Lecture 1: Introduction and Development Accounting

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Pete Klenow (Stanford University)

Presentation Slides

Video

Q: What about PPP GDP per worker of Southeast Asia and Oceania?

A: I believe you would see some relative catch-up as well, with divergence among the countries in the region.

The graph that Pete showed didn't include all the possible regions in the world, but the data is available in the Penn World Tables, if you want to seek it out.

For your reference: https://www.rug.nl/ggdc/productivity/pwt/?lang=en

Q: So does this mean that GDP PPP is a better measure for residents' welfare, while GDP is a better one for comparative production performances of countries? Should we focus more on 1 indicator over another?

A: GDP in PPP terms is especially useful for comparisons across countries, where domestic currencies are not easy to compare. For within country comparisons, domestic currency (deflated into real terms) is often a better measure. But, for comparisons across countries AND over time, you would most definitely want to use PPP measures.

Q: What is 'pop factor' that shown in the equation?

A: Country's population. So Y/pop is GDP per capita.

Q: Why residual A is linked to labour instead of being a general measure of total productivity as in the Solow model?

A: These turn out to be very similar formulations, in some ways. One reason for writing it down this way has to do with how we think of the nature of technological progress, whether it is "labour-augmenting" or not. This formulation has the nice property that it lends itself well to models of "balanced growth". But, it turns out that you can do this either way.

Q: Usually we take pop as equal to labour (L) in macroeconomics. Is there a reason Pete wrote them differently?

A: A priori differences in employment to population ratio could explain some of the GDP per capita differences across countries. So to do the accounting properly you want to entertain this possibility. Given the plot Pete just showed, in the data, it turns out there aren't much differences in employment to population ratio across countries

Q: Thank you for the fantastic class. I am wondering whether there is a good data source for capital-specific PPP?

A: The Penn World Tables (PWT) (see previous entries for the website) have some information on capital in PPP terms.

Q: I remember that the Pen world table use tangible capital only. Do you know why it does not include broader capitals like intangibles? Also is there any capital-specific PPP that is consistent with SNA (System of National Accounts) capital definition?

That's a great question. Intangible capital is harder to measure, by its nature. I'm not aware of good cross-country measures of intangible capital. Let me put this question to Pete at the end when we get to Q&A.

Q: For the measuring of human capital, there is an alternative method using wage share weighted hours input to measure labour service which aims to capture the quality/skills of labour. What are the differences between the methods and usually which one is better?

A: There are a lot of different ways to measure and construct aggregates of human capital. Pete is going to say some more about this shortly. There are some measures that focus on health as well as schooling.

Q: For the computations for human capital, the same returns to education were used for different countries, how good is that approximation?

A: Great question! Pete will shortly talk about one of Todd Schoellman's papers on quality of schooling across countries, and how to take such differences into account when doing this type of exercise.

Q: Is the high magnitude of A not suggesting that fundamental causes play a bigger role in determining PPP GDP than proximate causes?

A: The proximate causes refer to TFP (the A term), human capital, physical capital, employment/population. They are proximate in the sense that we still need deeper answers to what drives those.

Q: Is it surprising that in Chad Jones' figure, no country has a higher TFP than USA? Is there something mechanical about that calculation?

A: I don't think there is anything mechanical about it. Here's the handbook if you want to look at the methodology: https://web.stanford.edu/~chadj/facts.pdf

Q: PWT (Penn World Tables) measures have been criticized as more noisy relative to Madison and WDI (World Development Indicators) measures. What are the advantages of using PWT data over others?

A: The PWT are noisy for sure. The WDI do PPP adjustments a bit differently and differ in other ways, but I am not sure why they are much better. The Madison measures are more historical and more of a black box in my experience.

Q: Many thanks for fantastic class and organising! Why there is a tension/dilemma between capital K and the rest (labour; L, human capital; h, and technological productivity/TFP; A) regarding alpha - elasticity of output with respect to capital? Is this for the case of constant returns to growth?

A: The expression Pete is using for the accounting results from the Cobb Douglas aggregate production function specified on slide 10.

Q: Does the decision to take up schooling itself affected by local economic conditions? How does that affect returns to schooling?

