

This document provides a sketch of solutions to the exam. The provided solutions are intended as a guide to answering the questions, and are not meant as exhaustive. The written solutions would have to be worked out more completely.

This is the final exam for Economics of Education, Winter 2014. You have three hours to answer the following six questions, in any order you like. Note that the first question is not necessarily the easiest or shortest. Draft your responses with an eye to clarity of exposition and structure as well as to showing your understanding of the concepts learned in class. Link the problem at hand to economic theory.

Make sure to *pace yourself*. Also, you may choose to work on the questions in a *different order*: All questions can be answered independently.

Please turn over.

Private Schools

“Germany is becoming a country of private schools. Since 1992, the number of privately operated general education schools has risen about fifty per cent, and every week on the average one or two new establishments are added. [...] Private schools in Germany are varied. There are those with a special emphasis in music, [...] others for gifted pupils and for the handicapped, for pupils whose parents want them to be introduced as late as possible to the pressures of competitive and achievement-oriented society, and for those whose parents want to accelerate their achievement. [...] Concerning the content of their curriculae and selection of their staff, private schools may set their own emphases, but must accept the general conditions laid down by the respective federal state.” (recent article by the German Goethe Institut¹).

- (1) Discuss reasons why parents would favor private over public schools. Make sure to consider all different explanations from Economics of Education.

Solution:

Private demand: The classical human capital model posits that private demand for education is the result of optimizing behavior, balancing the expected productivity of investment against the costs. Note that Ben-Porath is strictly not useful to think about schooling *quality*, only *quantity*. But the basic decision-making structure is similar. If private schools are more productive, they might be worth extra expenditure. Why would they be more productive?

- human capital production functions may contain many arguments, including teacher quality, financial resources, and peers. As long as private schools signal that they are more productive, parents are willing to invest there.
- But private schools might be able to attract the best teachers only because of higher revenue from higher tuition payments (supply of schooling: . Thus, at a higher price, the question will become which parents are willing to make this trade-off. Clearly, those parents who expect a higher return from private schools than public schools. For example, if high-ability children benefit more from better teachers than less-able children, their parents may have a higher willingness to pay. This means that not *all* parents favor private schools, but the share of parents who do is increasing. Can you argue why they would be increasing? Ex. rising incomes, abilities.
- As indicated in the set-up text, parents act with a certain awareness of their child’s particular human capital endowment and production function. Thus, parents choose the right school to “match” their child’s existing capital best. Note that this type of thinking requires us to recognize that human capital is multi-dimensional (in contrast to Ben-Porath, for example).

¹Published at <http://www.goethe.de/wis/fut/sul/en4495615.htm>, accessed Nov. 13, 2013.

- Parents may also be able to match the exact level of schooling resources they find optimal for their child. This links to the reasons for school vouchers we discussed. This is relevant both for the child's production function as well as for parents (Private schools may offer longer supervision hours that fit the needs of two working parents or single-parent families.)
- If private schools screen on "ability to pay" through tuition, they provide a different peer group (see below). If they screen on ability, they provide more-able peers. That could be perceived as productivity-enhancing by parents, even if the evidence on peer-effects in schooling is mixed. Cite empirical articles. A small initial difference in peer composition may be magnified through sorting (ref. the Checchi version of a Benabou model to explain segregation). This means that parents of children in public schools find an ever-decreasing peer quality for their child if there is a trend that segregates high-ability/high-quality background peers in private schools - leading more parents to leave public schools in turn.
- The return to a "private education" might be higher than to a "public education" because of network reasons - they may produce higher wage outcomes without actually altering the individual's human capital.
- Also, if private schools screen students on stringent characteristics, their diplomas might have a higher signalling value than public school diplomas (another non-human capital explanation). (Ref: Spence's screening model)

- (2) The article further states that "[Private schools] attempt to stay abreast² of social changes and the increasing demands on pupils and parents. Thus the all-day supervision often offered by private schools meets the needs of single and working parents." In the medium- to long-run, what do you think will happen to public schools that are now facing competition from private schools? (Hint: Think of the lecture on school financing with models of voting.)

Solution:

Think of the voting scenario we discussed in class: median voter theorem applied to optimal taxation and redistribution via education. If all parents require longer supervision, they should vote for this. Especially lower-income parents, and typically income distributions are right-skewed (fatter tail left tail). Contrast the voting outcome to the benevolent planner solution. We had seen in Checchi's model that with only public schools and only income variation (no ability variation), there is too much redistribution from voting relative to the benevolent planner. If voting really pushes public schools to offer longer hours, to become more similar to private schools, there may be fewer reasons for parents to choose private over public schools.

²Definition "abreast:" up to a particular standard or level, or up to date.

