Increasing and Decreasing Labor Shares: Cross-Country Differences in the XXI Century

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Cross-Country Differences in the XXI Century*

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Abstract

We describe the behavior of the labor share in the corporate sector for twenty OECD countries over the first 15 years of the XXI century. Our first finding is that the OECD labor share—a cross-country average—is trendless over this medium-run horizon after adjusting for the labor income generated from IPP rents as in Koh et al. (2017). Second, we find that the behavior of the labor share is largely heterogeneous across countries over this period. Indeed, the corporate labor share significantly increases for equally as many countries (e.g., France, Italy and the United Kingdom) as it decreases (e.g., Germany, Israel and the United States) over this period. Third, a decomposition of the corporate labor share behavior into that of its components shows that the cross-country differences in labor share trends are mainly driven by the differences in labor productivity growth and not wages.

Keywords: Labor Share, Intellectual Property Products, SNA Revisions, Cross-Country, Wages, Labor Productivty,
JEL Classification: E01, E22, E25

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1 Introduction

The notion of a relatively constant labor share in the long run for modern economies (Kaldor, 1957) has directed much of the work of the factor distribution of income to its short-run (or cyclical) fluctuations (Gomme and Greenwood, 1995; Boldrin and Horvath, 1995; Ríos-Rull and Santaeulàlia-Llopis, 2010).[1] However, the debate on the long-run behavior of the labor share has been recently rejuvenated by the work of Elsby et al. (2013) and Karabarbounis and Neiman (2014) that document a decline in the labor share of the U.S. and other countries with sample periods that cover a large part of the twentieth century. In addition, Piketty (2014) has shed light on a potential link between the behavior of the labor share to the rise of within-country income inequality. In sharp contrast with previous work, Koh et al. (2017) recently show that the long-run decline of the labor share is not an economic phenomenon but the result of an accounting change in the system of national accounts: the 1999 and 2013 capitalizations of intellectual property products (IPP) that consists of, respectively, software and R&D (plus artistic originals) in the United States. Further, this is not only a feature of the U.S., but also of other OECD countries (Aum et al., 2018).

In this paper we focus on the medium-run behavior of the labor share—more along the lines of Bentolila and Saint-Paul (2003) and Blanchard (1997)—and of its components, mainly, labor productivity and wages using data for the XXI century only. We focus on the sample period from year 2000 to 2014 in which our cross-country data are available. Note that the labor share (LS) is a statistic that summarizes the relationship and potential misalignment between wages and labor productivity:

$$LS = \frac{WH}{Y} \tag{1}$$

where W is the wage per unit of labor input H (e.g., aggregate hours) and we denote the output

[1] See a detailed summary in Koh and Santaeulàlia-Llopis (2017).

as Y (e.g., gross value added). Indeed, in logs, we can write the LS as:

$$\ln LS = \ln W - \ln \frac{Y}{H} \tag{2}$$

Importantly, note equation (1) is an accounting definition of the labor share and, hence, it does not depend on any model.[2]

Our goal is to describe the behavior of the corporate labor share and its components throughout 2000-2014. Our first finding is that the OECD labor share—a cross-country average of 20 countries—is trendless over this medium-run horizon after adjusting for the labor income generated from IPP rents as in Koh et al. (2017) with an annual growth rate of -0.02% that is not significantly different from zero. That is, the medium-run behavior of the OECD labor share in the XXI century is consistent with the trendless long-run behavior of the U.S. labor share (Koh et al., 2017) and the trendless long-run behavior of the OECD labor share as described in (Aum et al., 2018).

Second, we find that the behavior of the labor share is largely heterogeneous across countries over this period. For example, on the one hand, the corporate labor share in France increases annually at a rate of 0.40% throughout our sample period from 2000 to 2014, Italy's corporate labor share grows at a an annual rate of 1.06%, and that of Great Britain at a rate of 0.10%. On the other hand, the corporate labor share in the U.S. decreases annually at a rate of -0.70% throughout our sample period, Israel's corporate labor share decreases at an annual rate of -0.48% and that of Germany at an annual rate of -0.19%. Indeed, in our OECD core sample of twenty countries we find that the corporate labor share increases for equally as many countries (i.e., ten countries) as it decreases over our period of interest, from 2000 to 2014.

Third, a decomposition of the corporate labor share behavior into that of its components shows that the cross-country differences in labor share trends are mainly driven by the differences in

[2]Theory imposes restrictions on this relationship. For example, competitive markets theory with a constant returns to scale technologies in which the elasticity of substitution between capital and labor equal to one ($\sigma = 1$) implies that $\ln W = -\ln Y/H$ always.

labor productivity growth and not wages. Precisely, when we separate the subsample of countries for which the corporate labor share increases from the subsample of countries for which the corporate labor share decreases we find that wage growth is nonsignificantly different between these two groups of countries and averages an annual growth rate of 1.35%. In contrast, labor productivity grows at an annual rate of 1.77% in countries for which labor share decreases which is almost twice as large as the labor productivity growth of 0.95% in the sample of countries with decreasing labor share for this sample period.

The paper goes on as follows. We describe our data in Section 2. We then examine the behavior of the labor share for our core sample of OECD countries as well as its components in Section 3. We then conduct the same analysis by country in Section 4. Finally, we separately study our OECD sample in two groups (or subsamples) differentiating increasing versus decreasing corporate labor share countries in Section 5.

