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Supplemental Lecture: Human capital in developing countries

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Presentation Slides

Video

Q: do we consider something like intelligence as human capital?

> A: Probably not. In some sense it's not susceptible to investment, although if you wanted to think about it as something that depends on early childhood nutrition and health, you could make a connection. We are mostly thinking about the parts of human skills that are susceptible to investment.

Q: Would "genetically inherited IQ" (if such a thing exists) be part of human capital?

> A: Not really. As I just wrote in response to another question, we want to think about human capital as the part that is amenable to increase through investment. We might also write down models in which people differ in intrinsic ability -- and in micro work, this might be important. Across countries, we wouldn't expect to see any systematic differences in intrinsic ability, so it's not such a relevant concept.

Q: When you say "Challenge: how to measure h_c? Probably not regressions". Probably not any regressions or probably not "cross-country regressions"? Micro data regressions still fairly useful or no?

> A: Good question. I think Todd is going there...Let me know if there are things that come out of what Todd is saying here that you want to follow up on...

Q: How well does human capital in production reflect the stock in a country? I.e. do we have a sense of how much we miss due to skill mismatch and high urban youth unemployment?

> A: You could think about the stock of human capital as being a measure of the *available* human capital within a country. It may be that, for many reasons, the stock is not efficiently used... in much the same way that the stock of physical capital may be used at less than full capacity. There are lots of reasons why we might find inefficient use of the stock, due to poor institutions or mismatch. So, you are right to want to distinguish between the available stock and the amount in effective use.

Q: I have a difficulty understanding why this framework doesn't separate

A: TFP from labor-augmenting productivity. I would imagine that some firms are inherently more productive than others and can pay their workers a higher wage. Wouldn't that drive variation in wages that isn't perfectly correlated with human capital?

A: This is the result of the assumption of perfect competition… if firms profit maximize and take wages as given, they will hire until MPL=w…. highly productive firms will hire more labor and earn higher profits, but they won't pay wage premia.

A: Obviously in the real world, perfect competition may not hold, but in the aggregate, this may not be a major problem for us. As Todd is currently saying, there are many other factors that feed into wages; the question is whether there are systematic biases...

A: When I saw the misallocation literature, I thought findings are that labor is not properly allocated across firms in developing countries due to some frictions. In this context, how can we know we are measuring cross-country differences in human capital rather than some factors preventing optimal work and firm allocation?

A: Great question. The exercise here is to measure the stock of human capital that is *available* within each country. It may in fact be inefficiently allocated, in the same way that physical capital may be misallocated. So, the point is that misallocation may affect the productivity of all inputs within the country. This links to Richard Rogerson's observation in the first lecture that we want to distinguish between how efficiently a country uses its inputs and how many inputs it has.

Q: I'm still confused about the definition of productivity comparison a few slides before. Is it just about output? or output times price? Suppose there are two barbers of the exact same skill level, one works in China and another one works in US. Due to the price difference of the haircut, the barber in China earns $10 per job. The barber in US earns $20 per job. Are they considered as having the same or different productivity (or human capital)?

A: They would be seen as having the same human capital, but it would have different marginal revenue product in different environments, because of the differences in price... In the way that we could think of a unit of physical capital having a marginal physical product and a marginal value product.

Q: Can you clarify why education is squared?

A: that is experience. life cycle or experience profiles tend to be concave and hump shaped In other words, the market wage tends not to increase linearly with age or time in the workforce... Wages rise for people through some portion of their lives, but eventually they plateau...

Q: Why is the experience square included in the Mincer regression and why not the square of schooling?

A: life cycle or experience profiles tend to be concave and hump shaped, education profiles tend to be more linear. Both of these are what Mincer observed.

Q: Recently, World Bank, 2017; Kraay, 2018; Angrist, et al, 2019, use New Human Capital Index (HCI) the adjusted years of learning that combines indicators of health and education into the human capital Index that a child born today can expect to obtain by her 18th birthday, given the risks of poor education and health that prevail in the country where she lives. How does this model control for this?