- (3) Now consider the government mandate that private schools may not reject students on the basis of their ability to pay. You could interpret this as a mandatory scholarship to low-income students, provided by the schools. What does this imply for the student-body composition in terms of a) financial background and b) ability?

Solution:

In theory, there should not be a composition difference in financial background, but in practice there might be. Parents with higher income might be the type of parents who push for high-quality education, or who believe that private schools provide better education. They will be the ones applying in greater numbers. Also, evidence on life cycle skill formation shows that school-readiness is often very correlated with parental background, including financial background. Therefore, children from families that are better off are more likely to have been prepared for schools that are more selective in terms of preparation or achievement measures.

Alternatively, if two parents in a family work, therefore increasing family income above a single earner, these working parents might be the type who need a private school that has longer hours. If single-earner families have lower income but also less need for the long hours, they would not be willing to pay. There might be a higher concentration of high-income families who send their children to private school.

One might intuitively think that the ability distribution within private schools will be unaffected by whether or not schools can reject students on the basis of ability to pay. But the student composition depends first on who applies, and next on who is accepted or rejected. Therefore, even if no students are rejected on the basis of income, we might still expect a higher concentration if highly able children in private schools if they benefit more strongly from private school. The rules did not say anything about rejecting students on the basis of ability - and any preparation work in order to demonstrate this high ability will be less costly to high-ability children.

The average ability in private schools would *increase* due to the rule *if* there were high-ability students that were previously rejected because their parents were not able to pay.

Many private schools and universities can also choose to improve their reputation by attracting the “best” students. They can attract these by screening with entrance exams and rejecting students below a certain cutoff. Alternatively, schools and universities can also offer scholarships to students who have the best grades from previous education, or the highest scores at an entrance exam.

- (4) From the governments’ perspective, or as a social planner, what can we say about the efficiency of entrance exams?

Solution:

Entrance exams are an effective screening device, and if higher-ability students really produce more human capital in private schools in a *non-linear*

fashion, it could be socially desirable to sort the highly able into the best schools. But the exam itself is costly (in terms of time during the test, but also in preparing for this signal), so there is a question whether the cost is offset by the benefits. It might instead be better to use existing information on student ability, such as from previous grades.

- (5) Contrast two situations: A country moves from having no merit-based scholarships available at all to a situation where private schools and universities offer such merit-based scholarships. This means that schools now offer financial support for the brightest and best children. What effect does this move to targeted financial aid have on inequality in human capital investments, and inequality in earnings? (Hint: Becker's Woytinski lecture may be useful.)

Solution:

Use Becker's Woytinski lecture - egalitarian vs elite approaches. The egalitarian case would not be helpful, as we want to contrast students of different abilities. Therefore, start out in the elite case where students vary by ability but not cost of financing. Now introduce a lower cost of schooling ("opportunity") for the highly able. That means that individuals who have higher demand curves will now also have lower supply curves of schooling. This will increase inequality, as in the positive correlation case, of both investments and earnings (not necessarily marginal rates).

In a more realistic scenario where both opportunity and the returns vary (combination case) we know that costs and returns may be correlated at the outset. The merit-based scholarships now add a positive force to the correlation. If it was previously negatively correlated, it is now less negatively correlated. But if it was positively correlated (high ability children have low costs of financing school) it will be even more negatively correlated with higher ability.

This means that the effect of merit-based scholarships may even be to increase inequality - children from high-income invest even more in education (and have accordingly even higher income), because they tend to be also high-ability. This prediction depends on who will merit the scholarships (on the basis of ability only) - more students with also high incomes (more inequality) or more students who previously had high costs of financing (less inequality).

- (6) Finally, it remains unclear whether private schools and universities are actually more productive or "higher quality" than public schools and universities. One might analyze the relative rates of return to these two types of educational institutions, in order to provide guidance on whether the returns are different. If you were to perform this analysis, how would you go about it? What kind of information would you need, and which data points would you use?

Solution:

In answering, think about whether you could use existing data sources, natural experiments or instruments, or if you would like to collect new data? If you wanted to use a natural experiment, what characteristics would it have to exhibit? Describe the conditions for a good instrument even if you cannot think of one. What can we learn from this type of analysis?

If you wanted to collect new data, what would you want to measure?

The answer should relate this question to our class discussion of rates of return. We discussed several instruments in detail, and how to identify good instruments. Proximity to college could be used for answering this question. If you suggest to use an instrument in their answer, you should be able to say that typically instruments identify returns only for those affected by an instrument, if the returns are not constant across sub-groups.

If you instead suggested a randomized experiment, you should acknowledge that they might be difficult to justify socially (not allowing students to attend the school of their choice).

One might also want to measure the actual quality of students, through test scores.

In terms of outcomes, one would want to know lifetime profiles of earnings, these will only appear later in life. Typically economists extrapolate, or use cross-sectional data as synthetic cohorts.