2 Data

We use the data for the corporate sector collected in Aum et al. (2018). Table 1 summarizes the availability of data in terms of the construction of the corporate sector labor share for the year 2000 and after that we are interested in. The use of the corporate sector to construct the labor share of income has the advantage that it avoids having to deal with potentially unambiguous income such as proprietor's income (Boldrin and Peralta-Alva, 2009; Karabarbounis and Neiman, 2014).[3]

Our OECD core sample consists of the countries for which we can compute labor share in the corporate sector and for which we can correct for labor income generated from IPP rents using the cost structure of R&D as in Koh et al. (2017). The adjustment applied by these authors has to do with the recent capitalizations of IPP (i.e., software in 1999 and R&D in 2013) that is implemented by national income and product accounts keeping the national accounting identity

[3]The use of the corporate sector is however not free of caveats, in particular for European countries. See a detailed analysis in Gutiérrez and Piton (2019) related to the role of self-employed income and dwellings.

Table 1: Corporate Sector Data Availability by Country, Post-2000

	Available Data Series			
	LS	LS_χ	Labor Productivity	Core Sample
Austria	2000-2014	2000-2014	2000-2014	Yes
Belgium	2000-2014	2000-2014	2000-2014	Yes
Czech Republic	2000-2014	2000-2014	2000-2014	Yes
Denmark	2000-2014	2000-2013	2000-2014	Yes
Estonia	2000-2014	2000-2014	2000-2014	Yes
Finland	2000-2014	2000-2014	2000-2014	Yes
France	2000-2014	2000-2014	2000-2014	Yes
Germany	2000-2014	2000-2014	2000-2014	Yes
Great Britain	2000-2013	2000-2013	2000-2014	Yes
Greece	2006-2014	2006-2014	2000-2014	No
Hungary	2000-2014	2000-2014	2000-2014	Yes
Ireland	2000-2014	-	2000-2013	No
Israel	2000-2014	2000-2014	2000-2014	Yes
Italy	2000-2014	2000-2014	2000-2014	Yes
Korea	2010-2013	2010-2013	2000-2014	No
Mexico	2003-2013	2003-2013	2000-2013	No
Netherlands	2000-2014	2000-2014	2000-2014	Yes
New Zealand	2000-2013	-	2000-2011	No
Norway	2000-2014	2000-2014	2000-2014	Yes
Poland	2000-2014	2000-2014	2000-2014	Yes
Portugal	2000-2014	2000-2014	2000-2013	Yes
Slovakia	2000-2014	2000-2014	2000-2014	Yes
Slovenia	2000-2014	2000-2014	2000-2014	Yes
Spain	2000-2014	-	2000-2014	No
Sweden	2000-2014	2000-2014	2000-2014	Yes
Switzerland	2000-2013	-	2000-2014	No
United States	2000-2014	2000-2014	2000-2014	Yes

Notes: Source of data Aum et al. (2018).

between expenditure and gross national income. As explained in Koh et al. (2017) and Aum et al. (2018), this implies that under the current system of national accounts (2008 SNA), that national account identity between expenditures (ignoring exports and imports) and gross national income is:

$$Y_{2008\ SNA} = C + X + I = \underbrace{RK}_{\text{Gross Operating Surplus}} + \underbrace{WH}_{\text{Compensation of Employees}} \tag{3}$$

where C is consumption, X is non-IPP investment (i.e., structures and equipment) and I is IPP investment. Using the current data we can reconstruct the national account identity (3) that applies before the revisions that capitalize IPP, i.e., under the pre-1993 SNA:

$$Y_{Pre\text{-}1993\ SNA} = C + X = \underbrace{(RK - \chi I)}_{\text{Gross Operating Surplus}} + \underbrace{(WL - (1-\chi)I)}_{\text{Compensation of Employees}} \tag{4}$$

Note then that the LS change from pre-1993 SNA to 2008 SNA is:

$$LS_{2008\ SNA} \equiv \left(1 - \frac{GOS_{2008\ SNA}}{Y_{2008\ SNA}}\right) < \left(1 - \frac{GOS_{2008\ SNA} - I}{Y_{2008\ SNA} - I}\right) \equiv LS_{Pre\text{-}1993\ SNA}$$

where the national accounts assume that $\chi = 1$. That is, in national accounts under the 2008 SNA all the rents generated from IPP are attributed to capital income. In reality, however, workers in R&D (or other IPP) activities often get paid less than the value of their marginal product in exchange for future equity compensation ($\chi < 1$) (McGrattan and Prescott, 2005, 2014). Following Koh et al. (2017) we proxy χ with the cost structure of R&D (i.e. $\chi =$ 1 − labor cost/total cost) to adjust the LS.[4] The adjusted labor share is:

$$LS_{\chi} = 1 - \frac{GOS - \chi I}{Y}. \tag{5}$$

This implies that we need data on the compensation of employees, gross value added of the

[4] Koh et al. (2017) provide additional alternative measures for χ, for example, based on long-term incentives.

corporate sector, gross IPP investment, as well as on the cost structure of R&D for the corporate sector to make the adjustment. In this manner, the core OECD sample consists of Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Israel, Italy, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden and the United States.

We also provide an analysis that extends our OECD core sample to include countries for which we have incomplete time-series for the corporate labor share LS and the adjusted labor share LS_χ. This includes Greece, Korea and Mexico. We further extend the sample for countries for which LS is available but not LS_χ. This extends our analysis to include Ireland, New Zealand, Spain and Switzerland. All this is summarized in Table 1.

To infer wages in a consistent manner from aggregate data across countries, we use our data on the labor share and labor productivity to solve:

$$W = LS\frac{Y}{H}. \tag{6}$$

Note that we also apply (6) to LS_χ which allows us to infer W_χ analogously:

$$W_\chi = LS_\chi\frac{Y}{H}.$$

A potential caveat of our analysis is in terms of the measurement of labor productivity. Since corporate hours are, in general, not available, we attribute the behavior of aggregate hours to the corporate sector. This measurement potentially introduces a downward bias in the sense that if corporate hours grow faster than aggregate hours then labor productivity growth would be lower and wage growth larger.

Table 2: Corporate Labor Share and Its Components (in $logs$), OECD Average, Post 2000s.

