A Reversal in the Global Decline of the Labor Share?

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November 2021
Working Paper No: 21/27

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30 September 2021

Abstract

It is widely acknowledged that a secular decline in the labor share has been underway around the world since the early 1980s. We document a sustained break in this trend following the global financial crisis. This holds for a majority of countries and is robust to different methods, measurements and aggregation procedures. When grouped by level of development, labor shares have stabilized in advanced and risen in developing economies since 2008. A novel application of the standard neoclassical growth model links this differential evolution to stronger increases in the growth of capital-output ratios in developing relative to advanced economies.

Keywords: Labor income share, functional income distribution, capital-output ratio, capital-labor ratio

JEL Codes: E22, E25, O11

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Non-technical Summary

It is widely acknowledged that a secular decline in the labor share has been underway around the world since the early 1980s. Using a sample including 124 countries, 36 (88) of which are advanced (developing), and spanning the period 1980-2017, we document a sustained break in this trend following the global financial crisis. In particular, we show that the total labor share has leveled off in advanced economies and increased in developing ones. This finding is robust to different methods (such as simple weighting and fixed effects estimation), measurements (such as total economy and private business sector) and aggregation levels (such as regional groupings). Moreover, the turnaround holds for a majority of countries representing more than 80 percent of the world output. A novel approach to the standard neoclassical growth model shows that, under some assumptions, labor share can be expressed as the ratio of growth in capital-output ratio to the difference between growth in capital-labor ratio and technology. Employing this perspective, we argue that the reversal in the labor share of developing countries after 2008 is associated with stronger increases in capital-output growth relative to advanced economies.

1. Introduction

Numerous studies have documented a worldwide secular shift in the functional distribution of income since the early 1980s.[1] In this note, we identify a break in this trend starting around the global financial crisis (Figure 1). We establish robustly that the labor share leveled off in advanced economies, and increased in developing countries. A standard neoclassical growth model links these developments to changes in capital-output and capital per effective labor ratios across the groups.

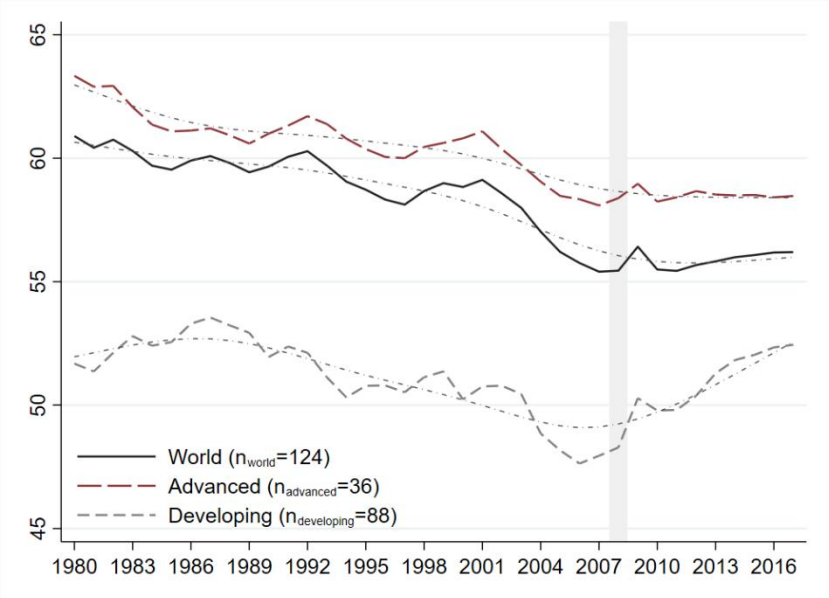
2. Data and computation

Our sample includes 124 countries and spans the period 1980-2017. Labor share data is taken from AMECO (European Commission) and Penn World Table (PWT) 9.1, which is also our data source for real GDP, capital stock and employment.[2] Both databases contain adjustments for self-employed earnings. Figure 1 displays averages of the country-level labor shares weighted by nominal GDP shares:

$$s_{L,j,t} = \sum_{i=1}^{n_j} w_{j,it} s_{L,it} \quad (1)$$

where $s_{L,j,t}$ is the labor share for group *j* comprised of n_j countries (36 advanced or 88 developing), $s_{L,it}$ is labor share in country i at time t and $w_{j,it}$ are country weights constructed using nominal GDP from the IMF WEO 2019; we use the IMF classification for country groupings.[3]

Figure 1. Labor income share (%), total economy, adjusted



Source: Authors' calculations using PWT 9.1, AMECO and IMF WEO October 2019. The shaded area denotes the global financial crisis. All series are adjusted for labor income of self-employed. Dotted lines show HP trends (λ=100).

[1] Elsby et al. (2013), Karabarbounis and Neiman (2014), Lawrence (2015), Grossman et al. (2017).

[2] For a detailed description of PWT 9.1, see Feenstra et al. (2015).

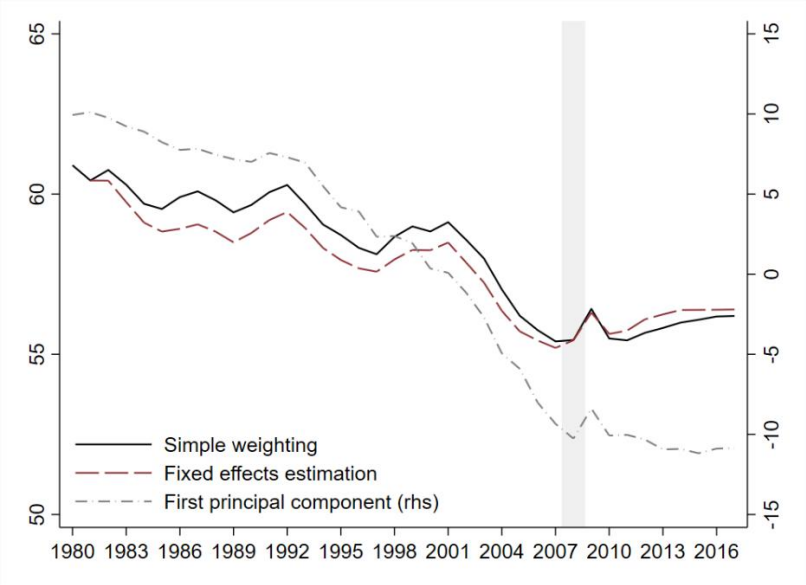
[3] An Appendix provides details on countries, data sources, regional labor shares, principal component analysis, structural break tests, country-level estimation results, formal proof of the link between labor share, capital-output and capital per effective labor ratios and sources of labor share changes with weighted and unweighted data.

3. Robustness checks

3.1. Alternative calculation methods

To establish the robustness of these developments, we ran fixed-effect, weighted regressions of country-level labor shares on time and country dummies. Following Karabarbounis and Neiman (2014), we construct aggregated labor shares using estimated time fixed effects and normalize them to values computed for 1981. This method gives a global labor share that is very similar to one obtained using simple weighting (Figure 2). As an alternative to aggregation, principal component analysis (PCA) produces two components that are informative and explain cumulatively more than 65 percent of the variation in the data. PCA shows that the falling trend in the global labor share has stabilized after the crisis, supporting our claim of a changing trend (Figure 2).

