Outsourcing, Markups and the Labor Share

Marc Giannoni
FRB Dallas, CEPR

Karel Mertens
FRB Dallas, CEPR

AEA, January 2020

This paper

Labor share decline of 4 pp since the late 1990s ▸ Data

Capital deepening or redistribution of rents (markups ↑)? ▸ Explanations

Our paper discusses implications of **domestic labor outsourcing trends** for empirics of labor shares/markups.

Overview:

- Stylized model of labor outsourcing
- Evidence and implications for labor share decompositions
- Implications for estimating industry markups
- Structural decompositions of the aggregate LS loss since the late 90s

Stylized Model of Outsourcing of Labor

Intermediate and final good sectors:

$$\begin{aligned} M &= A_m L_m \\ Y &= \left(\frac{K}{1-\alpha}\right)^{1-\alpha} \left(\frac{X}{\alpha}\right)^{\alpha} \end{aligned}$$

with task production

$$\ln(X) = \int_0^1 \ln\left(x(i)\right) d(i) \qquad , \qquad x(i) = \begin{cases} z(i)l(i) + m(i) & \text{if } \; i \leq I \\ z(i)l(i) & \text{if } \; i > I \end{cases}$$

where $l(i)$ is labor and $m(i)$ are intermediates purchased to complete task i

$z(i)$ is strictly increasing in $i \in [0, 1]$

Optimal to perform tasks $i > \theta \equiv \min(i^*, I)$ internally, outsource tasks $i \leq \theta$ with threshold i^* such that $P_m = W_y / z(i^*)$

With cost-minimizing outsourcing decisions, the sectoral prod functions are

$$\begin{aligned} Y &= e^{\alpha \int_{\theta}^{1} \ln(z(i))di} \left(\frac{K}{1-\alpha}\right)^{1-\alpha} \left(\frac{M_y}{\alpha\theta}\right)^{\alpha\theta} \left(\frac{L_y}{\alpha(1-\theta)}\right)^{\alpha(1-\theta)} \\ M &= A_m L_m \end{aligned}$$

with θ weakly increasing in $I, A_m, W_y/W_m$ and $1/\mu_m$

Sectoral labor/intermediate shares:

$$\frac{W_y L_y}{P_y Y} = \frac{(1-\theta)\alpha}{\mu_y} \quad , \quad \frac{P_m M}{P_y Y} = \frac{\theta\alpha}{\mu_y} \quad , \quad \frac{W_m L_m}{P_m M} = \frac{1}{\mu_m}$$

Aggregate labor share:

$$\lambda = \frac{W_y L_y + W_m L_m}{P_y Y} = \frac{\alpha}{\mu_y}\left(1 - \left(1 - \frac{1}{\mu_m}\right)\theta\right)$$

$\mu_m = 1$: no aggregate effect of changes in θ

$\mu_m > 1$: labor share declining in θ

In the data, decompositions based on $\lambda = \sum_i w_i^{va} \lambda_i$ show

- small total contribution of changes in value added shares w_i^{va}
- dominating role for declines in (most) industry labor shares λ_i

But: labor outsourcing trends mean $\lambda_i \downarrow$ in many industries, and $w^{va} \uparrow$ for intermediate labor services sectors, with no or little effect on λ.

Quantitatively dominant driver of industry labor shares

Tests of theories of the aggregate decline based on disaggregated data need to take this into account.

▸ Value added decomposition

Evidence for labor outsourcing

1. Employment growth in Professional and Business Services entirely accounted for by occupational reallocation ▸ PBS decomposition
2. Comovement of industry labor and intermediate share trends
3. Input-output evidence on labor substitution along the supply chain

Comovement of industry labor and intermediate share trends

$$\begin{aligned} \frac{W_y L_y}{P_y Y} &= \frac{(1-\theta)\alpha}{\mu_y} \\ \frac{P_m M}{P_y Y} &= \frac{\theta\alpha}{\mu_y} \end{aligned}$$

Testable implications:

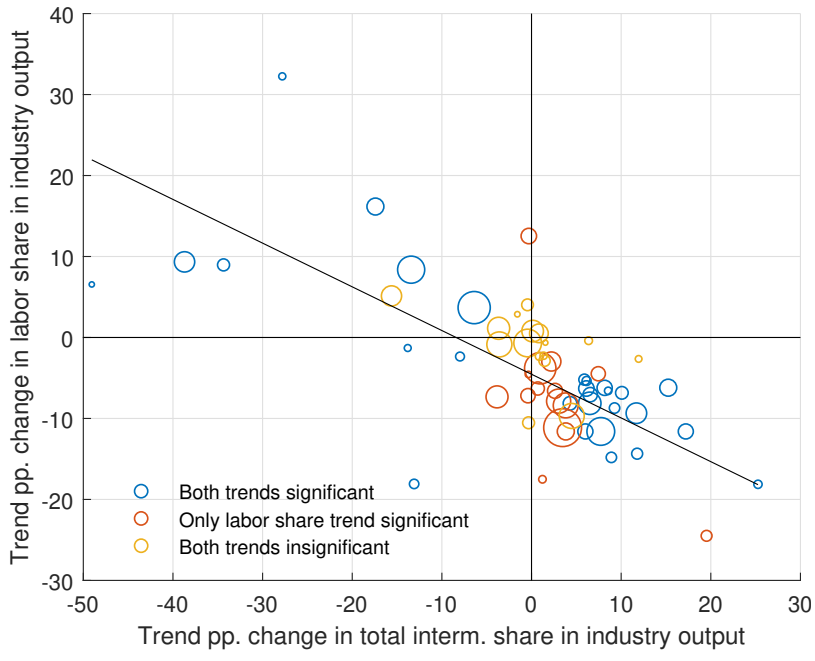
Trends in α/μ_y imply comoving labor/intermediates shares.

Changes in θ imply opposite trends in labor/intermediates shares.

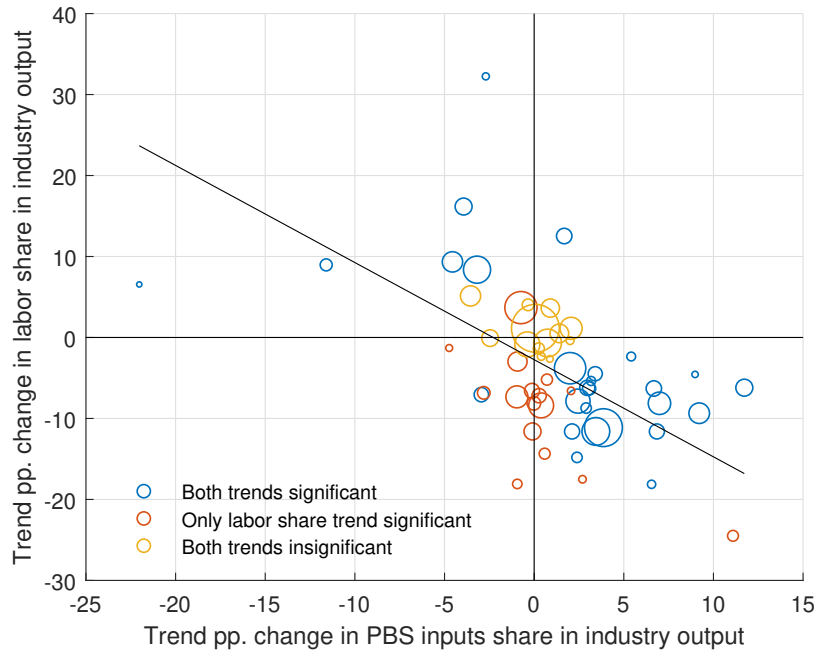
Industry labor and intermediate share trends, 1997-2016

In the data, labor and intermediate shares of gross output comove negatively:

All Intermediate Inputs



Intermediate PBS Inputs

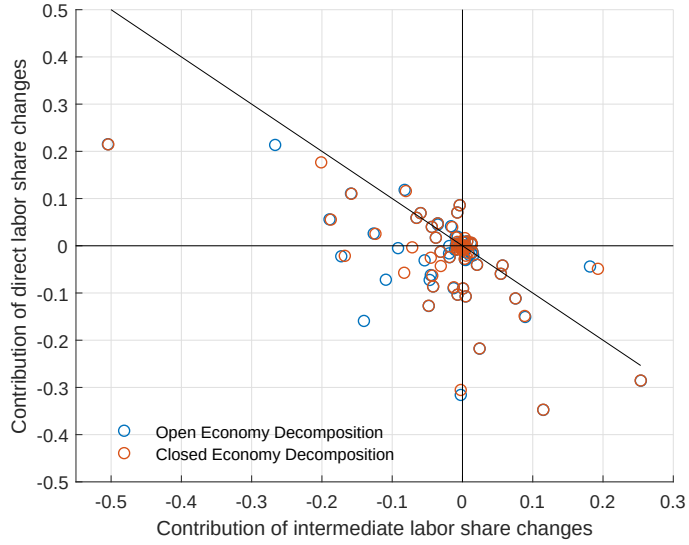


▸ Intermediate Imports

Input-Output Evidence on Labor Substitution Along the Supply Chain

Intermediate labor costs:
Total labor costs incurred in the production network to bring a unit of industry output to its final use

$$\text{aggregate labor share} \quad \lambda = \sum_i w_i^{final\ \ exp.} \left(\lambda_i^{direct} + \lambda_i^{intermediate}\right)$$



Negative industry contributions to aggregate labor share due to decline in labor use at final stage tend to be offset by positive contributions due to increase in indirect labor use through intermediates

▸ Final Use Decomposition ▸ Import Leakage

Outsourcing and Markup Estimation

Markup dynamics are often inferred from cost minimizing conditions associated with variable inputs:

- Labor input margin

  Bils (1987), Rotemberg and Woodford (1999), ... , Nekarda and Ramey (2013)

- Intermediate input margin

  Bils, Klenow and Malin (2018), Kim (2017)

- Cost of goods sold, operating expenses

  De Loecker and Eeckhout (2017), Traina (2018), Crouzet and Eberly (2018)

but labor outsourcing trends can induce spurious markup trends.

Different Regression Approaches

1. Constant markups as in Hall (1986,1988)

$$d \ln Y/K \quad = \quad \mu \left(d \ln(Y/K) - SR \right) + dTFP$$

2. Using labor share

$$d \ln Y/K \quad = \quad \epsilon_L^Y / s_L \left(d \ln(Y/K) - SR \right) + dTFP$$

3. Using intermediate inputs share

$$d \ln Y/K \quad = \quad \epsilon_M^Y / s_M \left(d \ln(Y/K) - SR \right) + dTFP$$

4. Using labor & intermediates share (operating margin)

$$d \ln Y/K \quad = \quad (\epsilon_L^Y + \epsilon_M^Y)/(s_M + s_L) \left(d \ln(Y/K) - SR \right) + dTFP$$

ϵ_j^Y: output elasticity w.r.t input j

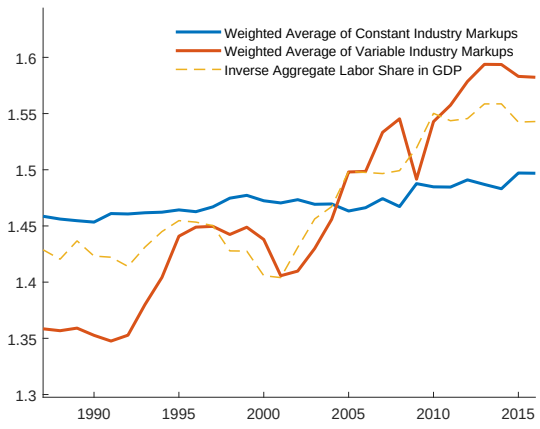
s_j: is cost of j relative to value of production

assumed constant

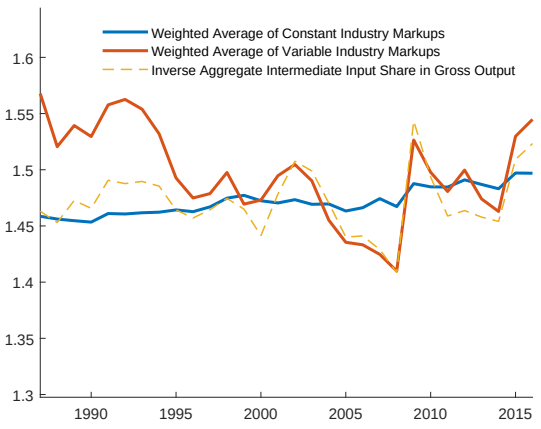
$\epsilon_K^Y + \epsilon_M^Y + \epsilon_L^Y = 1$

Only specifications (1) and (4) are robust to outsourcing trends

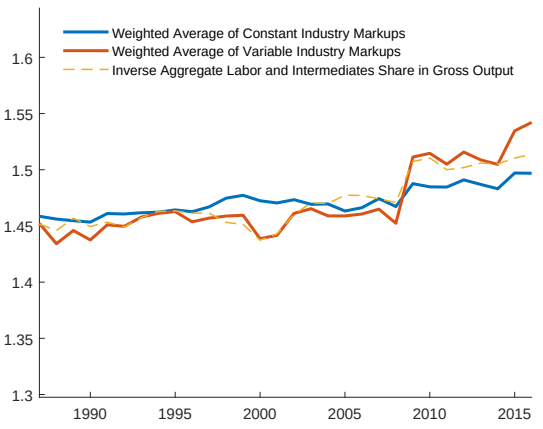
Labor-Based



Intermediates-Based



Operating Margin-Based



KLEMS data 1987-2016 and demand instruments in Hall (2018)

Weighted by value of production

Structural Decompositions of the Aggregate Labor Share Loss, 1997-2016

Defining

$$\mathcal{L} = I - \text{diag}(\mu)^{-1} \quad , \quad \Gamma = (I - \Omega)^{-1}$$

where Ω is the industry input matrix, and assuming cost minimizing conditions

$$\lambda_g = (I - \mathcal{L})E_L \quad \Omega = E_M(I - \mathcal{L})$$

where λ_g is the vector labor shares in g.o., and E_L and E_M are output elasticities with respect to labor and intermediates, leads to

$$\Delta\lambda = \underbrace{(\bar{\lambda}_x - \bar{\lambda})'\Delta\mathbf{w}_x}_{\substack{\text{final use} \\ \text{reallocation}}} + \underbrace{\bar{\lambda}_g'(I - \bar{\Omega})^{-1}\Delta E_M(I - \bar{\mathcal{L}})\bar{\Gamma}\bar{\mathbf{w}}_x}_{\text{use of intermediates}} + \underbrace{\Delta E_L'(I - \bar{\mathcal{L}})\bar{\Gamma}\bar{\mathbf{w}}_x}_{\substack{\text{net labor} \\ \text{intensity}}}$$

$$+ \underbrace{\left(-\bar{\lambda}_g'(I - \bar{\Omega})^{-1}\bar{E}_M - \bar{E}_L'\right)\Delta\mathcal{L}\bar{\Gamma}\bar{\mathbf{w}}_x}_{\text{markups}}$$

$$\text{net labor intensity} = \text{labor intensity} - \text{labor outsourcing to PBS}$$