	Labor Share		Wages		Labor Prod.
	LS	LS_χ	W	W_χ	Y/H
(1) OECD Core	-0.0010	-0.0002	0.0127	0.0135	0.0136
	(0.074)	(0.718)	(0.000)	(0.000)	(0.000)
(2) OECD Ext. 1	-0.0014	-0.0007	0.0117	0.0126	0.0130
	(0.015)	(0.189)	(0.000)	(0.000)	(0.000)
(3) OECD Ext. 2	-0.0015	-	0.0114	-	0.0128
	(0.006)		(0.000)		(0.000)

Notes: Here we report the linear trend, γ, computed from a least square minimization of $\ln x_{c,t} = const + \sum_c \beta_c \mathbf{1}_c + \gamma t + \varepsilon_{c,t}$ where $x = \{LS, LS_\chi, W, W_\chi, Y/H\}$ where we control for country-fixed effects, $\mathbf{1}_c$, t is the calendar year for the post-2000 sample period. In parenthesis we write the p-value. The core OECD sample of countries is as defined in Section 2. The first extension of the core sample incorporates countries for which we have incomplete time-series for LS_χ which includes Greece, Korea and Mexico. The second extension incorporates countries for which all variables are available except for LS_χ which includes Ireland, New Zealand, Spain and Switzerland.

3 The Corporate Labor Share and Its Components: Post-2000 OECD Average

To assess the behavior of the labor share in the OECD, we compute an average (common) linear trend for the labor share and its components that results from the least square minimization of:

$$\ln LS_{c,t} = const. + \sum_c \beta_c \mathbf{1}_c + \gamma t + \varepsilon_{c,t},$$

where we control for country-fixed effects, β_c, with country dummy variables, $\mathbf{1}_c$, in which c denotes the country and t is the calendar year for the post-2000 sample period. We are interested in the average linear trend γ. If $\gamma > 0$ then the corporate labor share in the OECD increases throughout the sample period, and decreases otherwise. The results for our core OECD sample are in Table 2. In parenthesis we write the p-value.

We find that the corporate labor share declines for the post-2000s period by an annual average of -0.10% under the 2008 SNA that attributes all IPP rents to capital income, The estimated trend is not large—compared with the size of long-run trends (Koh et al., 2017), but significant,

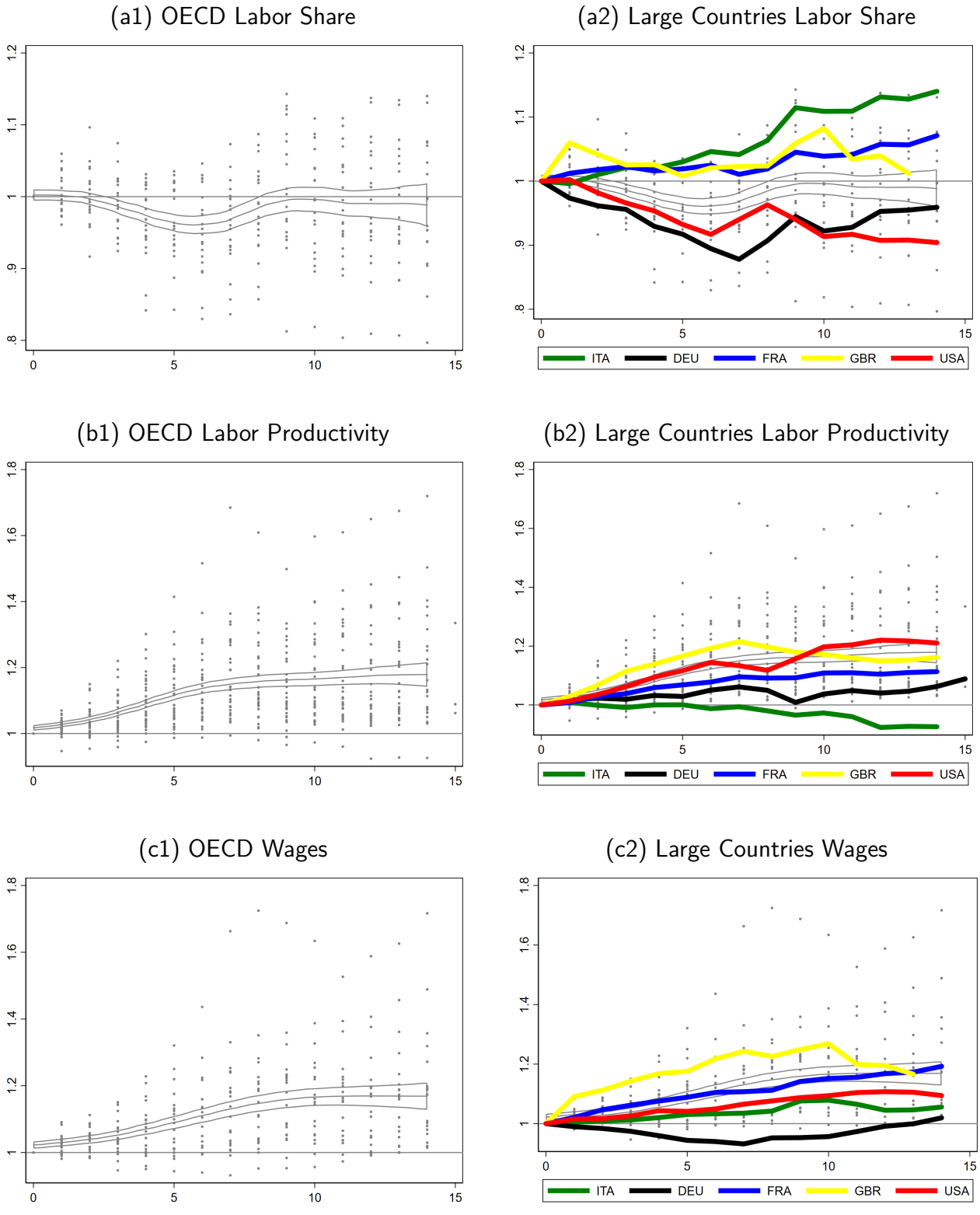
though only at the 10% level; see line (1) in Table 2. The corporate LS that uses the factor income distribution of $R\&D$ to split IPP rents (as in Koh et al. (2017) and Aum et al. (2018)) is trendless with a nonsignificant annual change of -0.02%. Wages grow by an annual rate (1.27%) that is smaller than that of the labor productivity (1.36%), which explains the mild labor share decline for the post-2000s period under the 2008 SNA. At the same time, the trendless behavior of the corporate labor share adjusted for χ is explained by wages that increase by a larger annual rate (1.35%) and that are balanced by the annual labor productivity increase. Both, the increase in wages and the increase in labor productivity are significantly different from zero.

