Decision Making on the Job, Career and Family, Childcare
What Happens Next – 10.24.2021
David Deming QA

Larry Bernstein:

Thanks, David. I have a question about how higher education plays into this skill building in the following way. I imagine that some of the things that we learn in school, the value of what we learn versus our work experience, it depreciates over time.

And yet we hear that it's so valuable, this higher education, in the long-term. Yet with you explaining that peak earnings has moved out by 20 years and we have a depreciation of higher education value over time, what's going on? How do those two concepts fit together?

David Deming:

That's a great question, Larry. I think it's important, when you think about the value of higher education, to break it into two parks. One is the specific things you learn how to do. If you're an engineer or you're a computer scientist you might learn specific programs, specific mathematical or computational processes; things that are in demand today. And those things do move fast and your skills do become obsolete, as you mentioned. If you're a computer science major today you're learning things that are completely different than what you learned 20 years ago. And that's less true in other majors but there is a component of your value to the firm that is tied into the specific skills you know.

But there's something deeper that's going on, which explains why, actually, the earnings advantage for college graduates actually grows over time rather than shrinks. And the reason is that it's not just the specific skills you learn that matter, it's also the learning how to learn or learning how to think, critical thinking, problem solving, as I mentioned. You might want to think about what you do in college as, actually, practice for that kind of open-ended problem solving in the workplace. And that's the kind of skill that doesn't depreciate, so if you learn how to write analytically, if you learn how to carefully take apart text, you learn how to work in a group on long-run projects were sometimes people don't do what they're supposed to do and people have different strengths and weaknesses and how do you balance that. Those are the kinds of skills that are future-proof, that don't become obsolete.

Colleges could do those things better but you do still do quite a bit of that kind of learning in college and so I think that's actually responsible for the lion share of the returns to college over time.

Larry Bernstein:

I want to talk about vocational learning.

David Deming:

Yep.

Larry Bernstein:

Yes, some of the four-year colleges work on critical thinking and problem-solving skills. But there are others that work on very specific skills like how to drive a truck, how to do plumbing, how to do welding. Nursing schools. I recently invested in a business that does income-sharing agreements where we pay for a kid's vocational education and in return if the young person earns more than a set amount, they share the earnings with us.

David Deming:

Yeah.

Larry Bernstein:

And if they don't earn above some bogey, then their education is free. How do you think about vocational education as a means of either going back after you've done some work, before you've entered the workforce? Because it does seem like you also seem to want vocational learning.

David Deming:

Yeah.

Larry Bernstein:

How should we think about new skill building?

David Deming:

Yeah. Again, going back to these two types of skills, think about it as specific skills versus general skills or other ways to think about it. Vocational education, I think, is an important gap filler for people who have ... If there's a need in a particular labor market and you want to move to a different type of career and if you get Cisco certified as a software engineer, if you learn how to be a welder, if you learn how to be a radiology technician, there's a variety of vocational-like degrees and certificates that provide a nice earnings premium for a specific job.

But they're not a global solution because they're kind of brittle in a sense. They only really apply to one type of job and often even a small set of employers in the area where you live and so if those employers leave town, you don't have much of a way to get the benefit of those skills. Or if the job changes then you also don't. So, they're not always a long run solution which is why you see more efforts to try to get people to go back to school to top-off their skills. But if you look at what employers actually want, this job outlook survey I mentioned and other data clearly show that employers feel that ... They're very happy to have somebody else pay for training for their employees but they think that the most critical weaknesses are actually in these, some say, soft skills. I would call them general purpose or high order skills like critical thinking and problem solving, et cetera.

It's sort of like if you don't have that baseline, it's hard to move from job to job and so if you're ... From the perspective of someone who wants to go get a vacation, you want to be getting

skills that are valuable in lots of jobs, not just one. I would think of it as a both/and rather than an either/or.

Larry Bernstein:

I was reading one of your older papers that you wrote with Claudia related to see what employers are looking for in resumes to decide whether or not to interview or hire people. Maybe you could comment a little bit about that because you've mentioned some of these skills that they were looking for but I think that it's also kind of a function of the economy.

Let me give you an idea about what I was thinking about. One is that if the economy's not doing very well then you may want to hire someone who you think might be overqualified for the position because you can get someone on the cheap and they're not going to leave you for a long time so you can get some value. But right now, the economy is running so hot that I think employers might be reticent to look for people who have these sort of skills you're talking about because for fear that they're going to get bid away very quickly. And we have to invest, as you said, in very firm-specific knowledge. How do you think about the decision about who to hire, who to invest firm-specific knowledge in and the fear of getting an employee taken away?