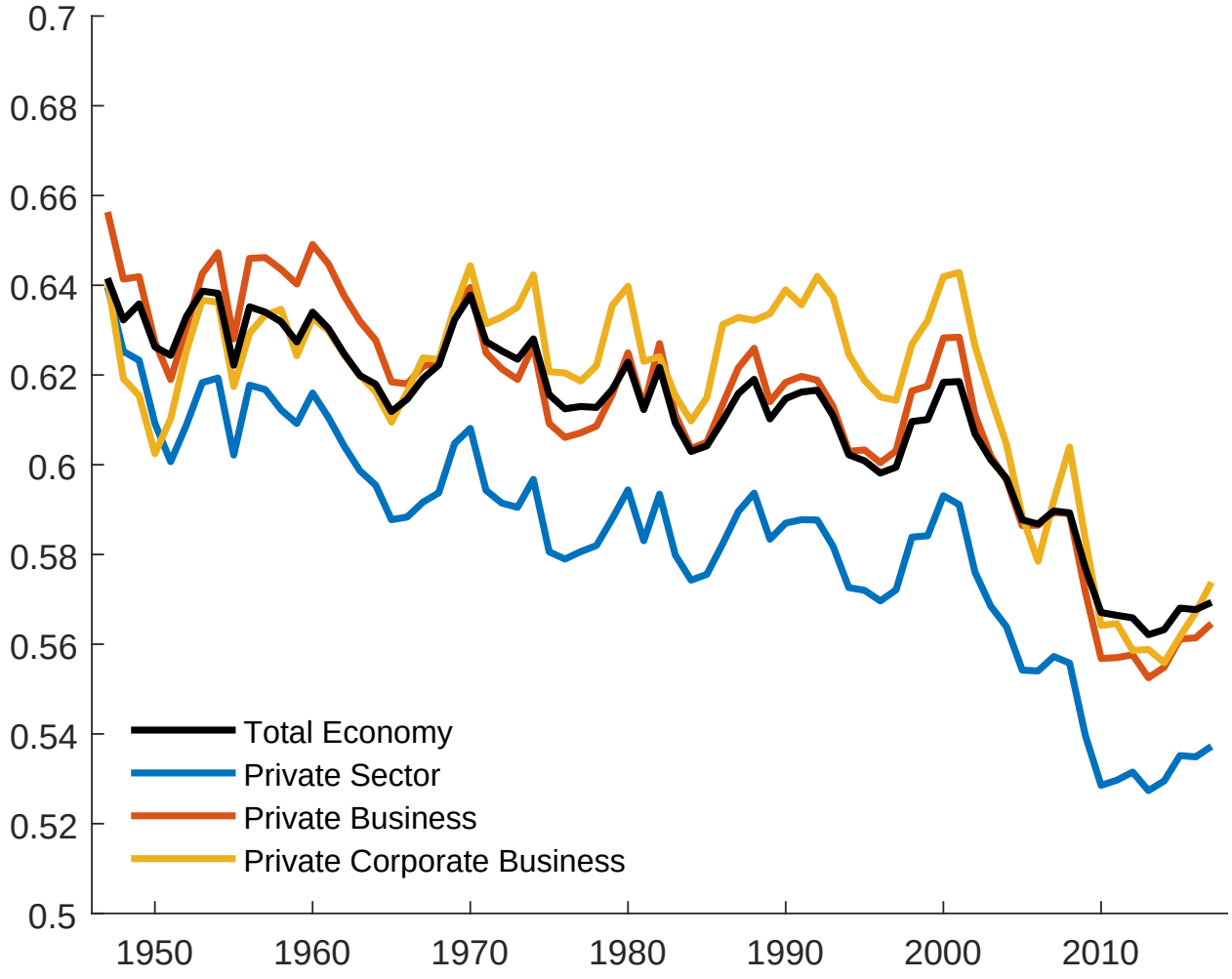
STRUCTURAL DECOMPOSITIONS OF THE AGGREGATE LABOR SHARE CHANGE, 1997-2016
OVERVIEW OF RESULTS

	Assuming Constant Capital Intensities			*Assuming Constant Markups*		
	1997-2008	2009-2016	1997-2016	1997-2009	2009-2016	1997-2016
1. Final Use Reallocation	**−0.28**	**−0.83**	**−1.12**	**−0.28**	**−0.83**	**−1.12**
2. Changes in Interm. Use (excl. PBS)	**−0.29**	**−0.40**	**−0.70**	**−0.09**	**−1.61**	**−1.71**
a) Changes in Interm. Use (Total)	1.02	0.35	1.37	1.28	−1.31	−0.03
b) less: Labor Outsourcing to PBS	1.31	0.76	2.07	1.38	0.31	1.68
3. Changes in Labor Intensities	**−1.79**	**3.41**	**1.61**	**−1.81**	**1.21**	**−0.60**
a) Net Labor Intensities	−3.39	2.48	−0.91	−3.49	0.83	−2.65
b) plus: Labor Outsourcing to PBS	1.59	0.93	2.52	1.68	0.37	2.06
4. Labor Outsourcing Net Effect	**−0.28**	**−0.17**	**−0.45**	**−0.30**	**−0.07**	**−0.37**
5. Markup Changes	**0.16**	**−3.30**	**−3.14**	**−0.00**	**−0.00**	**−0.00**
Total Change in Aggr. Labor Share	**−2.49**	**−1.31**	**−3.79**	**−2.49**	**−1.31**	**−3.79**

▸ Results By Industry

The End

λ: Labor Share in GDP , 1947 to 2017



Note: Proprietor's income imputed using the labor approach, BLS Productivity and Costs.

Back

Explanations

1. Capital deepening
   - Capital-labor substitution, automation:

     Karabarbounis and Neiman (2014), Koh et al. (2016), Acemoglu and Restrepo (2018)
   - Globalization and trade:

     Elsby, Hobijn and Sahin (2013)
   - Composition

     Real estate : Rognlie (2017), Gutierez (2017)

     Capital-intensive superstar firms: Autor et al. (2017), Kehrig and Vincent (2017)

2. Redistribution of rents
   - Decreasing bargaining power of workers

Labor market deregulation	Blanchard and Giavazzi (2003)
Domestic outsourcing	Goldschmidt and Schmieder (2017), Dorn et al. (2018)
Alternative work arrangements	Katz and Krueger (2016)
Demographics	Glover and Short (2018)
   - Increase in market power of firms in product markets

     Barkai (2016), De Loecker and Eeckhout (2017), Gutierez (2017), Eggertson et al. (2018)

