

Public Economics

José Mesquita Gabriel

Mail: jose.gabriel@novasbe.pt

Office Hours: Tuesday afternoon (15h30 – 16h50) – or simply e-mail me

3- Externalities and Public Goods

3.4) Mixed Goods (Chapter 11 Gruber)

N ON SCHOOL OF BUSINESS & ECONOMICS

Mixed Goods - Education

- 1. **Productivity (externality):** Education increases productivity, which brings both private benefits (higher wages), but also social benefits (productivity spillovers)
- 2. Citizenship (externality): A more educated population may lead to more informed and active voters. Furthermore, areas with higher levels of education are linked to lower crime rates, and better health outcomes.
- **3. Credit market failures (market failure):** Private institutions may refrain from issuing socially beneficial loans (there is no collateral)
- 4. Family decisions (irrational agents): Parents may not choose an appropriate level of education for their kids (myopic and selfish)
- 5. Redistribution (government goal): Higher income families will spend more on education, further increasing inequality and hampering intergenerational income mobility

Free Public Education and Crowding-Out

- Public provision may actually **decrease the level of education**, as students may shift from private to public schools, decreasing their spending on education **crowding out**
- This happens because the "subsidy" is contingent to a kid attending a public school
- Only expected for families from a medium/high socio-economic status, who are not certain whether to enroll their children on public or private schools





Vouchers as a Potential Solution

- A fixed amount is given, which can be spent in both public *or* private provision
- This solution **prevents crowding-out effects**, as now the "subsidy" is no longer contingent on a kid attending a public school

Pros: Consumer sovereignty, competition

Cons: Excessive school specialization, potential segregation, cherry-picking

Vouchers as a Potential Solution



Measuring Returns on Education

Human Capital Theory

- Assumes that education **does increase the productivity** of the agent.
- As a consequence, positive externalities will arise from one's education – i.e., when a person invests more on her own education, social benefits are generated.
- Scope for the government to **subsidize** education.

Screening Theory

- Assumes that education **does** *not* **increase the productivity** of the agent.
- Education only allows employers to separate high-ability from low-ability candidates – exclusively private benefits.
- As there is no positive externality, the government should not subsidize education.
- Nevertheless, screening increases job match quality, and thus can be socially optimal – scope for public intervention



PS 7: Mixed Goods

Ex.1) State and federal governments actively support education at the primary, secondary, and collegiate levels. But they mandate education at the primary and secondary levels, while merely providing subsidies and loan guarantees at the collegiate level.

Of the key rationales for public provision of education, which do you think explains this differential treatment?

Reasons for Public intervention on Education:

- Productivity education increases productivity, leading to private benefits (higher wage), and social benefits (productivity spillovers, higher tax revenue)
- Citizenship More informed and active voters. Lower crime rates. 2. Improved health.
- Credit market failures 3.
- Family decisions Parents may not choose an appropriate level of 4. education for their kids, as incentives may not be aligned
- Redistribution Higher income families will spend more on education, 5. further increasing inequality and preventing intergenerationall income mobility



Particularly for primary and secondary school – not so much for higher education

While in primary and secondary school the decision is purely from parents, in higher education parents play a much smaller role in decision-making

PS 7: Mixed Goods

Ex.2) Suppose that a family with one child has \$20 000 per year to spend on private goods and education, and further suppose that all education is privately provided. Draw this family's budget constraint.

- Suppose now that an option of free public education with spending of \$4 000 per pupil is introduced to this family. Draw three different indifference curves corresponding to cases in which:
- Free public education would a) *increase // b) decrease // c) not affect* the amount of money that is spent on the child's education



Ex.3) The town of Greenville has three families, each with one child, and each of which earns **\$20 000** per year, **pre-tax.** Each family is **taxed \$4 000** per year to finance the public school system in the town, which any family can then freely attend. Education spending is \$6 000 per student in the public schools.

The three families differ in their preferences for education: although **families A and B both** send their children to the **public school, family B places a greater value** on education than family A. **Family C** places the greatest relative value on education and **sends their child to private school**.

i) Graph the budget constraints facing each of the three families, and draw a possible indifference curve that could correspond to the choice each family makes

Ex.3)

i) Graph the budget constraints facing each of the three families, and draw a possible indifference curve that could correspond to the choice each family makes



PS 7: Mixed Goods

Ex.3) The town is considering replacing its current system with a **voucher system**. Under the new system, **each family would receive a \$6 000 voucher** for education, and families would still be able to send their children to the same public school. Since this would be more costly than the current system, they would also raise **taxes to \$6 000** per household to pay for it.

ii) Draw the budget constraint the families would face under this system.