The extension of our analysis to include countries for which we have incomplete time-series for LS_{χ} (i.e., Greece, Korea and Mexico) does not alter our results; see line (2) in Table 2. In this case, under the 2008 SNA the corporate labor share also goes down with a significant annual change of -0.14%, whereas the corrected corporate labor share remains trendless with a nonsignificant -0.07% annual change. Further extending the sample for countries for which LS_{χ} is not available (i.e., Ireland, New Zealand, Spain and Switzerland) does not alter the results for the corporate labor share under the 2008 SNA; see line (3) in Table 2. Notice that the estimates for the trends in the OECD core sample are not significantly different from those of the extended OECD samples. In particular, the point estimates of the extended samples are captured within the confidence intervals at the 5% level in the core OECD sample.

In the left column of Figure 1, we show the behavior of the labor share and its components for the OECD average. We focus on the labor share corrected for IPP labor income as in Koh et al. (2017), see panel (a1). To ease the graphical exposition we normalize each country's labor share to one in year 2000, see panel (a1) and (a2) in Figure 1. Each dot in the graph is a country for each year from year 2000 to 2014. To show the behavior of the labor share for the XXI century as a cross-country average of our full sample of countries we use a locally weighted polynomial.[5] Our main finding, consistent with Table 2, is that the OECD labor share is trendless. We also find that the medium-run behavior of labor share over this period shows some aggregate fluctuations

[5]We use the "lpolyci" command in Stata with Epanechnikov kernel and degree 0 (i.e., local mean smoothing.

Figure 1: The OECD Corporate Labor Share and Its Components, 200-2015



Notes: Each dot in each panel is a country for each year from year 2000 to 2015. In the panels of the left column we also report an OECD average using a locally weighted polynomial with Epanechnikov kernel and degree 0 (i.e., local mean smoothing. In the panels of the right column we add theseries for the five largest countriesin our sample. Notice that we normalize all series per country to be one in year 2000. See the construction of these series in Section 2.

with a decline between 2001 and 2005 and an increases between 2006 and 2009. Our insights do not change if instead we normalize each series to the average LS for each country to one which is equivalent to controlling for country-fixed effects in the estimation of the trend behavior of the OECD average labor share. In panel (a2) of Figure 1 we separately plot the behavior of the five largest countries in the sample against the average OECD behavior. We find that for three of these countries, Italy, France, and Great Britain, the corporate labor share increases through the early XXI century. The increase is particularly strong for Italy and France, and to a lesser extent in the Great Britain. In contrast, for Germany and the U.S. we find that for this sample period the labor share declines though with different patterns. In the case of the U.S. the labor share declines almost monotonically throughout the sample period, whereas in the case of Germany the labor share declines during the first half of the sample period (between 2000 and 2007) and increases afterwards (between 2008 and 2014).

In panel (b1) and panel (c1), we show the behavior of, respectively, labor productivity and wages for the OECD average using a locally weighted parameter. The average OECD labor productivity increases throughout the sample period with an initial acceleration between year 2000 and 2006-2008, and a posterior deceleration between years 2008 and 2014 where the increase in the average OECD labor productivity is mild. The average OECD wages follow a similar behavior but with a lesser acceleration in the first half of the sample period which explains the drop in labor share (before 2005) and posterior increase (between 2006 and 2009).

We also decompose the behavior of the labor share components for the largest five countries in terms of labor productivity (panel b2) and wages (panel c2). On the one hand, focusing on the countries that showed a labor share decline (i.e., Germany and the U.S.) we find that this is explained by wages increasing less through the sample period than labor productivity. On the other hand, focusing on the countries that showed an increase in labor share through this period we find two potential stories. In the case of France and the Great Britain both wages and labor productivity increase, but the extent of the increase is larger for wages. In the case of Italy, wages

barely increase and the labor share increase is explained by a decline in their labor productivity.

The differential pattern in the labor share behavior and its components across the largest five countries in early years of the XXI century is the first sign of heterogeneous behavior in the labor share that we examine in more detail by country in Section 4.