Figure 2. Global labor share, alternative calculations



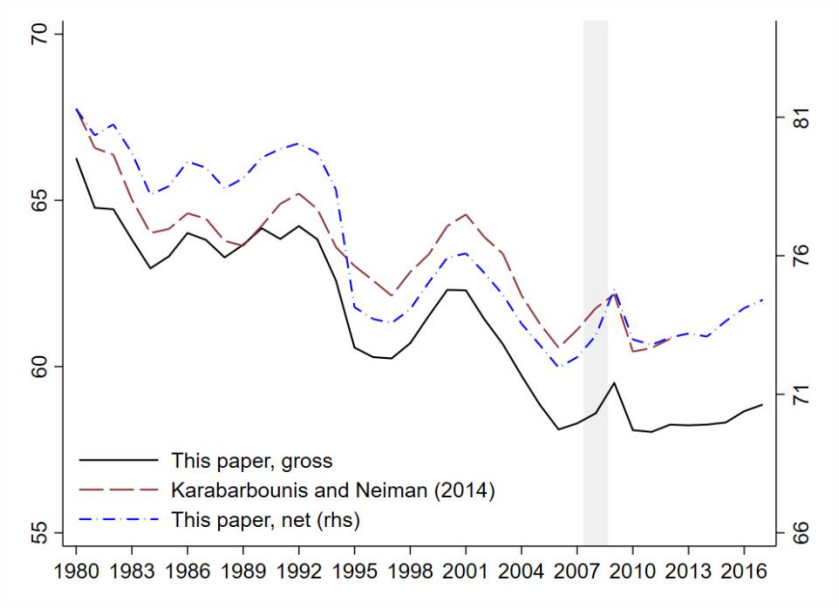
Source: See Figure 1. The first principal component accounts for 51 percent of variation in data.

3.2. Alternative Measurements

We examined the role of self-employment using private business sector labor shares for advanced countries with OECD nonfinancial accounts data.[4] The resulting labor share resembles that computed with the Karabarbounis and Neiman (2014) dataset (Figure 3) and exhibits a declining trend which levels off in the late 2000s. Following Rognlie (2015), we also considered labor share in net value added, to pin down more accurately the command over the resources ultimately paid to inputs. Adjusting value added for consumption of fixed capital and taxes less subsidies to production, we find a similar stabilization in the downward trend in the net private business sector labor share around the global financial crisis (Figure 3).

[4] OECD data was inadequate for the computation of private business labor shares in developing countries.

Figure 3. Private business sector labor share (%), advanced countries

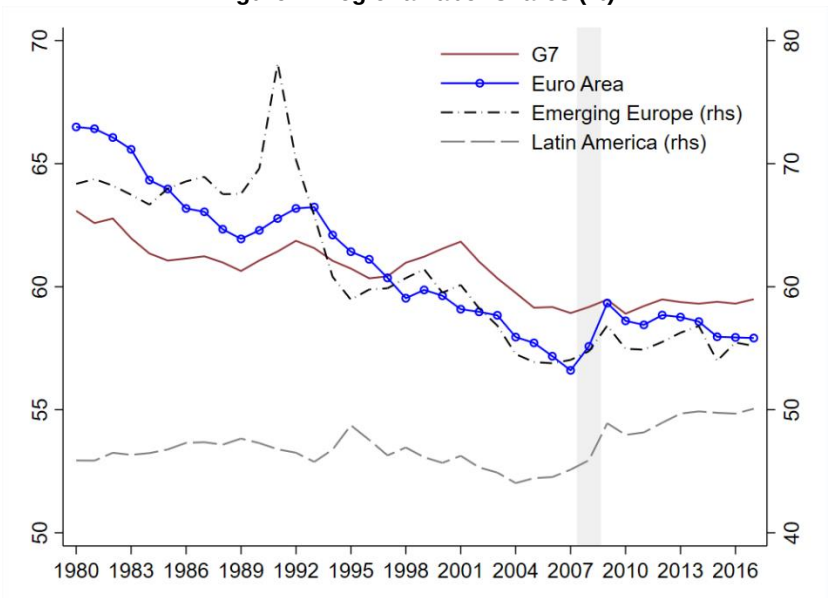


Source: Gross (net) private business labor share is calculated using OECD and AMECO data and includes 23 advanced countries. Shaded area denotes the global financial crisis.

3.3. Alternative aggregation levels

Aggregation of countries by level of development can conceal different trends in the labor share across regions. To account for potential regional heterogeneity, we aggregate labor shares as EU, Euro area, G7, emerging Asia, emerging Europe, Latin America, Middle East and Sub-Saharan Africa. Robustly, the labor share stabilizes after the global financial crisis in the first three advanced country groupings and reverses predominately in developing economies (Figure 4), suggesting a common, global phenomenon.

Figure 4. Regional labor shares (%)



Source: See Figure 1.

4. Changing trends across countries

To investigate internationally common features of the trend break in labor shares, we estimate the following regression for each country:

$$s_{L,t} = \beta_0 + \beta_1 T_t + \gamma_0 D_t + \gamma_1 T_t D_t + u_t \quad (2)$$

T_t is the time trend and D_t is a dummy that takes a value of 1 beginning in 2008.[5] A negative value of β_1 indicates a trend of declining labor share, and a non-zero value of γ_1 indicates a change in this trend. In 77 countries representing more than 80 percent of the world output, estimates of β_1 are negative and γ_1 are positive. Of these, 21 are advanced, 4 of which have constant labor shares after 2008; of the 55 developing countries, 30 have rising labor shares in the same period, including China, India, South Africa, and Turkey.

The results exhibit significant heterogeneity. Some countries either do not have a falling labor share before the crisis (negative $\hat{\beta}_1$) or an increasing trend (positive $\hat{\gamma}_1$). Yet countries exhibiting this feature account for a significant portion of the world GDP, and dominate the path of the global labor share. Consider the following within-between decomposition:

$$\Delta s_{L,world,t} = \underbrace{\sum_{i=1}^{n_{world}} w_{world,it-1} \Delta s_{L,it}}_{within} + \underbrace{\sum_{i=1}^{n_{world}} \Delta w_{world,it} s_{L,it}}_{between} \quad (3)$$

where Δ denotes annual first difference. We estimate that the global labor share decreased by 5.5 percentage points from 1980 to 2008 (Table 1), of which 5.1 percentage points is attributable to the within component while only 0.4 percentage points is due to the between component. The declining global labor share documented above is driven by widespread declines in country-level labor shares rather than changing country weights. Since 2008, the global labor share increased by 0.8 percentage points, and this is similarly due to the within component. Evidently, movements in aggregated labor shares in Figure 1 is a common experience across countries.

Table 1. Within-between decomposition of global labor share, pp

	Δs_L	$within$	$between$
1981-86	-0.99	-1.56	0.57
1987-92	0.38	0.58	-0.20
1993-97	-2.16	-1.69	-0.47
1998-02	0.45	0.04	0.41
2003-07	-3.17	-2.43	-0.75
2008-12	0.27	1.11	-0.84
2013-17	0.53	0.37	0.15
1981-07	-5.50	-5.06	-0.44
2008-17	0.79	1.48	-0.69
Total	-4.70	-3.58	-1.12

Note: Table shows cumulative changes.