A: There are lots of different ways to construct measures of human capital. Some approaches begin with indexes, like the HCI, and others try to use market data to arrive at measures of human capital. One reason for using the data from wages is that it suggests that we are valuing different components of human capital in relation to the market productivity -- which seems as though it might be the right way to measure things. But a reason for using the raw index might be that you think the market doesn't do a good job of recognizing some types of skills, or because you think labour markets are badly distorted. So, there are a lot of ways of constructing a measure of human capital, and they are all defensible. Which one you use probably depends a lot on the question you are asking.

Q: The quality of education is not reflected in the years of schooling, though it's really important and may result in large bias in estimation.

A: This will be a big focus of Todd's coming slides and Todd's own work.
A: Absolutely correct. This is a major area of research that people (including Todd!) have written on.

Q: It seems interesting that the supply of skilled workers is so different across countries, but the return to schooling is so similar... Would it imply that countries with higher/lower supply of skilled workers also have higher/lower *demand* for skilled workers (so that the returns get equalized)?

A: Yes, this can be used to impute the relative demand for skilled workers and skill-biased technical change. Tinbergen, who shared the first Nobel in economics, called this "the race between supply and demand" for education/skill.

A: Great ideas. For this reason, pushing more education won't make so much sense if demand for skilled occupation is not so much there.

Q: Couldn't this also be reflecting interactions with other institutions, or where each country is in its development path? So, the same experience has more benefits in some countries vs others.

A: Experience would certainly have different returns in different contexts. I can't do better than to refer you to the Lagakos et al paper. As you can see from the graph currently on the slide, the returns differ quite a bit across countries... so you're absolutely right.

Q: In the poorest countries, self-employment is much higher and thus wages are not measured. How would this influence the returns to education and experience estimated in the poorest countries relative to the richest countries? I wanted to ask because it is a barrier that I have hit., I assume most of the returns to self-employment are labor, but this is more difficult to attribute to various household members when multiple members are involved in the same self-employment activity and their observable education levels, for example, differ. If labor input is available, I can proportionally allocate, but all of these assumptions feel a bit problematic.

A: This a big issue with the early work that Psacharapoulos compiled... typically wage data was non-representative, only coming from the formal, urban, and sometimes public sector. The more recent work has more representative data and does not uses only wages and salary but income. Most self-employment income in poor countries is a return to labor rather than capital.

A: Definitely an issue that the wage data embed selection into who works for wages... Particularly in the poorest countries, lots of people earn their livelihoods from household enterprises or farms, where individual earnings aren't well defined. So, it's a relatively small

fraction of people -- very much not randomly chosen -- that we observe earning wages. A lot of papers have tried to impute individual wages to people in these surveys, but it's frankly a bit dodgy to do this.

Q: The two competing hypotheses are 1) higher return to "experience human capital" in rich countries, or 2) Acquire more "experience human capital" per year in rich countries. Is that right?

A: In an accounting sense, that's right... Those of course aren't deep explanations, though...

Q: Does wage in developing countries self-employers earning? Because a very large share of population in these countries are self-employers. Or, do you just consider the minority that are really employed by someone else?

A: I mentioned this in an earlier answer. Some of the earlier work from decades ago used only wage workers, but most work now uses the self-employed as well, and simply uses income, since most self-employment income in poor countries are returns to labor rather than the capital of the self-employed, which is usually minimal.

A: Definitely an issue that the wage data embed selection into who works for wages... Particularly in the poorest countries, lots of people earn their livelihoods from household enterprises or farms, where individual earnings aren't well defined. So, it's a relatively small fraction of people -- very much not randomly chosen -- that we observe earning wages. A lot of papers have tried to impute individual wages to people in these surveys, but it's frankly a bit dodgy to do this.

Q: Maybe, the best measure of quality could be a university someone attended going by university rankings.

A: This is an interesting idea, but of course doesn't help us much for the large majority of people in low-income countries who don't attend university at all.

A: There are "within-country" ranking of schools (primary, secondary etc) as well. The only challenge could be lack of data, I guess.

A: You might also worry that there is selection or sorting into which students end up at which schools / universities. It's always hard to tease out the quality of the schooling from the quality of the students.

