

Quantitative Macro HW 1

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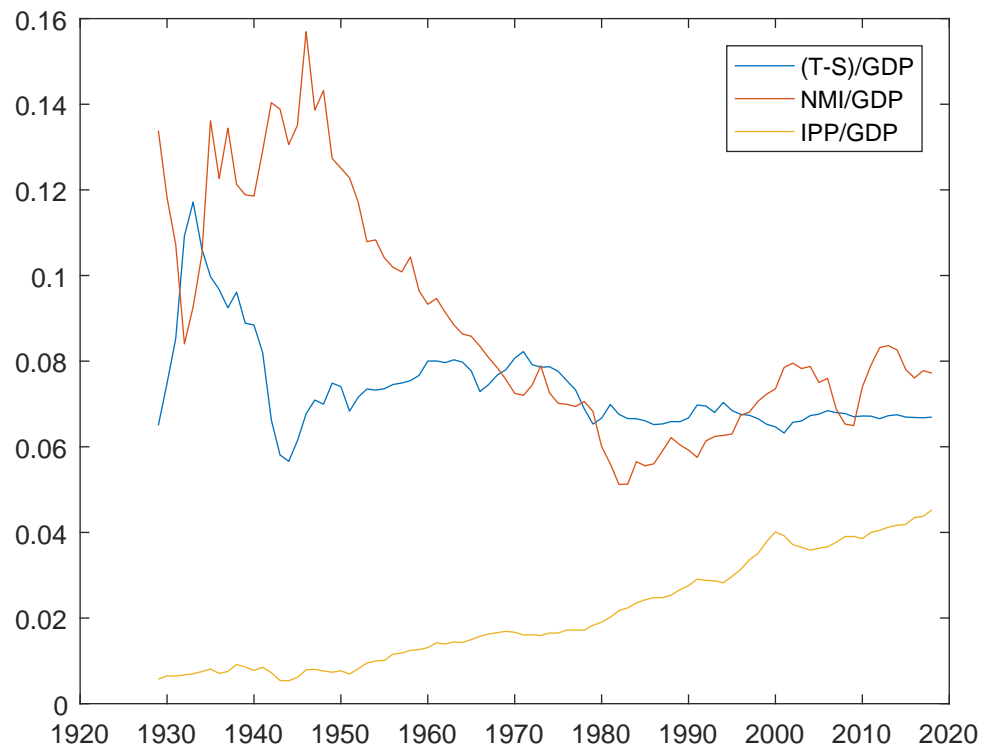
September 22, 2019

Data

In the following all data is obtained from the U.S. Bureau of Economic Analysis.

Q 1

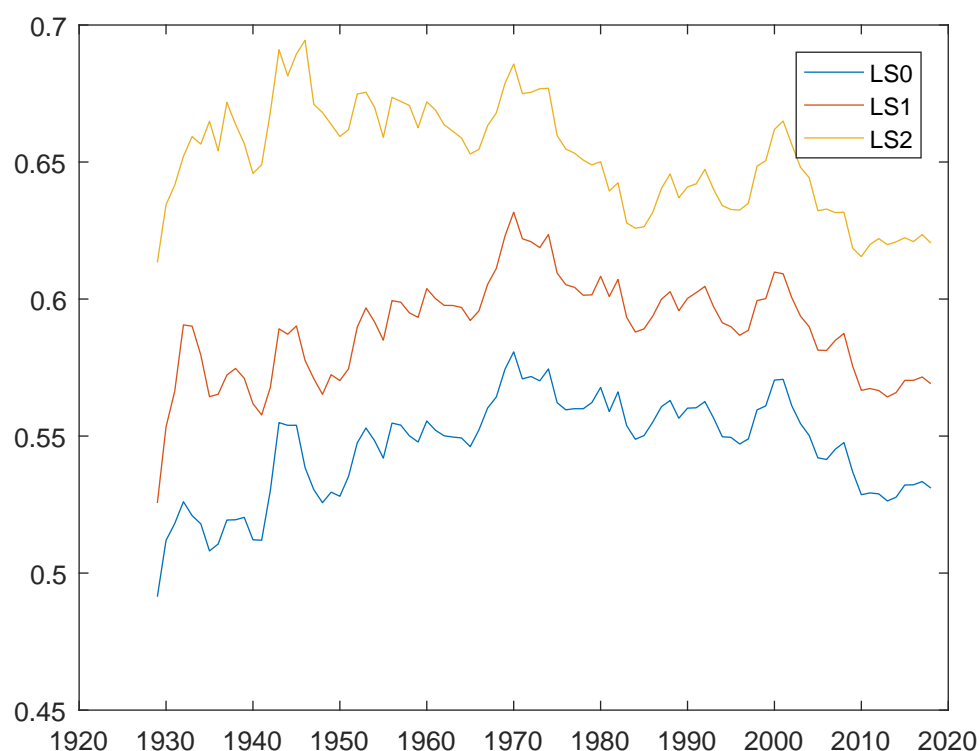
1.



Starting with tax revenue over GDP, there is an obvious jump from around 6-7 percent of GDP to 12 percent at the beginning of WW2, which fades out to the end of the war. After this tax revenue and GDP grow at roughly the same speed, such that the ratio stays constant. Net mixed income declined strongly after 1950, this could to a large degree be driven by small business being replaced by larger corporations (e.g.

small supermarkets being replaced by big supermarket chains). Intellectual property products steadily increased their share in GDP. Looking at the data this is driven by investments in Software in R and D having a higher growth rate than GDP.

2.