4 Analysis By Country

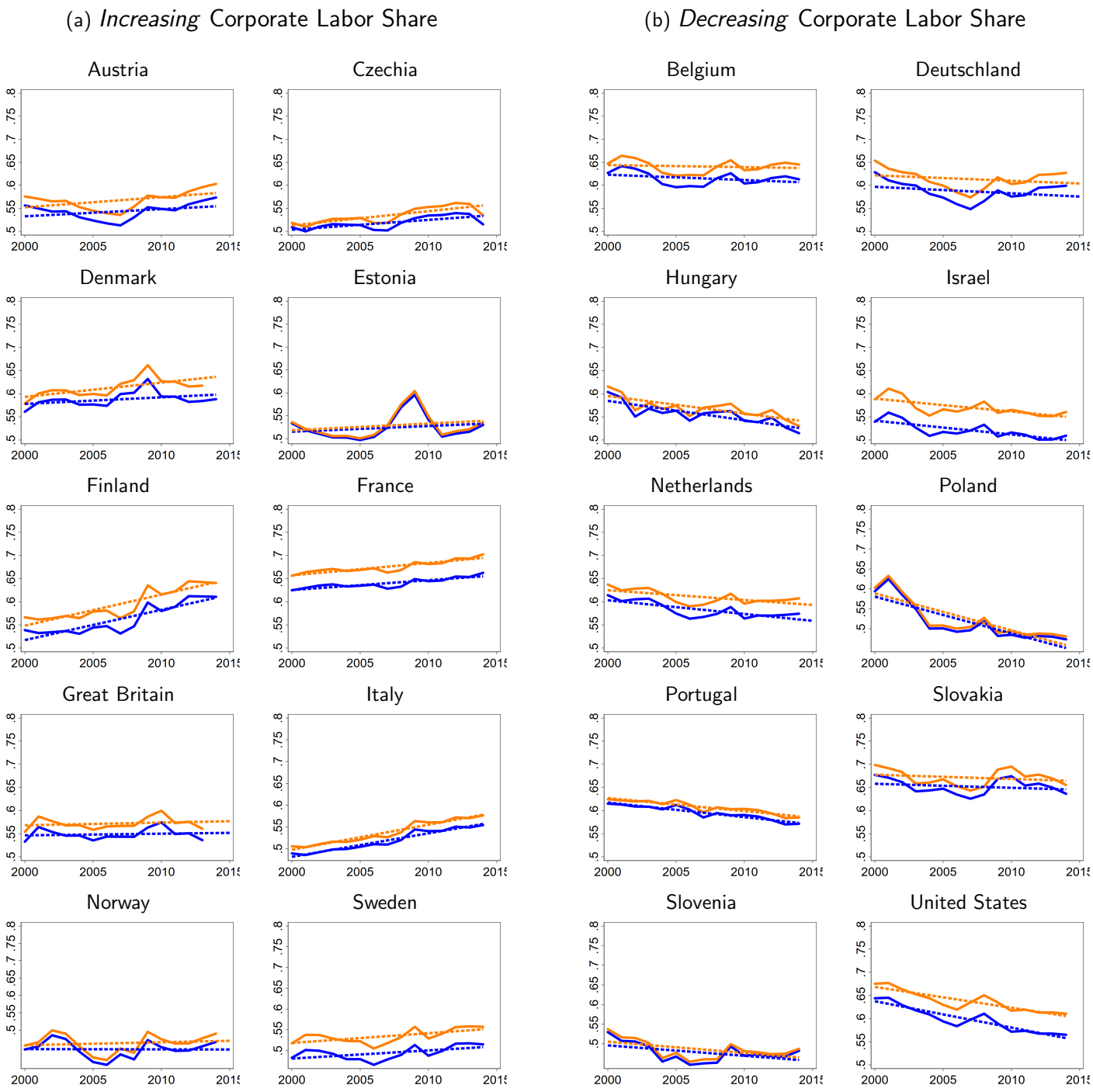
4.1 The Labor Share by Country

We focus on measures of the labor share from the corporate sector and in the countries for which this measure is available, a total of twenty countries that form our core OECD sample. We plot the behavior of the labor share by country in two groups depending on whether labor share increases or decreases throughout the sample period. We show the behavior of the labor share in countries for which labor share is increasing throughout the sample period in panel (a) of Figure 2, whereas we show the countries for which labor share is decreasing throughout the sample period in panel (b) of Figure 2. We plot both the corporate labor share attributing the entire IPP rents to capital income (blue line in each panel of Figure 2) and the labor share that adjusts for labor income rents using the R&D cost structure (orange line in each panel in Figure 2) as in Koh et al. (2017). Note that there are as many countries for which the labor share increases in our core OECD sample for this period, than countries for which labor share decreases. We also plot the linear trends computed as in (2) by country which we also show in Table 3.

4.1.1 Countries with Increasing Corporate Labor Share

The countries for which the corporate labor share increases throughout the sample period are Austria, Czechia, Denmark, Estonia, Finland, France, Great Britain, Italy, Norway and Sweden. The largest increase occurs for Italy with an annual increase in the corporate labor share of 1.06% and Finland 1.12%, see Table 3. The annual increase is also large and significant for Austria, 0.38%, Czechia, 0.57%, Denmark, 0.51%, Estonia, 0.27%, France, 0.40% and Sweden, 0.43%.

Figure 2: Labor Share by Country, Corporate Sector, 2000-2014



Notes: In each of these panels we show by country the time-series of the corporate labor shares LS (blue line) and LS_χ (orange line) for the sample period 2000-2014. The first and second (third and fourth) columns show the results for the countries with increasing (decreasing) corporate labor share LS_χ over the sample period. See the construction of these series in Section 2.

Further, Great Britain and Norway show smaller annual increases that are not significant with respective annual rates of 0.10% and 0.18%. Notice that the correction for labor income rents using the R&D cost structure does not change the sign of the trend, except for Norway, although in this case the 2008 SNA labor share and its corrected measure are both nonsignificantly different from zero.

4.1.2 Countries with Decreasing Corporate Labor Share

The countries for which the corporate labor share decreases are Belgium, Germany, Hungary, Israel, Netherlands, Poland, Portugal, Slovakia, Slovenia and the United States. Of these countries, the largest labor share declines for this sample period are observed for the United States, that shows an annual decrease in the corporate labor share of 0.70%, Poland, -1.71% and Hungary, 0.66%; see Table 3. Also significant declines in the labor share are displayed in the case of Israel, -0.48%, Portugal, -0.46%, Netherlands, -0.34% and Slovakia, -0.56%. Finally, we also find smaller declines in the labor share, that are nonsignificantly different from zero, for Belgium, Germany, and Slovenia with respective annual rates of -0.07%, -0.19% and -0.13%.