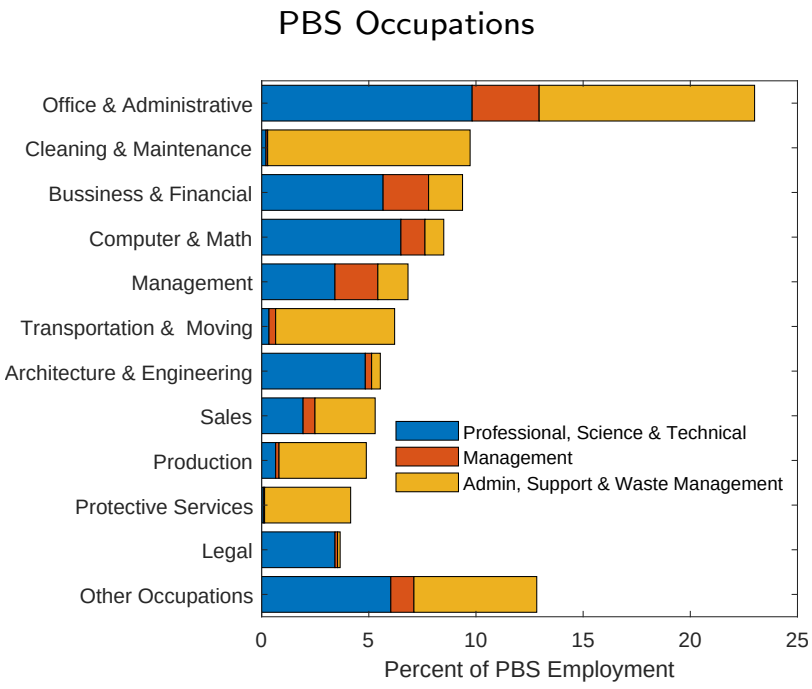
Back

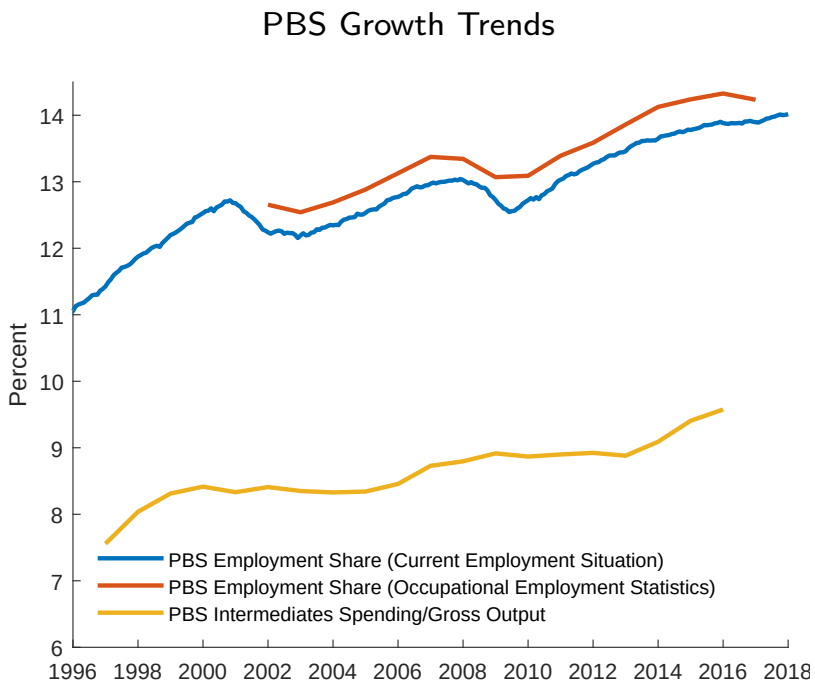
VALUE ADDED DECOMPOSITION OF THE AGGREGATE LABOR SHARE CHANGE: 1997-2016

	Weight in Value Added		*Labor Share in Value Added*		*Value Added Realloc-ation*	*Change in Labor Share*	
	1997	2016	1997	2016	[1]	[2]	Total
All industries	100.0	100.0	63.3	59.6	−0.76	−3.04	−3.79
Private industries	86.7	87.2	61.2	56.7	−0.68	−3.25	−3.93
Agriculture, forestry, fishing, and hunting	1.3	1.0	43.8	43.3	0.08	−0.03	0.05
Mining	1.1	1.4	41.6	31.6	−0.22	−0.00	−0.22
Utilities	2.0	1.5	26.3	30.5	0.15	0.07	0.23
Construction	4.0	4.2	86.2	80.7	0.03	−0.21	−0.18
Manufacturing	16.2	11.8	63.1	51.2	−0.61	−0.79	−1.39
Durable goods	9.7	6.4	68.7	61.8	−0.39	−0.23	−0.62
Nondurable goods	6.6	5.4	54.8	38.7	−0.22	−0.56	−0.78
Wholesale trade	6.1	5.9	67.7	59.2	−0.01	−0.49	−0.50
Retail trade	6.8	5.9	72.8	65.4	−0.05	−0.48	−0.53
Transportation and warehousing	3.1	3.1	70.0	68.4	−0.02	−0.02	−0.04
Information	4.7	4.9	48.0	41.5	0.02	−0.37	−0.35
Finance, insurance and real estate	18.8	20.9	36.0	34.7	−0.59	−0.22	−0.82
Finance and insurance	6.8	7.7	77.0	71.1	−0.04	−0.28	−0.32
Real estate and rental and leasing	12.0	13.2	13.0	13.7	−0.55	0.06	−0.50
Professional and business services	9.8	12.0	91.8	88.8	0.62	−0.31	0.31
Professional, scientific, and technical	5.8	7.1	95.0	90.7	0.36	−0.25	0.11
Management of companies and enterprises	1.5	1.9	83.4	84.8	0.10	0.02	0.12
Administrative and waste management	2.5	3.0	89.4	87.0	0.16	−0.08	0.08
Education and health care	6.7	8.3	61.7	58.9	−0.06	−0.18	−0.24
Educational services	0.8	1.1	28.9	38.3	−0.08	0.09	0.01
Health care and social assistance	5.9	7.2	66.4	62.0	0.01	−0.27	−0.26
Entertainment, accommodation and food	3.5	4.0	64.8	65.0	0.04	−0.01	0.03
Arts, entertainment, and recreation	0.9	1.0	49.4	51.0	−0.02	0.02	0.01
Accommodation and food services	2.6	3.0	70.3	69.8	0.05	−0.03	0.02
Other services, except government	2.7	2.3	83.3	74.7	−0.06	−0.21	−0.27
Addenda:							
Private goods-producing industries [a]	22.6	18.4	65.0	56.1	−0.71	−1.03	−1.74
Private services-producing industries [b]	64.1	68.8	59.9	56.8	0.03	−2.22	−2.19

Back

Professional and Business Services





$$\Delta(E^{PBS}/E) = \underbrace{\sum_j \left(\overline{E_j^{PBS}/E_j} - \overline{E^{PBS}/E}\right)\Delta(E_j/E)}_{\text{occupational reallocation}} + \underbrace{\sum_j (\overline{E_j/E})\Delta(E_j^{PBS}/E_j)}_{\text{within-occupation change in PBS share}}$$