5. A neoclassical account of changing trends in labor shares

The standard growth model sheds a novel perspective on potential causes of labor share changes. Suppose output Y is produced using capital K and labor L under constant returns with labor-augmenting

[5] Arguably, the financial crisis began in earnest only in 2009. Our results are largely unchanged when $D_t = 1$ starting in 2009 or 2010.

technical change, i.e., $Y = F(K, AL)$. Let g_x denote the growth rate of variable x. Assuming competitive factor remuneration, the growth rates of output $y \equiv \frac{Y}{AL}$ and capital $k \equiv \frac{K}{AL}$, both measured per efficiency unit of labor, are related to the capital share (s_K) along the transition to the steady state according to

$$g_y = s_K g_k. \tag{4}$$

Using $g_y = g_{Y/L} - g_A,\ g_k = g_{K/L} - g_A$, and $s_L = 1 - s_K$, (4) implies

$$s_L = \frac{g_{K/Y}}{g_{K/L} - g_A}. \tag{5}$$

At any point in time, the labor share of an economy equals the ratio of growth in capital-output ratio ($g_{K/Y}$) to the difference between growth in the capital-labor ratio ($g_{K/L}$) and labor-augmenting technical progress (g_A).[6] As g_A is the only unobservable in equation (5), it can be computed directly from the data as a residual. Equation (5), which holds irrespective of the elasticity of substitution in production, shows that changes in the labor share stem from differential evolution of growth in the capital coefficient (K/Y) relative to growth in effective capital intensity (K/AL).

Table 2 presents summary statistics for annual components of s_L over the pre- and post-financial crisis periods. While g_A declined globally following the crisis, steep increases both in $g_{K/Y}$ and $g_{K/L}$ occurred only in the developing countries. Labor share's reversal in the developing world is associated with a relative rise in the capital-output growth. Trends depicted in Figure 5 suggest that slowing output growth despite sustained capital accumulation is responsible for this development. In contrast, the arrest of labor share's decline in advanced economies coincided with modest and offsetting growth in capital coefficients and effective capital intensity. The post-crisis turnaround in the global labor share has been shaped by increased growth in capital-output relative to capital intensity adjusted for technical progress.

Table 2. Labor share (%) and growth rates (% p.a.)

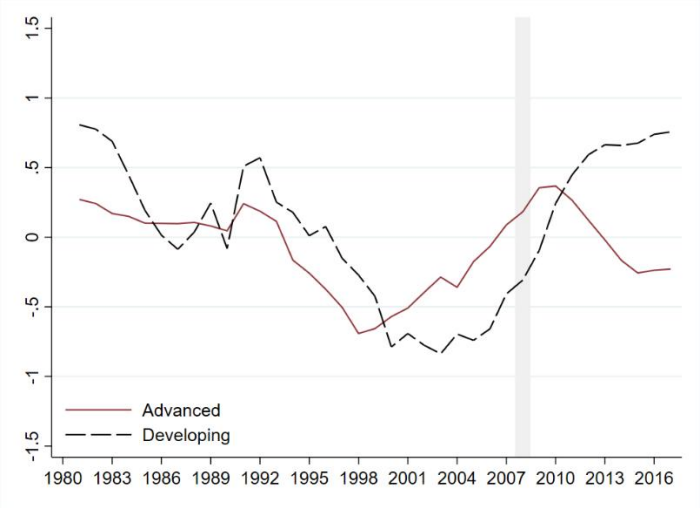
	$\mathbf{1980-2007}$	$\mathbf{2008-2017}$
Advanced countries		
s_L	60.8	58.5
$g_{K/Y}$	-0.16	0.06
$g_{K/L}$	1.71	0.79
g_A	1.98	0.69
Developing countries		
s_L	51.2	50.8
$g_{K/Y}$	-0.56	1.51
$g_{K/L}$	1.75	4.83
g_A	2.91	1.90

Note: s_L, $g_{K/Y}$ and $g_{K/L}$ are weighted averages of countries in each group; the table displays simple averages of annual values over the respective periods. See the Appendix for further details.

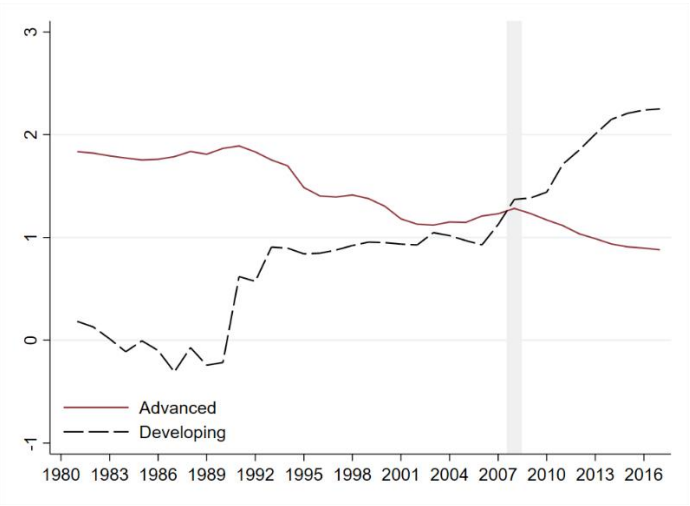
[6] Note that (5) characterizes economies strictly outside the steady state, i.e., $g_{K/Y} \neq 0$ and $g_{K/L} \neq g_A$.

Figure 5. Median growth rates in key variables (% p.a.)

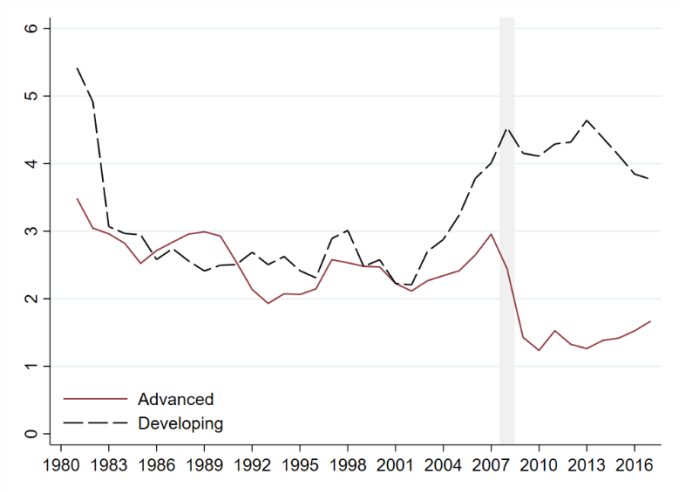
a) Capital-output ratio



b) Capital-labor ratio



c) Capital stock



Source: Capital, output and employment are $rnna$, $rgdpna$ and emp series in PWT 9.1, respectively. Panels a) and b) are computed from country-level HP trends (λ=100) of relevant ratios. Shaded areas denote the global financial crisis.

6. Conclusion

We document a break in the worldwide decline in the labor share in the aftermath of the global financial crisis. Our finding holds for a majority of countries and is robust to different methods, measurements and aggregation procedures. When grouped by level of development, labor shares have stabilized in advanced and even risen in developing economies since 2008. A novel application of the standard neoclassical growth model relates the inflection point in labor shares to increases in growth of capital input relative to output and labor, despite a worldwide slowdown of productivity growth. Stronger growth in capital-output ratio can account for the labor share's reversal in developing economies.

