

## Is a college education worth the price?

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### Is there a college premium?

Yes. Figure ?? presents the pre-tax median weekly wages for all wage and salary earning workers by educational attainment.<sup>1</sup> Clearly, the median wage is higher for more advanced educational degrees. For example, the median wage for those with only a high school degree was \$652 in 2012, while the median wage was \$1,066 for those with a bachelors and \$1,373 for an advanced degree.

Researchers have used various ways to measure the difference in wages for a typical person with a college degree compared to a typical person without one. Those measures consistently show a college wage premium. Still, correlation does not imply causation, and it is not true that everyone will benefit from college.

College is an expensive experience, thus the decision to go to college should not be made lightly. In order to understand the labor market benefits of college, you should first learn about how a college wage premium is possible.

<sup>1</sup> More information on the survey as these specific data can be found [here](#). The data can be downloaded directly from the Bureau of Labor Statistics' <http://download.bls.gov> or you can use their user-friendly interface at [www.bls.gov/](http://www.bls.gov/).

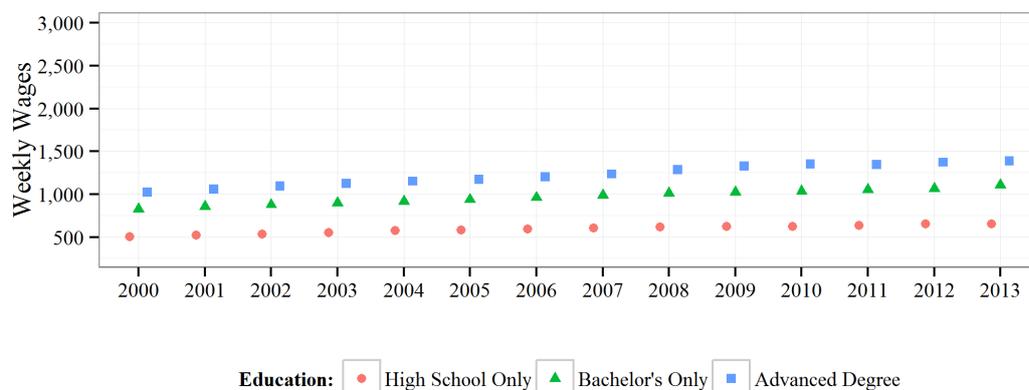


Figure 1: Median Weekly Wages by Educational Attainment (Current Population Survey)

### How can a college premium exist?

To understand the college premium market signal it is useful to engage in a mental exercise. All mental exercises require a set of assumptions to focus your attention. Please take the following assumptions as given.

1. Treat everyone as if they are identical and every job as identical. That is, everyone has the same skills and potential for learning, and every job requires the exact same skills.
2. College education simply makes a person more productive.

Given the above assumptions, employers will be willing to pay more for a college educated worker because the college educated can get more work done in a day. Since the college educated and non-college educated have different characteristics, you can place these people into two labor markets. Use the space in Figure ?? to draw two supply-demand models that describe the above situation.

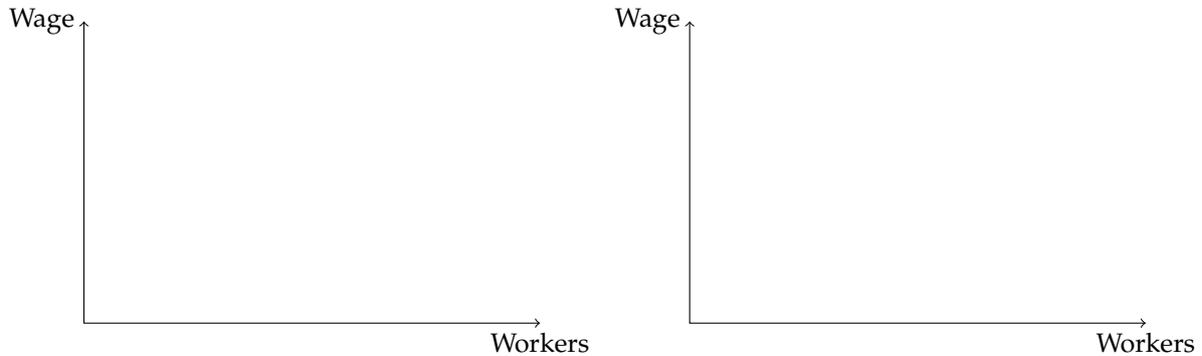


Figure 2: Two Labor Markets

If a college education could be had by anyone for free, what would happen to the college premium? Use your model in Figure ?? to answer the question. (In class I will walk you through this process.)

College is not free, so people will need to decide if the cost of education is worth the college wage premium. There are two important facts.

1. The cost of college is all up front. That is, you cannot attend classes until you have paid tuition. Of course you can borrow money, which will spread out the payments, but you are still obligated to a defined cost before you get a job.
2. The college wage premium is spread out over the rest of your working life.

