The Natural Resource Boom and The Uneven Fall of The Labor Share

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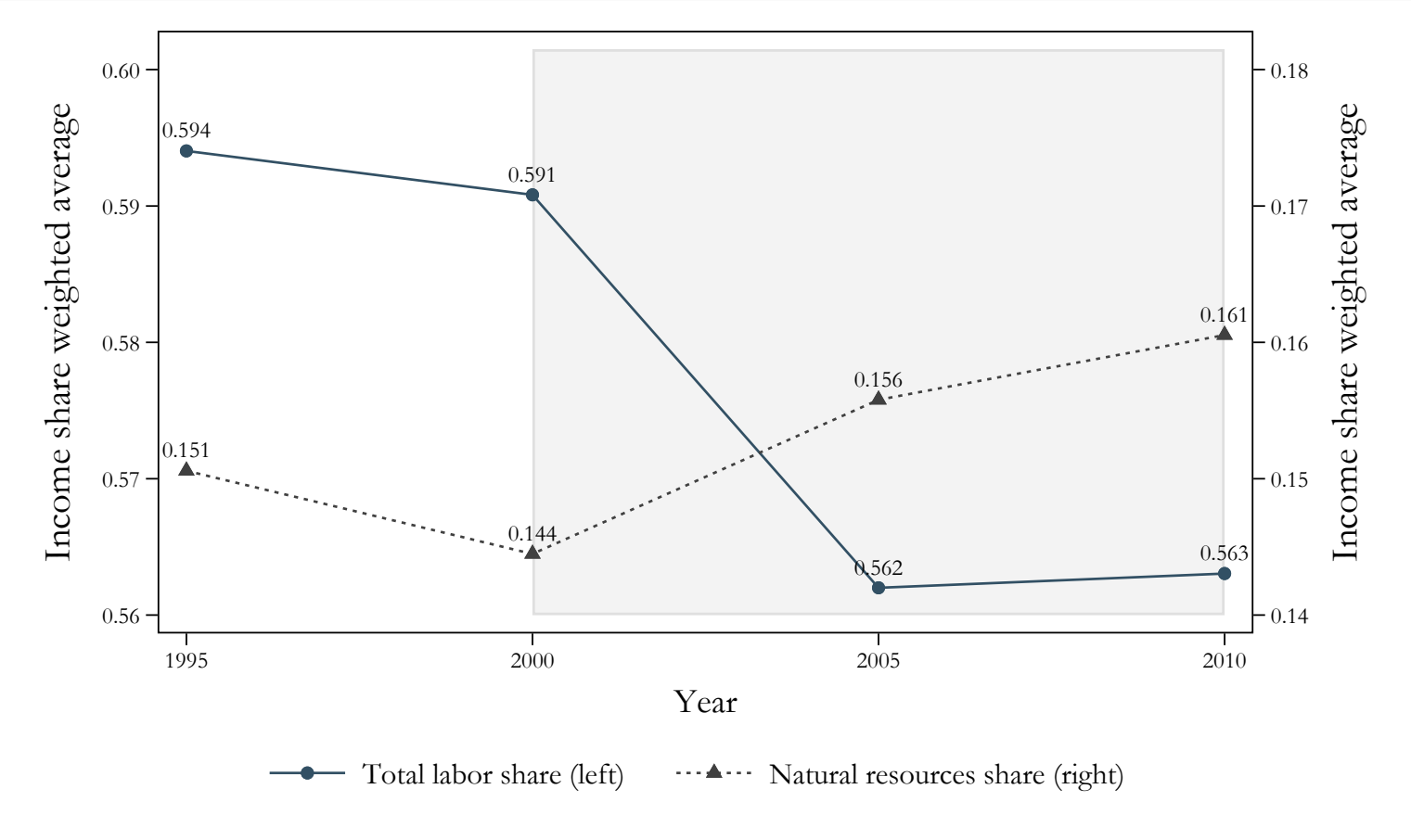
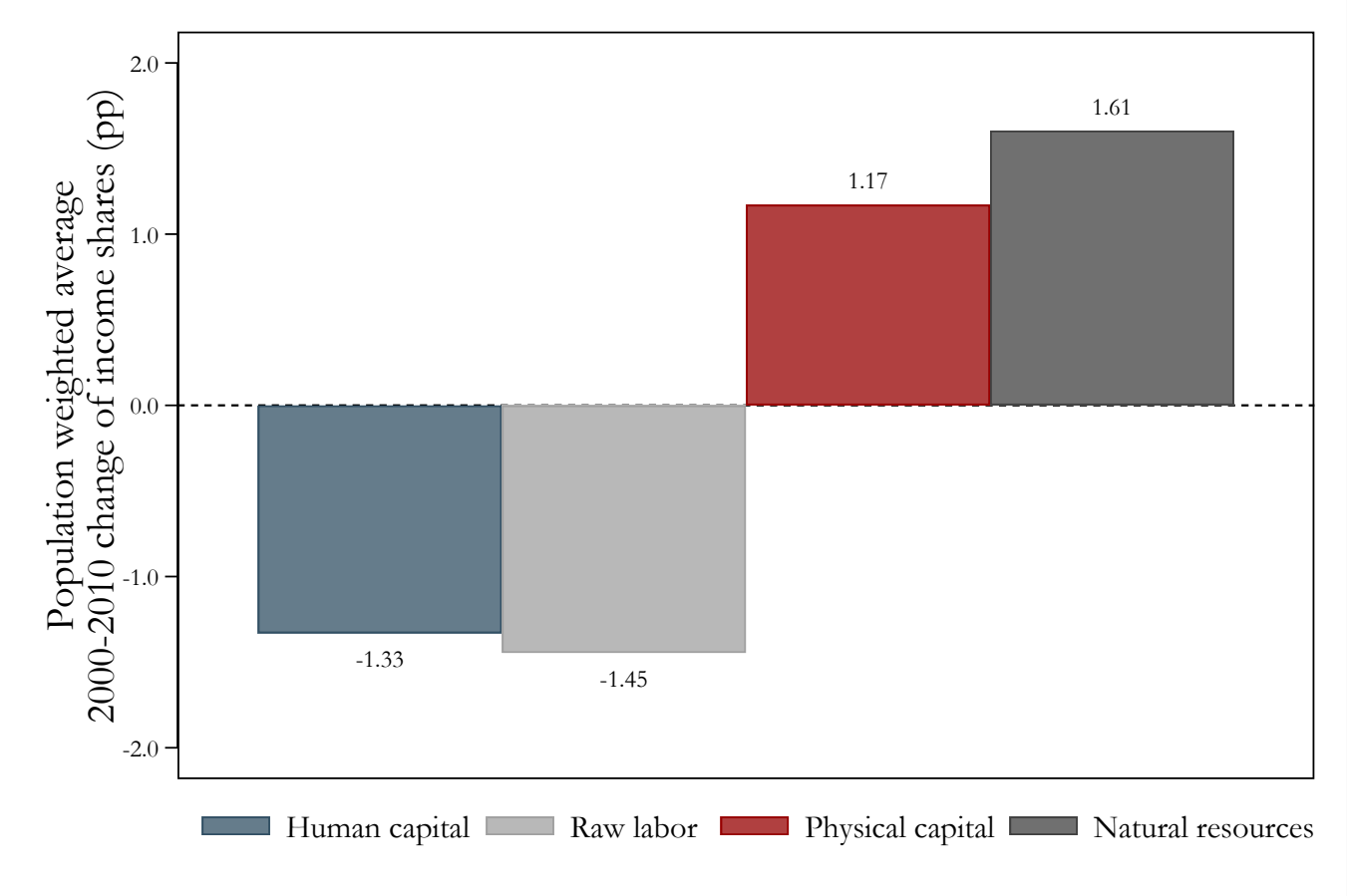
Declining Labor Share and the Rise of Natural Resources



- **The labor share declined by 4.7%** between 2000 and 2010.
- **The natural resources share increased by 11.8%** during the same period, driven by the **commodity price boom** of the 2000s.
- **Are these two patterns related?**

Changes in the Functional Distribution of Income 2000-2010



- **Raw labor and human capital** shares fall in similar magnitudes.
- **The natural resources share grew more than the physical capital share**, a fact that has been overlooked by the literature.

