On the Role of Profits-Wages Ratios in the Determination of the Long-Run Behavior of International Relative Prices

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Introduction

What is this paper about? (1/4)

- Within the mainstream and critical traditions in economics there is a great interest in the relationship between international relative prices (IRP) and unit labor costs (ULC)
  - IRP:= terms of trade (ToT) or real exchange rate (RER).
- In addition, there is a strong interest in the implications of this IRP-ULC relationship to nations' trade and competitiveness.
  - Misalignment in RER, wage devaluation policy, etc.
- The **mainstream** approach is based on the purchasing-power parity hypothesis and the principle of comparative advantage whereas the **critical** traditions are based on the principle of absolute cost advantage (PACA).
- Within the PACA, one of the most popular theories of the long-run determination of IRP is that of **Anwar Shaikh**, which is based on his theory of 'Real Competition' —the theory of IRP-RC.
- This paper evaluates the theoretical and empirical soundness of this theory of the long-run determination of IRP.

What is this paper about? (2/4)

The main thesis of the theory of IRP-RC: The long-run behavior of the IRP of any pair of tradable commodity bundles is determined exclusively by the relative total unit labor costs (RTULC) of these two bundles.

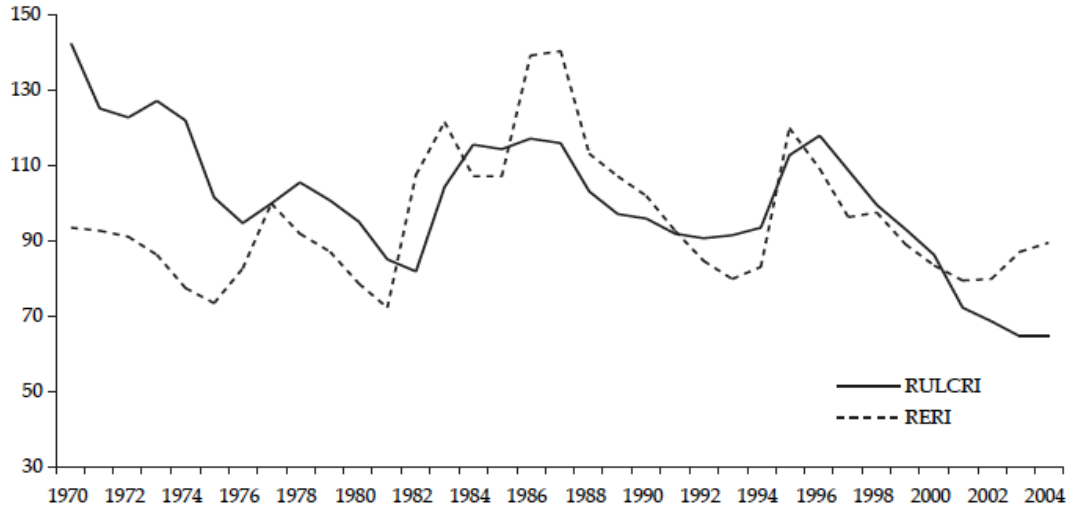
- Market prices are the most important variables to determine country's competitiveness.
- Relative market prices gravitate around relative production prices.
- These production prices are determined by the regulating capitals in each industry.
- Therefore, the thesis of the theory is that the relative production prices of the regulating capitals have as backbone the RTULC.
- As we shall see, this thesis is equivalent to the hypothesis that the total profits-wages ratios of both commodity bundles are sufficiently similar,

$$\frac{p_j^A}{p_k^B} = \frac{\Omega_j^A}{\Omega_k^B} \cdot \frac{(1+\Psi_j^A)}{(1+\Psi_k^B)}$$

What is this paper about? (3/4)

- The literature has reported that the long-run behavior of the bilateral RER, the effecive RER, and the ToT between pair of commodity bundles are well approximated by the RTULC
- e.g., Mex - U.S. (Martinez, 2010)

Real exchange rate index and real unit labor cost ratio index (us-Mex)



- The literature argues that the results are robust to
  - the level of development of the economies
  - the institutional characteristics of the economies
  - the econometric models ...
- ... suggesting with this that this long-run relationship between IRP and the RTULC might be a stylized fact of market economies.

