

2.13: Putting It Together- Choice in a World of Scarcity

The Challenging Budget Constraints of a Student

We began this module with a discussion of the annual salaries of full-time U.S. workers with different levels of education. Let's return to the very real economic issues that face most students when making decisions about their education.

First, we discussed the cost of choices and trade-offs and used the budget constraint model to demonstrate those costs. Each term, students make a trade-off between taking more credits in school and buying necessary items. Let's create a budget constraint model for Camila, a community college student who is struggling to cover the cost of education. First, let's assume that each credit hour costs \$75. Camila wants to take 12 to 16 credits but also needs to pay for gas to drive between school, work, and other family responsibilities. Gas costs \$3 per gallon. If she has a budget during the course of the academic term that allows her to spend a total of \$1,500 on course credits and gas, what are Camila's options?

Exercises

We can use the budget constraint equation to answer this question.

Step 1. Apply the budget constraint equation to the scenario.

In Camila's case, this works out to be

$$\text{Budget} = P_1 Q_1 + P_2 Q_2 \quad \text{Budget} = 1500 \quad P_1 = 3 \left(\text{price for a gallon of gas} \right) \quad P_2 = 75 \left(\text{price per credit hour} \right) \quad Q_1 = \text{gallons of gas} \quad Q_2 = \text{number of credit hours}$$

For Camila, this is

$$1500 = 3Q_1 + 75Q_2$$

Step 2. Simplify the equation.

At this point we need to decide whether to solve for Q_1 or Q_2 .

Remember, Camila was hoping to take at least 12 credit hours, so we know the value for Q_2 . We will solve for Q_1 because, in this equation, it represents the number of gallons of gas Camila can pay for, depending on how many credit hours she takes during the academic term.

We are going solve for Q_1 . First we will write the equation with the variables on the left to make solving easier:

$$3Q_1 + 75Q_2 = 1500 \quad (2.13.1)$$

$$3Q_1 + 75Q_2 = 1500 \quad 3Q_1 = 1500 - 75Q_2 \quad \text{isolate } Q_1 \text{ on one side} \quad \text{divide everything by 3} \quad Q_1 = 500 - 25Q_2$$

Step 3. Use the equation.

We know that Camila hopes to take 12 credit hours during a term. Q_2 represents the number of credits she hopes to fund, so we plug in 12 for Q_2 , which gives us

$$Q_1 = 500 - 25(12) \quad Q_1 = 500 - 300 \quad Q_1 = 200$$

This means that Camila can buy 200 gallons of gas during the term she is taking 12 credit hours (point M on the graph, below).

If you plug other numbers of credit hours into the equation, you get the results shown in Table 1, below.

Table 1. Camila's Budget Constraint		
Point	Number of Credit Hours	Gallons of Gas
A	0	500
B	1	475
C	2	450
D	3	425

Table 1. Camila's Budget Constraint		
Point	Number of Credit Hours	Gallons of Gas
E	4	400
F	5	375
G	6	350
H	7	325
I	8	300
J	9	275
K	10	250
L	11	225
M	12	200
N	13	175
O	14	150
P	15	125
Q	16	100

Step 4. Graph the results.

If we plot each point on a graph, as below, we can see a line that shows us the number of credit hours that Camila can fund while still paying for gas.

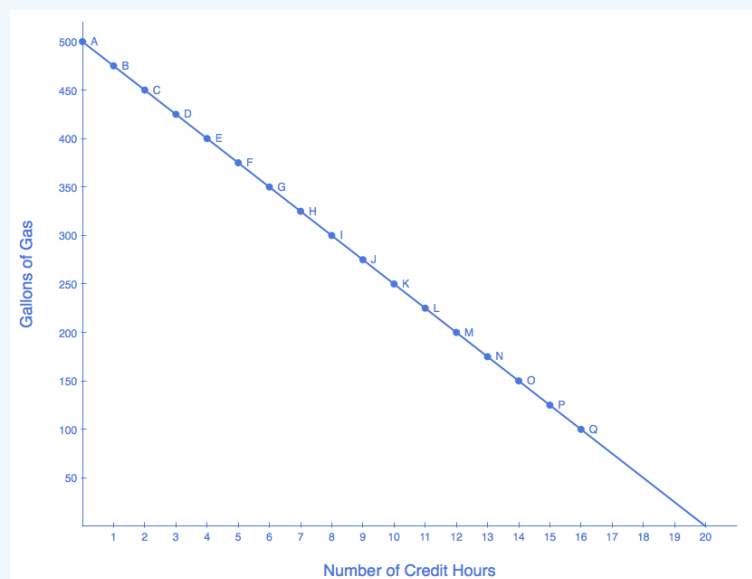


Figure 1. Camila's Budget Constraint.

