation of the projection results**: especially those school forms that are assumed to have high student numbers in the future, will only achieve such high student numbers if the offers are extended correspondingly. The question if this will really happen (and it will involve building new schools) remains. The projection model can therefore only be seen as a *ceteris paribus* condition. This applies especially to the results of the extreme projection variant for upper secondary level: should the number of new vocational or technical colleges built go down, or apprenticeship become more attractive, these forecasts will definitely not come true. (Apprenticeship could, for example, be made more attractive by introducing final exams that grant university access, i.e., integrating the existing job maturity examination into apprenticeship training.) If the path of a massive expansion of full-time schooling on upper secondary level should indeed be chosen, is a central but political question – and this is why we shall not pursue it here any further. The projections are thus not to be seen as political valuations or absolute statements; much more, they are an attempt to provide an empirical basis for discussion both for educational research as well as educational policy.

For a more detailed discussion of the projection results, please consider the following publications made by the *ibw*:

Schmid, Kurt: Regional educational flows in Austria. Developments since the school year 1985/86, as well as forecasts for lower and upper secondary level until 2020. *ibw* series Education & Economy No.31, 2004.

Download at: <http://www.ibw.at/html/buw/BW31.pdf>

¹ For an explicit description of the *ibw*'s projection model of educational flow, see the *ibw*'s publication Education and Economy No. 31, 2004.

² The pupil numbers of the primary schools do not include children attending pre-school.

³ It is quite risky to forecast the development of the number of special needs school students. This is due to the fact that in the course of the last decade, many special needs students have been integrated into 'regular' schooling in the course of integration pedagogy.

⁴ The *ibw*'s projection of educational flows refers to one's first education, i.e., the student numbers given do not include special school forms such as courses of lectures, on-the-job trainings, etc.)!

⁵ Due to the respective variants of the population projection rendering slightly different figures for the age groups relevant for upper secondary level only towards the end of the time span covered, we decided not to include these projection details separately.

⁶ The fact that participation in education of the age group would rise above 100 percent by the end of the projection horizon - which is impossible - also shows that this scenario cannot provide realistic results for student numbers.