What is this paper about? (4/4)

- However, how sound is the theory sustaining this thesis?
- After (i) reconstructing the theory, (ii) identifying the hypotheses, and (iii) evaluating the theoretical and empirical arguments we reach the following results:
  1. The proposed hypotheses advanced by the literature to derive their main result ($IRP \approx RTULC$) are inefficient by accounting reasons.
  2. The **theoretical** arguments used to constrain the profit-wages ratios in order to produce $IRP \approx RTULC$ are weak.
  3. The **empirical** arguments used to constrain the profit-wages ratios in order to produce $IRP \approx RTULC$ are weaker.
- While studying the profits-wages ratios for the first time in the literature the paper found several statistical regularities in these ratios
- These novel stylized facts can provide a sounder baseline to develop a sounder theory of IRP based on the PACA.

The accounting of prices within and between economies

Relative prices within an economy (1/3)

- The output value of industry j,

$$Z_j = \text{Wages}_j + \text{Profits}_j + \text{Value of the MoP}_j \tag{1}$$

- If we decompose commodity's output value into "price $\times$ quantity", $Z_j = p_j \cdot q_j$, then

$$\frac{p_j \cdot q_j}{q_j} = \frac{\text{Wages}_j}{q_j} + \frac{\text{Profits}_j}{q_j} + \frac{\text{Value of the MoP}_j}{q_j} \tag{2}$$

$$p_j = \underbrace{\omega_j}_{\text{unit labor cost}} + \underbrace{\pi_j}_{\text{unit profits}} + \underbrace{\mu_j}_{\text{unit cost of MoP}} \tag{3}$$

- Now, we can express **equivalently** μ_j in terms of the value-added in the value chain of commodity j:

$$\mu_j = \omega_j^I + \pi_j^I \tag{4}$$

Relative prices within an economy (2/3)

- The price of every commodity can be expressed **equivalently** in terms of **total (direct plus indiredct) or vertically integrated** unit labor cost and unit profits:

$$
\begin{aligned}
p_j &= \underbrace{\omega_j}_{\text{unit labor cost}} + \underbrace{\pi_j}_{\text{unit profits}} + \underbrace{\mu_j}_{\text{unit cost of MoP}} \\
\mu_j &= \omega_j^I + \pi_j^I \\
p_j &= \omega_j + \pi_j + \omega_j^I + \pi_j^I \\
&= (\omega_j + \omega_j^I) + (\pi_j + \pi_j^I) \\
&= \underbrace{\Omega_j}_{\text{TOTAL unit labor cost}} + \underbrace{\Pi_j}_{\text{TOTAL unit profits}} \qquad (5)
\end{aligned}
$$

- Let us define the **total profits-wages ratio** as $\Psi_j \equiv \Pi_j / \Omega_j$, then

$$
p_j = \Omega_j + \Pi_j = \Omega_j(1 + \Psi_j) \qquad (6)
$$

Relative prices within an economy (3/3)

- The price identity for industry j and k

$$p_j = \Omega_j(1 + \Psi_j)$$
$$p_k = \Omega_k(1 + \Psi_k)$$

- Now, the identity of relative prices within an economy:

$$\frac{p_j}{p_k} = \frac{\Omega_j}{\Omega_k} \cdot \frac{(1 + \Psi_j)}{(1 + \Psi_k)} \tag{7}$$

- It is easy to see that relative prices $\frac{p_j}{p_k}$ will equal their relative total unit labor costs $\frac{\Omega_j}{\Omega_k}$ if and only if $\Psi_j = \Psi_k$

$$\frac{p_j}{p_k} = \frac{\Omega_j}{\Omega_k} \iff \Psi_j = \Psi_k \tag{8}$$

- So far so good ... but what about INTERATIONAL relative prices?

