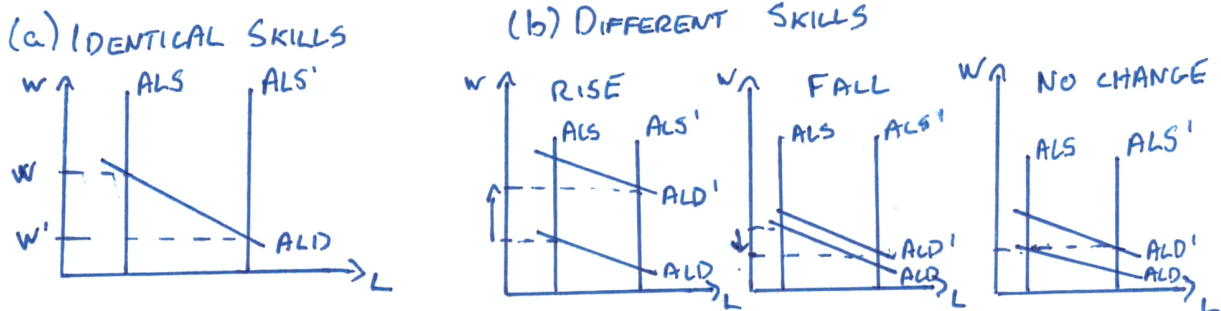


Prof. Bryan Caplan  
 bcaplan@gmu.edu  
 http://www.gmu.edu/departments/economics/bcaplan  
 Econ 321

**HW#3** (Answer **ANY 6** of the following. Please type all answers)

- I. Use Aggregate Labor Market diagrams to show the effect of immigration when (a) all workers have identical skills and (b) native and foreign workers have different skills.

With identical skills, ALS goes up and ALD stays the same, so wages fall. With different skills, both ALS and ALD go up, so wages could rise, fall, or stay the same.



- II. Suppose that inside the United States, Americans and Mexican workers can produce the following in a day.

	American Worker	Mexican Worker
Corn	4	2
Cars	4	1

Suppose that with immigration, one car sells for 1.5 bales of corn. Create a new table that shows how immigration effectively raises both Americans' and Mexicans' productivity.

With free immigration, Americans have a comparative advantage in cars, and Mexicans have a comparative advantage in corn. Both groups can therefore raise their effective productivity by specializing and trading. Like so:

	American Worker	Mexican Worker
Corn	6 (by trading 4 cars for 6 corn)	2
Cars	4	4/3 (by trading 2 corn for 4/3 cars)

- III. How would increased immigration from Mexico be likely to affect (a) U.S. workers in English-intensive jobs, (b) U.S. workers in non-English-intensive jobs, (c) U.S. capitalists and landowners, (d) Mexican immigrants, and (e) Mexicans who stay in Mexico? Why?

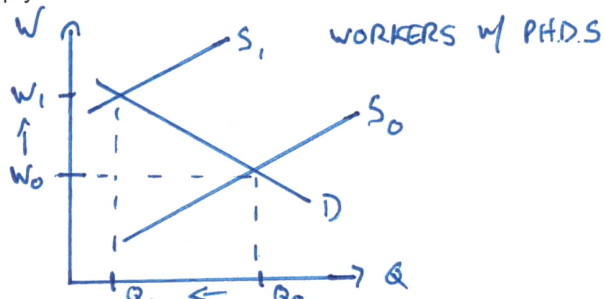
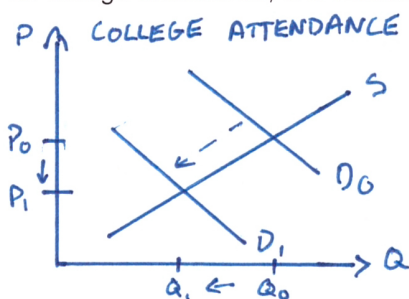
Everyone except for U.S. workers in non-English-intensive jobs benefits. U.S. workers in non-English-intensive jobs find that the S of competing labor increases, driving down wages. But for U.S. workers in English-intensive jobs, labor demand increases; for capitalists, the rate of return increases; and for landowners, demand for land and housing rises. Similarly, Mexicans who immigrate get higher U.S. wages; Mexicans who stay find that the S of labor in Mexico has fallen, raising wages. (You might also point out that Mexican capitalists and landowners, like U.S. unskilled labor, are worse off - though remittances immigrant workers mail home partly offset this).

IV. What is the single best argument against open borders? What are the main weaknesses with this argument? Describe a cheaper, more humane way to address this problem without restricting immigration. (1 paragraph)

The single best argument is that immigrants bring their dysfunctional political culture with them. So when they vote, policies move in a dysfunctional direction. Key weaknesses: (a) Immigrants have low turnout; (b) When immigrants vote, they tend to support their new country's status quo out of inertia; (c) Immigration reduces *natives* support for dysfunctional policies, because people don't like financially supporting outgroups. A cheaper, more humane way to address this problem is to admit immigrants as guest workers – eligible to live and work, but not to vote.