Research Question

What is the effect of a natural resource boom on the functional distribution of income?

- What is the effect of a sharp **price-induced** increase in natural resources income on **aggregate and relative factor shares**?
- Did the **commodity price boom** contribute to the **global decline of the labor share**?

What We Do

1. Build a **Dutch disease model** ⇒ Set of equations that characterize how **natural resource windfalls** affect **equilibrium factor shares**.
2. **Measure income shares** accruing to **raw labor, human capital, physical capital, and natural resources** for a sample of 47 countries between 1995 and 2010.
3. **Estimate the response** of aggregate and relative factor shares to **changes in commodity prices**.
   i. Two-way fixed effects strategy.
   ii. Differential exposure design ⇒ "shift-share" instrument.
4. **Quantify the effect** of the commodity price boom of the 2000s on the **functional distribution of income**.
   i. Effects on labor and physical capital income shares.
   ii. Redistribution of the labor share in raw labor and human capital.

▸ Model preview ▸ Results preview

Contribution to the Literature

1. **Dutch disease** ⇒ effects on the sectoral composition of output and employment (Corden and Neary, 1982; Corden, 1984; Sachs and Warner, 1995, 2001).
2. **Fall of the labor share** ⇒ new explanation in commodity price booms.
   - Technical change, ICTs, robots and biased innovations (Karabarbounis and Neiman, 2013; Zuleta, 2008; Acemoglu and Restrepo, 2018; Grossman et al., 2021; Peretto and Seater, 2013; Zuleta and Young, 2013).
   - Rising concentration, markups and recomposition of value added (Autor et al., 2017, 2020; Barkai, 2020; De Loecker et al., 2020; Kehrig and Vincent, 2021).
   - Bargaining power of workers (Macpherson, 1990; Fichtenbaum, 2009, 2011; Young and Zuleta, 2013)
   - Measurement (Koh et al., 2020; Gutiérrez and Piton, 2020; Elsby et al., 2013; Rognlie, 2016, 2018).
3. **Resource booms effect on inequality** ⇒ functional distribution of income.
   - Abundance of natural resources favor production in sectors with greater inequality (Leamer et al., 1999; Sokoloff and Engerman, 2000).
   - **The effect of a natural resource boom on the distribution of labor earnings depends crucially on the relative factor intensity between the tradable and non-tradable sectors** (Goderis and Malone, 2011).

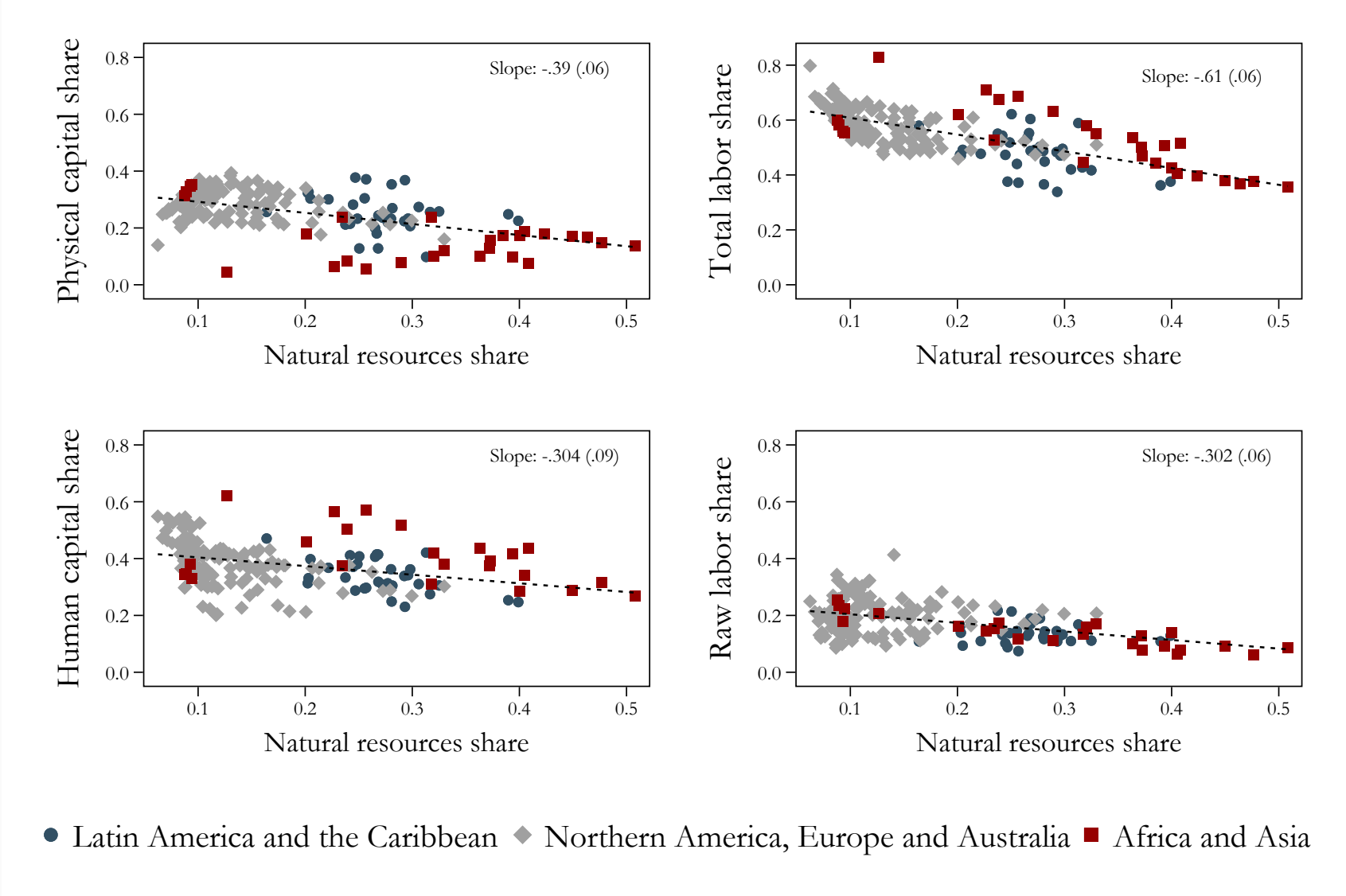
Data and Estimation of Factor Income Shares