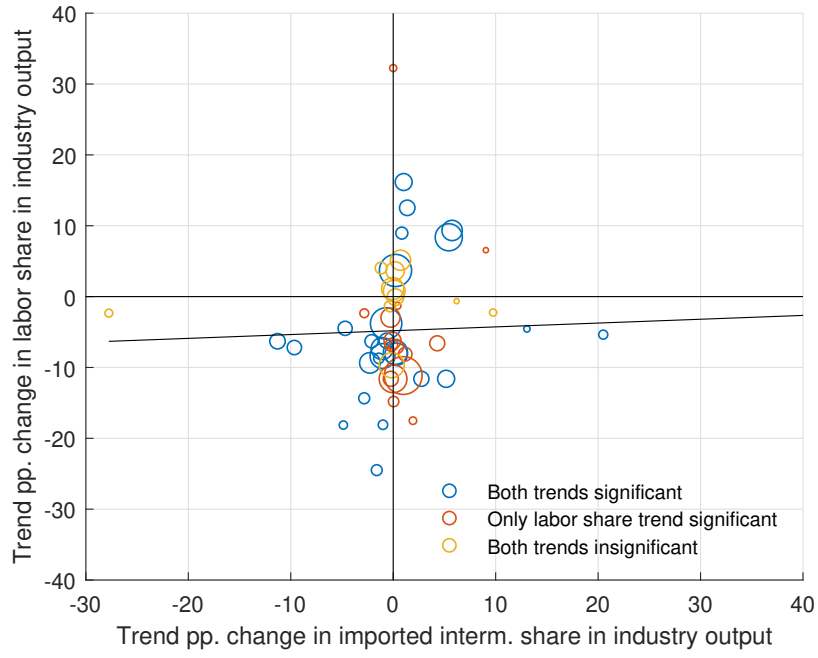
CHANGE IN THE PBS EMPLOYMENT SHARE BY OCCUPATION, 2002-2017

	Share in Total Employment		*Share in PBS Employment*		*Occupation Reallocation*	*Change in PBS Share*	
	2002	2017	2002	2017	[1]	[2]	Total
All Occupations	100.0	100.0	12.7	14.2	0.00	1.57	1.58
Management	5.6	5.1	16.0	21.1	−0.00	0.24	0.24
Business and Financial Operations	3.7	5.2	23.3	30.0	0.20	0.31	0.51
Computer and Mathematical	2.2	3.0	40.1	47.3	0.25	0.18	0.43
Architecture and Engineering	1.9	1.8	37.4	42.5	−0.03	0.09	0.07
Life, Physical, and Social Science	0.8	0.8	29.4	32.0	−0.01	0.02	0.02
Community and Social Service	1.2	1.5	2.7	2.4	−0.03	−0.00	−0.03
Legal	0.7	0.8	62.4	65.3	0.02	0.02	0.04
Education, Training, and Library	6.1	6.1	0.7	1.1	−0.00	0.03	0.03
Arts, Design, Entertainment, Sports, and Media	1.2	1.3	22.6	23.8	0.02	0.02	0.03
Healthcare Practitioners and Technical	4.8	6.0	4.9	4.8	−0.10	−0.01	−0.11
Healthcare Support	2.5	2.9	5.5	4.7	−0.03	−0.02	−0.05
Protective Service	2.3	2.4	22.4	24.4	0.01	0.05	0.05
Food Preparation and Serving Related	7.9	9.3	1.1	0.9	−0.17	−0.01	−0.18
Building and Grounds Cleaning and Maintenance	3.3	3.1	35.9	44.1	−0.06	0.27	0.21
Personal Care and Service	2.2	3.6	3.5	2.6	−0.15	−0.03	−0.17
Sales and Related	10.5	10.2	6.6	7.0	0.02	0.04	0.07
Office and Administrative Support	17.8	15.4	18.0	18.8	−0.12	0.12	0.00
Farming, Fishing, and Forestry	0.3	0.3	7.7	4.7	0.00	−0.01	−0.01
Construction and Extraction	4.8	4.0	5.6	5.7	0.06	0.00	0.06
Installation, Maintenance, and Repair	4.1	3.9	5.2	6.6	0.01	0.05	0.07
Production	8.4	6.3	8.3	10.8	0.09	0.16	0.25
Transportation and Material Moving	7.4	7.0	12.1	12.8	0.01	0.04	0.05

See also Dey et al. (2010), Berlingueri (2014), Dorn et al. (2018), Bloom et al. (2018).

▸ Back

Relation with Trends in Imported Intermediate Input Shares



Back

Intermediate Labor Share

$$\underbrace{\lambda_x}_{\text{labor share in final use}} = \underbrace{\lambda_g}_{\substack{\text{direct labor share} \\ \text{(labor share in gross output)}}} + \underbrace{(I - \Omega')^{-1}\Omega'\lambda_g}_{\text{intermediate labor share}}$$

where Ω is the industry input matrix

Model example:

$$\lambda_x = \underbrace{\begin{bmatrix}(1-\theta)\alpha/\mu_y \\ 1/\mu_m\end{bmatrix}}_{\text{direct labor share}} + \underbrace{\begin{bmatrix}\alpha\theta/\mu_y/\mu_m \\ 0\end{bmatrix}}_{\text{intermediate labor share}} = \begin{bmatrix}\lambda \\ 1/\mu_m\end{bmatrix}$$

Back

Final Use Decomposition

$$\Delta\lambda \quad = \quad \underbrace{\sum_i (\bar{\lambda}_i^x - \bar{\lambda})\Delta w_i^x}_{\substack{\text{final use} \\ \text{reallocation} \\ \text{contribution}}} + \underbrace{\sum_i \bar{w}_i^x \Delta\lambda_i^{x,direct}}_{\substack{\text{direct} \\ \text{labor share} \\ \text{contribution}}} + \underbrace{\sum_i \bar{w}_i^x \Delta\lambda_i^{x,interm}}_{\substack{\text{intermediate} \\ \text{labor share} \\ \text{contribution}}}$$

See also Baquee (2013).

FINAL USE DECOMPOSITION OF $\Delta\lambda$ IN THE MODEL EXAMPLE

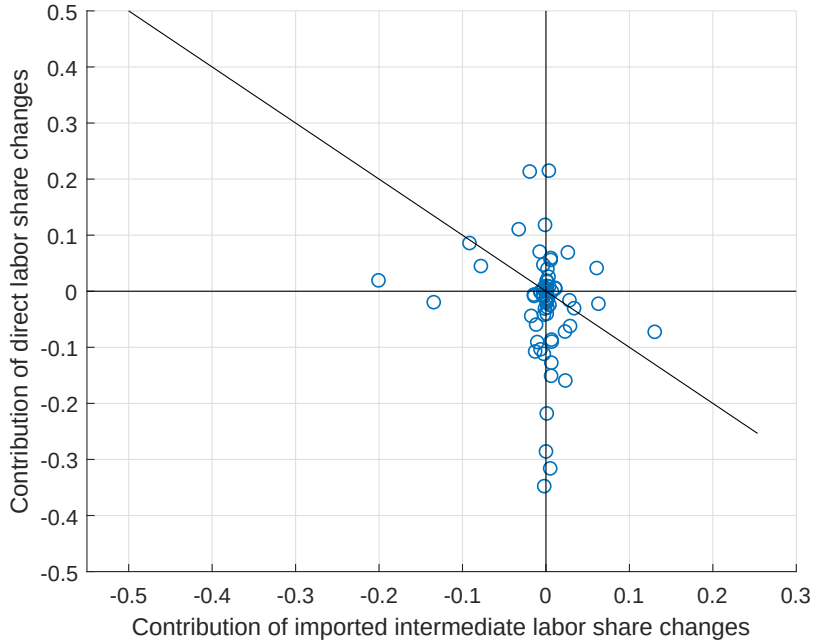
	Final Use Reallocation	*Direct Labor Share Change*	*Intermediate Labor Share Change*
	[1]	[2]	[3]
Final industry	0	$\overline{1/\mu_y}\Delta(\alpha(1-\theta)) + \overline{\alpha(1-\theta)}\Delta(1/\mu_y)$	$\overline{1/\mu_m}\ \overline{1/\mu_y}\Delta(\alpha\theta) + \left(\overline{1/\mu_m}\ \overline{\alpha\theta}\right)\Delta(1/\mu_y) + \overline{\alpha\theta/\mu_y}\Delta(1/\mu_m)$
Intermediate industry	0	0	0

FINAL USE DECOMPOSITION OF THE AGGREGATE LABOR SHARE CHANGE: 1997-2016

	Weight in Final Demand		*Final Use Realloc-ation*	*Direct Labor Share Change*	*Indirect Labor Share Change*	
	1997	2016	[1]	[2]	[3]	Total
All industries	100.0	100.0	−1.12	−1.50	−1.18	−3.79
Private industries	82.8	82.5	−1.13	−1.39	−1.21	−3.72
Agriculture, forestry, fishing, and hunting	0.6	0.4	0.01	−0.03	0.01	−0.00
Mining	−0.3	−0.0	−0.19	−0.02	0.17	−0.04
Utilities	1.4	1.1	0.08	0.06	−0.07	0.07
Construction	7.2	6.3	−0.10	0.21	−0.50	−0.39
Manufacturing	16.2	11.2	−0.47	−0.01	−0.58	−1.06
Durable goods	9.4	5.2	−0.26	0.06	−0.32	−0.52
Nondurable goods	6.8	6.0	−0.22	−0.07	−0.26	−0.55
Wholesale trade	4.4	4.7	0.02	−0.31	−0.00	−0.29
Retail trade	8.5	7.9	−0.02	−0.67	0.19	−0.50
Transportation and warehousing	2.3	2.0	0.01	0.00	−0.06	−0.04
Information	4.2	4.5	−0.04	−0.10	−0.22	−0.35
Finance, insurance and real estate	16.4	17.9	−0.48	−0.03	−0.16	−0.67
Finance and insurance	5.3	5.8	0.00	−0.08	−0.22	−0.30
Real estate and rental and leasing	11.1	12.1	−0.48	0.05	0.07	−0.37
Professional and business services	4.3	4.9	0.12	0.03	−0.13	0.02
Professional, scientific, and technical	3.8	4.4	0.11	0.05	−0.13	0.03
Management of companies and enterprises	0.0	0.1	0.00	−0.00	0.00	0.00
Administrative and waste management	0.4	0.5	0.01	−0.01	0.00	−0.00
Education and health care	10.2	13.5	−0.09	−0.34	0.17	−0.26
Educational services	1.1	1.5	−0.08	0.07	−0.01	−0.01
Health care and social assistance	9.1	11.9	−0.01	−0.41	0.18	−0.25
Entertainment, accommodation and food	4.8	5.4	0.02	0.03	−0.06	−0.02
Arts, entertainment, and recreation	1.1	1.2	−0.01	−0.03	0.03	−0.02
Accommodation and food services	3.8	4.2	0.03	0.06	−0.09	−0.00
Other services, except government	2.6	2.7	0.01	−0.22	0.02	−0.18
Addenda:						
Private goods-producing industries [a]	23.6	17.9	−0.76	0.16	−0.90	−1.50
Private services-producing industries [b]	59.1	64.6	−0.37	−1.55	−0.31	−2.22