The inefficiency and weaknesses of the theory

The terms of trade between two commodities and the **inefficiency** of the hypothesis of the theory of IRP-RC

- Recapitulating, for **national** relative prices,

$$\frac{p_j}{p_k} = \frac{\Omega_j}{\Omega_k} \cdot \frac{(1+\Psi_j)}{(1+\Psi_k)} \quad \text{and} \quad \frac{p_j}{p_k} = \frac{\Omega_j}{\Omega_k} \iff \Psi_j = \Psi_k \qquad (9)$$

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- Now, let us consider the ToT:

$$\frac{p_j^A}{p_k^B} = \frac{\Omega_j^A}{\Omega_k^B} \cdot \frac{(1+\Psi_j^A)}{(1+\Psi_k^B)} \tag{10}$$

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- The hypothesis from the literature to obtain $\frac{p_j^A}{p_k^B} = \frac{\Omega_j}{\Omega_k}$ has been $\Psi_j^A = \Psi^A$ and $\Psi_j^B = \Psi^B$, instead of $\Psi_j^A = \Psi_k^B$.

The **weakness** of the theory of IRP-RC

- The **proposed** hypothesis is **inefficient** to derive the thesis
- In addition, the **needed** hypothesis to sustain the thesis ($\Psi_j^A = \Psi_k^B$) is contradictory to the theory.
  - The literature sustain that there should be persistent differences in distribution and technology (!)
- Ok, let us identify the arguments advanced by the literature to see if they can be used to sustain the NEEDED hypothesis
  - The theoretical arguments used to constrain the profit-wages ratios Ψ_j are **weak** in the sense that they are speculative and
  - they are not empirically sustained
- The hypothesis $\Psi_j^A = \Psi^A$ and $\Psi_j^B = \Psi^B$ of the literature rests on two numbers: the comparisons of 2 standard deviations for the U.S. economy (1948 and 1999).
  - There is a lack of knowledge on the statistical properties of the Ψ_j

