

STEG Virtual Course on  
"Key Concepts in Macro Development"

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Lecture 6: Recent applications and advance

[Pete Klenow \(Stanford\)](#)

[Presentation Slides](#)

[Video](#)

Q: Could you kindly discuss ways to recover the production function elasticities. (E.g. Production Function estimation in presence of misallocation). Thank you!

A: This is a very difficult problem :). In particular, if you allow for firm-specific distortions that vary across inputs, then it may in fact be impossible to separately identify production elasticities from distortions. To deal with this people make different assumptions: Hsieh and Klenow (2009) for example applied U.S. production elasticities to China and India, the assumption being that these elasticities are less distorted. There are a lot of tools from Industrial Organization to do this carefully, but in practice people often just use the industry shares to infer the production elasticities.

Q: Potential sources of misallocation are diverse in nature. The question is how do we identify "misallocation from resources" separate from real differences in technological progress (or TFP)?

A: That's right. One way that I tend to think about this is that we call it 'misallocation' if the social planner could just reallocate resources and achieve a better outcome. But if the reallocation would require the expenditure of real resources -- say, building a road or a bridge -- then we can't conclude that there is a misallocation. For example, it might make labor markets more efficient if people could beam themselves frictionlessly across space. But that's (a) not possible yet (!); and (b) would require a bunch of resources to construct the beaming machines, or whatever...

Q: How do we think about cultural values, preferences and misallocation? If cultural values changes over time leading to re-allocation of resources such that the size of the pie increases, should we think that is a reduction in misallocation?

A: So that could definitely be the case, for example reductions in discrimination (either because of cultural values and/or policy) can lead to a productive reallocation of resources and falling misallocation (this is what Pete's paper on The Allocation of Talent is about). However, it could also be the case that changes in cultural values could change how we

should measure welfare: people may prefer a more/less egalitarian society for example, so as Pete mentioned early on, it could be that it's beneficial to welfare to tolerate a bit more misallocation. But Pete can maybe speak more to this issue in the Q&A at the end.

Q: Kindly explain wedges.

A: The wedges are a reduced form way of representing the various distortions which we think might cause misallocation. They can represent things like implicit subsidies or taxes firms face, regulations which affect firm decisions, or variable markups. Pete will provide some clearer examples next.

Q: How to think about endogenous TFPQ?

A: We often think that firms have to invest in things like R&D to improve their process efficiency or product quality (both in TFPQ). The incentives to do this will depend on the expected future returns from successful innovation, and so will depend on the distortions firms think they will face. In particular, if larger firms face larger distortions, then firms may face a disincentive to invest in improving their TFPQ.

A: Pete will mention some papers later on that tackle this issue explicitly in a model with both misallocation and firms that make choices about investments into improving their TFPQ.

Q: It seems to me that beyond measuring/identifying wedges, it is equally crucial to measure who pays for them. While Pete mentioned they can be taxes, we implicitly treat them as regulations that simply distort FOCs here. No one is directly paying for them. Is this thinking correct?

A: Right - when you infer distortions from the firm (or plant-level) data you are recovering the distortions that are gross of the wedge (as opposed to having it netted off). So in this sense, it can recover wedges that are implicit - if you observe the specific tax rates the firm is paying you could net those off and not include them in the wedges you're inferring.

A: Makes sense. However, if these are actual taxes, things like firm-revenue we observe might already be net of taxes. But at least in the setup in Hsieh-Klenow or what Pete showed in the slides, we assume that revenue is  $PY$ , not  $(1-t)PY$ .

A: Yes, absolutely right! We assume we're observing  $PY$  in the data, because in the model  $(1-t)PY/L$  is in fact going to be equalized across firms. Datasets vary in practice in terms of how revenues are reported, gross vs. net of taxes, and some have both, so researchers can usually clarify what they think they are/aren't reporting. That said, I think this issue sometimes doesn't get enough attention in misallocation papers. :)

Q: To what extent does the chart shown for fact 1 reflect differences in data quality? i could imagine that the us dedicates some more resources to provide high quality administrative data

A: So this is what we looked at in Bils, Klenow and Ruane. We found that measurement error was in fact worse in US Census data than in the Indian microdata, and so when we corrected for this the gains were actually quite similar to the original Hsieh and Klenow (2009) paper.

A: However it's worth highlighting that we only looked at additive measurement error, and so other forms of measurement error in the data could also be a problem which affect these cross-country comparisons.

Q: Is Pete going to touch on measurement issues here for the 5 facts about misallocation? I remember this recent paper on showing that a lot of variation is simply explained by differences in data cleaning by statistical agencies across India, China, US (for Hsieh & Klenow 2009)

A: He'll definitely touch on it if he has time, but this is an interesting area for discussion at the end of the talk. So Rotemberg and White point out that there is a lot of imputation in US Census data and so TFP dispersion is in fact a lot larger than people previously thought. This is still an evolving literature as there are still question marks about how much imputation is done in other countries' datasets also. Doing a perfect like-for-like comparison is pretty tough as statistical agencies don't tend to use the same methods. In Bils, Klenow and Ruane (2020) we tried to correct the Indian and US data for additive measurement error, and found that there were still larger losses due to misallocation in India than in the U.S.

A: Yes, the Rotemberg & White paper was the one I had in mind. It just seems incredibly hard to find as a working paper and so I forgot the name. Thank you!

Q: Sorry, I didn't understand the interpretation/discussion of the positive correlation between TFPQ and TFP in India. Without CRS in production, the correlation in the model should be driven by physical productivity right? So a positive relationship is just capturing this? In the US, this correlation is lower because demand component is more important?

A: So it's true that once you deviate from the assumptions of the simple model then you could get a positive correlation between TFP and TFPQ that is not due to a true correlation between  $\tau$  and  $A$ . But you could quantify that if you specify the returns to scale for example and then re-evaluate these correlations. Measurement error will also produce a spurious positive correlation by the way. But then the question is why are these issues worse in developing countries, and it's still an open question! I don't know of any papers that have measured the importance of demand for firm productivity in the U.S. vs other countries, I'd be interested to know how that looks.

A: Very interesting. Just based on the recent literature on measuring demand, demand seems to make up most firm-size variation in the US. I would conjecture this role is relatively smaller in dev countries (would also be interested in data). That would be an explanation that would not need any misallocation.

A: So if 'demand' here is a stand-in for 'product quality' then it seems like this could fit clearly in to how we think about TFPQ and the misallocation framework. But there's also a measurement element. Also I will add that deviations from CRS don't necessarily imply smaller gains from misallocation, in fact they could be even larger!

A: I totally agree on the last point on DRS still leading to large costs from misallocation. My point was simply on identification. CRS + CES demand just gives this knives-edge case where physical productivity entirely drops out of TFPR.

Q: By any chance would do you have an example of a paper that uses the « direct approach » i.e. that maps  $\tau_i$  to a reduced form (observable) financial (or other) frictions at the firm level, and that then computes the welfare loss due to misallocation?

A: Two ideas, though I'm not sure if these do exactly what you want. Rotemberg (2019 AER): The Equilibrium Effects of Firm Subsidies, and Natalie Bau and Adrian Matray have a new paper doing something like this also.

Q: How do we think about misallocation across sectors? E.g. the electricity sector has high average markups relative to the rest of the economy?

A: Misallocation across sectors is potentially a big issue. Many of us are trying to understand if there are gaps between agriculture and non-agriculture, for instance.

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