V. Suppose interest rates rise. What does human capital theory predict about college attendance? Wages for Ph.D.s? Use two diagrams - one for the S&D of education, the other for the S&D for workers with Ph.D.s?

College attendance falls; wages for Ph.D.'s rise. When interest rates rise, the PDV of a college degree falls (the benefits are in the future, the cost is in the present). This reduces the demand for college attendance, and reduces the supply of workers with Ph.D.'s.

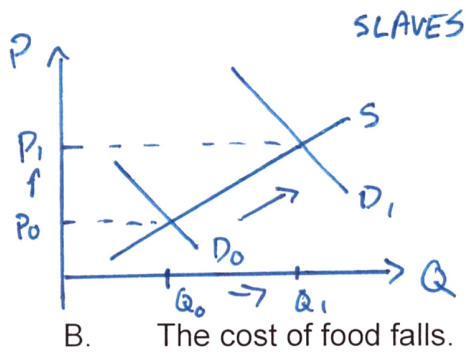


VI. Suppose a magic drug makes people immortal. What happens to the average level of education? Why? (2-3 sentences)

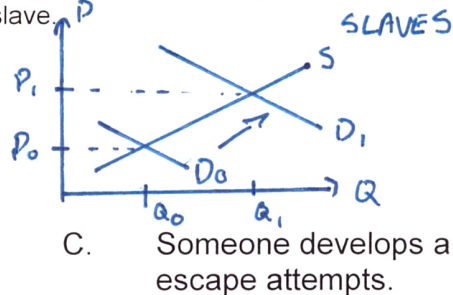
Education level rises because the PDV of education rises. If you only work for 40 years, you get 40 years of higher wages from extra education. If you were immortal, you would continue to benefit forever. (In case you're curious: This doesn't mean you would get infinite education. A bond that pays \$1/year forever is worth  $\$1/(\text{interest rate})$ , not infinity. The same holds for education).

VII. What happens to the price of slaves when...? Graph your answer.  
A. Interest rates fall.

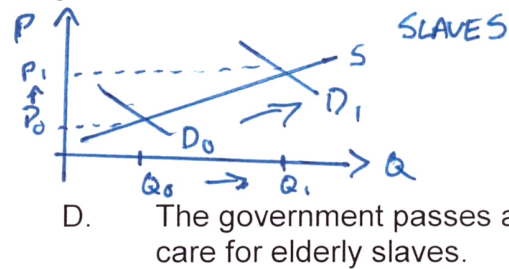
Demand increases - when interest rates fall, the PDV of the slave's lifetime production rises.



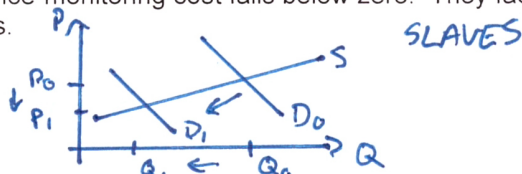
Demand increases. Slave-owners earn the slave's MVP-subistence-monitoring cost. If the price of food falls, so does the price of subsistence. Thus, slave-owners are willing to pay more to own a slave.



Demand increases. The higher the rate of escape, the less (on average) of a slave's MVP an owner can successfully capture. Reducing the escape rate increases demand for slaves, just like reducing the breakdown rate on cars raises the demand for cars.



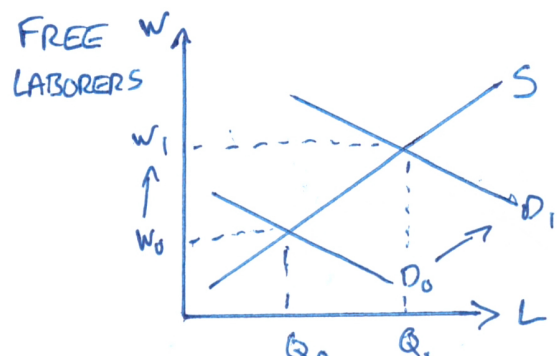
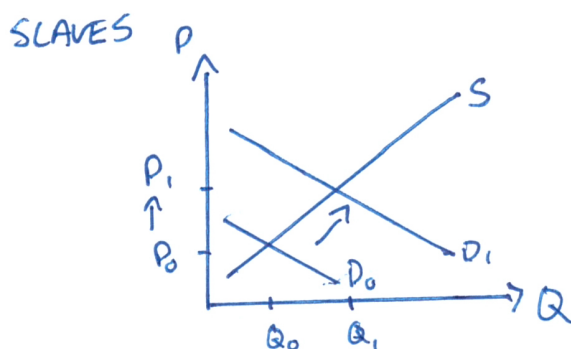
Demand decreases. Slave-owners now have to keep paying to support slaves after their MVP-subistence-monitoring cost falls below zero. They factor this burden into their slave-buying decisions.