David Deming:

Yeah. I think it's really important, Larry, in this conversation to think about it from the perspective of each side of the labor market. And when you do that I think you quickly see that there is a kind of mismatch inherent in the relationship between going to get skills and what employers want versus what workers want.

If you're somebody who's a young person going to get your education, you don't necessarily want to get ... You're trying to get skilled up for a lifetime. You're trying to go and spend a few years and acquire a set of skills that'll make you employable for the rest of your working life. And those skills are often quite general. That's where the college degree comes in.

On the other hand, if you're an employer you have a perspective, "I have a specific need I need to fill right now." Hot economy, as you said. Those needs get pretty urgent so you're willing to pay a lot for something right now to plug an immediate hole and you actually don't really ... you might even be willing to subsidize that skill, pay for your existing employees to get it, because it's valuable to you. But you're never going to get employers to invest in general skills building. Why? Because if my employee pays for me ... I shouldn't say never but you're rarely going to get it. If my employer pays for me to go get a degree from a prestigious college I can then leave that employer after a few years and take my skill somewhere else because the skill is useful everywhere, not just in this particular job.

It's much easier to develop arrangements between the supply side and demand side of the labor market when the skills you're building are very specific to a particular firm or industry than it is to build skills that are useful in all types of jobs. That's why you need an education system. That's why you need public support of higher education, of K through 12 education, precisely because those skills are so general. You're not going to get a private market solution to that in any kind of global sense, I don't believe.

David Deming:

Let me also just briefly mention ... Larry, since you mentioned our audit study, trip down memory lane for me and Claudia. That paper was actually ... We created a bunch of fictitious resumes and we sent them out to a bunch of employers and we randomly changed the degree from the school from which you got your degree. Some people had bachelor's degrees from large online for-profit institutions and some people had bachelor's degrees from less selective, regional public institutions. And what we found was that the people who had degrees ... These are not people. These are fake resumes who made up ... They're identical except for the degree. The resumes with the for-profit degrees got many fewer callbacks, suggesting that employers view that degree as a weaker signal of skills.

That was what we found in that study and I'm happy to talk more about that or maybe Claudia can take up the torch in her section of the show.

Larry Bernstein:

Much of the interesting things about that I thought was interesting about that paper. One was you noticed there was no discrimination on the basis of race in the callbacks.

David Deming:

Yeah.

Larry Bernstein:

I just want to understand how you tested for that and what you observed.

David Deming:

Yeah. The way we tested for it is because we also randomly varied the race of the applicant and found no difference in callback rates. That's quite a real result from the perspective of our study.

I have a hypothesis. We can't prove it. But as job applications become more online, many of the resume studies ... the famous one by Marianne Bertrand and Sendhil Mullainathan was pre-internet job postings. And I think what a lot of companies use now is resume screening software. They automate the process of servicing candidates for callbacks, which is kind of a virtue rather than a vice from our perspective because if they're down-wading some colleges more than others we actually want to know that because that's mechanically leading to differences in employment outcomes. But you could see why employers would be quite hesitant to do that on the basis of race. When you're using a screening technology, that might get rid of the racial difference in callbacks but, for example, it might not. It doesn't rule out discrimination on the basis of hires so you might still leave an applicant of color in the pool to call them back to protect yourself legally but then not hire them or something.

I don't think you should conclude from our study that there's no discrimination in the labor market. I just think you could conclude in our study ...

Claudia Goldin:

This is Claudia. Let me just say one thing to the audience. These resumes did not include race but they have names and we used names that were more Black names or more white names or more Hispanic names.

David Deming:

That's correct. Yeah. Thanks Claudia. Yeah. So we signaled race with the names. And the way we did that slightly different from some of the other studies was we picked ... we basically calculated frequency of names and then uniqueness of names by race. We picked the most common, most frequently Black or Hispanic names and used those.

Larry Bernstein:

All right. Different direction. This one relates to brains versus brawn. You mentioned in your introductory remarks that the value of brawn has been in steep decline, first with agriculture and then with manufacturing. And now we're in this much more brain-intensive service economy. We got a question from Alan Herskowitz who. is one of our listeners. And he was wondering about how AI will affect these various human/machine interrelations. Let me try to narrow the question in the following way.