4.2 Labor Productivity and Wages by Country

We now examine cross-country differences in labor productivity and wages separately for countries in which the corporate labor share increases and for countries in which the corporate labor share decreases. In panel (a) of Figure 3 we plot the behavior of the labor share LS_χ, wages W_χ and labor productivity Y/H for the sample of countries for which the corporate labor share is increasing between 2000 and 2014. In panel (b) of Figure 3 we do the same for the sample of countries in which labor share decreases throughout the sample period. Note that we normalize by country all variables to one in year 2000. The normalization helps highlight some patterns for wage and labor productivity growth across countries.

Table 3: Corporate Labor Share and Its Components (in $logs$) by Country, Post 2000s.

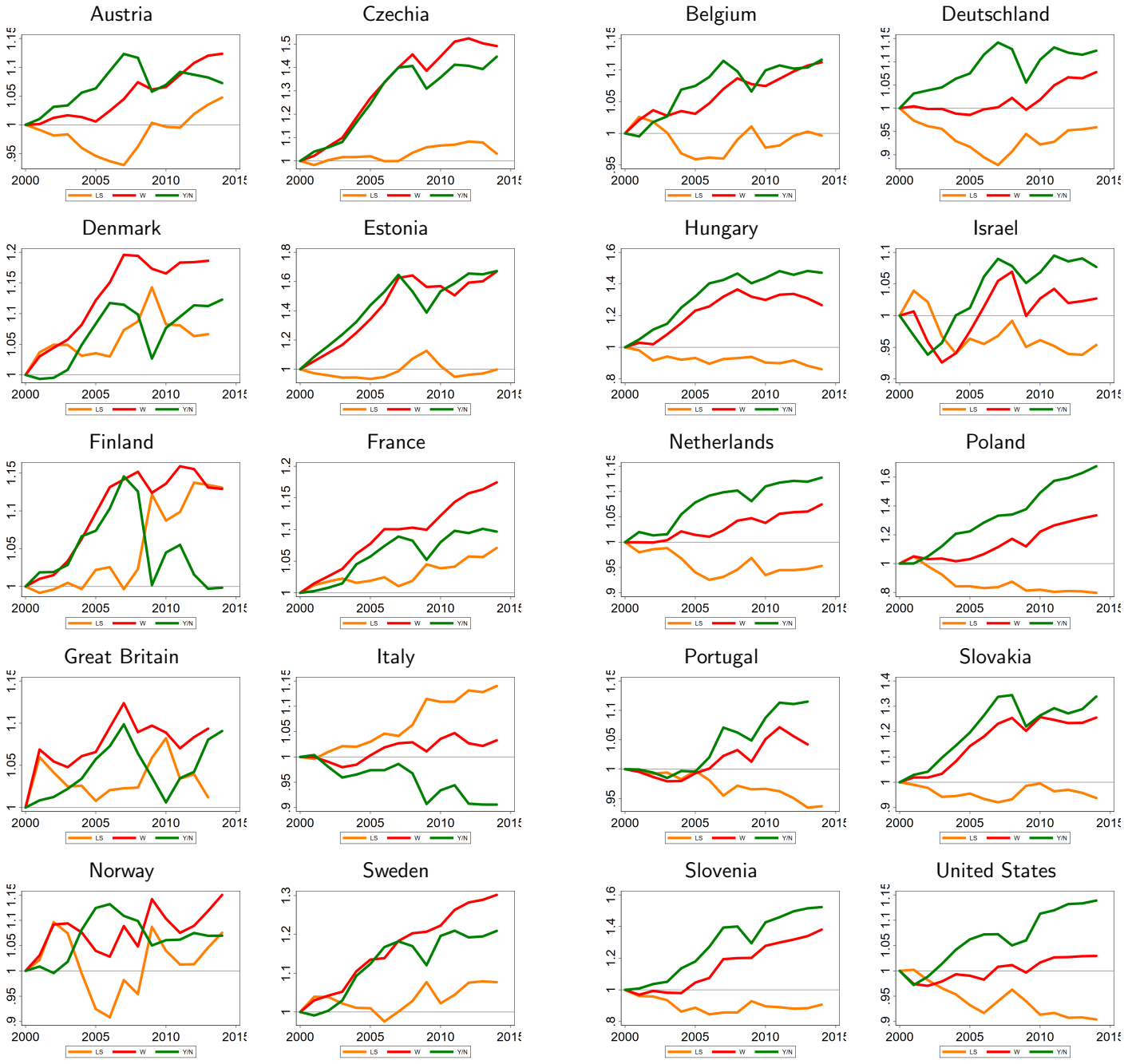
	Labor Share		Wages		Labor Prod.
	LS	LS_χ	W	W_χ	Y/H
Austria	0.0028	0.0038	0.0079	0.0090	0.0051
	(0.153)	(0.061)	(0.000)	(0.000)	(0.005)
Belgium	-0.0018	-0.0007	0.0059	0.0071	0.0077
	(0.194)	(0.613)	(0.000)	(0.000)	(0.000)
Czech Republic	0.0041	0.0057	0.0307	0.0323	0.0265
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)
Denmark	0.0024	0.0051	0.0107	0.0135	0.0083
	(0.133)	(0.011)	(0.000)	(0.000)	(0.000)
Estonia	0.0023	0.0027	0.0353	0.0357	0.0330
	(0.465)	(0.401)	(0.000)	(0.000)	(0.000)
Finland	0.0115	0.0112	0.0106	0.0103	-0.0008
	(0.000)	(0.000)	(0.000)	(0.000)	(0.769)
France	0.0033	0.0040	0.0105	0.0112	0.0072
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Germany	-0.0023	-0.0019	0.0050	0.0055	0.0074
	(0.290)	(0.378)	(0.001)	(0.000)	(0.000)
Great Britain	0.0007	0.0010	0.0040	0.0043	0.0039
	(0.666)	(0.495)	(0.018)	(0.011)	(0.027)
Hungary	-0.0075	-0.0066	0.0201	0.0210	0.0276
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Israel	-0.0057	-0.0048	0.0043	0.0051	0.0099
	(0.001)	(0.004)	(0.057)	(0.030)	(0.000)
Italy	0.0103	0.0106	0.0032	0.0035	-0.0071
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Netherlands	-0.0050	-0.0034	0.0037	0.0053	0.0087
	(0.001)	(0.010)	(0.000)	(0.000)	(0.000)
Norway	-0.0001	0.0018	0.0040	0.0060	0.0041
	(0.983)	(0.601)	(0.039)	(0.006)	(0.092)
Poland	-0.0173	-0.0171	0.0216	0.0218	0.0389
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Portugal	-0.0053	-0.0046	0.0053	0.0060	0.0105
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Slovakia	-0.0053	-0.0056	0.0286	0.0283	0.0339
	(0.072)	(0.048)	(0.000)	(0.000)	(0.000)
Slovenia	-0.0013	-0.0013	0.0181	0.0180	0.0194
	(0.391)	(0.404)	(0.000)	(0.000)	(0.000)
Sweden	0.0039	0.0043	0.0190	0.0194	0.0150
	(0.038)	(0.013)	(0.000)	(0.000)	(0.000)
United States	-0.0094	-0.0070	0.0015	0.0039	0.0109
	(0.000)	(0.000)	(0.042)	(0.000)	(0.000)

