

# Capital Depreciation and Labor Shares Around the World: Measurement and Implications

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## Online Appendix

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### A Adjusting for Taxes

As with depreciation, some analyses may call for adjusting labor shares to account for the treatment of taxes in national accounts. Typical labor share measures include taxes on production in the measure of income but not in the measure of compensation of employees.<sup>1</sup> Therefore, this practice effectively treats all taxes as capital income. A reasonable alternative treatment of these taxes is to augment compensation of employees with a proportion of taxes that equals the share of non-tax value added belonging to compensation. Bridgman (2014), for example, makes such an adjustment for a handful of countries.

We denote this tax-adjusted labor share as  $\tilde{s}_{L,i,t}^j$ , defined by:

$$\tilde{s}_{L,i,t}^j = \frac{\text{Compensation} + \tilde{s}_{L,i,t}^j \times \text{Taxes on Production}}{\text{Value Added}} \implies \tilde{s}_{L,i,t}^j = s_{L,i,t}^j \frac{1}{1 - \tau_{i,t}^j}, \quad (\text{A.1})$$

where  $\tau_{i,t}^j$  is the size of taxes on production as a share of the value added measure corresponding to the denominator of type  $j$  labor shares. Depending on one's view of the measurement of these accounting terms and their mapping to objects in theoretical models, the unadjusted labor share  $s_{L,i,t}^j$  and the tax-adjusted labor share  $\tilde{s}_{L,i,t}^j$  might be differentially useful and informative. As seen in equation (A.1), differences in the growth rates of the two concepts for the labor share are attributable to growth in the tax share of value added  $\tau_{i,t}^j$ .

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<sup>1</sup>Taxes on production equal the sum of (i) "taxes on products" such as federal excise taxes, state and local sales taxes, and taxes and duties on imports and (ii) "other taxes on production" such as property taxes or taxes paid by employers for their employed labor. We simply refer to "taxes on production," "other taxes on production," and "taxes on products," but these items in the national accounts subtract the corresponding value of subsidies and so sometimes are called "(other) net taxes on production and imports" or "taxes on production and imports less subsidies." In the U.S. corporate sector these taxes equal line 7 of NIPA Table 1.14.