Some properties of the Ψ_j^α within and between countries

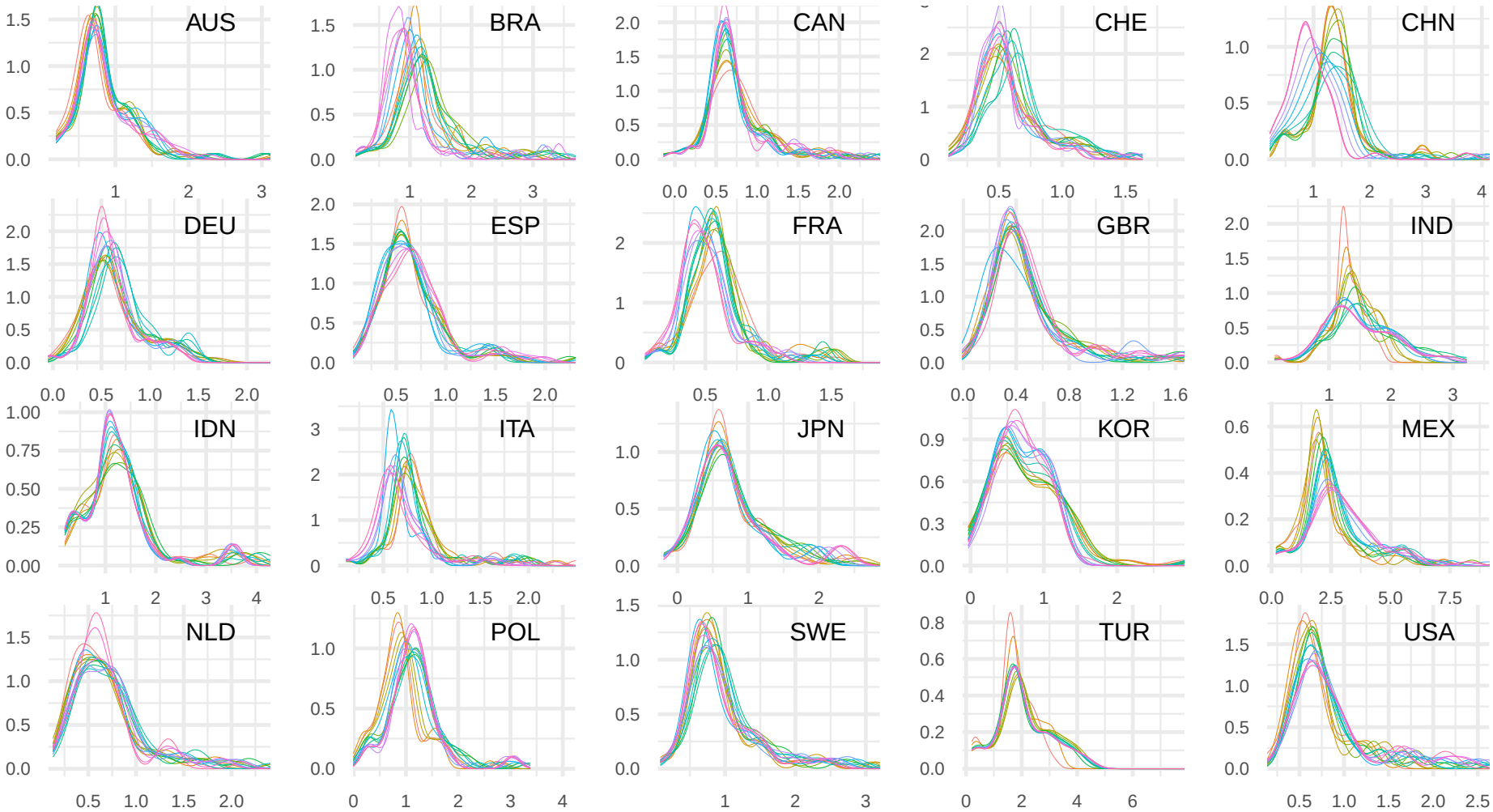
Methodology

- The expressions of national and international relative prices $\frac{p_j}{p_k} = \frac{\Omega_j}{\Omega_k} \cdot \frac{(1+\Psi_j)}{(1+\Psi_k)}$ and $\frac{p_j^A}{p_k^B} = \frac{\Omega_j^A}{\Omega_k^B} \cdot \frac{(1+\Psi_j^A)}{(1+\Psi_k^B)}$ show the importance of the profits-wages ratios, Ψ_j^{α}.
- We mentioned that there is a lacuna of knowledge of the statistical properties of this ratios.
- We took the WIOD database to study the Ψ_j^{α} from 42 countries in 15 years.
- We used the National Input-Output Tables from the WIOD to calculate