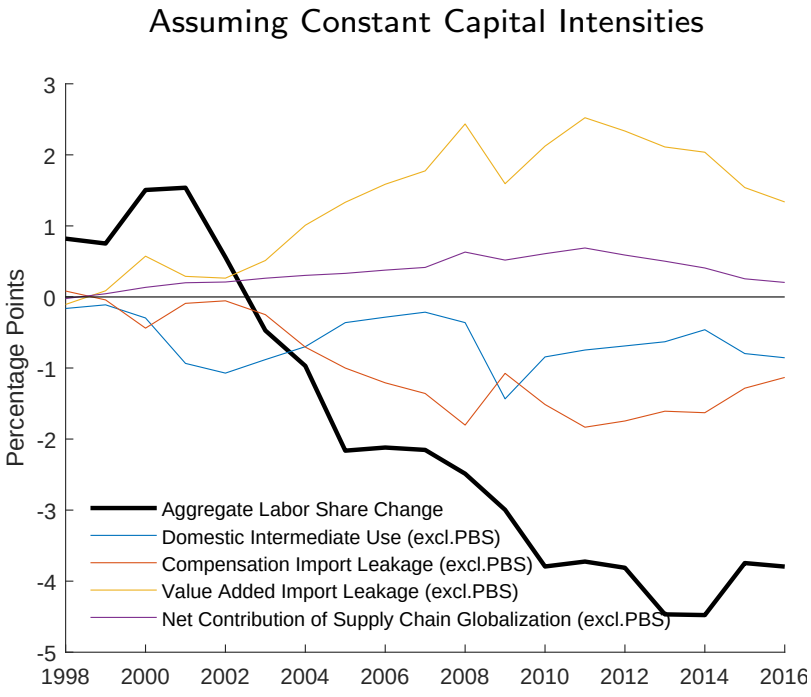
Back

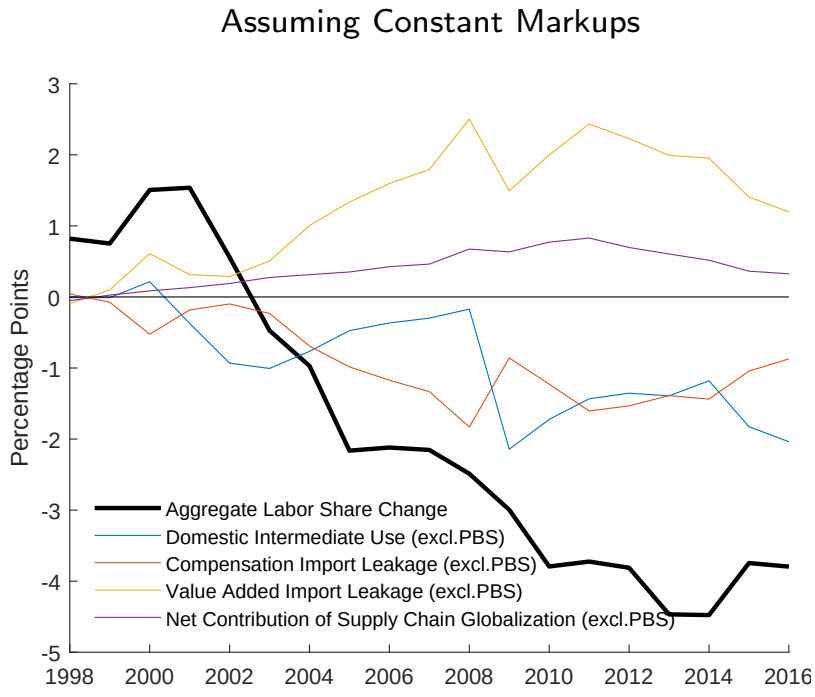
Labor Share Import Leakage Contributions



Back

Role of Supply Chain Globalization, 1997-2016





Back

STRUCTURAL DECOMPOSITION OF THE AGGREGATE LABOR CHANGE: 1997-2016
CONSTANT CAPITAL INTENSITIES

	Final Use Realloc-ation	*Labor Inten-sity*	*Labor Out-sourcing*	*Net Labor Inten-sity*	*Use of Industry Inter-mediates*	*Markup*	
	[1]	[2]	[3]	[2] − [3]	[4]	[5]	Total
All industries	−1.12	1.61	2.52	−0.91	1.37	−3.14	−3.79
Private industries	−1.13	1.30	2.09	−0.79	1.48	−3.14	−3.58
Agriculture, forestry, fishing, and hunting	0.01	0.02	0.01	0.01	−0.06	0.01	−0.02
Mining	−0.19	0.19	0.05	0.14	−0.11	−0.09	−0.25
Utilities	0.08	0.12	−0.01	0.14	−0.09	0.03	0.15
Construction	−0.10	0.51	0.10	0.40	0.17	−0.26	0.21
Manufacturing	−0.47	0.61	0.52	0.09	−1.26	−0.92	−2.57
Durable goods	−0.26	0.58	0.30	0.28	−0.65	−0.40	−1.02
Nondurable goods	−0.22	0.03	0.22	−0.19	−0.61	−0.52	−1.54
Wholesale trade	0.02	−0.19	0.16	−0.35	0.03	−0.27	−0.57
Retail trade	−0.02	−0.38	0.28	−0.67	0.02	−0.13	−0.80
Transportation and warehousing	0.01	−0.05	0.01	−0.06	0.28	−0.09	0.14
Information	−0.04	−0.04	−0.01	−0.03	0.01	−0.46	−0.51
Finance, insurance and real estate	−0.48	0.32	0.08	0.24	0.58	−0.68	−0.34
Finance and insurance	0.00	0.23	−0.03	0.26	0.43	−0.78	−0.09
Real estate and rental and leasing	−0.48	0.09	0.11	−0.02	0.15	0.10	−0.25
Professional and business services	0.12	0.01	0.09	−0.09	2.07	−0.30	1.80
Professional, scientific, and technical	0.11	0.29	0.08	0.21	0.69	−0.30	0.71
Management of companies and enterprises	0.00	−0.21	0.00	−0.21	0.78	0.04	0.62
Administrative and waste management	0.01	−0.07	0.01	−0.09	0.60	−0.04	0.48
Education and health care	−0.09	0.10	0.43	−0.32	0.00	−0.02	−0.43
Educational services	−0.08	0.11	0.04	0.08	0.02	0.01	0.03
Health care and social assistance	−0.01	−0.01	0.39	−0.40	−0.02	−0.03	−0.46
Entertainment, accommodation and food	0.02	0.31	0.27	0.04	0.09	0.01	0.16
Arts, entertainment, and recreation	−0.01	−0.04	0.04	−0.07	0.04	0.08	0.03
Accommodation and food services	0.03	0.35	0.24	0.11	0.06	−0.06	0.13
Other services, except government	0.01	−0.23	0.10	−0.33	−0.25	0.02	−0.55
Addenda:							
Private goods-producing industries [a]	−0.76	1.32	0.68	0.64	−1.26	−1.26	−2.63
Private services-producing industries [b]	−0.37	−0.02	1.41	−1.43	2.73	−1.88	−0.95