To deal with this problem, and any other related problems, you need to convert the stream of benefits (e.g. the college wage premium) into a stock of current benefits. The framework for making this calculation is called present discounted value (*PDV*). Once you calculate the *PDV* of benefits, you then can directly compare the current costs and the current benefits.

Calculating *PDV* is often difficult, but the framework is easy. A simplified version of *PDV* is as follows:

$$PDV = \frac{R}{i}, \quad (1)$$

where  $R$  is the stream of returns to investment (in this case the college wage premium) and  $i$  is the implicit opportunity cost of investment.<sup>2</sup> The variable  $i$  can represent many things, but it may be best to think of  $i$  as the rate of return on an alternative investment, like corporate stocks or bonds. (Notice that the *PDV* of college will rise as the college premium rises ( $R$ ), and will fall as the implicit opportunity cost of being in college rises ( $i$ .)

<sup>2</sup> Remember, economists see all costs as opportunity costs, but these costs can be explicit (e.g. paying tuition) or implicit (e.g. forgoing a full-time job while in school).

Again, trying to figure out the correct values of  $R$  and  $i$  is challenging, but the framework is fairly simple. Try the following example.

- Four years of college costs \$100,000. For now ignore the emotional costs of college — yes, there are emotional costs.
- Your college wage premium will be exactly \$3,600 every year for the rest of your working years.
- The implicit opportunity cost of your investment in college is 3%.

With the above information given, you only need to make two simple calculations.

1. Calculate the present discounted value of college:

$$R/i = \$3,600/0.03 = \$120,000.$$

2. Compare the current costs with the current benefits:

$$\$100,000 < \$120,000.$$

In this case the investment benefits are greater than the costs, so you should go to school. Easy, right? The rest of this lecture is focused on the details of  $R$  and  $i$ .

### *Section Questions*

If the federal government paid for college like local governments pay for public K-12, so that college students were not charged for college, would college be free?

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Once people learn that they can earn high wages by going to college, the demand for college will rise. What will happen to the cost of college when the demand for it rises?

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Under what conditions will people be indifferent about going to college (at least for investment purposes)?

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*How does college actually create a wage premium?*

Researchers are not quite sure how a college education actually creates a wage premium. That is, it is not clear how being exposed to lectures, tests, and other campus activities make people more valuable in the labor market. I will sketch out three current ideas.

First, the **signaling** model suggests that college *doesn't* improve your skill set. All the admission process, lectures, tests, and other trials are simply a set of hoop-jumping exercises that don't produce any valuable market skills. In this model, college is effective at identifying the best combination of intelligence and work ethic, which employers do value.

In other words, an employer may ask for a college degree not because they believe you learned something about their business in your classes. Rather they know that in order to complete a college degree (maybe with good grades) you needed to be punctual, manage your time well, work on long-term projects and meet deadlines, work with others, and follow sometimes arbitrary rules and vague instructions. Once an employer knows you have these skills, then they are more willing to invest in your **firm-specific training**.

Second, colleges can provide some **industry-specific training**. Majors like accounting or nursing will require you to learn specific skills that are directly related to a specific industry. As an accounting major you will not learn everything you need to know about the industry or the workings of a specific firm, but you should have a good head start.<sup>3</sup>

Third, all bachelor degree issuing schools are required by their accreditors (if the school is accredited) to provide a **liberal arts education**. A liberal arts education is focused on developing general reasoning skills that should promote independent thinking (i.e. learning how to learn). These skills are most useful when a job requires you to not only find the right answers but also, and more importantly, the right questions.

All three of these ideas are a part of the college wage premium. However, it is difficult to know how much of a role each of these ideas play in the premium creation. Fortunately, you don't need to know the exact relative importance of each to help guide your decision.

<sup>3</sup> Of course, majors vary in their industry-specific training content.

*Section Questions*

If the college premium is most about signaling, then why don't business simply skip the degree requirement and create their own hoop-jumping exercises?

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If business need to provide some training to employees anyway, why don't they simply skip the college requirement and complete all training in house.

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*Is the financial return to education risky?*

Yes. Deciding to go to college does not gift you a college wage premium. Depending on your skills, interests, chosen major, and college, you may not benefit from college or you may benefit greatly. As you can see in Figure ?? there is a tremendous amount of overlap in the weekly wages earned by educational attainment.