Data and Estimation of Factor Income Shares

1. Country and year level estimates of the **total labor share**.
   - Data from UN Yearbook of National Account Statistics.
   - Employee compensation as a share of GDP minus indirect taxes.
   - Adjust for labor income of the self-employed using gross mixed income as in Bernanke and Gürkaynak (2001) and Gollin (2002). Details
2. Separate the total labor share into compensation for **human capital** accumulation and for **raw labor**.
   - Microdata from SEDLAC and LIS to estimate Mincer regressions and recover the raw labor share of wages, as in Krueger (1999). Details
   - What if the microdata is insufficient? Imputation or prediction (GBM).
3. Separate total capital share into **physical capital** and **natural resources** income shares.
   - Measures of the value of natural resources and physical capital stocks from the **World Bank's Wealth of Nation's Database** (WND) (Gylfason, 2001; Caselli and Feyrer, 2007; Bhattacharyya and Hodler, 2010; van der Ploeg, 2011; Sturgill, 2012). Details
   - We follow Caselli and Feyrer (2007) to separate capital income. Details

Evolution of factor shares

Natural Resources Share Correlation with Factor Shares



A Model of Natural Resource Booms and Factor Shares

Model - Production and Factor Income Shares

- **Sectors**: non-tradable (N), tradable (T), and natural resources (R).
- T and N sectors produce consumption goods with **three factors**: **physical capital** (K), **raw labor** (L), and **human capital** (H).
- The R sector output Y_R is a **commodity** produced with K, L and H, plus an exogenous and fixed **natural resources endowment** E.
- Perfect factor mobility and no assumptions on the market structure.
- **Sector-specific** factor income shares:

$$\alpha_{F,S} \equiv \frac{r_F F_S}{P_S Y_S} \quad \text{for} \quad F \in \{K, L, H, E\} \quad \text{and} \quad S \in \{N, T, R\}. \tag{1}$$

- **Share of income** (Y) accruing to each factor:

$$\alpha_F \equiv \frac{r_F F}{Y} = \frac{r_F (F_N + F_T + F_R)}{Y} \quad \text{for} \quad F \in \{K, L, H, E\}, \tag{2}$$

$$\alpha_E \equiv \alpha_{E,R} \cdot \frac{P_R Y_R}{Y}. \tag{3}$$

Model - Consumption

- Agents $i \in \{1, ..., L\}$ have identical preferences

$$U_i = \ln C_{i,T} + \gamma \ln C_{i,N}. \tag{4}$$

- Households supply a unit of L **inelastically** and own H, K and E.
- Agents receive a share (ν_i) of the **rents from natural resources**.
- Each agent i can **own** ν_i of E, or **receive** its rents as a transfer from the government. Regardless, the **theoretical predictions hold**.
- Income from a **fixed endowment of factors**:

$$Y_i = r_H H_i + r_L + r_K K_i + \nu_i \alpha_{E,R} P_R Y_R, \tag{5}$$

with a budget constraint:

$$C_{i,T} + P_N C_{i,N} = Y_i, \tag{6}$$

where P_R and P_N are prices in terms of the tradable good price.

Model - General Equilibrium

Conditions where all agents are **optimizing** and **markets clear**.

1. Market clearing condition: $C_N = Y_N$.
2. P_R is **exogenous**, determined in the **international markets**.

Model - Theoretical Predictions

Equilibrium factor income shares:

$$\alpha_F = \frac{1}{1+\gamma}\left(\gamma\alpha_{F,N} + \alpha_{F,T}\right) + \left(\alpha_{F,R} - \alpha_{F,T}\right)\frac{P_R Y_R}{Y}.$$

- $\alpha_{F,R}$ is the income share of factor F within the R sector.
- $\alpha_{F,T}$ is the income share of factor F within the T sector.
- $\alpha_R \equiv \frac{P_R Y_R}{Y}$ is the natural resources sector share of output.

The **relative factor share** between factors F and F' is given by:

$$\alpha_{F-F'} = \frac{1}{1+\gamma}\left(\gamma\alpha_{F-F',N} + \alpha_{F-F',T}\right) + \left(\alpha_{F-F',R} - \alpha_{F-F',T}\right)\frac{P_R Y_R}{Y}.$$

- $\alpha_{F-F',R}$: relative share of factors F and F' within the R sector.
- $\alpha_{F-F',T}$: relative share of factors F and F' within the T sector.
- Effects **within labor** α_{H-L} and **between labor and capital** α_{Z-K}.

Empirical Strategy

Empirical Strategy

Counterparts of the theoretical equations:

$$\alpha_{Fct} = \eta_c + \phi_{gt} + \beta\alpha_{Ect} + \mathbf{x}'_{ct}\gamma + \epsilon_{ct} \tag{7}$$

$$\alpha_{F-F'ct} = \eta^*_c + \phi^*_{gt} + \beta^*\alpha_{Ect} + \mathbf{x}'_{ct}\gamma^* + \epsilon^*_{ct}, \tag{8}$$

- η_c: country fixed effects.
- ϕ_{gt}: year and group-specific (region/income) flexible time trends.
- $\mathbf{x}_{ct}$: vector of controls (more on this later).
- β's are the **parameters of interest**.
- Estimate the impact over α_Z, α_H, α_L, α_{H-L}, α_K, and α_{Z-K} of a **price-induced** increase in α_E.
- We use α_E as a proxy for $\alpha_R \equiv \frac{P_R Y_R}{Y}$ $\Rightarrow$ recall $\alpha_E \equiv \alpha_{E,R} \cdot \alpha_R$.
- Our **identification challenge** is to **isolate variation** in α_E induced by **exogenous changes** in P_R.

Identification

- We construct a standard **shift-share** instrument for α_E. Details
  - **Shift/shock:** the **upsurge in the price paid by China** for **commodities** included in the natural resources share. Details
  - **Share/exposure:** country's **commodities' exports share** in 1995 weighted by **trade openness** (trade-to-GDP ratio). Details
- **Fixed-effects** account for:
  - Time-invariant unobserved heterogeneity across countries.
  - Flexible time trends that are common within regions/income groups.
- We include **controls** for:
  - Baseline (1995) manufacturing value added $\times$ year FE.
  - Weight of China's exports on each country's imports.
- Strong **first-stage**. Details

The Natural Resource Boom Effect on Factor Shares

Effect on Total Labor Share

	Total Labor Share α_{Zct}					
	OLS	IV	OLS	IV	OLS	IV
	I	II	III	IV	V	VI
Natural resources share α_{Ect}	-1.124***	-0.468***	-1.235***	-0.413*	-1.099***	**-0.415****
	(0.125)	(0.097)	(0.154)	(0.241)	(0.159)	**(0.173)**
F of excluded instruments		37.950		19.892		43.251
Observations	173	171	169	167	169	167
Countries	47	46	46	45	46	45
Country fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓				
Region specific time trend			✓	✓		
Income group specific time trend					✓	✓
Controls	✓	✓	✓	✓	✓	✓
Total labor share α_{Zct} mean	0.56	0.56	0.56	0.56	0.56	0.56
Total labor share α_{Zct} SD	0.09	0.09	0.09	0.09	0.09	0.09
Natural resources share α_{Ect} mean	0.18	0.17	0.18	0.17	0.17	0.17
Natural resources share α_{Ect} SD	0.10	0.10	0.10	0.10	0.10	0.09
Standardized coefficient	-0.11	-0.04	-0.12	-0.04	-0.11	**-0.04**

Effect on Human Capital Share

	Human Capital Share α_{Hct}					
	OLS	IV	OLS	IV	OLS	IV
	I	II	III	IV	V	VI
Natural resources share α_{Ect}	-0.864***	-0.657***	-0.871***	-0.867***	-0.782***	**-0.541*** **
	(0.100)	(0.134)	(0.146)	(0.224)	(0.119)	**(0.191)**
F of excluded instruments		36.058		20.747		39.640
Observations	170	168	166	164	166	164
Countries	46	45	45	44	45	44
Country fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓				
Region specific time trend			✓	✓		
Income group specific time trend					✓	✓
Controls	✓	✓	✓	✓	✓	✓
Human capital share α_{Hct} mean	0.38	0.38	0.38	0.38	0.38	0.38
Human capital share α_{Hct} SD	0.08	0.08	0.08	0.08	0.08	0.08
Natural resources share α_{Ect} mean	0.17	0.17	0.17	0.17	0.17	0.16
Natural resources share α_{Ect} SD	0.09	0.09	0.09	0.09	0.09	0.09
Standardized coefficient	-0.08	-0.06	-0.08	-0.08	-0.07	**-0.05**