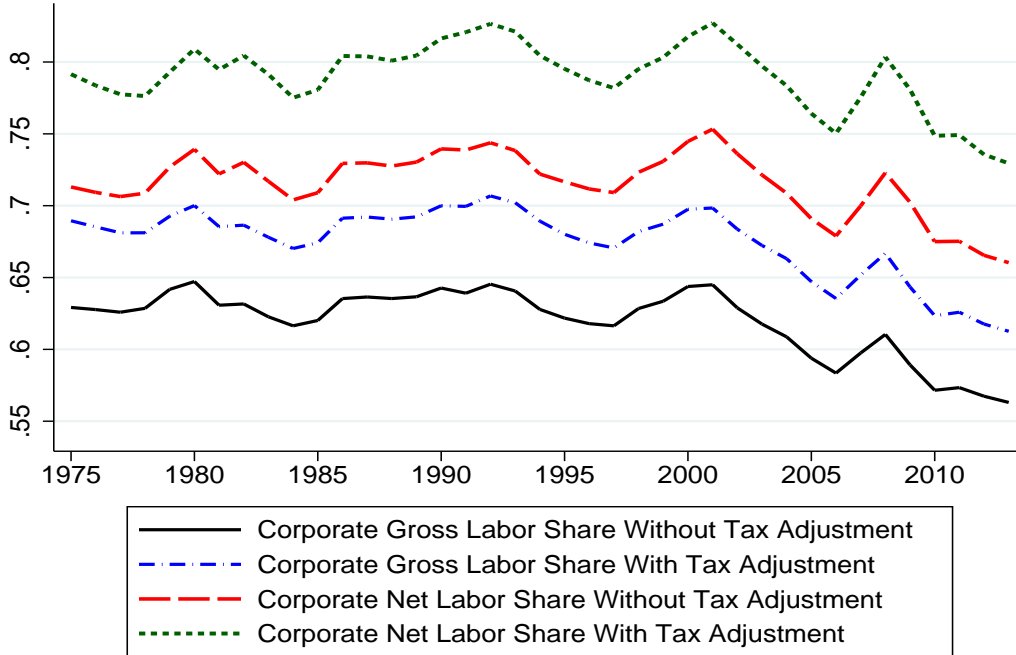


Figure A.1: U.S. Corporate Labor Shares With and Without Tax Adjustments

## A.1 Tax Adjusted Labor Shares for the United States

The solid and long-dashed lines in Figure A.1 plot the gross and net of depreciation labor shares for the U.S. corporate sector,  $s_{L,i,t}^{CG}$  and  $s_{L,i,t}^{CN}$ . These are not adjusted for taxes. Consistent with the global results presented in the main text of the paper, both gross and the net labor shares in the United States are by 2012 at levels meaningfully lower than the levels from the mid-1970s or early 1980s. For the U.S. corporate sector, the net labor share decline is on the order of two-thirds of the gross labor share decline.

The medium-dashed and short-dashed lines give the tax-adjusted versions of these lines,  $\tilde{s}_{L,i,t}^{CG}$  and  $\tilde{s}_{L,i,t}^{CN}$ . The numerators of these labor shares are the same as those used in the unadjusted labor shares but the denominators are smaller since taxes, given in line 7 of NIPA Table 1.14, have been subtracted. For this reason, the tax-adjusted labor shares are higher in levels.

The time series patterns of the tax-adjusted and unadjusted labor shares are quite similar. The linear trend of the tax-adjusted gross labor share declines at a rate of 1.51 percentage points per 10 years, slightly faster than the rate of 1.42 percentage points per 10 years for the

unadjusted gross labor share. The linear trend in the tax-adjusted net labor share declines at a rate of 0.85 percentage point per 10 years, slightly slower than the rate of the unadjusted net labor share of about 0.89 percentage point per 10 years. The tax adjustments have essentially no impact, consistent with the relatively stable share of taxes in both gross and net value added of the corporate sector.<sup>2</sup>

## A.2 International Tax-Adjusted Labor Shares

We can similarly measure the impact of taxes on the labor share for those countries with raw national accounting data on corporate gross labor shares and corporate taxes on production. Taxes on production were generally not recorded in the Karabarbounis and Neiman (2014) dataset from country-specific web pages. This part of our analysis therefore relies on data from the OECD and UN. The treatment of taxes in most countries in these data differ from that in the U.S. NIPA tables. For instance, in many countries some subset of the taxes are not “sectorized.” This means that while they contribute to overall GDP, they do not contribute to the gross value added of any sector, including the corporate sector. Rearranging equation (A.1), one can easily verify that an alternative way to calculate the tax-adjusted labor share is:

$$\tilde{s}_{L,i,t}^j = \frac{\text{Compensation}}{\text{Value Added} - \text{Taxes}}.$$

In this sense, those countries that already removed some taxes from corporate value added have already made a part of this tax adjustment for us.

Some part of taxes on production in these data, however, remains recorded as part of the corporate sector. We use this component of taxes to calculate the tax share  $\tau_{i,t}^j$  and analyze the impact of tax adjustments on labor share trends around the world.<sup>3</sup> Looking across countries,

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<sup>2</sup>Previous versions of Bridgman (2014) included a plot showing that  $\tilde{s}_{L,i,t}^{CN}$  declined significantly more slowly than  $s_{L,i,t}^{CN}$  in the United States since 1975. We have corresponded with the author and verified that the pattern he previously showed reflected a mistake.

