Discussion of:
"Capital Depreciation and Labor Shares Around the World: Measurement and Implications" by L. Karabarbounis and B. Neiman

Tony Smith
Yale University, NBER

Thomas Piketty and gross vs. net

- ▶ Piketty's book has galvanized interest in the distinction between gross and net (= gross less depreciation) variables in macroeconomics.
- ▶ Piketty's "second law" holds the net savings rate (net investment over net output) constant (as does Solow in his original growth model!).
- ▶ Krusell and Smith (2014) argue that the saving theory underlying the second law is untenable, in part because it implies that the gross rate, held constant in the "textbook" Solow model, goes to one as growth slows!
- ▶ The second law aside, Piketty draws attention to net income shares, arguably more reasonable, or informative, than gross income shares (since capitalists do not consume depreciation).

Contributions of this paper

- Careful measurement of declining trend in net labor shares (labor compensation divided by gross output less depreciation) in many countries.

- Theory showing how gross and net shares move in different ways in response to different shocks: the net share is a new and informative "moment" for identifying which shocks are operative.

- A "capitalist-worker" model exploring whether the gross and net labor shares can be viewed as "sufficient statistics" for (consumption) inequality: yes, in steady state (by construction); not so much, out of steady state.

My discussion

- The data work looks beautifully done (and is mostly outside my expertise)—not much to add here.
- The theory about how gross and net shares move is insightful—and I provide my own "undergraduate" version.
- The model of inequality is really too stark to allow any firm conclusions (but will not dwell on this).

The (advanced) undergraduate version

- The textbook Solow model with investment-specific technical change:

$$
\begin{aligned}
K' &= (1 - \delta)K + qI \\
I &= sY \\
Y &= F(K, N),
\end{aligned}
$$

where N is constant.

- Gross saving rate, s, is constant.
- F is CES with elasticity $(1 - \rho)^{-1}$ and "share" coefficient α.
- $q \ (= \xi^{-1})$ measures efficiency of investment.

Steady state

- Law of motion for capital: $K' = (1 - \delta)K + sqF(K, N)$.
- Define $x \equiv X/N$. In steady state, $q^{-1}\delta\bar{k} = sf(\bar{k})$, where $f(k) \equiv F(K, 1)$.
- The capital-output ratio in steady state is:

$$\frac{\bar{k}}{\bar{y}} = \frac{qs}{\delta}.$$

- Let $R = f'(k)$. Capital's share of gross output in steady state is:

$$\bar{s}_g^K = \frac{R\bar{k}}{\bar{y}} = \alpha\left(\frac{\bar{k}}{\bar{y}}\right)^\rho = \alpha\left(\frac{qs}{\delta}\right)^\rho.$$

Labor's gross and net shares

- Gross labor share in steady state is:

$$\bar{s}_g^N = 1 - \bar{s}_g^K = 1 - \alpha \left(\frac{qs}{\delta}\right)^\rho.$$

- Let W be the wage (the marginal product of labor). Net labor share is:

$$s_n^N = \frac{WN}{Y - q^{-1}\delta K} = \frac{W/y}{1 - q^{-1}\delta \frac{k}{y}}.$$

- In steady state:

$$\bar{s}_n^N = \frac{\bar{s}_g^N}{1 - s} = \frac{1 - \alpha \left(\frac{qs}{\delta}\right)^\rho}{1 - s}.$$

Comparative statics

- Use the simple theory to conduct some comparative statics exercises: how do the gross and net shares respond to changes in the parameters?
- First: an increase in s, leading the capital-output ratio to rise (in the spirit of Piketty's work).
- Second: an increase in q, the force underlying Karabarbounis and Neiman's work.

Comparative statics I: an increase in s

- Gross labor share falls if $\rho > 0$.
- Net labor share falls if

$$\left(\frac{1-s}{s}\rho + 1\right)\bar{s}_g^K > 1.$$

- Cutoff value of ρ is:

$$\left(\frac{s}{1-s}\right)\left(\frac{\bar{s}_g^N}{\bar{s}_g^K}\right) = \left(\frac{0.2}{0.8}\right)\left(\frac{0.55}{0.45}\right) \approx 0.31.$$

  This is very close to the (inferred) cutoff in the paper!

- Paper estimates $\rho \approx 0.25$: bad news for Piketty (see also critiques by Rognlie and Summers).

Comparative statics II: an increase in q

- Gross and net labor shares fall if $\rho > 0$.
- This is good news for Piketty: an alternative to his driving force of slowing population growth (or slowing labor-augmenting technical progress) could instead be investment-specific technical change.
- But if this rate were to slow (analogous to a decrease in q here), then the shares would move in the "wrong" way!
- Effective return to saving is:

$$qR = \alpha q^\rho \left(\frac{s}{\delta}\right)^{\rho - 1}.$$

- An increase in q increases qR (but only a little) if ρ is close to zero (more good news for Piketty and his "$r - g$" story); changes in s have larger (and opposite) effects.

Final remarks

- Well-done and insightful paper—no surprise there!
- Trends in income shares continue to provoke and draw attention to paucity of research on non-balanced growth (they were there before Piketty!).
- Interesting research agenda to study full-fledged models of inequality with declining labor shares. But is that where the real action is? For example, dispersion of labor income itself is growing, especially at the the high end.
- Over beers: long-run implications of investment-specific technical change and CES technology?