Q: Is this survival rate accounting for causes of death? I can imagine how accidents, violence and such might play an important role in survivality but not that much in the health quality of an individual

A: This is an interesting point. You might want to subtract off some of these causes in calculating an adjusted measure...

A: Yeah.. specially when accidents, drug accidents (involuntary overdose), violence and such are quite heterogeneous across countries.

Q: Have these returns been looked at over time? How would such an analysis square with the fact that real wages in many high-income countries have stagnated since the 70s? Would that suggest human capital has remained the same, or that there isn't perfect competition?

> A: Well, assuming that you are willing to believe that labour markets are competitive, and wages are market-determined, which is always a big assumption... Wages are determined by both supply and demand. You could imagine that the demand for human capital has shifted in some important ways, rather than assuming that this is all about supply. And of course, you might worry about ways in which wages also reflect some kind of rents... There are also a lot of complex measurement issues, such as how we think about compensation that is provided through the state or through employers, which may not show up in the wages... so, measurement is always a challenge.

> A: Thanks Doug, my thoughts exactly. I think demand for labour plays a massive role in determining the market wage. A good example being somebody who becomes unemployed from one day to the next (with no obvious change in their human capital). Struggling to move passed the competitive labour market assumption!

> A: You might also wonder how changes in technology (for instance) have altered the demand for (returns from) different types of schooling and human capital.

Q: Maybe the relevant measure is "health/nutrition" investment in first years of life, as probably correlates with "IQ" (whatever that means)

> A: There is an active literature on the importance of early years in human capital formation. Within the U.S., Jim Heckman and co-authors have done some very interesting work, as has Valerie Ramey, in thinking about the determinants of inequality within a population. There is work on lead paint as well. In development, Orazio Attanasio and co-authors have work on early childhood intervention and human capital

Q: Thanks for the information. I have a question about percentage of cumulative human capital. I wonder to know why the difference after '+health' is added is not so considerable, just 56% and 59%. What is possibly seen as a reason here?

> A: As Todd said, there are lots of questions here about measurement of health human capital. One reason that we may find such a small contribution is that we are already capturing health in other measures of human capital, such as schooling. But it's a question that researchers are actively trying to understand.

Q: Why are countries and people lag behind in getting educated despite knowing it is important?

> A: This is of course a huge and complex issue. There are political challenges as well as questions of how you actually carry out the education... It's not always clear that governments are deeply committed to the project of educating the population, sad to say.

Q: This type of accounting approach won't address confounding issue (political institution drives both human capital and growth?) and reserve causality (more advanced sector is demanding more educated worker). So, I am totally sure how to interpret these 30%.

> A: The goal here is not to try to understand the causality. Many of us recognize that the causality is impossible to understand in this kind of cross-country analysis (as Todd just said). The goal is to understand, in an accounting sense, how strong these associations actually are -- and how consequential the differences in human capital seem to be.

You are exactly right that this is not a causal exercise! But not all the interesting questions are causal...

Q: Is there a concern that with migration there is 'brain drain' and which would bring the avg human capital of developing countries down?

A: This is clearly a concern. The idea here is neither to promote nor criticize migration policy or migration, but instead to use existing migration as a source of evidence about human capital.

Q: Sorry, why return to experience stands as a linear function and not a quadratic function? what about consequences of not measuring it particularly in developing countries?

A: We do tend to model returns to experience as having a quadratic form. Did I miss something? I've been trying to answer questions and may have missed something on a slide.

Q: Not a question, but it might be interesting to see if these returns are linear. I'm currently doing research on poverty traps and underlying my research is that returns are non-linear and depends on initial wealth / assets

A: When you say, 'returns are non-linear', do you mean returns to human capital? And do you mean individual returns depending on initial wealth and assets? Or aggregate returns??

A: I suppose it works both on micro and macro levels; on the individual level, returns to education and experience would be lower for poorer individuals than wealthier individuals ceteris paribus

A: I'm sure that's right at the individual level, and it must also be true at the country level.