Acknowledgements

We thank Loukas Karabarbounis for data and code sharing. This research was supported by the Forschungsschwerpunkt 1764 of the German Research Foundation.

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APPENDIX

A1. Data sources and country groupings

Table A1.1. All countries in the analysis and data sources of the gross labor shares

	PWT 9.1	AMECO
Advanced	Australia, Canada, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Hong Kong, Israel, Italy, Japan, Latvia, Lithuania, Malta, Netherlands, New Zealand, Norway, Singapore, Slovakia, Slovenia, Sweden, South Korea, Switzerland, Taiwan, United Kingdom, United States	Austria, Belgium, Denmark, Greece, Iceland, Ireland, Luxembourg, Portugal, Spain
Developing	Angola, Argentina, Armenia, Aruba, Azerbaijan, Bahrain, Bolivia, Belarus, Benin, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Chile, China, Colombia, Costa Rica, Croatia, Côte d'Ivoire, Djibouti, Dominican Republic, Ecuador, Egypt, Eswatini, Fiji, Gabon, Georgia, Guatemala, Guinea, Honduras, Hungary, India, Indonesia, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Lesotho, Malaysia, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nicaragua, Niger, Nigeria, North Macedonia, Oman, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Rwanda, Russia, Saudi Arabia, Senegal, Serbia, Sierra Leone, South Africa, Sri Lanka, Sudan, Suriname, Tajikistan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Ukraine, Uruguay, Venezuela, Zimbabwe	Romania, Turkey

Note: Labor share data are taken from the source providing the longest series for each country. The codes of relevant series are $labsh$ and ALCD0 in PWT 9.1 and AMECO, respectively.

Table A1.2. Countries used in the private business sector labor share and data sources

Countries	Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States
Labor compensation, taxes less subsidies on production, gross value added	OECD non-financial accounts by sectors, S11 non-financial corporations. Codes of labor compensation, taxes less subsidies on production and gross value added are NFD1P, NFD2P and NFR211, respectively.
Depreciation	Drawing on AMECO, we first obtain ratio of the difference between Gross Operating Surplus (GOS with code UOGD) and Net Operating Surplus (NOS with code UOND) to GOS for the total economy. Assuming that this ratio also holds at the sectoral level, we multiply the GOS in non-financial corporate sector (from the OECD with code NFB2G_B3GP) with the mentioned depreciation over GOS ratio to get the depreciation in non-financial corporate sector.
Nominal exchange rate	XNE series from AMECO. National currencies are converted to USD.

Table A1.3. Countries by region

G7	Canada, France, Germany, Italy, Japan, United Kingdom, United States
Euro Area	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovenia, Spain, Slovakia
Other advanced	Australia, Czech Republic, Denmark, Iceland, Israel, New Zealand, Norway, Singapore, Sweden, Switzerland, Korea, Hong Kong, Taiwan
EU	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Slovakia, United Kingdom
Emerging Asia	China, Fiji, India, Indonesia, Malaysia, Mongolia, Philippines, Sri Lanka, Thailand
Emerging Europe	Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania, Russia, Serbia, Moldova, Turkey, Ukraine
Latin America	Argentina, Aruba, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela
Middle East	Armenia, Azerbaijan, Bahrain, Djibouti, Egypt, Georgia, Iraq, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Tajikistan, Tunisia
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Eswatini, Gabon, Guinea, Kenya, Lesotho, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Zimbabwe

Note: IMF classification in World Economic Outlook October 2019 is used.

A2. Structural break tests of labor shares

Table A2. Test for a single unknown structural break, 1980-2017.

	with trimming		w/o trimming	
	(1)	**(2)**	**(1)**	**(2)**
Global	2010	2012	2010	2008
Advanced	1986	2011	2010	2008
Developing	2006	2012	2010	2008
Developing ex. China	1988	1988	2010	2008
EU	1990	1989	2009	2008
G7	2005	2011	2008	2008
Euro Area	2008	1990	2008	2008
Other Advanced	2006	2011	2010	2009
Emerging Asia	2006	2011	2008	2008
Emerging Europe	2004	1992	2010	2008
Latin America	2004	2005	2009	2008
Middle East	1999	1990	2008	2009
Sub-Saharan Africa	2010	2009	2010	2009

Note: (1) refers to $s_{L,t} = \beta_0 + \beta_1 trend_t + u_t$ and (2) refers to $\Delta s_{L,t} = \alpha_0 + e_t$. (1) and (2) are estimated with HAC standard errors. The first two columns show the years of break according to the supremum Wald statistics with 15 percent symmetric trimming applied to the beginning and end of the data. The last two columns show the results according to the χ^2 statistics of the standard Chow test, where we recursively tested for a break between 2008 and 2010 and selected the year with the maximum χ^2 .

A3. First two principal components of the aggregated labor shares by level of development

Figure A3.1. Global labor share and principal components

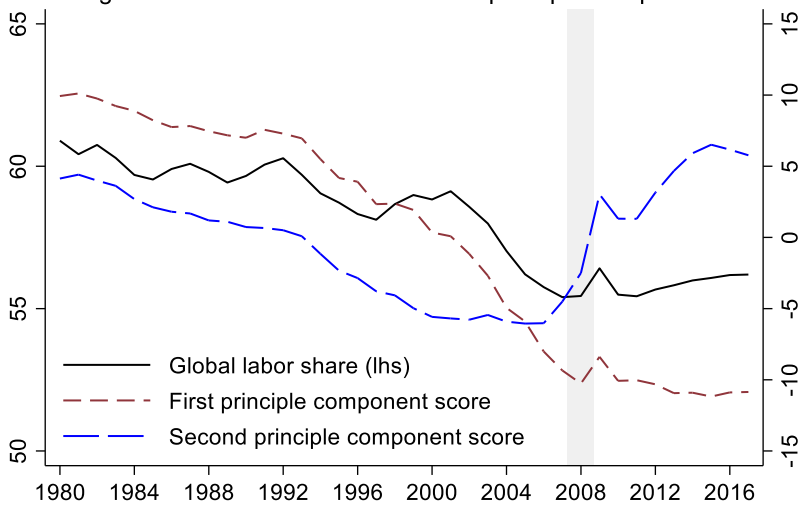


Figure A3.2. Aggregated labor share of advanced countries and principal components