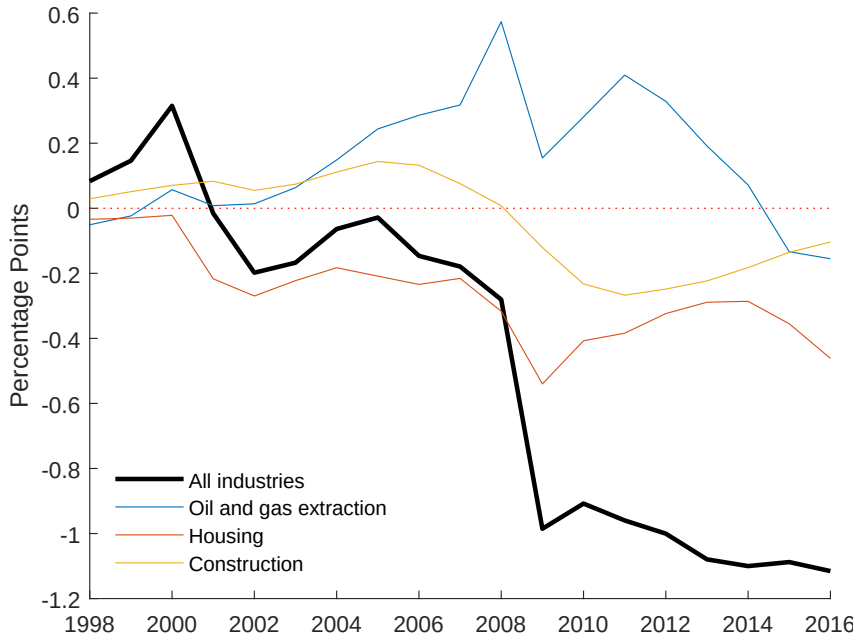
Back

STRUCTURAL DECOMPOSITION OF THE AGGREGATE LABOR CHANGE: 1997-2016
CONSTANT MARKUPS

	Final Use Realloc-ation	*Labor Inten-sity*	*Labor Out-sourcing*	*Net Labor Inten-sity*	*Use of Industry Inter-mediates*	*Markup*	
	[1]	[2]	[3]	[2] − [3]	[4]	[5]	Total
All industries	−1.12	−0.60	2.06	−2.65	−0.03	−0.00	−3.79
Private industries	−1.13	−0.87	1.66	−2.53	0.13	−0.00	−3.53
Agriculture, forestry, fishing, and hunting	0.01	0.02	0.01	0.01	−0.08	−0.00	−0.06
Mining	−0.19	0.15	0.05	0.11	−0.14	−0.00	−0.23
Utilities	0.08	0.10	−0.01	0.12	−0.10	−0.00	0.09
Construction	−0.10	0.32	0.07	0.25	0.13	−0.00	0.28
Manufacturing	−0.47	0.10	0.39	−0.29	−1.53	−0.00	−2.29
Durable goods	−0.26	0.30	0.24	0.06	−0.80	−0.00	−1.00
Nondurable goods	−0.22	−0.20	0.15	−0.35	−0.72	−0.00	−1.29
Wholesale trade	0.02	−0.41	0.12	−0.53	−0.06	−0.00	−0.57
Retail trade	−0.02	−0.51	0.25	−0.76	−0.00	−0.00	−0.78
Transportation and warehousing	0.01	−0.10	0.01	−0.10	0.20	−0.00	0.11
Information	−0.04	−0.36	−0.08	−0.28	−0.05	−0.00	−0.37
Finance, insurance and real estate	−0.48	−0.10	0.04	−0.14	0.27	−0.00	−0.34
Finance and insurance	0.00	−0.22	−0.09	−0.13	0.14	−0.00	0.01
Real estate and rental and leasing	−0.48	0.12	0.13	−0.00	0.13	−0.00	−0.36
Professional and business services	0.12	−0.23	0.07	−0.30	1.68	−0.00	1.50
Professional, scientific, and technical	0.11	0.06	0.05	0.01	0.52	−0.00	0.64
Management of companies and enterprises	0.00	−0.18	0.00	−0.18	0.68	−0.00	0.50
Administrative and waste management	0.01	−0.11	0.01	−0.12	0.48	−0.00	0.37
Education and health care	−0.09	0.05	0.39	−0.34	−0.00	−0.00	−0.44
Educational services	−0.08	0.11	0.03	0.08	0.02	−0.00	0.02
Health care and social assistance	−0.01	−0.06	0.36	−0.42	−0.02	−0.00	−0.46
Entertainment, accommodation and food	0.02	0.30	0.26	0.04	0.07	−0.00	0.13
Arts, entertainment, and recreation	−0.01	0.01	0.04	−0.03	0.03	−0.00	−0.01
Accommodation and food services	0.03	0.29	0.22	0.07	0.04	−0.00	0.14
Other services, except government	0.01	−0.22	0.09	−0.32	−0.26	−0.00	−0.56
Addenda:							
Private goods-producing industries [a]	−0.76	0.59	0.52	0.07	−1.62	−0.00	−2.30
Private services-producing industries [b]	−0.37	−1.47	1.14	−2.61	1.74	−0.00	−1.23