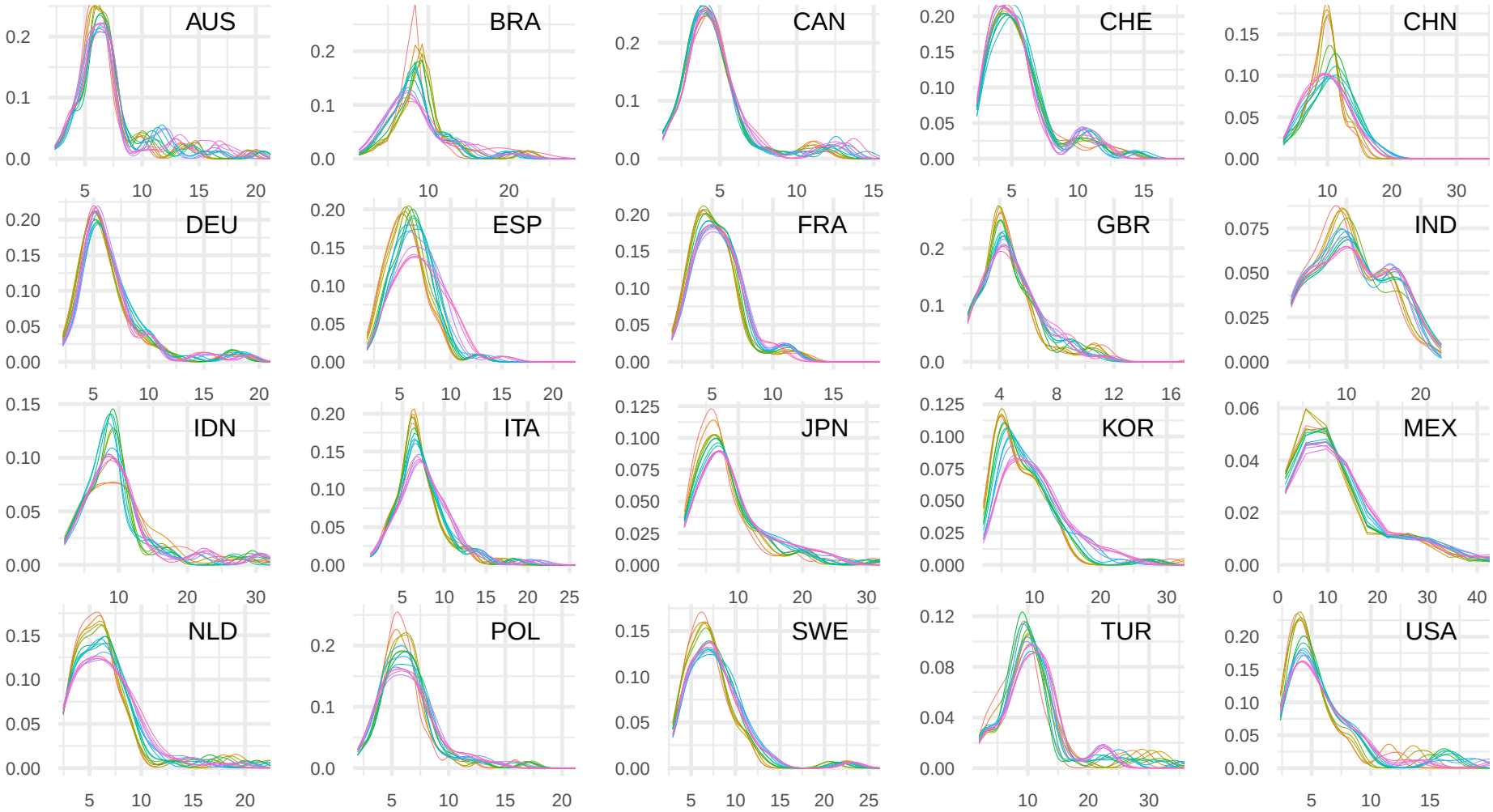
$$\Psi_j^{\alpha} \equiv \frac{\psi(\mathbf{I}-\mathbf{A})_{(j)}^{-1}}{\omega(\mathbf{I}-\mathbf{A})_{(j)}^{-1}}$$

  using Leontief's inverse and the direct wages-output and profits-output coefficients.
- We encourage alternative studies of these ratios! Our paper is just one modest exercise.