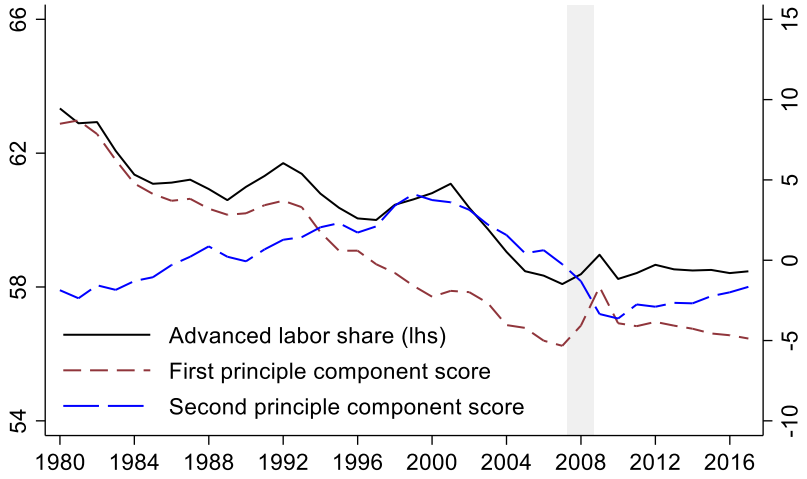
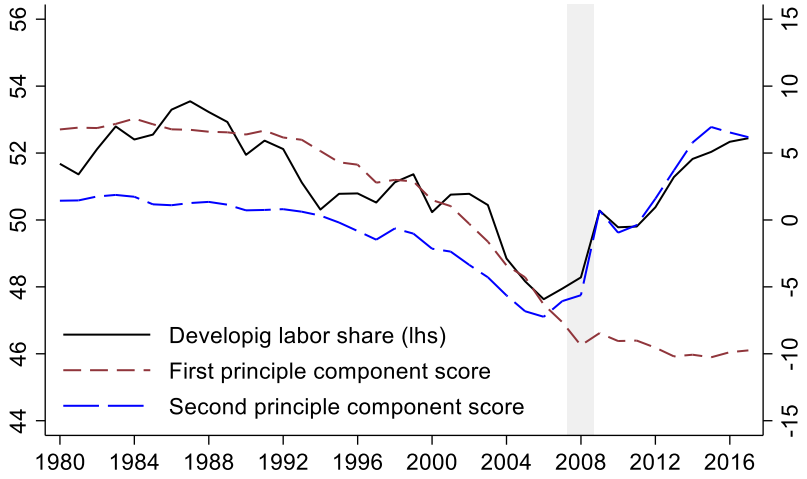


Figure A3.3. Aggregated labor share of developing countries and principal components



A4. Aggregated labor shares by regions

Figure A4.1. Labor share in developing countries total economy, adjusted, (%)

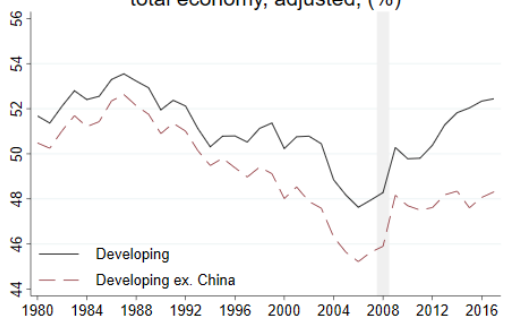


Figure A4.2. Labor share in Emerging Asia, Emerging Europe and Latin America, total economy, adjusted, (%)

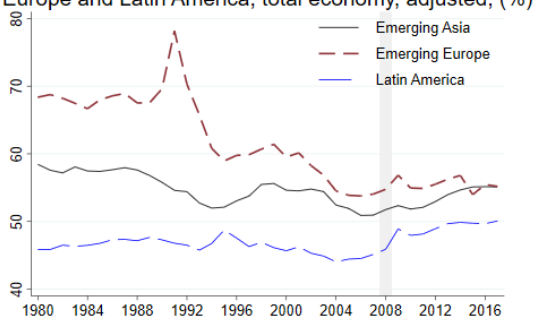


Figure A4.3. Labor share in EU, Euro area, G7 and other advanced countries, total econ., adjusted, (%)

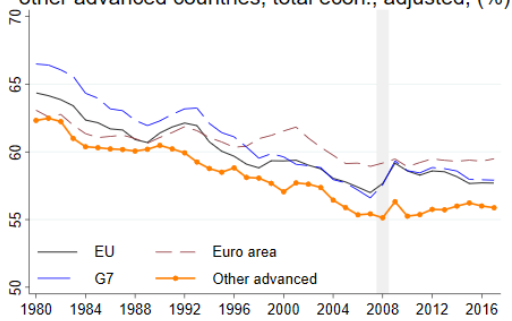
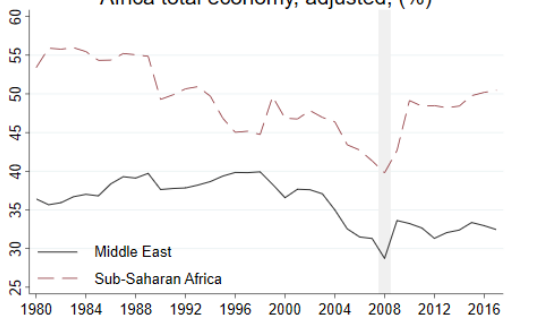


Figure A4.4. Labor share in Middle East and Sub-Saharan Africa total economy, adjusted, (%)



A5. Estimation results of equation (2)

Table A5.1 Country-level estimation results of equation (2)

	$\hat{\beta}_0$	$\hat{\beta}_1$	$\hat{\gamma}_0$	$\hat{\gamma}_1$	Average s_L 1980-2007 ($\hat{\beta}_0$)	Average s_L 2008-2017 ($\hat{\beta}_0 + \hat{\gamma}_0$)
Angola	27.969 (0.253)	-0.099 (0.042)	2.931 (1.056)	0.651 (0.385)	27.969	30.900
Argentina	40.312 (0.475)	-0.472 (0.057)	9.681 (0.851)	2.137 (0.249)	40.312	49.993
Armenia	70.89 (0.605)	-0.494 (0.085)	-13.321 (0.674)	0.428 (0.135)	70.89	57.569
Aruba	64.643 (0.073)	-0.019 (0.005)	-0.133 (0.073)	0.019 (0.005)	64.643	64.511
Australia	64.484 (0.289)	-0.227 (0.016)	-6.098 (0.367)	0.475 (0.082)	64.484	58.385
Austria	58.345 (0.182)	-0.364 (0.021)	-3.861 (0.237)	0.422 (0.069)	58.345	54.484
Azerbaijan	48.257 (0.936)	-1.174 (0.127)	-23.605 (1.079)	1.83 (0.216)	48.257	24.652
Bahrain	32.309 (0.342)	-0.205 (0.054)	-3.537 (0.504)	0.412 (0.178)	32.309	28.773
Belarus	51.685 (0.526)	0.478 (0.041)	6.059 (1.164)	0.068 (0.203)	51.685	57.744
Belgium	61.582 (0.225)	-0.197 (0.027)	-1.08 (0.345)	0.105 (0.092)	61.582	60.502
Benin	63.333 (0.208)	-0.179 (0.014)	-1.617 (0.208)	0.179 (0.014)	63.333	61.715
Bolivia	54.277 (0.635)	-0.059 (0.05)	-7.102 (0.75)	0.581 (0.138)	54.277	47.176
Bosnia and Herzegovina	63.964 (0.062)	0.019 (0.012)	3.177 (0.134)	-0.024 (0.057)	63.964	67.141