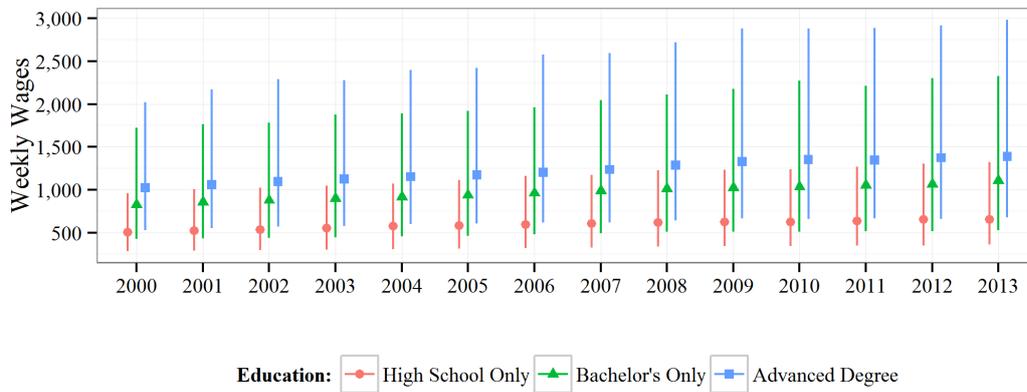


Figure 3: Median Weekly Wages by Educational Attainment with First and Ninth Deciles (Current Population Survey)

There are several factors you should consider before investing your time and someone's money in college.

1. Graduation is important, but only a slim majority of high school graduates expecting to complete a bachelors degree actually complete one within six years. In other words, there are many challenges to completing a four-year degree, and many people are unable to finish.
2. Wages vary substantially by degree. The college premium is high among difficult majors, but may be negative for others.
3. **Mal-employment:** some graduates don't find jobs that match with their degree or with a college education in general.

If you graduate from the most selective school and with a difficult major (e.g. economics), you will likely receive a strong college wage premium (i.e.  $R$  increases). However, choosing to attend the most selective school with a difficult major increases your odds of failing out of school (i.e.  $i$  increases). In short, attending college

should be viewed as a serious investment. Thus, you should be honest with yourself about your skills, interests, and work ethic before you take a dive into college.

### *Should you borrow money or work during school?*

Borrowing money to purchase a house is normally considered a financially responsible thing to do<sup>4</sup>, but many people are quite adverse to borrowing money for college. Obviously, if someone is handing you money for college, you should take the money. Otherwise, you should be careful about your decision to borrow for or work during college. It is just as easy to borrow too little as it is to borrow too much!

You should view student loans and work (while going to college) as substitutes — not complements<sup>5</sup>. Each has its own advantages and disadvantages, and you should first consider what you want to get out of college before you decide between borrowing or working.

Many people work while they attend college. About 80% of people in my undergraduate courses work at least 20 hours per week. There are several potential benefits of working depending on the job. If the job is related to your major or is an internship, then you may be picking up useful labor market experience.

Still, many people who are working while in school are employed in a low-skill job that is completely unrelated to their desired career path. If that is the case then main advantage of working during college is the insurance it buys you: insurance against the case that the *PDV* of college turns out to be less than the cost.

If in your case the *PDV* of college was less than the cost of college, don't panic, you may have made the right decision. For example, you may be passionate about working in a occupation that happens to be low-paying — there is a lot to be said about passion. Still, the cost of college must be paid, and four or six extra years in the labor market will help offset the cost of college. Therefore, if you expect to be in a low-paying occupation or are worried about finding only low-paying jobs, then you should consider working during college.

The downside of working during college is that a job will absolutely sap your time and energy away from your studies. Which means you will be less able to handle more challenging schools and majors, and you will be more likely to drop out of classes or school. In short, taking a job during college will likely lower your potential *PDV* of college.

The main disadvantage of student loans is that the interest will effectively increase  $i$  and thus lower *PDV*. On top of that, many people tend to be less price conscience because the loan is normally not due until after college and it's spread out over time. When you work, you tend to pay attention to prices. (Always pay attention to prices.)

Still, student loans are not all bad, and some students don't

<sup>4</sup> It is odd to me that people find a mortgage so financially responsible because owner-occupied residential real estate is usually a poor investment.

<sup>5</sup> It may be wise for you to work and borrow because there are limitations to the amount you can work or borrow. But if you want to work more (or borrow more) then it should be wise to borrow less (or work less). If you find yourself wanting to work more *and* borrow more (or vice versa), then you should probably consider a different major and/or school.

borrow enough. The big advantage to borrowing is that you can avoid working while you are in school. If you are taking school seriously as an investment, then you should be spending 45 hours or more a week on your classes. You should always save some time for fun, friends, and reflection, but you really shouldn't have much time or energy for 20 plus hours of employment plus commuting.

If you expect to earn (or want to earn) the median bachelors degree wage or better, then schooling should be your full-time job. Look to student loans to replace college-time employment.

*Do you want my advice?*

I'll give it anyway. My advice to you depends on your skills, interests, and goals. My best advice will come with a conversation, but in lieu of an interview, you may read my conditional advice below.