<sup>3</sup>In OECD data, we measure taxes in the corporate sector as the difference between item codes D.2 and D.3 (taxes on production less than subsidies) in that sector. The UN data provides only items D.29 and D.39 for the corporate sector, the difference of which corresponds to the “other taxes on production less subsidies” item, which is a sub-item of “net taxes on production.” Though these entries are (confusingly) labeled in these different ways, a comparison of these entries across OECD and UN data strongly suggests they correspond to the same accounting concept.

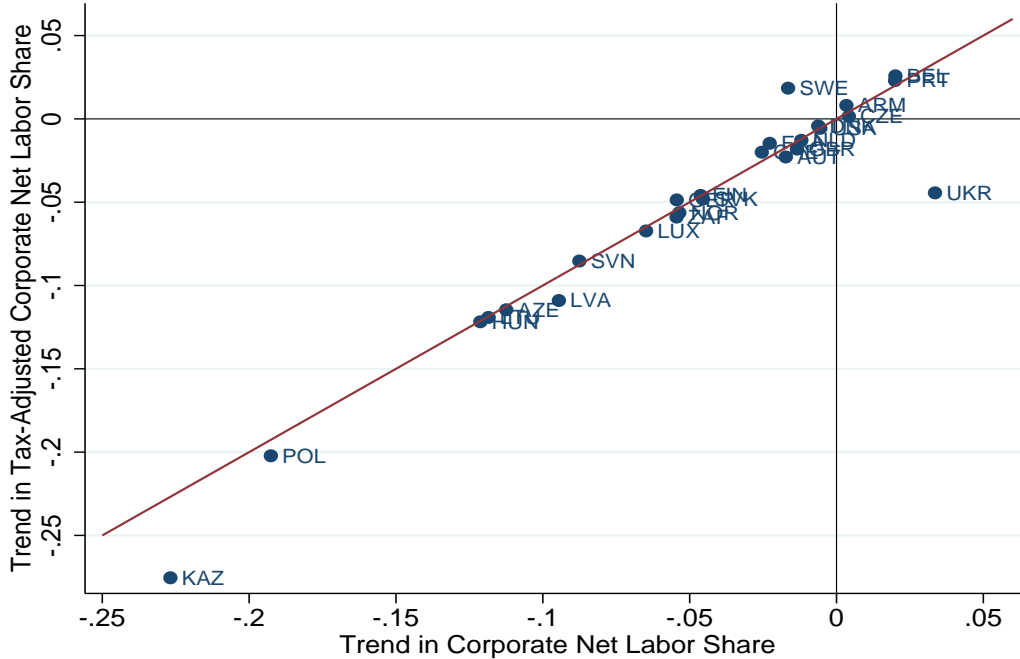


Figure A.2: Corporate Net Labor Share Trends With and Without Tax Adjustments

there is considerable variation in the share of these taxes in gross value added. Corporate taxes on production range from negative values to more than one-tenth of corporate gross value added.

As can be seen in equation (A.1), an increase in the tax share  $\tau_t$  over time would cause the tax-adjusted labor share to increase relative to the unadjusted labor share. Summary statistics from the international data, however, do not suggest this has occurred. The (corporate gross value added) weighted average tax share decreased from roughly 7 percent to roughly 5 percent between the beginning and the end of the sample.

Figure A.2 makes this point by comparing the trends per 10 years in the corporate net labor share with and without the tax adjustment. Most countries lay near the plotted 45 degree line and the slope of the best-fit line is not statistically distinguishable from one. Of the 26 countries with data on corporate labor shares and taxes, 24 have unadjusted and tax-adjusted trends with the same sign. The equivalent analysis with corporate gross labor shares yields the same result. The tax adjustments are small and generally do not alter any qualitative or quantitative conclusions about labor share trends.

## References

BRIDGMAN, B. (2014): “Is Labor’s Loss Capital’s Gain? Gross Versus Net Labor Shares,” Working Paper, Bureau of Economic Analysis.

KARABARBOUNIS, L., AND B. NEIMAN (2014): “The Global Decline of the Labor Share,” *Quarterly Journal of Economics*, 129(1), 61–103.