Ex.3) Suppose that when the new system is introduced, family A continues to send their child to public school, but family B now sends their child to private school (along with family C's child).

iii) Explain how you know that family C is made better off, and family A is made worse off by the voucher policy.

• Family C is made better-off: pure income effect. Since they spend more than \$6 000 on education anyway, this voucher is as good as cash.

Without voucher: pay \$4 000 in taxes

With voucher: pay an extra \$2 000 in taxes but get a \$6 000 voucher in return.

• Family A is made worse-off.

Without voucher: pay \$4 000 in taxes and receive public education

With voucher: pay an extra \$2 000 in taxes, but still receive the same level of public education

PS 7: Mixed Goods

Ex.3)

iv) Show, using diagrams, that family B could be made better or worse off by the voucher policy

- Family B can made be worse off with the voucher policy if the indifference curves look like the dashed indifference curves; but can be made better off if we assume indifference curves as the solid one;
- If the $MRS^B_{x,y}$ is large enough, that is, if family B cares relatively more about education, then the voucher policy might increase their utility.



Ex.4) Several researchers have found evidence of sheepskin (diploma) effects in which the labour market return to twelfth grade is higher than the return to eleventh grade and the return to the fourth year of college is higher than the return to the third year of college

- Does this evidence support the human capital theory or the screening explanation for the relationship between education and earnings?
- It seems unlikely that productivity-enhancing skills are disproportionately gained in the last year of any degree program.
- Rather, staying through the last year may signal tenacity, a trait that employers value and that is not directly observable
- Hence, the high earnings associated with completing a degree are consistent with the screening theory!

Midterm Fall '24 (Mixed Goods)

II (5 points)

Consider a mixed good such that the aggregate demand curve for the *private component* is given by p = 10 - 2q.

Assume that there are 3 agents in this economy.

Let the individual marginal valuations for the *public component* of the mixed good be $p_1 = 2 - 0.5q$ (for agent 1), $p_2 = 2 - 0.5q$ (for agent 2), and $p_3 = 4 - q$ (for agent 3).

The marginal cost is 10.

a. (1 point) How much would be consumed without government intervention?

Market Outcome: $p^{Priv} = MC \Leftrightarrow q^{Priv} = 0$

Grading: 0.5 for the identification of the relevant demand and supply; 0.5 for the correct calculation

b. (1.5 points) How would you aggregate the individual demands for the public component? What would the efficient quantity be?

We need to aggregate the individual demands for the public component vertically:

 $p^{Pub} = 2 - 0.5q + 2 - 0.5q + 4 - q = 8 - 2q$

Then, the public component is similar to a positive externality (marginal external benefit) and therefore the efficient quantity is such that:

 $p^{Priv} + p^{Pub} = MC \Leftrightarrow 18 - 4q = 10 \Leftrightarrow q^* = 2$

Grading: 0.75 *for the aggregation of demands for the public component,* 0.75 *for the reasoning and calculation of final result.*

Midterm Fall '24 (Mixed Goods)

c. (1 point) Suggest one subsidy policy in order to achieve the efficient solution.

One possibility would be a Pigouvian subsidy to producers such that $P^{Priv}(q^*) = MC - S \Leftrightarrow 10 - 4 = 10 - S \Leftrightarrow S = 4$

Grading: 0.25 for mention of Pigouvian subsidy; 0.75 for explanation and calculation.

 d. (1.5 points) In case this mixed good is primary education, would your preferred policy recommendation be the one in c. or would you recommend any alternative policy? What if the good were higher education? (max. 12 lines)

Education is a mixed good and therefore private provision will not ensure efficiency, but different solutions (including public provision and different degrees of public financing) can be discussed. For efficiency, the extent to which the government should intervene and subsidize the primary and the higher education market is directly related to how large the public component of this good is in comparison with the private one. It would be important to compare whether labor market gains from additional years of primary and tertiary education are in fact a result of increased productivity (human capital theory), or if instead, there are large signaling/screening effects – the latter hypothesis would not recommend as much government intervention in this market. Other arguments include additional spillovers/externalities (citizenship, health), educational credit market failures, failure to maximize family utility and redistribution. The role of education in income mobility has important fairness implications – and this should be discussed both for primary and higher education.

Grading: 1 for pointing the efficiency and fairness arguments for government intervention in education; 0.5 for the discussion of the relevance of these arguments at primary and higher education levels

Public Economics

José Mesquita Gabriel

Mail: jose.gabriel@novasbe.pt

Office Hours: Tuesday afternoon (15h30 – 16h50) – or simply e-mail me