Education and the Production Possibilities Curve

As state legislators allocate funding, they often make independent decision about the funding amount and approach for education and the funding amount and approach for corrections (or prisons). Economists recognize that these are not independent decisions. The production possibilities curve demonstrates that if society invests more in prisons, there are will be a reduction in the resources available to invest in education.

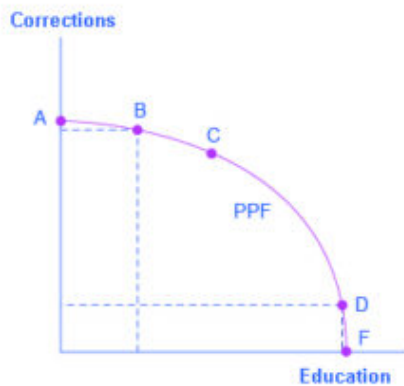


Figure 2. Education vs. Corrections Production Possibilities Frontier

The graph above demonstrates the trade-off between devoting resources to corrections and to education. If the society were to allocate all of its resources to corrections, it could produce at point A, but it would not have any resources to produce education. If it were to allocate all of its resources to education, it could produce at point F. Alternatively, society could choose to produce any combination of corrections and education shown on the production possibilities frontier.

Sometimes legislators don't recognize the direct trade-off between investing in education and investing in prisons, but inevitably economists will point out the connection, and the press will jump in and question the legislators' decision. In a world of scarcity, more spending in one necessarily means less to spend in others.

Should Society Invest in Prisons or Education?

As we consider the trade-offs between investments in prisons and education, is there a definitive "right" answer? Consider the following analysis by the Center on Budget and Policy Priorities:

Even as states spend more on corrections, they are underinvesting in educating children and young adults, especially those in high-poverty neighborhoods. At least 30 states are providing less general funding per student this year for K–12 schools than before the recession, after adjusting for inflation; in 14 states the reduction exceeds 10 percent. Higher education cuts have been even deeper: the average state has cut higher education funding per student by 23 percent since the recession hit, after adjusting for inflation. Eleven states spent more of their general funds on corrections than on higher education in 2013. And some of the states with the biggest education cuts in recent years also have among the nation's highest incarceration rates.

This is not sound policy. State economies would be much stronger over time if states invested more in education and other areas that can boost long-term economic growth and less in maintaining extremely high prison populations. The economic health of many low-income neighborhoods, which face disproportionately high incarceration rates, could particularly improve if states reordered their spending in such a way. States could use the freed-up funds in a number of ways, such as expanding access to high-quality preschool, reducing class sizes in high-poverty schools, and revising state funding formulas to invest more in high-poverty neighborhoods.^[1]

While the analysis cited is thorough and logical, the report above includes a range of positive and normative statements. If you reread the analysis with that in mind, you will find examples of both.

Positive Statements

- At least 30 states are providing less general funding per student this year for K–12 schools than before the recession, after adjusting for inflation; in 14 states the reduction exceeds 10 percent.
- Higher education cuts have been even deeper: the average state has cut higher education funding per student by 23 percent since the recession hit, after adjusting for inflation.
- Eleven states spent more of their general funds on corrections than on higher education in 2013. And some of the states with the biggest education cuts in recent years also have among the nation's highest incarceration rates.

Normative Statements

- Even as states spend more on corrections, they are underinvesting in educating children and young adults, especially those in high-poverty neighborhoods.
- This is not sound policy.

- State economies would be much stronger over time if states invested more in education and other areas that can boost long-term economic growth and less in maintaining extremely high prison populations.

As you can see, your experience as a student affords you an important view into the trade-offs that are core to economics.

1. <http://www.cbpp.org/sites/default/files/atoms/files/10-28-14sfp.pdf> ↵

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