Table A5.1 Country-level estimation results of equation (2) cont'd

	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\gamma}_0$	$\widehat{\gamma}_1$	Average s_L 1980-2007 ($\widehat{\beta}_0$)	Average s_L 2008-2017 ($\widehat{\beta}_0 + \widehat{\gamma}_0$)
Botswana	32.136 (0.342)	-0.36 (0.029)	-4.34 (0.342)	0.36 (0.029)	32.136	27.796
Brazil	52.626 (0.291)	0.133 (0.016)	4.052 (0.322)	0.221 (0.051)	52.626	56.678
Bulgaria	45.189 (0.613)	0.538 (0.061)	5.873 (0.824)	0.002 (0.218)	45.189	51.063
Burkina Faso	63.626 (0.346)	-0.346 (0.052)	-6.377 (0.64)	0.137 (0.23)	63.626	57.249
Burundi	75.478 (1.009)	0.094 (0.18)	-14.856 (1.009)	-0.094 (0.18)	75.478	60.622
Cabo Verde	56.401 (0)	0 (0)	5.344 (0.392)	0.825 (0.131)	56.401	61.745
Cameroon	52.819 (0.201)	-0.275 (0.019)	-2.553 (0.201)	0.275 (0.019)	52.819	50.266
Canada	69.11 (0.415)	-0.274 (0.031)	-3.911 (0.573)	0.401 (0.161)	69.11	65.199
Central African Republic	22.707 (0.311)	-0.096 (0.058)	-6.275 (0.311)	0.096 (0.058)	22.707	16.432
Chad	47.222 (0.771)	0.078 (0.105)	-2.73 (0.931)	0.318 (0.271)	47.222	44.492
Chile	47.415 (0.539)	-0.126 (0.09)	-3.54 (0.544)	0.173 (0.097)	47.415	43.875
China	58.578 (0.246)	-0.071 (0.031)	-1.959 (0.3)	0.534 (0.065)	58.578	56.62
Colombia	48.117 (0.228)	0.029 (0.023)	-0.987 (0.432)	0.348 (0.105)	48.117	47.13
Croatia	66.602 (0.323)	0.022 (0.043)	-4.282 (0.649)	-0.915 (0.196)	66.602	62.32
Cyprus	51.167 (0.274)	0.085 (0.043)	6.186 (0.557)	-0.645 (0.204)	51.167	57.352
Czech Republic	51.12 (0.151)	0.02 (0.017)	0.206 (0.267)	0.161 (0.065)	51.12	51.325
Côte d'Ivoire	51.321 (0.679)	-0.72 (0.055)	-16.637 (0.741)	0.211 (0.104)	51.321	34.684
Denmark	56.626 (0.208)	-0.218 (0.027)	-0.848 (0.326)	-0.091 (0.105)	56.626	55.779
Djibouti	59.389 (0.315)	0.269 (0.024)	2.008 (0.315)	-0.269 (0.024)	59.389	61.397
Dominican Republic	60.606 (0.762)	-0.606 (0.102)	-14.722 (0.785)	0.413 (0.128)	60.606	45.884
Ecuador	45.433 (1.19)	-0.165 (0.135)	20.013 (1.3)	0.791 (0.233)	45.433	65.447
Egypt	39.234 (0.275)	-0.031 (0.047)	-4.431 (0.602)	0.365 (0.118)	39.234	34.803
Estonia	63.609 (0.431)	-0.484 (0.048)	-3.65 (0.839)	0.256 (0.243)	63.609	59.959
Eswatini	63.553 (0.648)	-0.399 (0.091)	-2.345 (0.648)	0.399 (0.091)	63.553	61.208
Fiji	58.668 (0.385)	-0.722 (0.048)	-9.806 (0.385)	0.722 (0.048)	58.668	48.863
Finland	62.174 (0.441)	-0.363 (0.031)	-2.042 (0.658)	0.289 (0.223)	62.174	60.132
France	65.801 (0.27)	-0.185 (0.013)	-2.961 (0.299)	0.305 (0.059)	65.801	62.84
Gabon	36.039 (0.673)	-0.243 (0.091)	-8.5 (0.673)	0.243 (0.091)	36.039	27.539

Table A5.1 Country-level estimation results of equation (2) cont'd

	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\gamma}_0$	$\widehat{\gamma}_1$	Average s_L 1980-2007 ($\widehat{\beta}_0$)	Average s_L 2008-2017 ($\widehat{\beta}_0 + \widehat{\gamma}_0$)
Georgia	48.486 (1.319)	-1.054 (0.175)	-7.795 (1.528)	1.91 (0.357)	48.486	40.69
Germany	65.461 (0.286)	-0.273 (0.042)	-3.987 (0.347)	0.408 (0.094)	65.461	61.474
Greece	52.047 (0.472)	-0.231 (0.058)	-0.731 (0.589)	-0.327 (0.151)	52.047	51.316
Guatemala	45.908 (0.113)	-0.065 (0.018)	-4.008 (0.14)	-0.051 (0.032)	45.908	41.9
Guinea	38.728 (0.104)	0.022 (0.021)	6.759 (0.641)	0.879 (0.2)	38.728	45.487
Honduras	58.285 (0.11)	0.059 (0.014)	1.046 (0.306)	-0.374 (0.103)	58.285	59.331
Hong Kong	48.517 (0.303)	0.126 (0.031)	2.843 (0.396)	0.049 (0.121)	48.517	51.359
Hungary	64.093 (0.264)	-0.26 (0.025)	-4.699 (0.37)	0.173 (0.081)	64.093	59.395
Iceland	56.201 (0.446)	0.248 (0.055)	-3.161 (0.756)	0.399 (0.307)	56.201	53.041
India	64.682 (0.409)	-0.806 (0.055)	-13.457 (0.426)	0.903 (0.07)	64.682	51.224
Indonesia	44.521 (0.053)	0.005 (0.009)	1.689 (0.12)	0.04 (0.046)	44.521	46.21
Iraq	16.256 (0.563)	0.22 (0.077)	13.24 (0.741)	-0.116 (0.248)	16.256	29.495
Ireland	54.437 (0.333)	-0.769 (0.048)	-9.423 (0.798)	-1.4 (0.21)	54.437	45.014
Israel	58.298 (0.131)	-0.048 (0.018)	-3.411 (0.287)	-0.222 (0.121)	58.298	54.887
Italy	54.658 (0.233)	-0.415 (0.026)	-2.265 (0.273)	0.394 (0.069)	54.658	52.393
Jamaica	55.336 (0.758)	-0.029 (0.053)	4.804 (0.764)	0.179 (0.06)	55.336	60.14
Japan	58.819 (0.239)	-0.221 (0.023)	-2.467 (0.286)	0.129 (0.057)	58.819	56.352
Jordan	48.955 (0.229)	-0.054 (0.021)	0.076 (0.407)	0.272 (0.166)	48.955	49.031
Kazakhstan	51.023 (0.946)	-0.204 (0.099)	-10.507 (0.981)	-0.206 (0.137)	51.023	40.516
Kenya	58.617 (0.574)	-0.152 (0.073)	3.446 (0.644)	1.174 (0.137)	58.617	62.063
Korea	57.291 (0.254)	-0.407 (0.023)	-6.03 (0.318)	0.546 (0.077)	57.291	51.261
Kuwait	23.227 (0.091)	-0.029 (0.016)	0.641 (0.25)	0.389 (0.079)	23.227	23.867
Kyrgyzstan	64.675 (1.24)	-0.096 (0.098)	-11.401 (1.328)	-0.282 (0.157)	64.675	53.274
Latvia	52.708 (0.551)	-0.067 (0.054)	2.905 (1.131)	0.101 (0.328)	52.708	55.613
Lesotho	68.703 (0.602)	-0.49 (0.091)	-6.023 (0.849)	1.743 (0.261)	68.703	62.68
Lithuania	51.176 (0.353)	0.071 (0.034)	-1.339 (0.938)	-0.149 (0.311)	51.176	49.837
Luxembourg	52.579 (0.396)	-0.214 (0.058)	-0.083 (0.534)	0.136 (0.161)	52.579	52.496