Effect on Raw Labor Share

	Raw Labor Share α_{Lct}					
	OLS	IV	OLS	IV	OLS	IV
	I	II	III	IV	V	VI
Natural resources share α_{Ect}	-0.271***	0.195	-0.372***	0.440*	-0.323***	**0.153**
	(0.091)	(0.165)	(0.136)	(0.264)	(0.089)	**(0.165)**
F of excluded instruments		36.058		20.747		39.640
Observations	170	168	166	164	166	164
Countries	46	45	45	44	45	44
Country fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓				
Region specific time trend			✓	✓		
Income group specific time trend					✓	✓
Controls	✓	✓	✓	✓	✓	✓
Raw labor share α_{Lct} mean	0.18	0.18	0.18	0.18	0.18	0.19
Raw labor share α_{Lct} SD	0.06	0.06	0.06	0.06	0.06	0.06
Natural resources share α_{Ect} mean	0.17	0.17	0.17	0.17	0.17	0.16
Natural resources share α_{Ect} SD	0.09	0.09	0.09	0.09	0.09	0.09
Standardized coefficient	-0.03	0.02	-0.04	0.04	-0.03	**0.01**

Effect on Human Capital to Raw Labor Relative Share

	Human Capital to Raw Labor Relative Share α_{H-Lct}					
	OLS	IV	OLS	IV	OLS	IV
	I	II	III	IV	V	VI
Natural resources share α_{Ect}	-0.593***	-0.851***	-0.499**	-1.307***	-0.459***	**-0.694****
	(0.140)	(0.283)	(0.233)	(0.425)	(0.135)	**(0.307)**
F of excluded instruments		36.058		20.747		39.640
Observations	170	168	166	164	166	164
Countries	46	45	45	44	45	44
Country fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓				
Region specific time trend			✓	✓		
Income group specific time trend					✓	✓
Controls	✓	✓	✓	✓	✓	✓
Relative factor share α_{H-Lct} mean	0.20	0.20	0.20	0.20	0.19	0.19
Relative factor share α_{H-Lct} SD	0.12	0.12	0.12	0.12	0.12	0.12
Natural resources share α_{Ect} mean	0.17	0.17	0.17	0.17	0.17	0.16
Natural resources share α_{Ect} SD	0.09	0.09	0.09	0.09	0.09	0.09
Standardized coefficient	-0.06	-0.08	-0.05	-0.12	-0.04	**-0.06**

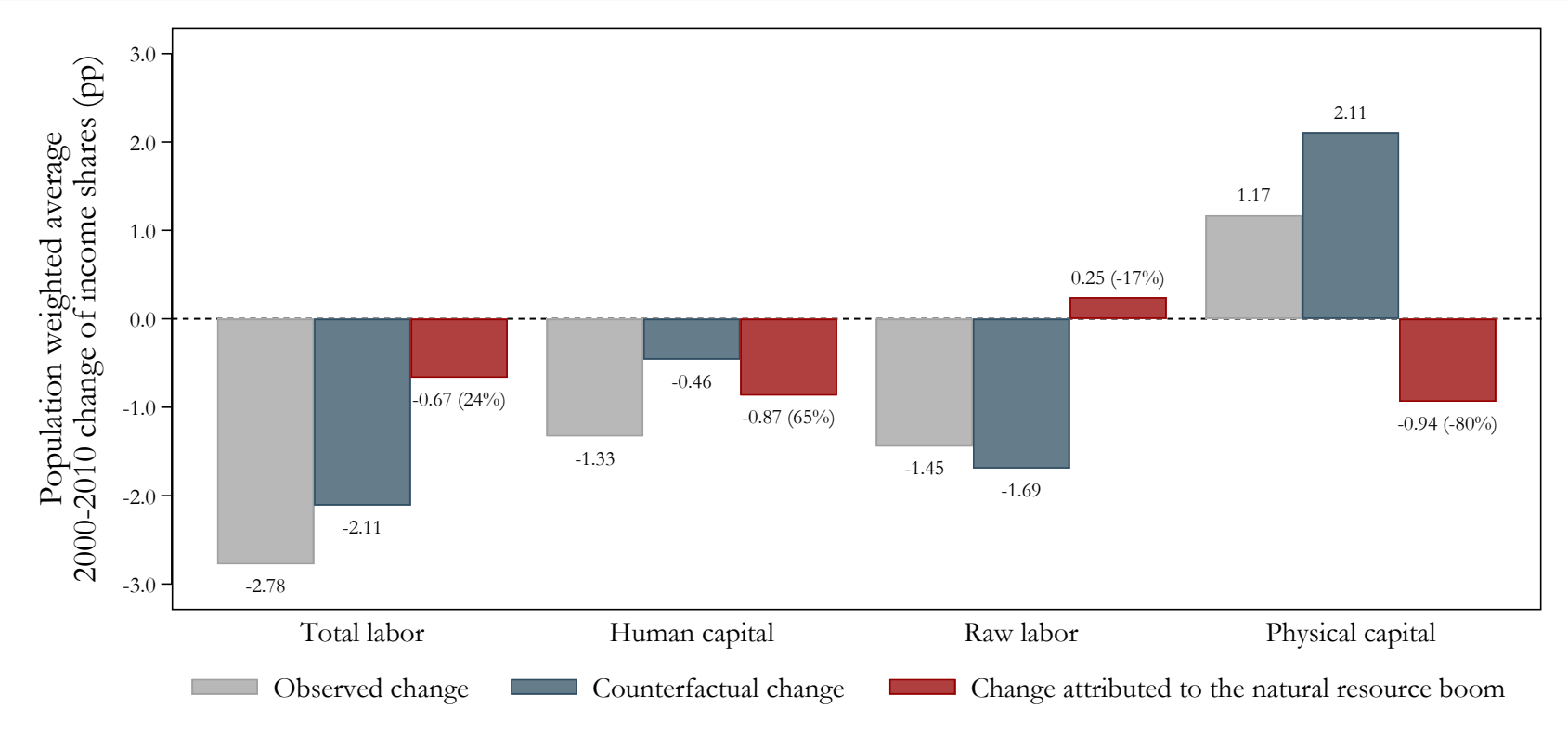
Effect on Physical Capital Share

	Physical Capital Share α_{Kct}					
	OLS	IV	OLS	IV	OLS	IV
	I	II	III	IV	V	VI
Natural resources share α_{Ect}	0.124	-0.532***	0.235	-0.587**	0.099	**-0.585*** **
	(0.125)	(0.097)	(0.154)	(0.241)	(0.159)	**(0.173)**
F of excluded instruments		37.950		19.892		43.251
Observations	173	171	169	167	169	167
Countries	47	46	46	45	46	45
Country fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓				
Region specific time trend			✓	✓		
Income group specific time trend					✓	✓
Controls	✓	✓	✓	✓	✓	✓
Physical capital share α_{Kct} mean	0.26	0.26	0.26	0.26	0.27	0.27
Physical capital share α_{Kct} SD	0.07	0.07	0.07	0.07	0.07	0.06
Natural resources share α_{Ect} mean	0.18	0.17	0.18	0.17	0.17	0.17
Natural resources share α_{Ect} SD	0.10	0.10	0.10	0.10	0.10	0.09
Standardized coefficient	0.01	-0.05	0.02	-0.06	0.01	**-0.06**