We've had discussions on our program where Charles Isabel from Georgia Tech who is the Dean of Computing. He mentioned that AI machines are powerful, humans are powerful but together they're really powerful. And it comes down to how you can use these tools to make you more productive. And I'm thinking of, as example, in medicine. There's talks of new methods where doctors will be given information from the AI machine to suggest different conclusions that take advantage of all the research that's out there. How do you think about how this new skill of how you work interactively with a machine to solve problems?

David Deming:

Yeah.

Larry Bernstein:

So team building not with other people but with machines.

David Deming:

Right. That's a great question. I think it's important, if we want to dig in on this, to define exactly what we mean by AI. There's two conversations around AI, loosely speaking. One of them is about the current state of AI, the uses of AI today by firms. For example, the Netflix algorithm that decides what shows to recommend to you is an example of artificial intelligence. Or how does Amazon know how to price the things you're buying as you scroll through the app or what to offer you? That's artificial intelligence technology in its current state.

And then there's this nebulous conversation about AI general intelligence, computers taking over the world. I don't have a lot to say about that second conversation but what I can say is how I think this skill demand will be affected by the kinds of AI technologies that are already in existence and the near future of it. If you think about what those technologies are doing, they're actually assembling large amounts of data, which are just records of past experiences of customer transactions or web search behavior or whatever it is.

And they're technologies that are fundamentally about making predictions, so they take massive amounts of data, much more than a human could computationally handle, and predict some outcome. They might predict, "Well, given all the things that Larry's watched before, what does he want to watch today?" And they're going to use lots of people that look like Larry and their viewing histories and combine it and think about all the interactions between the variables in ways that are much more complex than what people can do to get a better prediction.

But making predictions is only an input in the decision making. It's not the decision, itself. And so, that prediction might be more or less accurate depending on what else is going on. What I think people are good at is figuring out how do you use predictions as inputs in the decisions? How do you design the environment so that you're making the right choices or paying attention to the right things. What am I even trying to predict? Why should I be trying to predict it? What do I care about? Whose welfare am I interested in?

Those are all these kind of fuzzy, meta level process going on in human interaction, in human decision making that I think are far more complex than what any AI can currently handle and so I see them as highly complementary. But that's my reasoning for it, which is largely in agreement with Professor Isabel.

Larry Bernstein:

I want to bring Claudia into the conversation. Claudia, you wrote a book Education and Technology and you looked at over the history of, let's say, the 20th century. Individuals made choices about how much to invest in education. And you noticed that the returns of education varied over various long-term cycles. Sometimes there are too many people with skills relative to the job opportunities or not enough people will skills resulting in very large returns to education.

Given what David has been saying about these new skills that managers and businesses are looking for, how should we expect people to change their decisions on how to invest in their own educations and what are we seeing out there in terms of changes in choices of majors and going to school and for how many years based upon the skills that they have?

Claudia Goldin:

Sure. I think that, going back to the history, it was rare in history for there to be too much education. There may be one small period in US history in the 1970s which led to the writing of a book by one of my colleagues, The Overeducated American. But, in fact, not much after he wrote that book he was wrong and, in fact, the returns to higher educations zoomed up. And that was a brief period in which the end of the Vietnam War led there to be a huge group of

individuals who were highly educated in part because they were trying to escape from being drafted.

In fact, it's almost always the case that there's too little good education. And one of the reasons is that individuals cannot sell themselves. We do not have slavery and so, therefore, there's no collateral. And so, education is an un-collateralized loan. You don't get a mortgage on it. And, in fact, the loans that we do have are loans for which you cannot get out of. And that has a very interesting history.

If anything, we should be investing more in education. In fact, the cutbacks of the state system of community college system have led to too little education. The returns to the marginal year for the marginal student in higher education, which many very, very good empiricists have identified is still extremely high. That's the first point.

Then you ask, "Well, given that people should be investing in education, what type of education should it be?" And clearly, that's ... When young people go to a college and see this enormous array like chocolate of potential majors it's very difficult. And there's more of an attempt to give information about ... You take this major, you can probably earn this much in the future. But there's obviously a lot of uncertainty. But we can see that more and more young people are going into computer science, into biology. Many of the humanities are being left behind although they're still extremely useful. Writing is still a very, very important skill.

Larry Bernstein:

Just following that up, what David is saying when we're looking for general problem solving skills and writing skills, you would think that this would result in more people wanting to major in the humanities. But we're seeing an exodus for specific skills like computer science, which David said had these highly depreciable educational benefits and that what we really should be doing is building skills that we can use for a lifetime. How do you make sense of that problem?