Q: What if the lower increase in wage rate in developing country is because of the lack of education in poor countries?

A: There is surely an issue both of the quantity and quality of education in poor countries. I think Todd will be getting at this in a moment, with this section of the lecture.

Q: From the point of my standpoint, I would say that although a poor country separates more money for human capital than the developed nations, those countries are not becoming richer to human capital. While some say because many people migrate, augmentation of human capital will not be exposed. However, is that idea true at all?

A: Brain drain is a big issue, and I am not sure that brain drain has been convincingly quantified. In developing countries, the quality, returns, match of stocks and needs of skills, and allocation of human capital may also be poor. There is some empirical evidence on these, but not sure of any convincing aggregate quantitative work.

Q: I wondered if you'd looked at scenarios where workers migrate from a rich country to a poor country; maybe that might raise answers to the poor to rich country dilemma?

A: Interesting question. I haven't seen papers that do this... But you might worry even more about the selection issues that arise. Are we seeing workers for multinationals, who are probably atypical and not really fully embedded in the local labour market in the poor

country? Or are mining engineers who are going to places where there are high rents to their skills? An interesting question, but the selection challenges seem real.

Q: Has there been a comparison of the cross-country micro panel estimates to implied human capital share from visa lotteries, like David Mckenzie et al. 2010 (New Zealand visa lottery), Mobarak 2020 (Bangladesh-> Malaysia visa lottery)?

> A: I don't know of an explicit comparison, but these two literatures are very much in conversation with each other. (And a bunch of the authors are the same :))

Q: Taking the US for example, Does family background matter for university entry more than primary and secondary entry?

> A: It's an interesting question, with an ambiguous answer, I think. On the one hand, you could argue that family background matters at each stage, and so it sort of accumulates through the life cycle... But on the other hand, you could imagine that individual motivation takes on progressively more importance (and are more rewarded) at higher levels. It's hard to know which effect dominates.

Q: If many people in poor countries are more credit constrained, the return to schooling will be much higher right? Earlier showed that return is 10% across countries. So, it is more like that low schooling is a result in equilibrium.

> A: Maybe within-country, right?

> A: Well, don't forget that the returns reflect demand as well as supply. I think your question assumes that it's only the supply side that will affect the returns.

Q: What about the role of public reforms and policies to enhance mass schooling?

> A: There are always trade-offs between provision of education quantity and quality, and this becomes the source of a lot of public policy debates over schooling. It relates to distributional concerns (e.g., subsidize primary education versus higher education). So, it's clear that public reforms and policies matter -- but not so easy to think about how to do this most effectively.

Q: Why is the quality of education provided by the government have low quality compared to the private education provider in developing countries?

> A: There is no necessary reason for this to be true. State education in many countries is better than private... But you could imagine that the government has to provide mass education, which may limit the ability to concentrate inputs on a smaller number of students. I don't think we would want to assume that it's something about the technology of public versus private schooling, though.

Q: When we think about borrowing constraint, is there also a view that a firm may not want to invest in developing technology that supports high skilled individuals because human capital is intangible so not collateralizable, and imperfect financial markets may lead firms to invest in technology that promotes the use of collateralizable capital instead? Just wondering about this

> A: Fantastic question: I am wondering whether it is more of an issue in developing countries because labor markets are less differentiated and so any training is less job-specific

Q: Why nations remain poor or why nations fail?

A: We are all struggling -- fundamentally -- to make progress in answering this question...

Q: Do you have the reference for the paper on Training and Development (Ma et al, 2020)?

A: You should be able to access this from the slides, as a hyperlink...

A: Ma, Xiao, Alejandro Nakab, and Daniela Vidart, "Human Capital Investmetn and Development: The Role of On-the-job Training," 2020. mimeo, UC San Diego.

A: Here is the link to the paper:

https://acsweb.ucsd.edu/~anakab/pdfs/training_development_Ma_Nakab_Vidart.pdf

Sheepskin effects (because old-fashioned degrees in Anglophone institutions were written on sheepskin instead of paper)

https://personal.lse.ac.uk/ghatak/PovertyTraps_Revised.pdf