Effect on Total Labor to Physical Capital Relative Share

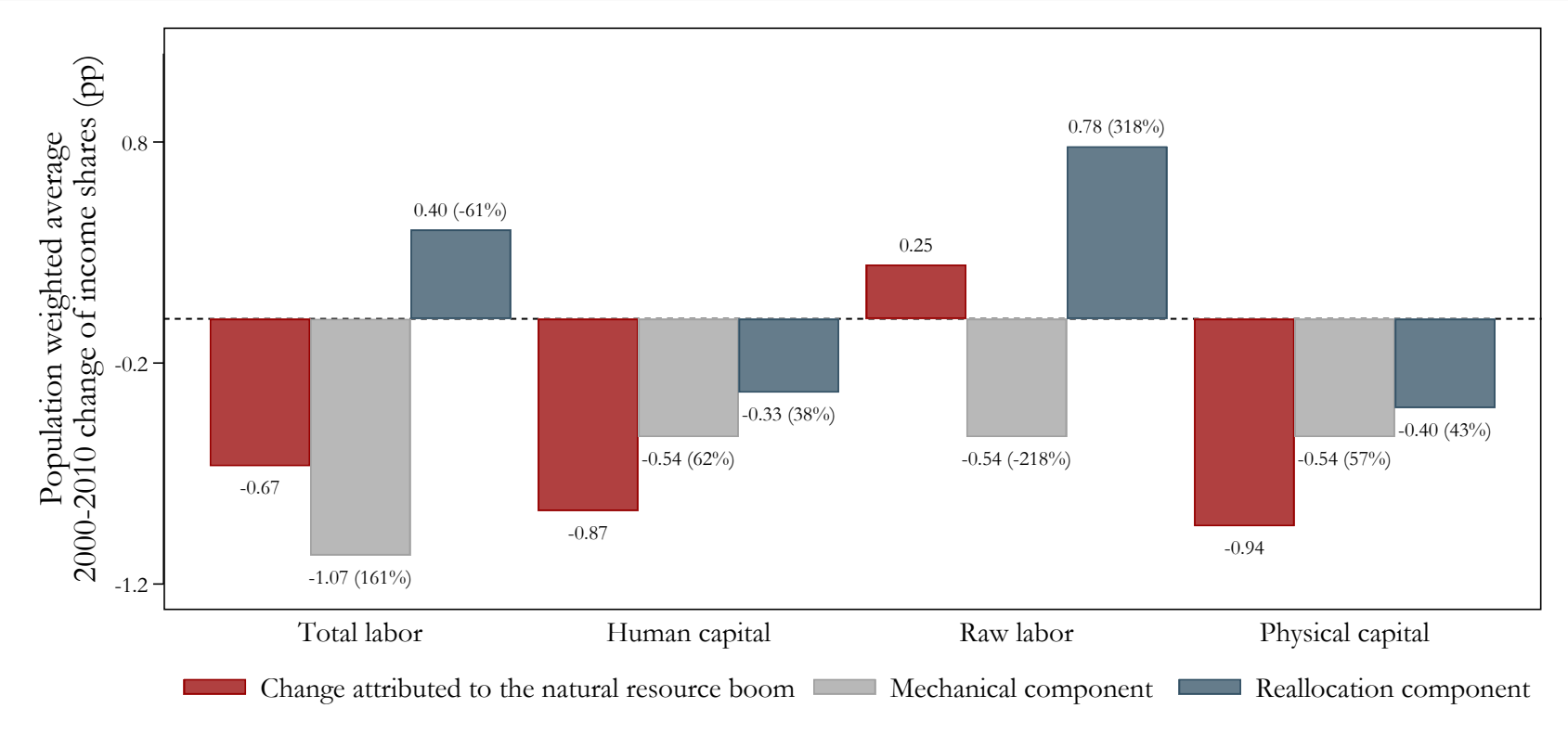
	Total Labor to Physical Capital Relative Share α_{Z-Kct}					
	OLS	IV	OLS	IV	OLS	IV
	I	II	III	IV	V	VI
Natural resources share α_{Ect}	-1.248***	0.064	-1.470***	0.173	-1.198***	**0.169**
	(0.251)	(0.194)	(0.307)	(0.482)	(0.318)	**(0.346)**
F of excluded instruments		37.950		19.892		43.251
Observations	173	171	169	167	169	167
Countries	47	46	46	45	46	45
Country fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓				
Region specific time trend			✓	✓		
Income group specific time trend					✓	✓
Controls	✓	✓	✓	✓	✓	✓
Relative share α_{Z-Kct} mean	0.30	0.30	0.30	0.30	0.29	0.29
Relative share α_{Z-Kct} SD	0.13	0.13	0.13	0.13	0.12	0.12
Natural resources share α_{Ect} mean	0.18	0.17	0.18	0.17	0.17	0.17
Natural resources share α_{Ect} SD	0.10	0.10	0.10	0.10	0.10	0.09
Standardized coefficient	-0.12	0.01	-0.15	0.02	-0.12	**0.02**

Counterfactual



- **Counterfactual:** predicted change in the respective factor share if the **natural resource share was fixed at the level of 2000**.
- The **contribution** of the **natural resource boom** to the **global decline of the labor share** between 2000 and 2010 is about **-0.67** pp, around **24%** of the observed change.

Decomposition: Mechanical and Reallocation Forces



- **Mechanical:** uniform-**homogeneous** compensation.
- **Reallocation:** general equilibrium **heterogeneous** adjustments.
- The **Dutch disease** mechanism that fuels **reallocation** is the explanation for the consequences on **inequality**.