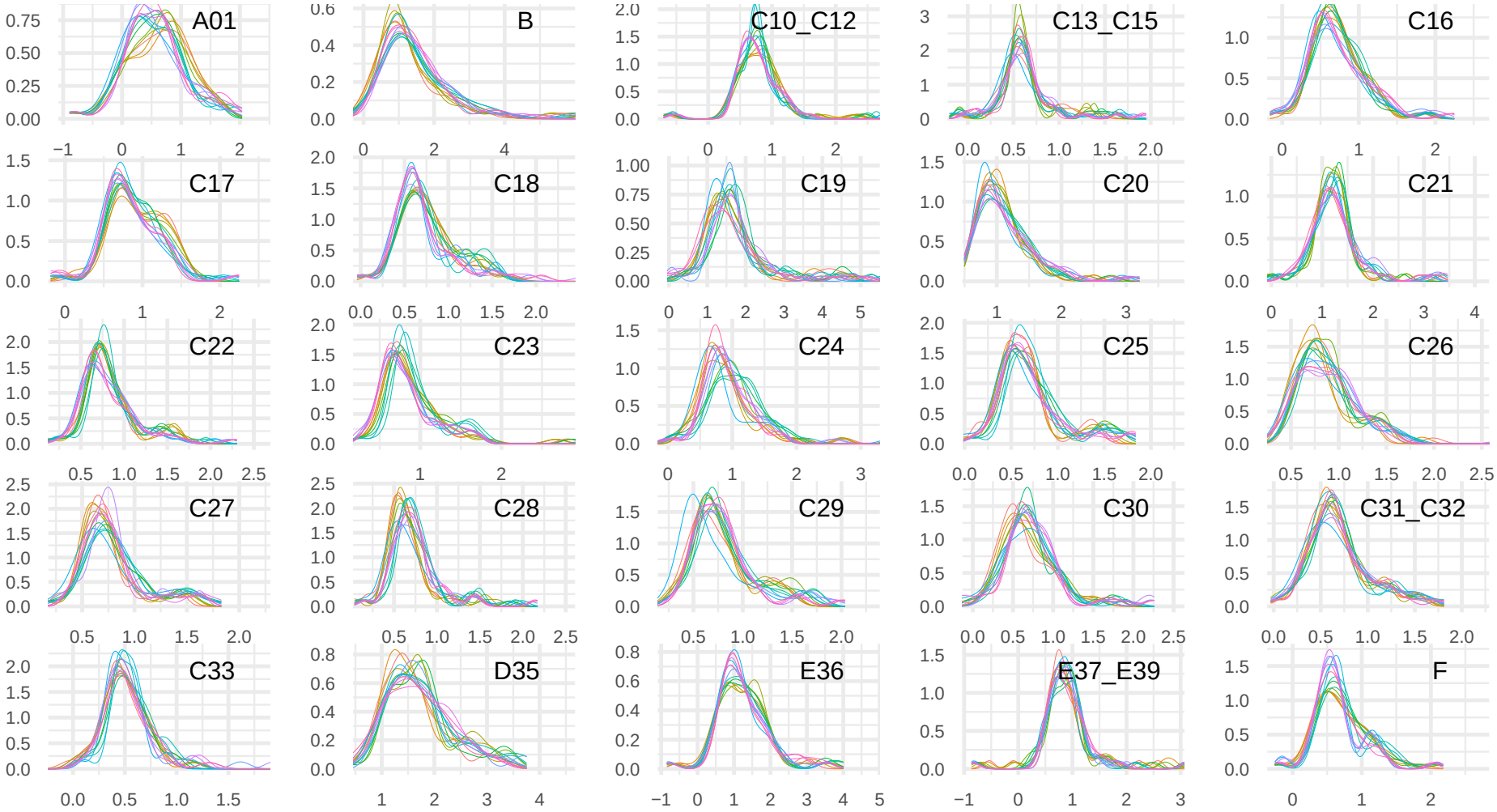
The industry level total profits-wages ratios Ψ_j **within** countries (sample of 20 out of 42 countries)



