Misallocation and Manufacturing TFP in China and India

Correction Appendix

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Abstract

Our paper "Misallocation and Manufacturing TFP in China and India" (Quarterly Journal of Economics, 124: 1403-1448, Nov 2009) contained some errors in the equations pertaining to the definition of TFP. This appendix gives the correct equations. All the gains from reallocation were computed using the correct equations and hence are not affected.

1. The definitions of $\overline{MRPL}_s$ and $\overline{MRPK}_s$, below equations (12) and (13), should be (the inverses of the sum, rather than the sum of the inverses):

$$\overline{MRPL}_s \triangleq \frac{w}{\left(\sum_{i=1}^{M_s}(1-\tau_{Ysi})\frac{P_{si}Y_{si}}{P_sY_s}\right)}$$

$$\overline{MRPK}_s \triangleq \frac{R}{\left(\sum_{i=1}^{M_s}\frac{1-\tau_{Ysi}}{1+\tau_{Ksi}}\frac{P_{si}Y_{si}}{P_sY_s}\right)}$$

2. The definitions of $TFPQ_{si}$ and $TFPR_{si}$ on page 1410 should not have the wage per unit of labor input in the denominators:

$$TFPQ_{si} \triangleq A_{si} = \frac{Y_{si}}{K_{si}^{\alpha_s}L_{si}^{1-\alpha_s}}$$

$$TFPR_{si} \triangleq P_{si}A_{si} = \frac{P_{si}Y_{si}}{K_{si}^{\alpha_s}L_{si}^{1-\alpha_s}}.$$

3. In footnote (10), the wage per unit of labor should appear in the second equality of the definition of $TFPR_{si}$:

$$TFPR_{si} = \frac{\sigma}{\sigma-1}\left(\frac{MRPK_{si}}{\alpha_S}\right)^{\alpha_s}\left(\frac{MRPL_{si}}{1-\alpha_S}\right)^{1-\alpha_s} = \frac{\sigma}{\sigma-1}\left(\frac{R}{\alpha_S}\right)^{\alpha_s}\left(\frac{w}{1-\alpha_S}\right)^{1-\alpha_s}\frac{(1+\tau_{Ksi})^{\alpha_s}}{1-\tau_{Ysi}}$$

4. The definition of $\overline{TFPR}_S$ in footnote (11) should be (again, the inverse of sums rather than the sums of inverses):

$$\overline{TFPR}_S \triangleq \frac{\sigma}{\sigma-1}\left[\frac{R}{\left(\alpha_S \sum_{i=1}^{M_s} \frac{1-\tau_{Ysi}}{1+\tau_{Ksi}} \frac{P_{si}Y_{si}}{P_sY_s}\right)}\right]^{\alpha_s}\left[\frac{w}{\left((1-\alpha_S)\sum_{i=1}^{M_s}(1-\tau_{Ysi})\frac{P_{si}Y_{si}}{P_sY_s}\right)}\right]^{1-\alpha_s}$$

$$= \frac{\sigma}{\sigma-1}\left(\frac{\overline{MRPK}_s}{\alpha_S}\right)^{\alpha_s}\left(\frac{\overline{MRPL}_s}{1-\alpha_S}\right)^{1-\alpha_s}$$

5. Equation (16) is correct when there is only variation in $\log(1-\tau_{Ysi})$, not $\log(1+\tau_{Ksi})$. When there is also variation in $\log(1+\tau_{Ksi})$, we must assume that $(\log A_{si}, \log(1-\tau_{Ysi}), \log(1+\tau_{Ksi}))$ is multivariate normal. Let the variances of $\log(1-\tau_{Ysi})$ and $\log(1+\tau_{Ksi})$ be denoted by σ_Y^2 and σ_K^2, respectively, and their covariance by σ_{KY}. Then,

$$\log TFP_s = \frac{1}{\sigma-1}\left(\log M_s + \log E(A_{si}^{\sigma-1})\right) - \frac{\sigma}{2}\operatorname{var}\left(\log TFPR_{si}\right) - \frac{\alpha_S(1-\alpha_S)}{2}\sigma_K^2$$

$$= \frac{1}{\sigma-1}\left(\log M_s + \log E(A_{si}^{\sigma-1})\right) - \frac{\sigma}{2}\sigma_Y^2 + \sigma\,\alpha_S\,\sigma_{KY} - \left(\frac{\sigma\,\alpha_S^2}{2} + \frac{\alpha_S(1-\alpha_S)}{2}\right)\sigma_K^2.$$

6. The definition of κ_s on page 1415 should not have a wage per unit of labor:

$$\kappa_s = \left(P_sY_s\right)^{-\frac{1}{\sigma-1}} / P_s$$

7. In the notes to Tables I, II, IV, and VI, a plant-specific wage appears in the denominators when defining $TFPQ_{si}$ and $TFPR_{si}$. This is because we measured labor input using the wage bill $w_{si}N_{si} = wL_{si}$. Here w_{si} is the wage per worker, N_{si} the number of workers, and w and L_{si} are as defined in the model (the wage per unit of labor, and labor input). Thus the common wage per unit of labor appears in our empirical definitions of $TFPQ_{si}$ and $TFPR_{si}$, unlike in the model. This does not affect our calculation of gains from reallocation, as the scalar cancels out in all cases.

8. The TFP expression in Appendix I: Lucas Span-of-Control Version on page 1444 should be:

$$TFP = \frac{\sum_{i=1}^{M} \left\{ TFPQ_i \left(\frac{\overline{TFPR}}{TFPR_i} \right)^{\gamma} \right\}^{\frac{1}{1-\gamma}}}{L^{1-\gamma} \left(\sum_{i=1}^{M} \left\{ TFPQ_i \frac{\overline{TFPR}}{TFPR_i} \right\}^{\frac{1}{1-\gamma}} \right)^{\gamma}}$$