Claudia Goldin:

There are general coding skills where in the universities when they teach computer science are not teaching people how to put square pegs into square spaces. They're teaching individuals to think about what type of pegs to create. The really good programs are non-vocational programs. This is not a ... Well, one might call a pre-professional degree. This is a degree that is rooted in a higher auto-mathematics.

David Deming:

Yeah, just to say, Larry ... I think there's a sense in which the answer is you really want both. And what you see ... I've done some earlier work looking at exactly what we've been talking about, which is depreciation of returns to high tech majors, STEM majors. But that doesn't mean that it's bad to be STEM major. It just means that you got an initial earnings advantage of, let's say, 40% if you're a computer science major relative to being a history major. But then by the time you're 35-40 years old, that advantage has gone down from 40% to 15%.

But it's not like you're doing worse. What you see empirically is that, at some point, if you think about ... You acquire the frontier knowledge in computer science when you go to college but

that frontier moves outward rapidly and by the time you're 40 or 45 years old you need to have enough knowledge to understand what's happening in the field, even if you're not actually doing the program. But then you become a manager or somebody who makes decisions about what you should invest in and that requires some technical knowledge but it also requires these general purpose skills. And those are the people that really advance these days are people that have both the technical skills and the general purpose, complex high order skills, problem solving, critical thinking, et cetera. Teamwork.

Larry Bernstein:

We had Zvi Galil, who runs Georgia Tech's new online computer science school. And I think he has something in the order of 12,000 students now in his program. It's the largest online program. And what's really interesting about it is who's taking the classes. So it's much more domestic than Georgia Tech. It's much older than the typical Georgia Tech student. And what I think is really interesting is it's much cheaper than a Georgia Tech degree. It was like 8,000 bucks or something a year. And it's a Master's program in Computer Science. How do you think about online? You were showing that employers were not very not excited about the for-profit schools. How do you feel about the online approach to allowing for mass production of these skills?

David Deming:

Yeah. Great question. So when I think about online degrees, I think about it again in two different parts. So think about it, roughly speaking, as the big lecture. So there's some things about education you can scale almost infinitely, right? So why would you listen to David Deming lecture ECON101 when you could listen to Claudia Goldin? She's much better and if she produces a 45 minute lecture and I produce one, we can all watch it. The marginal cost of another person watching it is zero. And so the returns ought to go to the best lecture which is going to be Claudia rather than David, right? So in the lecture component, which is just watching somebody else transmit knowledge, that scales to the online format. But that's not all that education is. Education is also meeting your learning needs where they are, identifying holes in your learning and addressing them, providing support around the learning experience.

That's tutoring, that's checking your work and providing feedback. Those things really don't scale online at all, actually. You can do them online, but the online advantage, there's a benefit in terms of access. So there's some folks who couldn't physically be on the Georgia Tech campus who could go into this program so that's a benefit to them. But it's not an infinite cost scaling.

And so when I look at the online education landscape, what I see is not much evidence that it can bend the cost curve at all on these important support components of education. I think it can on the lecture component. And so I think as online education matures, what we'll see is more separation of the functions, right? So it's not clear to me that an in-person, 600 person lecture is any better than online. And so I think you'll see more of those things go online. But here at Harvard and other institutions that are fortunate to have the resources Harvard does, a lot of what we do in education is actually supporting students in their personal learning journey. And that's very expensive and is not particularly helpfully done online.

Claudia Goldin:

Yeah. Larry, the program that you described was evaluated by two economists, Josh Goodman and Amanda Palace, and they found it to have an enormously high return. This is the Georgia Tech program. But part of it, I think, is that there was a touch component. So that's what David was referring to, whether there's a high touch or a no touch component to these online courses.

Larry Bernstein:

Yeah. I think you're absolutely right. There is a touch and they use students... They've hired a lot of TAs to help them. And then a lot of the former students have become TAs as well as sort of a symbiotic relationship. All right. Let's try a different path. David, given your findings, how would you change public policy to improve or to take advantage of this information?

David Deming:

Yeah, for me, the primary implications would be in the education and training side. So if you accept my argument and you think these are important skills, are we doing as much as we should to build them intentionally in education and training institutions in the US and around the world? And I think the answer to that is no. I think some people acquire those skills. As I mentioned, people do acquire those skills in college. That doesn't necessarily mean that college is the most efficient way of delivering them. It probably isn't. But the difficulty is that unlike, I don't know if you'd want to call them foundational skills like numeracy and literacy... There's not like, "Okay, it's fourth period. We're going to teach teamwork now." These skills sit above specific content and they're more about how you approach information, how you work together with people.