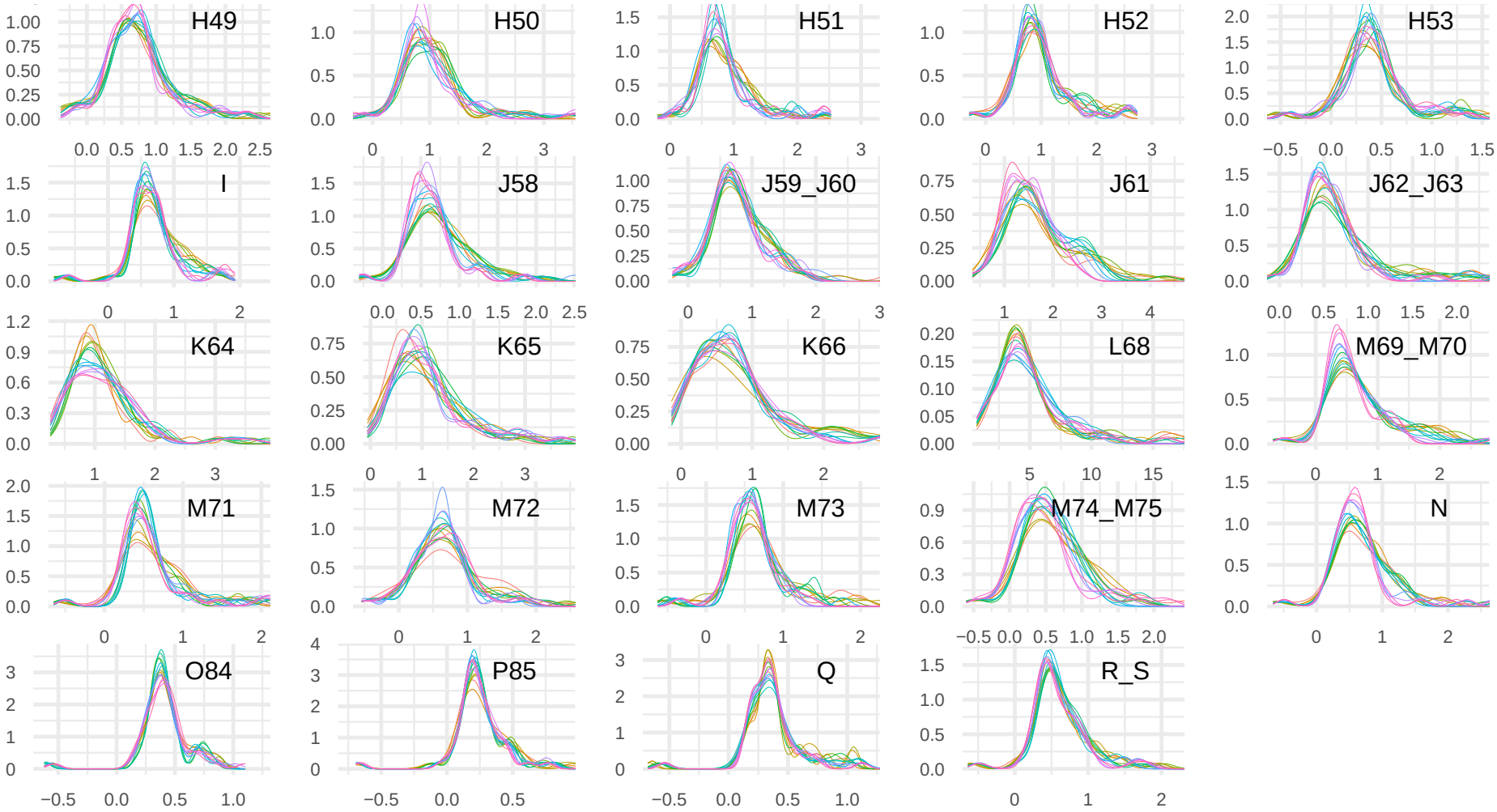
The industry level total capital intensities $\Psi_j \frac{w_j}{r_j} = \frac{K_j}{v_j}$ **within** countries (sample of 20 out of 42 countries)



The industry level total profits-wages ratios Ψ_j **b** countries (sample of 20 out of 42 countries) (1/2)