*Are you primarily looking to have fun in college?*

Then don't tell your family! They probably will not approve of a \$100,000 (plus) six year party. Still, college can be fun for all types of personalities. If you are in it for the college amenities, then pick the least expensive school with enough amenities to keep your attention, borrow as little as possible, and pick up a part-time or full-time job.

I also suggest you stay away from difficult majors. Even if you are in college for the experience, it is better for you to complete a degree.

*Do you already know the career you want?*

Great! Then before you do anything else, you need to build a report for yourself about the education you need (graduate school?), the employment opportunities, and the wage distribution you can expect. A great place to start your research is the Bureau of Labor Statistics' **Occupational Outlook Handbook**. There you can find nearly every occupation you can think of, with information on wages, employment growth, necessary skills and education, typical working conditions, and more.

With this information you can make a better prediction about  $R$  and how much you should borrow (or if you should work). Add to this the below resources and you are on your way to making a good call on one of your more important decisions.

Don't be lazy about this step, and don't let anyone talk you out of doing this work. College is far more expensive than it was 30 years ago, and the labor market has changed substantially. I know I am advising you to voluntarily increase your homework load, but this work will provide more than a good grade. Besides, homework never real ends, so you might as well get use to it.

Don't panic if while in school you decide that another occupation is better for you. That happens. If you are in the habit of

making well-informed decisions, then you can handle a change in majors or schools.

*Are you completely unsure about what to do?*

Don't be embarrassed. You haven't seen much of the world. You need to start sampling. Unfortunately, colleges are not well designed to explore occupations — you can sample all the class you want, but that is not the same as sampling occupations.<sup>6</sup> There is really no substitute for trying each occupation, but there is currently no low-cost way to sample occupations. So, try the following approach.

Seek out respectable adults. You will spend most of your life as an adult, but you probably spend most of your current time around other teenagers. Teenagers are great but they lack experience and perspective. Seek out adults that impress you, and ask about their experiences.

Family members and teachers are a good place to start. You may be interested in what they do (or how they behave), or they may know people you are more interested in. I am sure you will be uncomfortable talking to unfamiliar adults, but most people are happy to give up 10 or 20 minutes to give advice.

Sample classes. Early on you should try a variety of classes and explore what interests you. Colleges require you to take a wide variety of classes anyway, so there is no harm done by exploring. Just be sure to take the courses seriously. And don't pick a major based on the charisma of one professor.

Learn more about the world. The world is big, diverse, exciting, and you know almost nothing about it. Your k-12 education is only the first step to learning about the world, and you should continue those studies by keeping up with worldly periodicals and well-written blogs.<sup>7</sup> You will never excel in an exciting occupation if you never know about it.

Once you have an idea about what you may want to do see the above advice. There is no effective way around careful planning.

*Are you unsure about the career, but want to make a ton of money?*

You bore me. If you are really interested in making money, or just want to be a decent human, then focus your attention on solving other people's problems. The people who *generated* the greatest amount of money did it by solving (at least temporarily) the biggest problems or by solving small problems for the greatest number of people.

You need to find a problem-solving specialization and then passionately invest your time and energy. See the above advice.

*A list of your questions.*

Below are the two list of questions your teacher sent me.

<sup>6</sup> In the face of online education, brick-and-mortar schools may begin to support occupational sampling as a regular service, but not by the time you are going to school.

<sup>7</sup> I like *The Economist*, *The Atlantic*, *Slate*, *Marginal Revolution*, *TheMoneyIllusion*, and others.

- How much should loans factor into the college decision?
- Should your major (or expected job) affect the loans you could take?
- Is there a point where the cost of tuition is greater than the benefit of the degree?
- Which is the best economic decision: choosing an strong academic college with high tuition or a less expensive college with weaker academics?
- Why are interest rates on student loans so high? What's the solution?
- What does a typical college economics class look like?
- Would you change agricultural subsidies? If so, how?
- What your favorite part of economics?
- What is the possibility of a stock market reset?
- Is minimum wage helping us or hurting us?
- What the biggest problem with the American economy right now?
- How will the decrease in oil prices affect other professions? (e.g. petroleum engineers or other oil/natural gas professions)
- Is socialism economically possible in the United States?

*Selected Resources (Hyperlinked)*

1. Timothy Taylor. **Job Polarization by Skill Level.** *Conversable Economist*, April 25, 2013.
2. Timothy Taylor. **What If You Aren't the Average College Student?** *Conversable Economist*, May 13, 2013.
3. Christopher Avery and Sarah Turner. **Student Loans: Do College Student Borrow Too Much — Or Not Enough.** *Journal of Economic Perspectives*, winter 2012.
4. **Freakonomics Goes to College, Part 1**
5. **Freakonomics Goes to College, Part 2**
6. **Occupational Outlook Handbook.** *Bureau of Labor Statistics.*