A: Yes, that is surely true. People making schooling decisions are presumably forward-looking. They are not only taking into account the *current* returns to schooling, but potentially also the expected future returns to schooling. So these relationships are thoroughly complicated by endogeneity. Modelling schooling choice in detail would require thoughtful dynamic models, so in a sense the development accounting work is just looking at the "proximate" role of schooling rather than the deep determinants of how and why schooling differs across countries.

Definitely, local economic conditions will affect decision to take up schooling. Perhaps you can check out this paper: http://users.nber.org/~rdehejia/!%40%24devo/Lecture%2008%20Child%20labor/supplemental/Jensen_Perceived_Returns_Schooling-1.pdf

Q: Considering the decline in labour share income in many countries, Cobb Douglas doesn't seem suitable for aggregate production. Why do development economists still use it? Maybe CES (Constant elasticity of substitution) might be better and solve the puzzles too!

A: You're right that there are a bunch of analyses arguing that the labour share is declining (slightly) in some countries, but it's a somewhat contested area. The broader question of why macro people use Cobb-Douglas rather than CES or other functional forms is a totally valid one. Part of the reason is that it seems to fit the data awfully well. The so-called ‘Kaldor Facts of growth’ seem in general to be consistent with models of balanced growth and Cobb-Douglas. But probably an honest answer would say that Cobb-Douglas is widely used because it's so tractable, and we have a lot of reasons to believe that any CES function would not be "too far" from Cobb-Douglas.

Q: Is A the TFP or the TFP residual?

A: A is TFP. In the accounting exercise, the way we measure it as a residual (rather than having direct data on it).

Q: How can we disentangle the effect of natural, physical and human capital on TFP?

A: Great question! This is the sense in which Pete described this exercise as proximate accounting. The same underlying factors might explain low TFP and low K. There is also an effect the other way around, from TFP on K, which is why the accounting has K/Y on the right hand side instead of K.

Q: What's about the effect of shadow economy, especially in developing countries ?

A: The effect of informal sector is definitely noteworthy, but we are not stressing it here. In macroeconomics we usually measure it using indirect methods.

Q: Wouldn't returns to human capital (and thus its contribution to GDP) depend on the other variables? For example, some country might have a large supply of high skilled workers but firms with good enough quality of technology and capital they can work at are limited. I find it hard to

grasp how that would be captured in accounting with Cobb-Douglas aggregate production function.

A: You're exactly right. The literature has thought about imperfect substitutability between high and low education workers, for example. See the Ben Jones AER paper: https://www.aeaweb.org/articles?id=10.1257/aer.104.11.3752. It definitely changes the importance of human capital. There are others that cite that paper. They are related to your point.

Q: Could you share a list of references for this session, please? I saved the presentation and some links the assistants sent, but I would like to know more about the topic. Thanks!

A: Pete has the key citations on slide 3. The others are references throughout the slides.

Q: Why do we take TFP as given like an endowment distributed between countries randomly? Isn't it attainable with learning-by-doing ?

A: It's a good place to start. But yes, its a proximate cause. A country can certainly raise TFP through its choices, policies, regulatory environment, etc.

Q: a few questions: 1- why this specific production function? 2- How much these contributions of each factor is dependent on the choice of production function? 3- Can you test individually whether these contributions are significant? and jointly? 4- I don't see any sort of variance/confidence intervals here. They are not important?

A: The functional form matters. See this Ben Jones paper for more on this: https://www.kellogg.northwestern.edu/faculty/research/researchdetail?guid=d2ba5030-c7e3-4b1d-a5d6-5e11e0897653

A: On 1 (and 2), do you want to ask Pete in the live Q&A? I assume you mean Cobb Douglas with a constant labour share. On the rest, it is a good question and a bit tricky to think about confidence intervals. Its not a sample of countries where we are worried about extrapolating to a larger population. Most of the uncertainty I worry about is not sample uncertainty but your first question, is this the right production function, how should we measure human capital and physical capital in the aggregate.

Q: I was wondering if there is any accounting framework that exploits heterogeneity in firms (sizes, productivity, capital and skilled workers they use)

A: Yes. One such framework is the Extended Supply-Use Tables (SUTs) used by the U.S. Bureau of Economic Analysis (BEA).