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Mitchell Valdes-Bobes

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Abstract

We examine [X]

[*]Valdes-Bobes: University of Wisconsin. I thank [X] for helpful comments and discussions.

This paper ....

1 Introduction

2 Industry Specific Skill Premium

3 Model

This section presents the model which is the same as (Krusell et al., 2000). There are four inputs for production in this economy: two types of capital, equipment (k_e) and structures (k_s) and two types of labor, skilled (s) and unskilled (u). Inputs are combined thourgh a produciton funciton $G(\cdot)$ to produce three final goods: consumption (c), investment in equipment (i_e) and investment in structures (i_s). Assuming an hicks-newutral technological shocks A, the aggreate production is given by

$$c_t + i_{e_t} + i_{s_t} = A_t G(k_{s_t}, k_{e_t}, u_t, s_t) \tag{1}$$

The production function is assumed to be Cobb-Douglas in structures and a nested CES in all other inputs:

$$G(k_{s_t}, k_{e_t}, u_t, s_t) = k_{s_t}^{\alpha} \left(\mu u_t^{\sigma} + (1-\mu) \left(\lambda k_{s_t}^{\rho} (1-\lambda) s_t^{\rho} \right)^{\frac{\sigma}{\rho}} \right)^{\frac{1-\alpha}{\sigma}} \tag{2}$$

where α is the share of capital structures in output, μ and λ are income shares, ρ and σ govern the elasticity of substitution between capital equipment and labor:

- $\sigma_H = 1/(1-\rho)$ is the elasticity of substitution between equipment and high-skilled.
- $\sigma_L = 1/(1-\sigma)$ is the elasticity of substitution between low-skilled and equipment + high skill labor.

Labor input is defined as

$$u = \psi_t^u h_t^u$$
$$s = \psi_t^s h_t^s$$

where ψ_t^i is the (unobserved) efficiency of each type of labor and h_t^i is the number of labor hours.

3.1 Skill Premium

Firms solve the following profit maximization problem

$$\max_{k_{s_t},k_{e_t},u_t,s_t} G(k_{s_t},k_{e_t},u_t,s_t) - r_{s_t}k_{s_t} - r_{e_t}k_{e_t} - w_{u_t}h_{u_t} - w_{s_t}h_{s_t} \tag{3}$$

Rember to show that capital-skill complementarity is requieres $\sigma > \rho$

4 Data

I estimate the model following the approach outlined in KORV Krusell et al. (2000). I constructed data series for wages, labor input, and capital input from 1963 to FINAL YEAR to replicate KORV with updated data following Ohanian et al. (2021). I then collect the same series at the industry level to re-estimate the model, due to data availability industry series cover the period from INITIAL YEAR-FINAL YEAR.

Labor input and wages are estimated using CPS data downloaded from IPUMS, see Flood et al. (2015),

4.1 Capital Data

To extend both capital series to replicate KORV I obtained investment series in equipment (I_e) and structures (I_s) from NIPA Table 5.2.5. Then the equipment (K_e) and structure (K_s) capital series were constructed using the perpetual inventory method:

$$K_{i_{t+1}} = (1-\delta_{i_t})K_{i_t} + I_{i_t} \qquad i \in \{e,s\} \tag{4}$$

I departed from KORV by using time-varying depreciation rates δ_{i_t}, instead of constant depreciation rates for each series. As in (Ohanian et al., 2021) I deflate structures using the implicit price deflator of GDP [1], and equipment using the product of the consumption delfator[2] and the relative price of equipment [3].

To obtain capital data at the industry level I used the BEA Fixed Assets dataset to obtain investment and capital consumption series by industry and type, details of which tables were used are included in Appendix A.1. Fixed Assets dataset groups industries into 76 groups. To construct a series of the labor share of output by industry, I used the BEA-BLS Integrated

[1] Available https://fred.stlouisfed.org/series/GDPDEF

[2] Available at https://fred.stlouisfed.org/series/CONSDEF

[3] Available at https://fred.stlouisfed.org/series/PERIC

Industry-level Production Accounts (KLEMS)[4]. KLEMS data consists on 57 industry groups some of which are aggregations of industries on the BEA dataset. Table presents the crosswalk between BEA, KLEMS, and Census industry codes. I used the crosswalk provided by (Acemoglu and Restrepo, 2020). A description of the codes is in INSER TABLE AND REFERENCEIT.

4.2 Labor Data

5 Results

[4]Available at https://www.bls.gov/productivity/articles-and-research/industry-production-account-capital.xlsx

References

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A Data Construction

A.1 Capital Inputs and Labor Share

OUTLINE

- Mention why are those delators used.
- How is the depreciation rate contructed?

A.2 Labor Inputs and Wage Rates