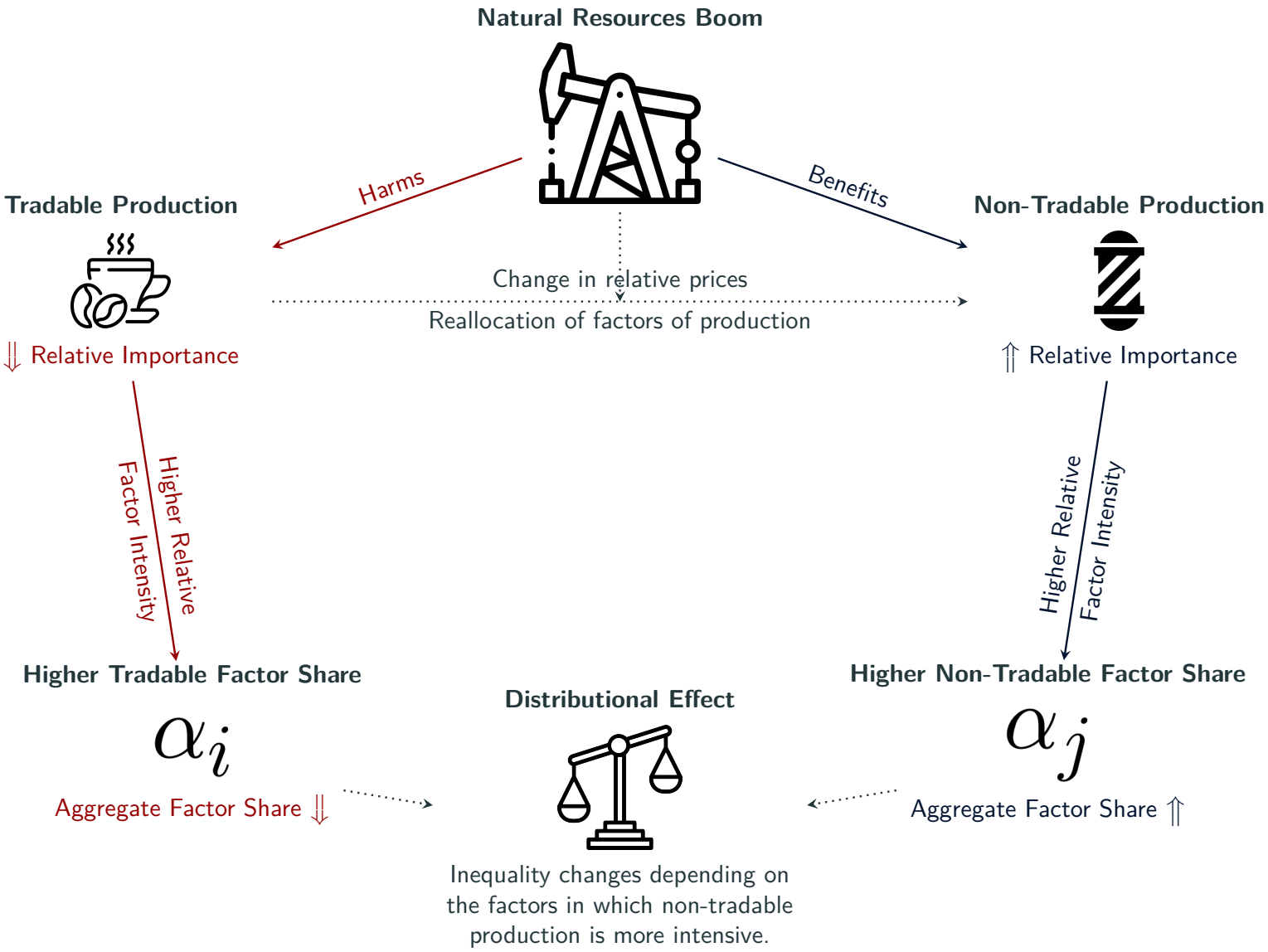
Robustness

Conclusions

- The **commodity price boom** impact on factor shares depends on **the relative intensity of factors in the T and R sectors**.
- A natural resource boom causes a **change in the functional distribution of income**.
  - **Negative effect** on total labor, human capital, and physical capital factor income shares.
  - The raw labor share remains **unchanged**.
  - **Re-distribution effect** in favor of raw labor against human capital $\Rightarrow$ **uneven fall** of the labor share.
  - Total labor and physical capital are affected in **similar magnitudes**.
- The natural resource boom **explains** around **24%** of the global decline of the **total labor share** between 2000 and 2010.
- The commodity price boom **hindered the pace of growth of inequality** through its **redistribution effect** on the total labor share.

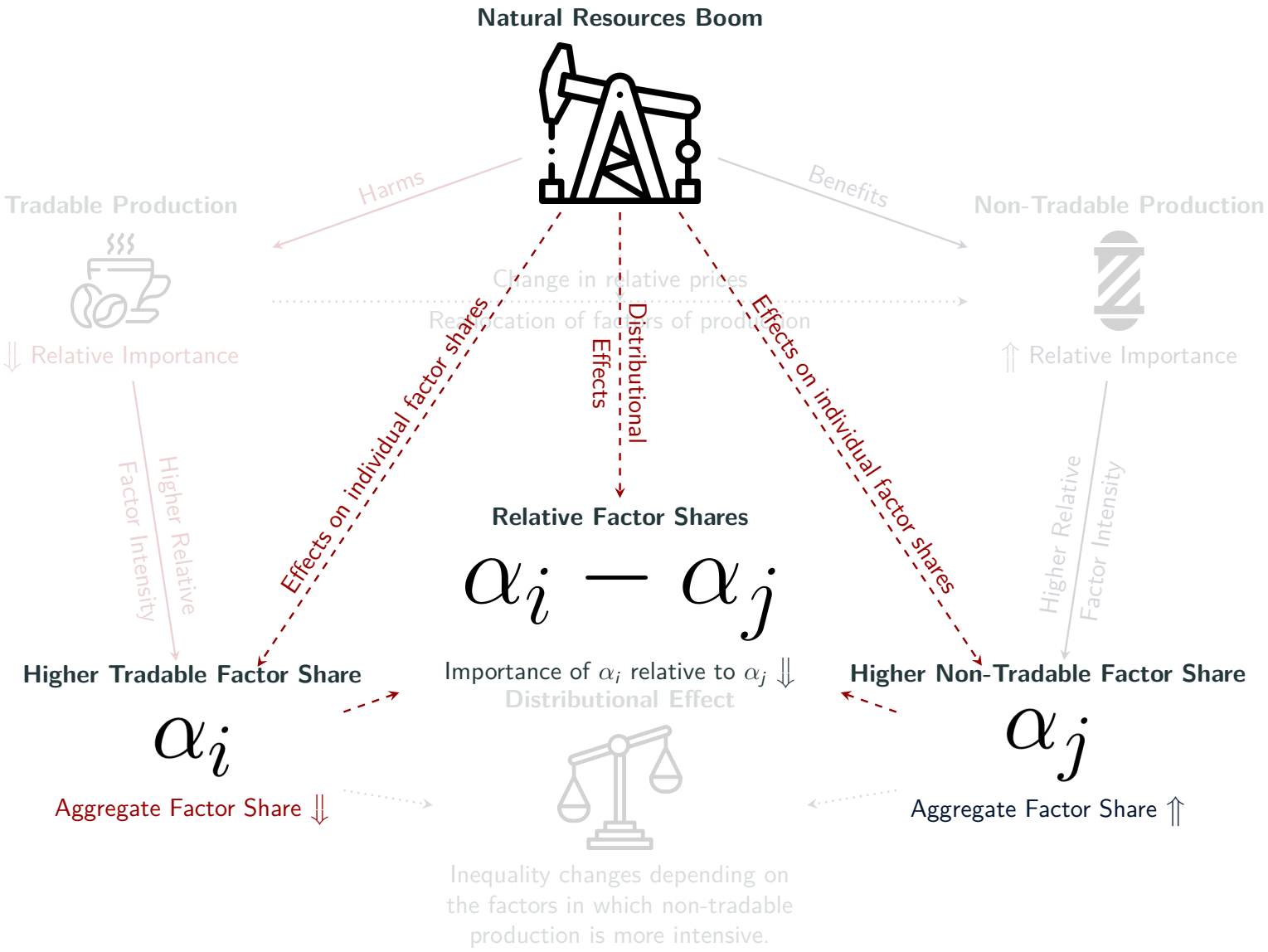
Appendix

Dutch disease Mechanism



What we do

The Effect of a Natural Resource Boom on Factor Shares



What we do

Results Preview

1. A natural resource boom has a **negative effect** on:
   - The **total labor** share.
   - The **human capital** share.
   - The **physical capital** share.
2. **No effect** on the **raw labor share**.
   - Re-distribution effect in favor of raw labor and against human capital.
   - Reduces labor earnings inequality.
3. **No evidence** of a re-distribution effect **in favor of physical capital**.
4. The **contribution** of the natural resource boom to the global decline of the labor share between 2000 and 2010 is -**0.67** pp (**24**%).