Notes: Here we report the country-specific linear trend (γ) computed from a least square minimization of $\ln x_{c,t} = cons. + \gamma_{c,t}$ where $x = \{LS, LS_\chi, W, W_\chi, Y/H\}$ and t is the calendar year for the post-2000 sample period; see the construction of these series in Section 2. In parenthesis we write the p-value.

Figure 3: Wages and Labor Productivity by Country, Corporate Sector, 2000-2014

(a) *Increasing* Corporate Labor Share

(b) *Decreasing* Corporate Labor Share



Notes: In each of these panels we show by country the time-series of the labor share LS_χ (orange line), wages W_χ (red line) and labor productivity Y/H (green line) for the sample period 2000-2014. The first and second (third and fourth) columns show the results for the countries with increasing (decreasing) corporate labor share LS_χ over the sample period. See the construction of these series in Section 2.

4.2.1 Countries with Increasing Corporate Labor Share

In the case of Denmark, Finland, Sweden and France we find that wage growth is above labor productivity growth in almost all years under study, in particular after 2008; see panel (a) in Figure 3. Throughout the sample period wages grow annually at a significant rate for Denmark, Finland, Sweden and France by, respectively, 1.35%, 1.03%, 1.94% and 1.12%, whereas labor productivity grow annually at a significant rate of, respectively, 0.83%, -0.08%, 1.50% and 0.72%, see Table 3. In the case of the Czech Republic and Estonia we also find this pattern but to a lesser extent after 2008. Indeed, for Estonia we do not find that the increase in the labor share throughout the period is significantly different from zero.

The case of Austria is similar to the previous countries though it differs in that labor productivity was growing faster than wages before 2008; see panel (a) in Figure 3. This implies first a decline in the labor share of Austria for the 2000-2008 subperiod that has been offset by wages that overtake labor productivity after 2011 generating an overall increase in the labor share at an annual rate of 0.38% throughout the period, see Table 3.

The case of Italy is substantially different to the rest of countries for which labor share increases. We find that the increase in the labor share throughout the period is generated by a mild but significant increase in wages 0.35% that is accompanied by a decline in labor productivity growth by a significant annual rate of -0.71%; see panel (a) in Figure 3 and Table 3. Italy is the only country for which we found a decline in labor productivity throughout the sample period.

Finally, although the point estimates of the labor share trend are positive both for the Great Britain and Norway, the labor share growth estimates are not significant for this sample period. In the case of Great Britain, although the normalized wages are always above labor productivity these two series never really diverge from each other and we find periods in which both series move in parallel (e.g., between 2003 and 2008 and back in 2014). Precisely, for the Great Britain, wages grow annually at a rate of 0.43% and labor productivity at a rate 0.39%, leaving labor

share basically trendless; see Table 3. The behavior of wages and labor productivity for Norway is less clear with normalized wages and labor productivity crossing more than once throughout the sample period. This implies large fluctuations in the corporate labor share for Norway around an average labor share; see panel (a) in Figure 3.

4.2.2 Countries with Decreasing Corporate Labor Share

For this set of countries the behavior of labor productivity and wages is more homogeneous than in the previous sample. In general, the normalized values of labor productivity are (almost) always above those of wages throughout the sample period. This is the case of Germany, Hungary, Israel, Netherlands, Poland, Portugal, Slovakia and the United States; see in panel (b) of Figure 3 and also Table 3. The case of Germany and Portugal is slightly different from the rest of these countries in that wage growth is not really present before 2005. Indeed, the increase in wages in Germany is so large after 2008—compared to previous years—that it generates an increase in the labor share for that 2008-2014 subperiod in a manner that makes the corporate labor share for the entire sample period not significantly different from zero.

Finally, in Belgium both labor productivity and wages significantly grow throughout the sample period but intertwine in a manner that makes the observed labor share decline not significant. In the case of Slovenia the observed labor share decline is also not significant and is due to the fact that although labor productivity and wages significantly grow throughout the sample period they do so in parallel after approximately year 2005; see in panel (b) of Figure 3 and also Table 3.