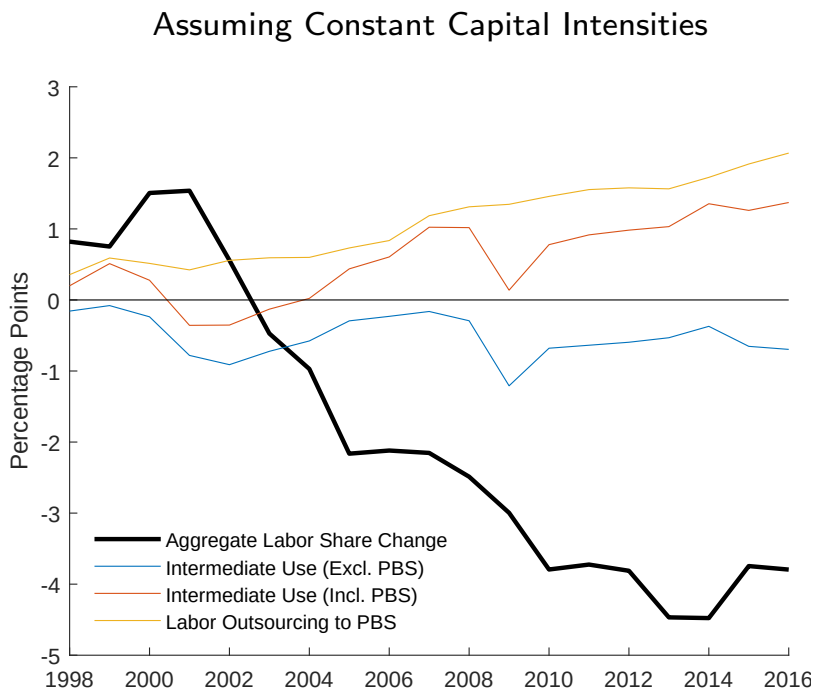
Back

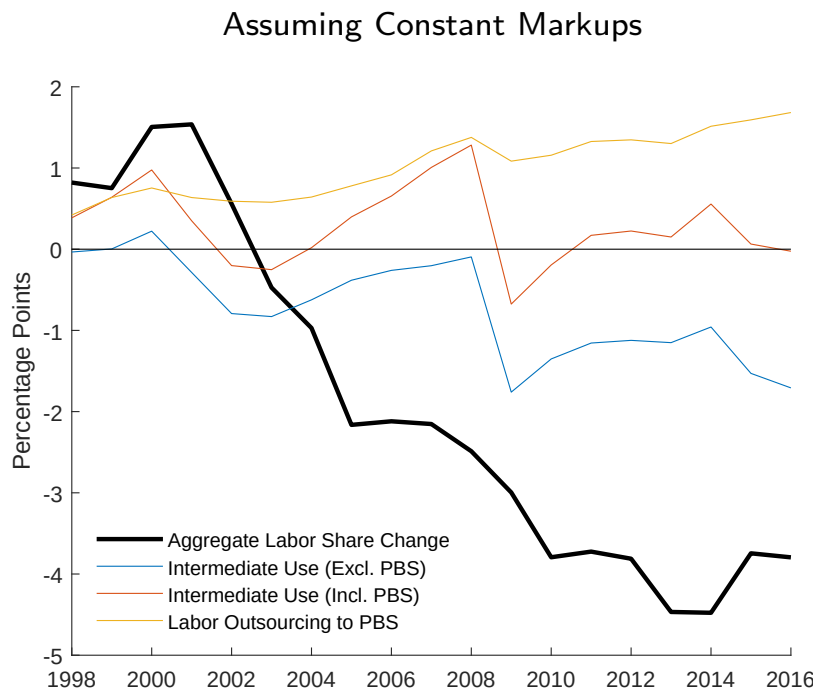
Role of Reallocation in Final Expenditures, 1997-2016



▸ Results By Industry

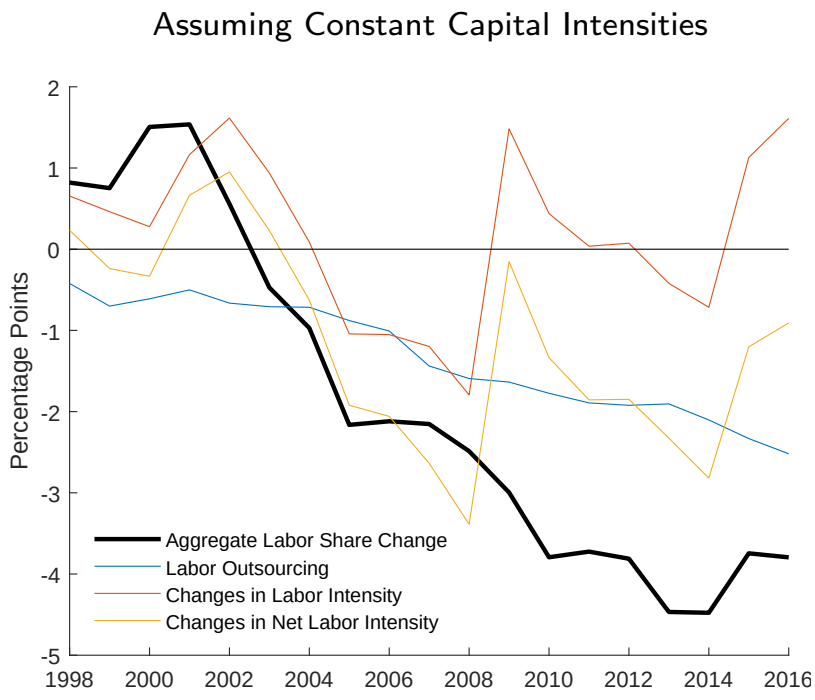
Role of Changes in the Use of Intermediates, 1997-2016

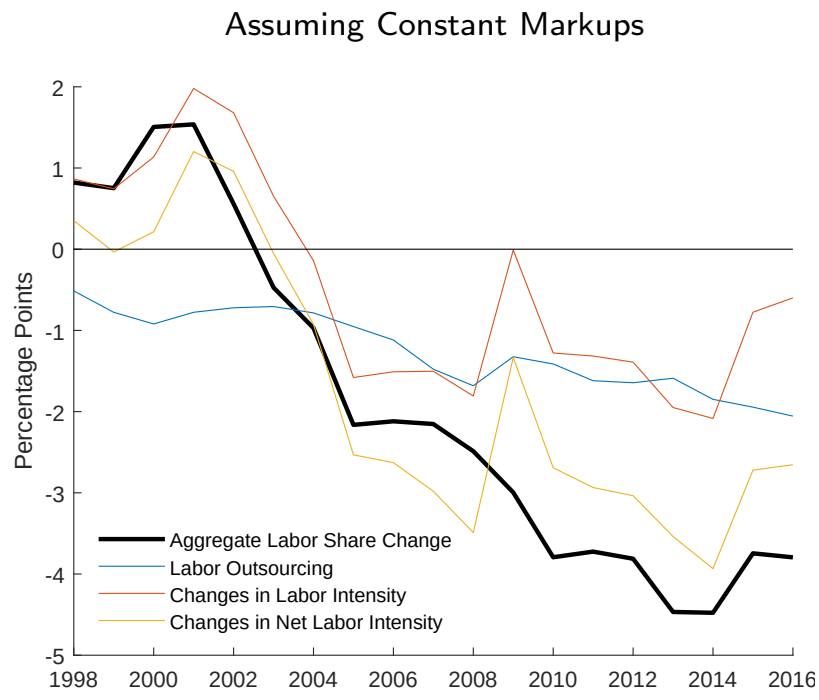




▸ Global Supply Chains ▸ Results By Industry

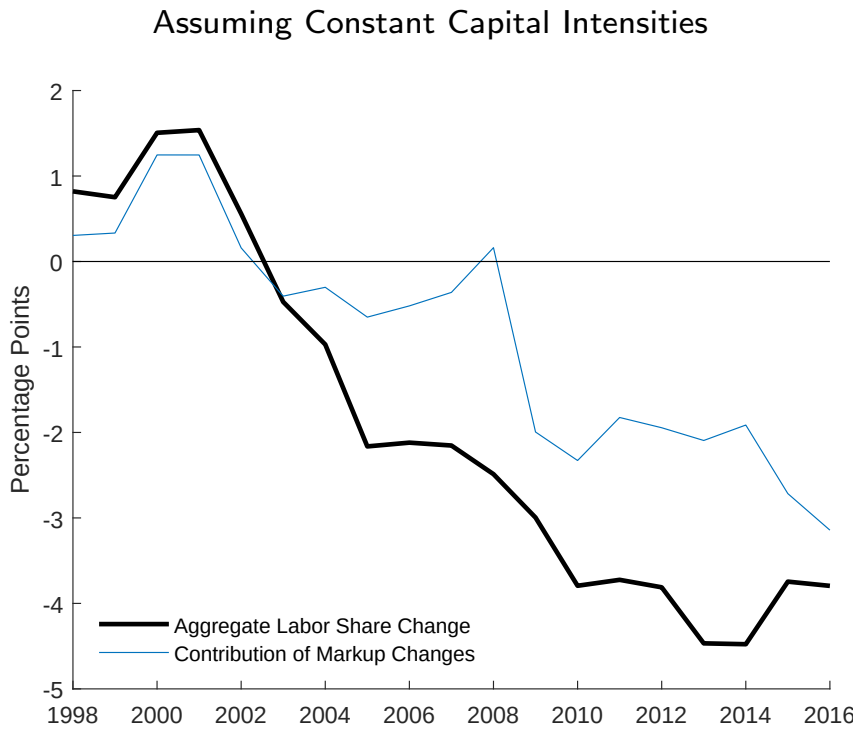
Role of Changes in Labor Intensities of Production, 1997-2016





▸ Results By Industry

Role of Markup Changes, 1997-2016



▸ Results By Industry