What we do

Estimates of Total Labor Share and Total Capital Share

- **Total Labor Share** ($\alpha_Z \equiv \alpha_H + \alpha_L$):

$$\alpha_Z = \left(\frac{\textit{Employee Compensation}}{\textit{GDP- Indirect Taxes - Gross Mixed Income}} \right). \tag{9}$$

- Adjust for self-employed income as in Bernanke and Gürkaynak (2001) and Gollin (2002).

- The **total capital share** ($\alpha_K + \alpha_R$) is

$$\alpha_K + \alpha_R = 1 - \alpha_Z. \tag{10}$$

Source: United Nations Yearbook of National Account Statistics.

Data

Separating Human Capital and Raw Labor Shares

- We estimate a **Mincer regression**:

$$\ln w_i = \beta_0 + \beta_1 S_i^M + \beta_2 S_i^H + \beta_3 O_i^M + \beta_4 O_i^S + \beta_5 E_i + \beta_6 E_i^2 + \varepsilon_i,$$

- Microdata on yearly labor income, education levels, skills classification of tasks, and potential experience for employed workers (20-60).
- Following Krueger (1999), we capture the compensation for low education, no experience and elementary tasks $\hat{\beta}_0$ and compute:

$$\text{Raw Labor Share of Wages} = \frac{\sum_i w_0}{\sum_i w_i} = \frac{e^{\hat{\beta}_0}}{\bar{w}_i}.$$

- The **raw labor share**: $\alpha_L = \text{Raw Labor Share of Wages} \times \underbrace{(\alpha_H + \alpha_L)}_{\alpha_Z}$.
- The **human capital share**: $\alpha_H = \alpha_Z - \alpha_L$.
- What if the microdata is insufficient? Imputation in the wage distribution, or prediction using a GBM algorithm.

Source: microdata from LIS and CEDLAS.

Data

Estimates of Physical Capital and Natural Resources Shares

Assume that the **physical capital share** is a **proportion** of **the total capital share**, determined by the relative value of physical capital stocks to the complete wealth value of total capital (Caselli and Feyrer, 2007).

A. **Natural resources wealth** include subsoil assets, timber resources, nontimber forest resources, protected areas, cropland, and pastureland.

   - **Present value of the stream of expected rents** that can be extracted until the resource is exhausted.
   - Rents are calculated based on asset-specific information on revenues (production and prices) and costs, while the lifetime of each resource is calculated based on the size of reserves and extraction rates.

B. **Physical capital stocks** consists of manufactured or built assets such as machinery, equipment, and physical structures.

   - Historical investment data.
   - Estimates using the **perpetual inventory method**.

Data

Separating Physical Capital and Natural Resources Shares

- We follow Caselli and Feyrer (2007). Let $\tilde{K} \equiv K + Y_R$ and define $r_{\tilde{K}}$ as the **equalized rent** between types of capital.

$$\alpha_K = \frac{r_{\tilde{K}} K}{Y} = \frac{K}{\tilde{K}} \frac{r_{\tilde{K}} \tilde{K}}{Y} \Rightarrow \alpha_K \approx \frac{K}{\tilde{K}} \underbrace{(\alpha_k + \alpha_R)}_{1-\alpha_Z}. \tag{11}$$

- Y_R: energy and mineral resources, agricultural land, forests, and protected areas or reserves.
  - Estimate the value of rents from a particular asset and then capitalize this value using a fixed discount rate.
  - Calculate the lifetime based on the size of reserves, extraction rates and rates of resource replacement.
- K: value of physical capital stocks constructed from historical investment data using the **perpetual inventory method**.

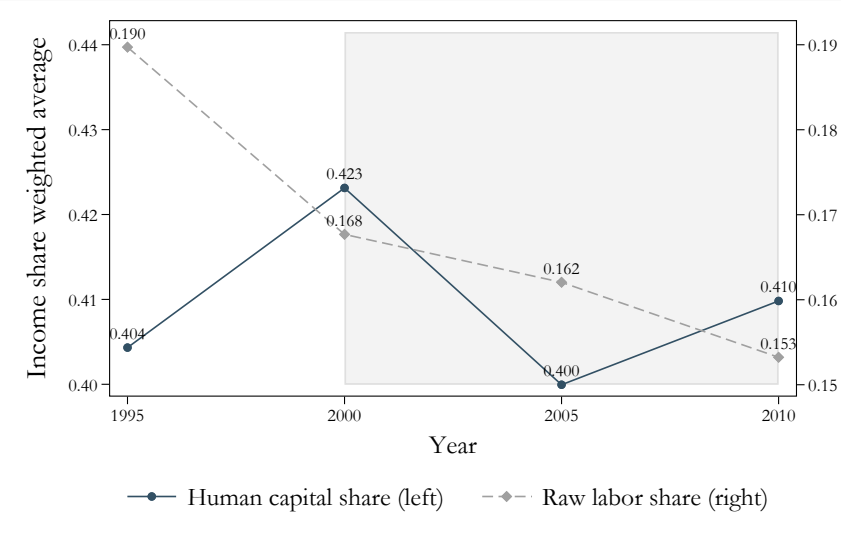
Source: World Bank's Wealth of Nation's Database (The World Bank, 2019).

Data

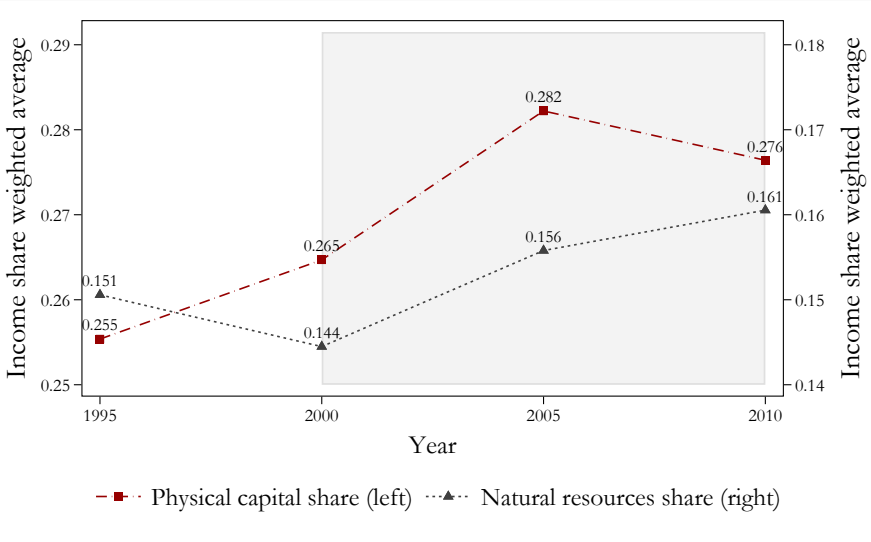
Evolution of Factor Shares Between 1995-2010

- Unbalanced panel of **47 countries** in **1995, 2000, 2005 and 2010**.
- 30 countries in Europe and North America, 10 in Latin America and 7 in either Asia, Africa or Oceania.

(a) Labor related factor shares



(b) Capital related factor shares



How the natural resource boom shaped the patterns in the evolution of factor shares?

Data

Shift-share Instrument

- **The shift/shock:**

$$P_{jt} = \frac{M_{jt}}{Q_{jt}} \tag{12}$$

  - P_{jt}: price perceived by China for imports of commodity j in year t.
  - Price retrieved from China's imports value M_{jt} and quantities Q_{jt}.