VIII. Using two diagrams per question, show what happens to slaves and free laborers when:

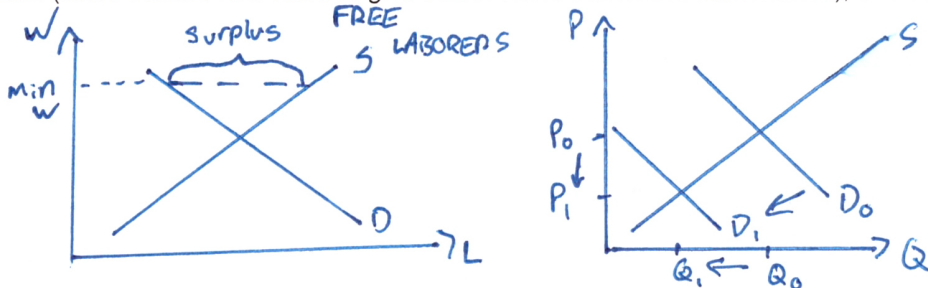
A. Worker productivity rises (and product demand is relatively elastic).

For free laborers, labor demand rises, and so do wage rates. For slaves, demand rises, and so do slave prices.



B. The government imposes a minimum wage.

For free laborers, the labor market no longer clears; there is surplus labor. For slaves, demand falls (since owners now have to give slaves more than mere subsistence), and so do slave prices.



For free laborers, labor supply rises, and wage rates fall. For slaves, demand increases → slaves can now be used to perform tasks that employers previously thought were bad investment risks. But since free laborers care about both their lives and their expected earnings, while slave-owners care only about earnings, there is a larger shift in the market for free labor. (In the **rental** market for slaves, the supply of slaves for previously unsafe work increases, reducing rental rates).

IX. Calculate your PDV of going to college, using your best guesses for your income if you do and don't go to college. (To save time, just do your calculations for 15 years after high school graduation). Assume the interest rate is 5%. Does college attendance have a positive PDV?

Here I calculate what my PDV was in 1989 (the year I started college).

Year	\$Income	Present Value	Comment
1989	-20,000	-20,000	undergraduate - lost wages + tuition
1990	-20,000	$-20,000/(1.05)$	"
1991	-20,000	$-20,000/(1.05)^2$	"
1992	-20,000	$-20,000/(1.05)^3$	"
1993	-30,000	$-30,000/(1.05)^4$	graduate school - no tuition, but higher opportunity cost
1994	-30,000	$-30,000/(1.05)^5$	"
1995	-30,000	$-30,000/(1.05)^6$	"
1996	-30,000	$-30,000/(1.05)^7$	"
1997	+20,000	$+20,000/(1.05)^8$	finish school, begin work
1998	+22,000	$+25,000/(1.05)^9$	raises are higher than if I hadn't attended college
1999	+24,000	$+30,000/(1.05)^{10}$	"
2000	+26,000	$+35,000/(1.05)^{11}$	"
2001	+28,000	$+40,000/(1.05)^{12}$	"
2002	+30,000	$+45,000/(1.05)^{13}$	"
2003	+32,000	$+50,000/(1.05)^{14}$	"

Using a calculator, the PDV of the losses from 1989-1996 was -\$166,359. The PDV of the gains from 1997-2003 was +\$139,925. So the overall PDV = -\$26,424. Perhaps college was a mistake for me? Of course, truncating the gains at 2003 makes the estimated benefit too low.

- X. Using your answer to VI, guess what the interest rate would have to be to reverse your answer. (Your guess doesn't need to be right, but it must go in the right direction). Then calculate the PDV using the new interest rate. Was your guess too high? Too low?

Clearly, if the interest rate were lower, it would be more likely that college would pay. I guess that if the interest rate were 3%, the above table would have a positive sum. Punching in the numbers shows that the PDV of the losses from 1989-1996 was -\$178,622, while the gain was \$174,310, for an overall PDV=-\$4312. I should have guessed a slightly lower interest rate, maybe 2.9%.

- XI. Carefully explain ONE reason why a 12.6% rate of return on education is an overestimate. (1 paragraph)

This rate does not factor in the cost of tuition; it only counts foregone earnings. By leaving a large part of the expense of college out of the equation, it inflates the estimated rate of return. For example, suppose one year of college raises your wage from \$20,000 to \$22,520. Counting only foregone wages as a cost, your rate of return is  $(\$22,520 - \$20,000) / (\$20,000)$  per year - 12.6%. But adding in say a \$10,000 tuition cost makes the calculation  $(\$22,520 - \$20,000) / (\$20,000 + \$10,000) = 8.4\%$ .

- XII. Why does controlling for IQ reduce the estimated rate of return to education? (1 paragraph)

Education and IQ are highly correlated - smart people get more schooling. And both independently tend to increase income - smart people who drop out of school earn more income on average than average people who drop out of school. So if you control for education alone, education takes credit for both its own effect AND much of the effect of intelligence. When you control for intelligence, the effect of education is no longer inflated.

- XIII. How would you expect controlling for Conscientiousness to change the estimate rate of return to education? (2-3 sentences)

Since Conscientiousness is uncorrelated with intelligence but correlated with education, controlling for Conscientiousness should further reduce the estimated rate of return for education. The 7.5% return controlling for education thus remains too high. Intuitively, hard-working determined people who go to school earn more money, but so do hard-working, determined people who *don't* go to school! To accurately calculate the effect of education by itself, you need to compare people who are equally Conscientious but unequal in years of schooling.