

Measuring and Explaining Resource Misallocation Across Industries and its Impact on China's Aggregate TFP Growth

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*IARIW 34th General Conference, Dresden, Germany
21-27 August, 2016*

Aggregate and industry TFP growth (μ)

Top down:

$$\mu^{top} := \hat{V} - \alpha \hat{K} - (1 - \alpha) \hat{L}$$

Bottom up:

$$\mu^{bottom} := \sum_{i=1}^N d_i \mu_i^{GO}$$

where

$$d_i := \left[\frac{GO_i}{GDP} \right], \text{ the Domar weights}$$

and

$$\mu_i^{GO} = \hat{Y}_i - \sum_{k=1}^C \alpha_{ik} \hat{K}_{ik} - \sum_{l=1}^D \beta_{il} \hat{L}_{il} - \sum_{j=1}^N m_{ij} \hat{M}_{ij}$$

As a matter of maths,

$$\mu^{bottom} = \mu^{top}$$

provided that a given input earns the same return in all industries

If this assumption is not satisfied

$$\mu^{top} = \mu^{bottom} + \text{Reallocation}$$

Or: Measured TFP = True TFP + Reallocation

If KLEMS data are available both μ^{top} and μ^{bottom} can be calculated. Then Reallocation can be calculated as the residual.

Intuition

If you transfer a worker of given type from an industry where his/her wage (= MP) is low to one where it is high, then GDP increases for the same quantity of inputs, i.e. TFP appears to increase.

Jorgenson, Gollop and Fraumeni (1987) went further and decomposed Reallocation into a contribution from labour and one from capital.

Their formulas involved differences between the contribution of $K(L)$ calculated from the bottom up and from the top down.

They found the effects to be small. But this was for the US in the post WW2 period up to 1987.

My problem

Wu and Zhang say they are following the methodology of Jorgenson et al., but nothing like the latter's formulas appear in their paper.

Their formulas involve the ratio of total capital (labour) in the i th industry to aggregate capital (labour) in the whole economy.
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Big picture

Reallocation is small in the US but ought to be huge in China.

Hundreds of millions of people on very low wages in agriculture are migrating to work in factories in cities.

Is this reflected in the Wu-Zhang figures?