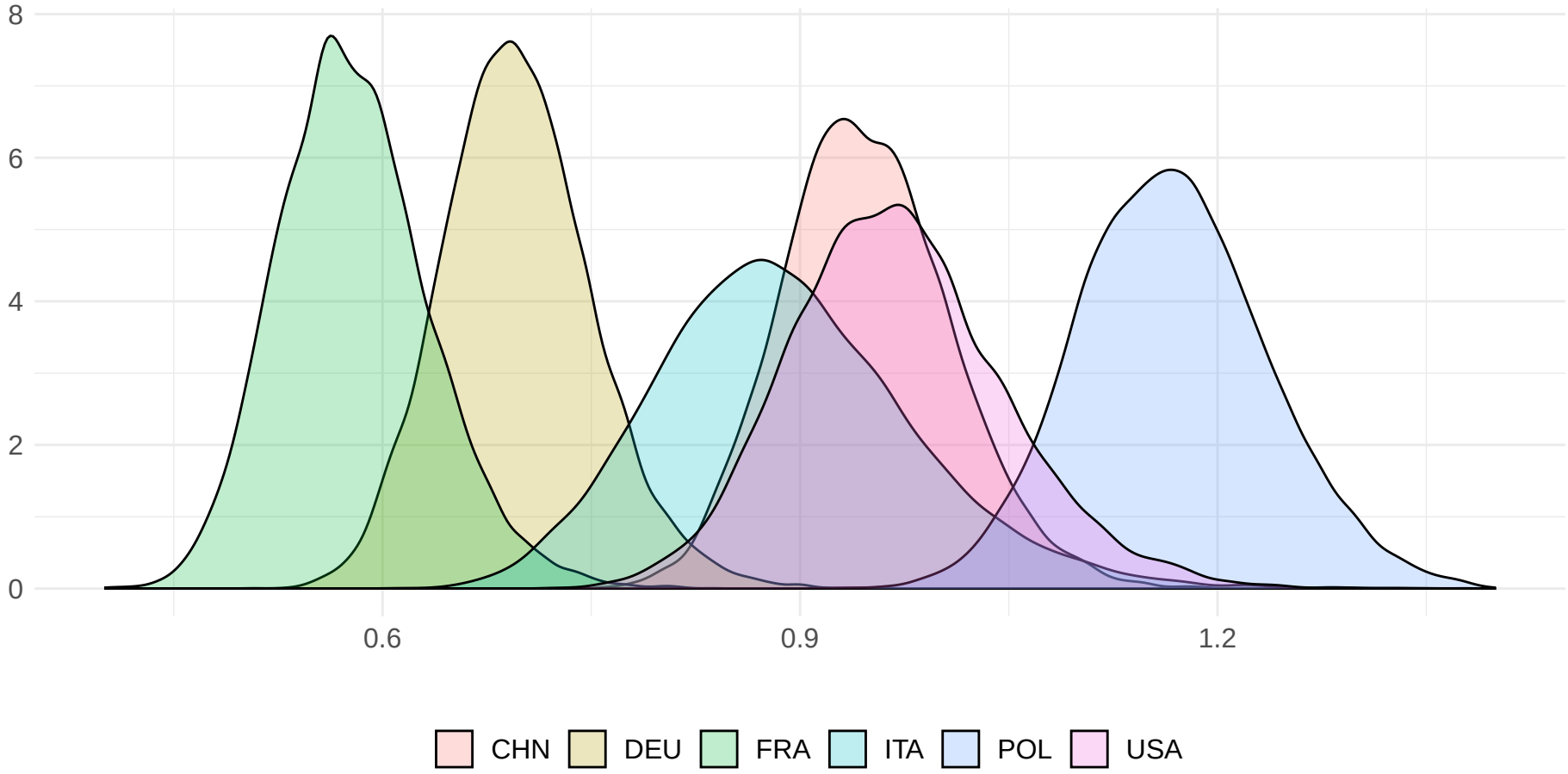


The industry level total profits-wages ratios Ψ_j **between** countries (sample of 20 out of 42 countries) (2/2)



Is there empirical evidence that $\Psi_j^A \approx \Psi_k^B$?

Strategy to asses the probability of $\Psi_j^A \approx \Psi_k^B$ (1/3)



Strategy to asses the probability of $\Psi_j^A \approx \Psi_k^B$ (2/3)

The probability model for Ψ_j

$$\Psi_j|\alpha,\beta \sim \textbf{Gamma}(\alpha,\beta) \tag{12}$$
$$\alpha \sim \textbf{Normal}(0,10) \tag{13}$$
$$\beta \sim \textbf{Normal}(0,10). \tag{14}$$

With this model we estimate the posterior probability distribution of the MEANS of the Ψ^α:

$$p(\mu_{\Psi^A}|\Psi_j^A) \propto p(\Psi_j^A|\mu_{\Psi^A})p(\mu_{\Psi^A}) \tag{15}$$

where $\mu_\Psi = \frac{\alpha}{\beta}$.

Strategy to asses the probability of $\Psi_j^A \approx \Psi_k^B$ (3/3)