Table A5.1 Country-level estimation results of equation (2) cont'd

	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\gamma}_0$	$\widehat{\gamma}_1$	Average s_L 1980-2007 ($\widehat{\beta}_0$)	Average s_L 2008-2017 ($\widehat{\beta}_0 + \widehat{\gamma}_0$)
Malaysia	30.546 (0.05)	0.011 (0.01)	6.275 (0.163)	0.389 (0.058)	30.546	36.821
Malta	54.51 (0.026)	-0.004 (0.005)	-1.852 (0.436)	-0.579 (0.146)	54.51	52.658
Mauritania	58.946 (0.638)	-0.295 (0.112)	-13.529 (0.638)	0.295 (0.112)	58.946	45.416
Mauritius	49.849 (0.527)	-0.237 (0.06)	-7.233 (0.527)	0.236 (0.06)	49.849	42.616
Mexico	40.861 (0.304)	-0.25 (0.027)	-3.555 (0.441)	0.214 (0.135)	40.861	37.306
Moldova	54.385 (0.734)	0.5 (0.073)	6.075 (0.886)	-1.639 (0.183)	54.385	60.46
Mongolia	40.126 (0.492)	-0.178 (0.061)	0.712 (0.897)	0.468 (0.271)	40.126	40.838
Morocco	50.308 (0.122)	-0.069 (0.018)	-0.841 (0.262)	0.21 (0.106)	50.308	49.467
Mozambique	42.744 (0.553)	0.104 (0.073)	-1.259 (0.553)	-0.104 (0.073)	42.744	41.484
Namibia	59.676 (0.748)	0.028 (0.094)	-6.765 (0.833)	-0.288 (0.181)	59.676	52.911
Netherlands	64.407 (0.273)	-0.495 (0.03)	-5.939 (0.363)	0.473 (0.113)	64.407	58.468
New Zealand	56.421 (0.286)	-0.34 (0.045)	-0.683 (0.336)	0.099 (0.07)	56.421	55.738
Nicaragua	54.163 (0.013)	0.003 (0.003)	1.001 (0.111)	0.053 (0.039)	54.163	55.164
Niger	59.323 (0.463)	0.23 (0.063)	-13.113 (1.207)	-1.314 (0.38)	59.323	46.211
Nigeria	31.118 (0.628)	0.245 (0.085)	14.275 (2.092)	1.557 (0.777)	31.118	45.393
North Macedonia	71.986 (0.801)	-1.367 (0.108)	-21.286 (0.861)	0.829 (0.139)	71.986	50.7
Norway	52.539 (0.541)	-0.247 (0.066)	-2.044 (0.722)	0.964 (0.199)	52.539	50.495
Oman	30.342 (0.216)	-0.05 (0.037)	-0.826 (0.677)	0.459 (0.316)	30.342	29.517
Panama	44.187 (0.213)	-0.084 (0.032)	-11.816 (0.393)	-0.835 (0.131)	44.187	32.371
Paraguay	51.471 (0.436)	0.445 (0.037)	5.018 (0.436)	-0.445 (0.037)	51.471	56.489
Peru	49.939 (1.715)	-0.867 (0.183)	-5.191 (1.738)	1.103 (0.201)	49.939	44.748
Philippines	42.467 (0.285)	-0.19 (0.032)	-5.769 (0.467)	-0.292 (0.161)	42.467	36.699
Poland	62.209 (0.345)	-0.082 (0.049)	-5.711 (0.435)	-0.248 (0.133)	62.209	56.497
Portugal	59.671 (0.642)	-0.173 (0.093)	-5.534 (0.67)	-0.56 (0.125)	59.671	54.138
Qatar	29.171 (0.651)	-0.59 (0.079)	-11.94 (0.753)	0.688 (0.147)	29.171	17.231
Romania	70.68 (1.164)	-1.179 (0.109)	-21.874 (1.347)	0.52 (0.261)	70.68	48.805
Russia	58.622 (0.189)	-0.097 (0.028)	1.41 (0.629)	0.125 (0.218)	58.622	60.032
Rwanda	74.586 (0.452)	-0.082 (0.054)	-0.485 (0.452)	0.082 (0.054)	74.586	74.101

Table A5.1 Country-level estimation results of equation (2) cont'd

	$\widehat{\beta}_0$	$\widehat{\beta}_1$	$\widehat{\gamma}_0$	$\widehat{\gamma}_1$	Average s_L 1980-2007 ($\widehat{\beta}_0$)	Average s_L 2008-2017 ($\widehat{\beta}_0 + \widehat{\gamma}_0$)
Saudi Arabia	31.71 (0.408)	-0.199 (0.068)	-4.551 (0.798)	0.637 (0.343)	31.71	27.159
Senegal	36.348 (0.214)	0.094 (0.02)	3.866 (0.304)	0.161 (0.078)	36.348	40.214
Serbia	77.086 (0.896)	-0.813 (0.085)	-18.666 (0.937)	0.257 (0.134)	77.086	58.42
Sierra Leone	53.433 (0.036)	-0.015 (0.005)	0.405 (0.121)	0.241 (0.033)	53.433	53.838
Singapore	44.357 (0.45)	0.014 (0.067)	-0.149 (0.475)	-0.134 (0.088)	44.357	44.208
Slovakia	55.814 (0.227)	-0.115 (0.018)	-0.547 (0.452)	0.467 (0.152)	55.814	55.267
Slovenia	69.798 (0.345)	-0.425 (0.036)	-4.839 (0.479)	0.176 (0.146)	69.798	64.959
South Africa	57.684 (0.374)	-0.31 (0.054)	-3.409 (0.378)	0.923 (0.057)	57.684	54.275
Spain	60.081 (0.315)	-0.32 (0.038)	-4.003 (0.355)	-0.2 (0.064)	60.081	56.077
Sudan	81.326 (0.916)	-0.51 (0.107)	-13.433 (0.916)	0.51 (0.107)	81.326	67.894
Sweden	59.756 (0.304)	-0.386 (0.023)	-4.428 (0.41)	0.438 (0.088)	59.756	55.329
Switzerland	65.799 (0.211)	-0.039 (0.035)	-1.454 (0.289)	0.219 (0.092)	65.799	64.345
Taiwan	74.02 (0.202)	-0.111 (0.033)	-7.683 (0.284)	-0.367 (0.081)	74.02	66.337
Tajikistan	50.813 (0.789)	-0.501 (0.112)	-9.1 (0.977)	1.535 (0.207)	50.813	41.714
Tanzania	51.585 (0.487)	-0.32 (0.063)	-2.264 (0.646)	1.992 (0.171)	51.585	49.321
Thailand	42.606 (0.447)	-0.346 (0.034)	-3.147 (0.458)	0.264 (0.051)	42.606	39.459
Trinidad and Tobago	48.142 (1.403)	-0.46 (0.135)	-15.35 (1.521)	0.84 (0.318)	48.142	32.792
Tunisia	53.112 (0.164)	-0.251 (0.021)	-3.591 (0.28)	0.55 (0.081)	53.112	49.521
Turkey	63.928 (1.335)	-1.279 (0.128)	-18.78 (1.415)	1.86 (0.211)	63.928	45.149
Ukraine	54.063 (0.677)	0.159 (0.023)	1.774 (0.677)	-0.159 (0.023)	54.063	55.837
United Kingdom	56.833 (0.285)	0.197 (0.021)	2.73 (0.336)	-0.351 (0.076)	56.833	59.562
United States	62.184 (0.157)	-0.045 (0.011)	-2.724 (0.205)	0.046 (0.062)	62.184	59.46
Uruguay	51.294 (0.505)	-0.11 (0.066)	-3.879 (0.505)	0.11 (0.066)	51.294	47.415
Venezuela	41.797 (0.435)	-0.112 (0.055)	-0.489 (1.134)	0.786 (0.319)	41.797	41.308
Zimbabwe	60.788 (0.592)	-0.523 (0.047)	-5.714 (0.592)	0.523 (0.047)	60.788	55.074