5 Sources of Cross-Country Differences: Wages and Labor Productivity in Increasing versus Decreasing Labor Share Countries

At the peril of ignoring country-specific idiosyncrasies described in the previous Section 4, first we split the core OECD sample into countries for which the corporate labor share increases and countries for which the corporate labor share decreases. Then, we re-conduct our computation of

the corporate labor share trend following (2) separately for the sample of countries with increasing corporate labor share and for the sample of countries with decreasing corporate labor share. The sample of countries with increasing labor share in the OECD through the post-2000 period is Austria, Czechia, Denmark, Estonia, Finland, France, Great Britain, Italy, Norway and Sweden. The sample of countries with decreasing labor share in the OECD for the post-2000 period is Belgium, Germany, Hungary, Israel, Netherlands, Poland, Portugal, Slovakia, Slovenia and the United States. Next, we conduct our analysis by splitting a restricted sample that focuses on countries for which either the increase or decrease of the corporate labor share is significantly different from zero over the sample period. Following our results in Section 4, this implies that the restricted sample excludes Great Britain and Norway from the previous increasing labor share sample and Belgium, Germany and Slovenia from the previous decreasing labor share sample.

Our results are in Table 4. For the full OECD core sample we find that the corporate labor share (LS) significantly increases by 0.42% under the 2008 SNA that attribute all IPP rents to capital income and the corporate labor share (LS_χ) significantly increases by 0.51% after a correction that attributed to labor income a proportion of the IPP rents using data on the R&D cost structure, see Table 4. Using the restricted sample we find a larger significant increase of 0.55% in LS and of 0.64% in LS_χ. In the decreasing labor share sample we find a significant decrease of -0.61% in LS and -0.53% in LS_χ. In the restricted sample the decrease is magnified to -0.79% in LS and -0.71% in LS_χ.

What component of the labor share is behind the differential trends in the labor share across these two groups—increasing vs. decreasing—over the early XXI century? We find that labor productivity differences, and not wages, is what drives the different corporate labor share behavior. First, focusing on the sample of countries with increasing labor share through this period, we find that wages significantly increase at an annual rate of 1.48% with a confidence interval [1.25%, 1.70%] at the 5% level, while labor productivity grows annually at a smaller rate, 0.95% with a confidence interval [0.71%, 1.19%] at the 5% level. Second, focusing on the sample of countries

Table 4: Increasing and Decreasing Labor Share, OECD Core Sample, Post 2000s.

	Labor Share		Wages		Labor Prod.
	LS	LS_χ	W	W_χ	Y/H
Full Sample:					
(1) *Increasing* Labor Share Countries	0.0042	0.0051	0.0138	0.0148	0.0095
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(2) *Decreasing* Labor Share Countries	-0.0061	-0.0053	0.0115	0.0123	0.0177
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Restricted Sample:					
(3) *Increasing* Labor Share Countries	0.0055	0.0064	0.0133	0.0142	0.0078
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(4) *Decreasing* Labor Share Countries	-0.0079	-0.0071	0.0124	0.0133	0.0204
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: Here we report the linear trend, γ, computed from a least square minimization of $\ln x_{g,c,t} = const + \sum_{c \in g} \beta_c \mathbf{1}_c + \gamma_g t + \varepsilon_{g,c,t}$ where $x = \{LS, LS_\chi, W, W_\chi, Y/H\}$ where we control for country-fixed effects, $\mathbf{1}_c$, t is the calendar year for the post-2000 sample period. In parenthesis we write the p-value. The full OECD core sample of countries is as defined in Section 2. We compute γ separately for two groups g. The sample of countries with increasing labor share in the full OECD core sample through the post-2000 period is Austria, Czechia, Denmark, Estonia, Finland, France, Great Britain, Italy, Norway and Sweden. The sample of countries with decreasing labor share in the OECD for the post-2000 period is Belgium, Germany, Hungary, Israel, Netherlands, Poland, Portugal, Slovakia, Slovenia and the United States. Second, we conduct our analysis by splitting a restricted sample that focuses on countries for which either the increase or decrease of the corporate labor share is significant over the sample period. Following our results in Section 4, this implies that the restricted sample excludes Great Britain and Norway from the previous increasing labor share sample and Belgium, Germany and Slovenia from the previous decreasing labor share sample.

with decreasing corporate labor share through the sample period, we find that wages significantly increase at an annual rate of 1.23% with a confidence interval [1.04% and 1.41%] at the 5% level and labor productivity annual growth is larger in this sample, 1.77% with a confidence interval [1.54%, 1.99%] at the 5% level.

It is important to highlight that wage growth is nonsignificantly different between the sample of countries with increasing corporate labor share and the sample of countries with decreasing corporate labor share. To see this, note that the confidence intervals of wage growth at the 5% overlap across the increasing and decreasing labor share groups. In contrast labor productivity growth is significantly different across the two groups. In particular, labor productivity growth in countries for which labor share declines is almost twice as large point estimate is almost twice as large in the sample of countries with decreasing labor share than in the sample of countries with increasing labor share for this sample period. The restricted sample also attains similar insights with even larger (and also significant) differences in labor productivity across increasing and decreasing labor share samples, and smaller (and not significant) differences in wages across the two samples.

6 Conclusion

The OECD corporate labor share that attributes to labor income a proportion of the IPP rents using data on the R&D cost structure (as in Koh et al. (2017)) is trendless for the 2000-2014 period; a medium-run horizon. Nevertheless, we find large cross-country heterogeneity in the relationship between wages and labor productivity and hence the labor share throughout this period. Indeed, the number of countries in which the labor share increases is equal to the number of countries in which labor share decreases in this period. This finding makes a one-fit-all theory of the labor share very unlikely.

Further, we find that the countries in which labor share increases face similar (nonsignificantly different) wage growth from the countries in which labor share decreases. This implies that

labor productivity growth—and hence sources generating labor productivity growth differences across countries—is behind the differential behavior of the labor share between these two groups of countries. Precisely, we find that labor productivity growth in countries where labor share decreases is approximately twice as large as the labor productivity growth in countries where labor share increases for the sample period 2000-2014.

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