And so it's not as simple as writing a textbook and transmitting knowledge to people. You have to engineer the learning environment differently. And so I do think you see that happening in a lot of places from as far as I can tell, as a college professor myself. There's much more team orientation. There's many more group projects now than there used to be. Students don't like that always, but they need to do it because that's the way the workplace looks.

But I think even the idea of grades is very individualistic. I don't have a good alternative solution, but I think a lot of what we do in education is implicitly, or even explicitly, pushed towards individualism when actually learning how to make a team better is really important. So I've done some work on how to do that, which I'd be happy to get into. But I think basically starting from first principles and saying, "If we were to redesign the learning environment from scratch to build these skills, how would we do it?" And then trying to get us closer to that, I think is the right frontier to push on.

Larry Bernstein:

I'm a bit dated.

David Deming:

We're all a little dated.

Larry Bernstein:

I took Claudia's class 37 years ago.

Claudia Goldin:

That means I gave it 37 years ago.

Larry Bernstein:

Exactly. That's the way the math works. And what I mean by that is that when I had my group projects at Penn, what happened was invariably in the group one kid would do most of the work and the other kids wouldn't really do it. And there was a lot of anger and frustration with those students that took advantage of the system. But in the work environment that probably wouldn't occur very much. There would be a problem, a disciplinary problem, associated with that and that guy would be kicked off the team. And going back to the Georgia Tech example, about that touch work... It was other students who became TAs and how they interacted with those people. And I can think of a certain amount of Montessori schools even, where third graders would teach second graders and ninth graders would teach seventh graders. And there is this idea of working together in a symbiotic relationship. How are the universities evolving?

David Deming:

Yeah. So I think right now what we've done is say, "Oh, well, it's important to learn how to work with others. So we're going to take the same types of assignments and we're going to make them group projects instead," which is an add on to an existing structure rather than any kind of fundamental rethink. But I'm not going to pretend to have all the answers here, Larry, but I think one thing you might think about is: Suppose we designed a course whose sole purpose was making you a better team player? How would we design that? That's not something that's incidental. "We're teaching you calculus, but on the way we're teaching how to do it in groups." No, we're actually teaching you how to be a better team member. What are the important components of being a good team member?

Well, obviously there's effort, right? If somebody is shirking and not paying attention and not coming to the meetings, that's bad. That's basic. But then there's also what economists would call comparative advantage, right? So when Claudia and I write a paper together, we arrive at a division of labor. In our case, since I'm a little closer to the data frontier, maybe I would do the data work and Claudia would do the writing because she comes up with wonderful titles, like the title of our paper together "Nimble Critters or Agile Predators?" And she would write the introduction because she knows the field better than I do and she can set the table well. But that's very different than the division of labor I would arrive at if I was writing a paper with one of my graduate students where I might serve the function Claudia served, and my student might serve the function that I served in.

So do I have the wisdom to understand where I fit in on a team when everyone has different strengths and weaknesses? And some people have that naturally and some people don't, but what if we tried to teach that? What if we intentionally gave people feedback about how they divided their labor in a group and how they could do it better? It's just not something we're

doing in most colleges and universities, because we're not intentionally building the skill of teamwork or the skill of decision-making. How do you use information to make better decisions? How do you give people feedback so that they understand how to make this decision better than the last one? It's all in the air and incidental rather than being done purposively.

Claudia Goldin:

David, this is Claudia. What about athletics? Is that some reason why we have athletics in universities?

David Deming:

Yeah, that's a great point. I don't know if it's the reason we have athletics. Maybe one benefit of athletics is to build team skills. And I think you do hear from a lot of employers, they like to hire athletes. Although that's a mix of being good in a team and having the self-discipline to keep yourself to a schedule. When I get up on Sunday mornings... I live on Harvard campus. When I get up on Sunday mornings, the only people I see out before 10:00 AM are the athletes. And so there's something to the work ethic of an athlete that matters too. But yeah, absolutely. I think again, there are elements of the college experience that build these skills, but we ought to lean into them and try to build them even better and build them for everyone. Not just the people who happen to be in the right clubs or sports or what have you.

Larry Bernstein:

That reminds me. One of my work colleagues at Salomon Brothers once told me: "No matter how many times I get promoted, I always end up working for a former football player." So there is something to that.