Note: HAC standard errors in parenthesis. T_t in equation (2) is a demeaned time trend. Demeaning is done separately for the period up to 2008 and after 2008 so that $\widehat{\boldsymbol{\beta}}_{\mathbf{0}}$ corresponds to the average labor share before the crisis and $\widehat{\boldsymbol{\gamma}}_{\mathbf{0}}$ corresponds to the change in average level after the crisis. Estimations of Australia, France, Sweden and United States start from 1960. Those of Bolivia, Canada, Ecuador, Jamaica, Jordan, Kenya, Peru, Thailand, Trinidad and Tobago and Zimbabwe start from 1971. Those of Chad, Finland, India and Rwanda start from 1976. Estimation of Fiji starts from 1978. Finally, estimations of Norway and South Africa start from 1979. See notes under Table 1 for data sources.

A6. Formal proof of equation (5)

The definitions and assumptions described in section 5 imply that profit maximization equates the marginal product of capital per effective unit of labor to the rental rate of capital:

$$f'(k) = R. \tag{A6.1}$$

Competitive remuneration implies that the capital share (s_K) is $\frac{RK}{Y}$. Substituting equation (A6.1) and dividing the numerator and denominator of this definition by AL we get:

$$s_K = \frac{f'(k)k}{f(k)}. \tag{A6.2}$$

Output in efficiency units along the transition to the steady state can be expressed as $y = f(k)$, and taking the derivative of the logarithm of this equality with respect to time yields:

$$g_y = s_K g_k. \tag{A6.3}$$

Using $g_y = g_{Y/L} - g_A$, $g_k = g_{K/L} - g_A$, and $s_L = 1 - s_K$, equation (A6.3) can be rewritten as (5).

$$s_L = \frac{g_{K/Y}}{g_{K/L} - g_A} \blacksquare \tag{5}$$

A7. Weighting methodology used in Table 2

We want to understand the link between growth in capital-output, capital-labor, productivity and the *aggregated* labor shares shown in Figure 1. Assuming equation (5) holds at the aggregate level j at time t:

$$s_{L,j,t} = \frac{g_{\frac{K}{Y},j,t}}{g_{\frac{K}{L},j,t} - g_{A,j,t}}. \tag{A7.1}$$

$s_{L,j,t}$ is computed using equation (1). We back out $g_{A,j,t}$, once we calculate $g_{\frac{K}{Y},j,t}$ and $g_{\frac{K}{L},j,t}$. Note that

$$g_{\frac{K}{Y},j,t} = g_{K,j,t} - g_{Y,j,t}. \tag{A7.2}$$

$$g_{\frac{K}{L},j,t} = g_{K,j,t} - g_{L,j,t}. \tag{A7.3}$$

We use the Tornqvist approach to obtain the growth in real capital stock, real output and employment by the level of development.

$$g_{X,j,t} = \sum_{i=1}^{n_j} \alpha_{j,it}\, g_{X,it},\ \ \alpha_{j,it} = \frac{P_{it}^X X_{it}}{\sum_{i=1}^{n_j} P_{it}^X X_{it}},\ X = K, Y. \tag{A7.4}$$

where i denotes country. Equation (A7.4) shows that growth in the aggregated capital stock [output] in advanced (developing) countries is a weighted sum of the growth in capital stock [output] of 36 (88) advanced (developing) countries, where weights are the nominal capital stock [GDP] shares. To calculate growth in aggregated employment, we use the employment shares as weights. See Table A7.1 for codes and data sources of variables used.

Table A7.1. Codes and data sources of the key variables in equation (A7.4)

Variables	Codes & Data sources
Real capital stock (K)	$rnna$ in PWT 9.1
Nominal capital stock $(P^K K)$	Constructed as $pl\_n * rnna$ using PWT 9.1
Real output (Y)	$rgdpna$ in PWT 9.1
Nominal GDP $(P^Y Y)$	NGDPD in IMF WEO 2019
Employment (L)	emp in PWT 9.1

A8. Sources of labor share changes under alternative computations

We compute Table 2 using the original data weighted as described in section A7. To demonstrate the robustness of the results, we re-do the calculations using the *trends* of the data with and without weighting in this section. We further extend the table by time intervals for interested readers.

Table A8.1. Labor share (%) and growth rates (% p.a.), weighted

	$1980-89$	$1990-99$	$2000-07$	$1980-07$	$2008-17$
Advanced countries					
s_L	61.9	60.7	59.4	60.7	58.5
$g_{K/Y}$	-0.24	-0.08	-0.07	-0.13	-0.05
$g_{K/L}$	1.90	1.86	1.29	1.70	0.80
g_A	2.28	1.98	1.41	1.91	0.88
Developing countries					
s_L	52.5	51.1	49.5	51.2	50.7
$g_{K/Y}$	0.47	-0.57	-1.30	-0.44	0.98
$g_{K/L}$	1.16	1.58	2.65	1.76	4.93
g_A	0.27	2.71	5.27	2.65	3.02

Note: Computations are based on the HP trends (λ=100) of s_L, real and nominal K, real and nominal Y as well as L. Trend in s_L of each country is weighted by smoothed nominal output shares. Growth in the trends of capital, output and employment are weighted by the methodology described in section A7 to get $g_{K/Y}$ and $g_{K/L}$ at the aggregate level over time. Then, g_A is backed out as a residual using equation (A7.1). Table shows the period simple averages. s_L and growth rates are in percent.

Table A8.2. Labor share (%) and growth rates (% p.a.), unweighted

	$1980-89$	$1990-99$	$2000-07$	$1980-07$	$2008-17$
Advanced countries					
s_L	59.3	56.7	56.1	57.4	55.5
$g_{K/Y}$	0.15	-0.21	-0.28	-0.11	0.04
$g_{K/L}$	1.80	1.61	1.18	1.55	1.04
g_A	2.03	2.29	1.53	1.98	0.74
Developing countries					
s_L	53.1	52.9	50.0	52.1	48.2
$g_{K/Y}$	0.35	0.07	-0.70	-0.07	0.44
$g_{K/L}$	-0.06	0.72	0.99	0.54	1.86
g_A	-0.54	0.85	2.76	0.96	1.32

Note: Computations are based on the HP trends (λ=100) of s_L, K/Y and K/L. $g_{K/Y}$ and $g_{K/L}$ are computed using the trends in the relevant ratios and g_A is backed as a residual for each country. Median of s_L, $g_{K/Y}$, $g_{K/L}$ and g_A across countries is taken to get unweighted series at the aggregate level over time. Table shows the period simple averages. s_L and growth rates are in percent.

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