- **The share/exposure:**

$$s_{jc} = \frac{X_{jc1995}}{X_{c1995}} \times O_{c1995} \tag{13}$$

  - X_{jc1995}: value of exports by country c of commodity j in 1995.
  - O_{c1995}: trade-to-GDP ratio of country c in 1995.

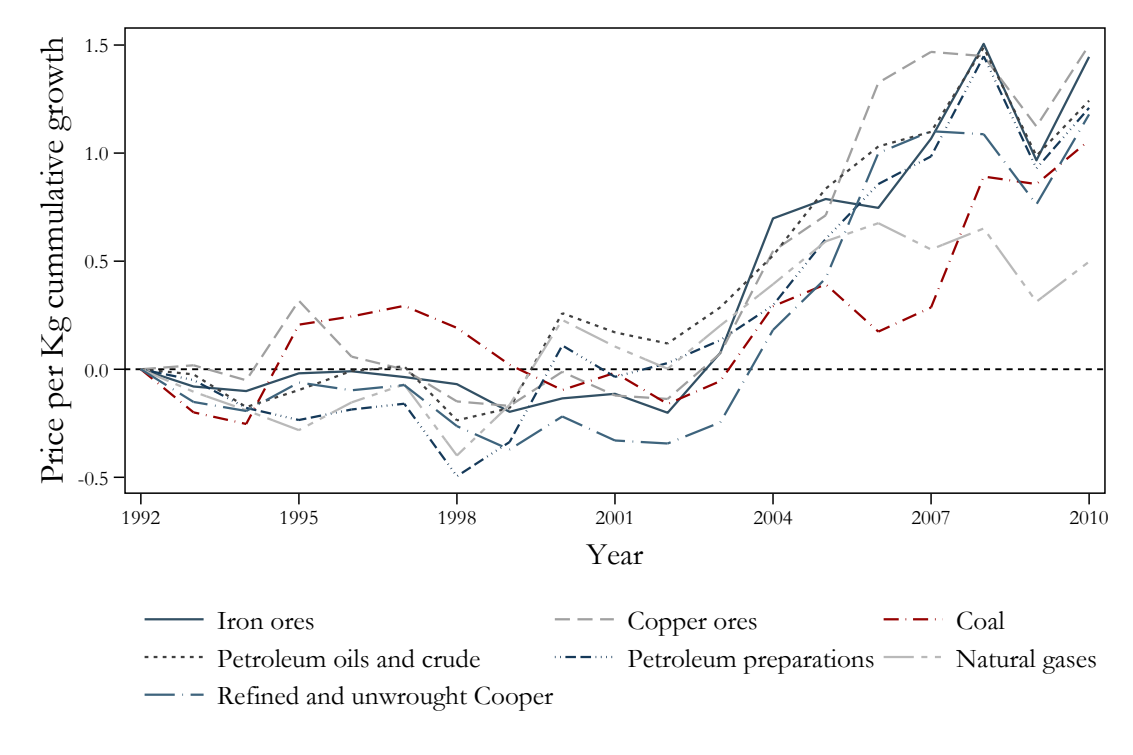
- **The instrument:**

$$B_{ct} = \sum_{J} s_{jc} \times P_{jt} \tag{14}$$

Identification

The Commodity Price Boom and The China Shock

We exploit variation in **commodity prices** to instrument $\alpha_E \equiv \alpha_{E,R} \frac{P_R Y_R}{Y}$.



- **China's demand** for **commodities** was the main driver behind the **prices upsurge** (Erten and Ocampo, 2013; Costa et al., 2016).
- **Unanticipated** and fueled by **internal idiosyncratic conditions** (Autor et al., 2016).

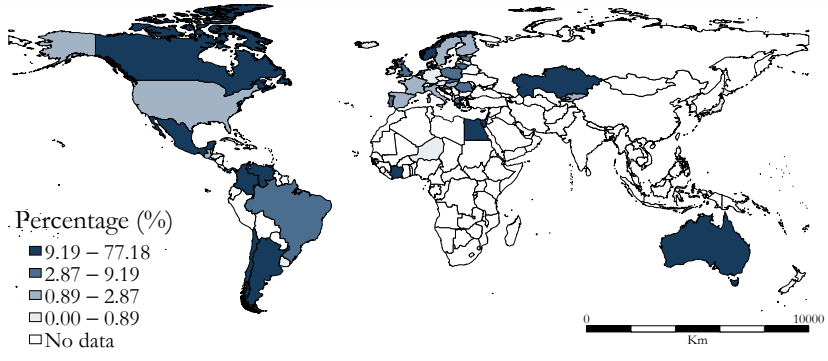
Identification

Exposure to the China Shock

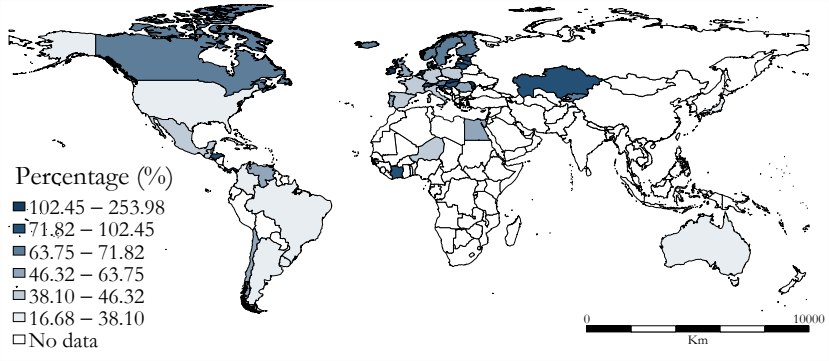
- Differential exposure across countries based on baseline (1995) **export value share** of selected commodities and **trade openness**.
- Trade openness adjusts for countries where commodities are important for exports, but are **poorly connected to international trade flows**.

Expousure to China's Demand for Commodities

(a) Commodities Share of Exports in 1995



(b) Trade-to-GDP ratio in 1995



- **Massive variation** in exposure.

Identification

First Stage

	Natural Resources Share α_{Ect}		
	I	II	III
Commodity prices shift-share instrument B_{ct}	0.228***	0.179***	**0.244*** **
	(0.033)	(0.040)	**(0.035)**
F of excluded instruments	37.950	19.892	**43.251**
Observations	171	167	167
Countries	46	45	45
Country fixed effects	✓	✓	✓
Year fixed effects	✓		
Region specific time trend		✓	
Income group specific time trend			✓
Controls	✓	✓	✓
Natural resources share α_{Ect} mean	0.17	0.17	0.17
Natural resources share α_{Ect} SD	0.10	0.10	0.09
Commodity prices shift-share instrument B_{ct} mean	0.03	0.03	0.03
Commodity prices shift-share instrument B_{ct} SD	0.09	0.09	0.09
Standardized coefficient	0.02	0.02	0.02

Identification

Robustness Checks

Results are qualitatively similar for all the specifications.

1. Measures of human capital and raw labor from Sturgill (2012).
   - Follow Pritchett (2001) and Hall and Jones (1999) to compute the human capital share of wages.
   - Use Barro and Lee (2013) data of the share of workers on each education category and combine it with data of (constant) returns to education from Psacharopoulos and Patrinos (2004).
   - These measures do not need any imputation or prediction method.
2. Measures of the natural resources and physical capital shares following Weil and Wilde (2009) and Zuleta and Sturgill (2015).
   - Compute the natural resources share with data of the mining industry value added and total land rents.
   - Is not necessary to rely in the assumption of equalized rents between types of capital.
3. Instrument using a leave-one-out shock, the cumulative growth of the value imported by China, instead of the corresponding price.

▸ Counterfactuals