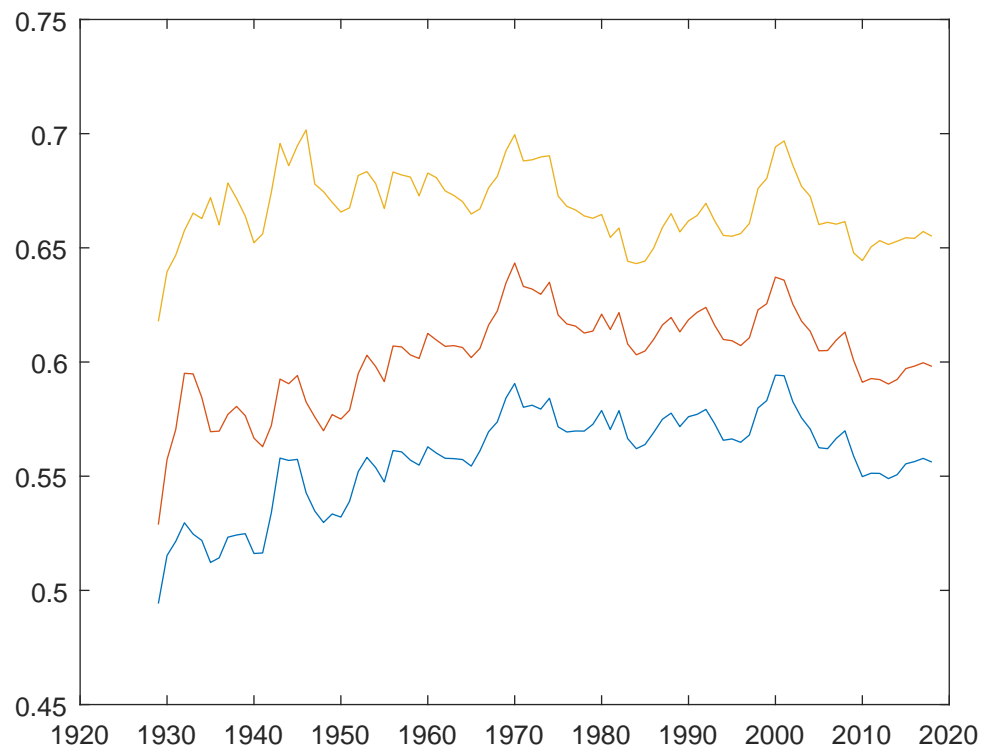


We can see the classical shape of the development of the labour share of income with a rise until 1970 and thereafter a gradual decline (with a sizeable upside hump around 2000). Obviously by correcting for taxes and subsequently additionally for net mixed income increases the overall share. At the same time the three time series move almost parallel. This relationship is especially strong after 1970. In EX 1 we already saw that $(t-S)/GDP$ and NMI/GDP are relatively constant, which explains the co-

movement of all three measures. On top of that LS_1 displays a positive hump in the pre war period corresponding to the hump in $(T-S)/GDP$. And as NMI decreases between 1950 and 1970, LS_2 does not show an upwards trend similar to LS_0 and LS_1 and stays relatively constant in that period.

So especially for that period it seems to be important to find the proportion of NMI that is treated as labour or capital income (assuming that the true ratio is constant).

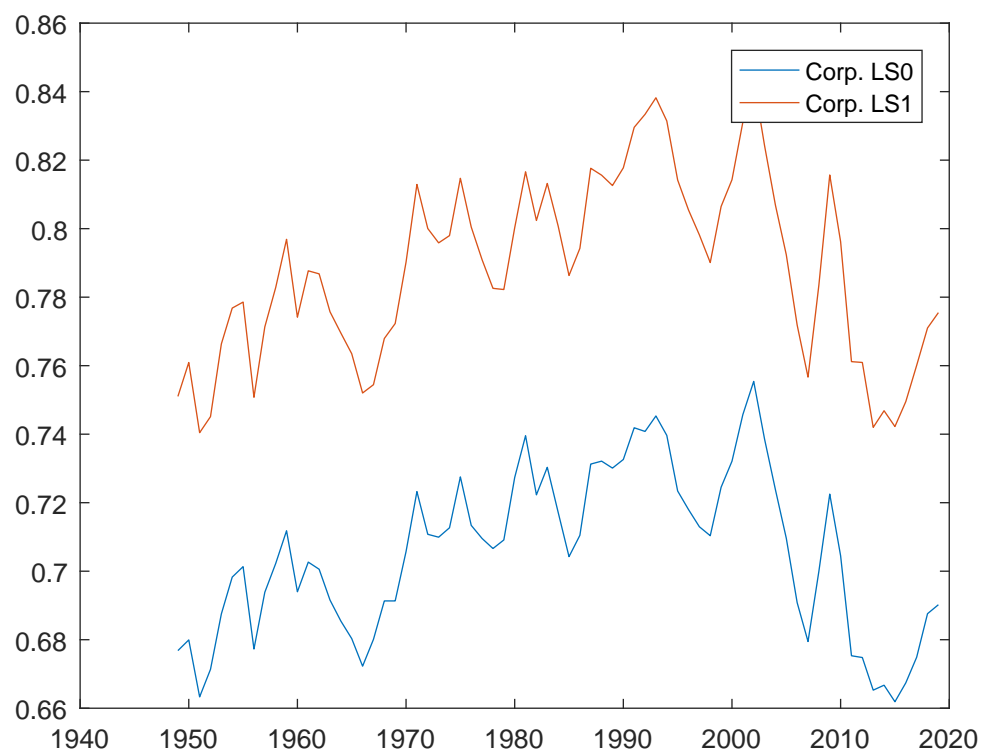
Q 2



Subtracting IPP from GDP and therefore going back to the pre-SNA93 calculation of GDP changes the trends in the development of the labour

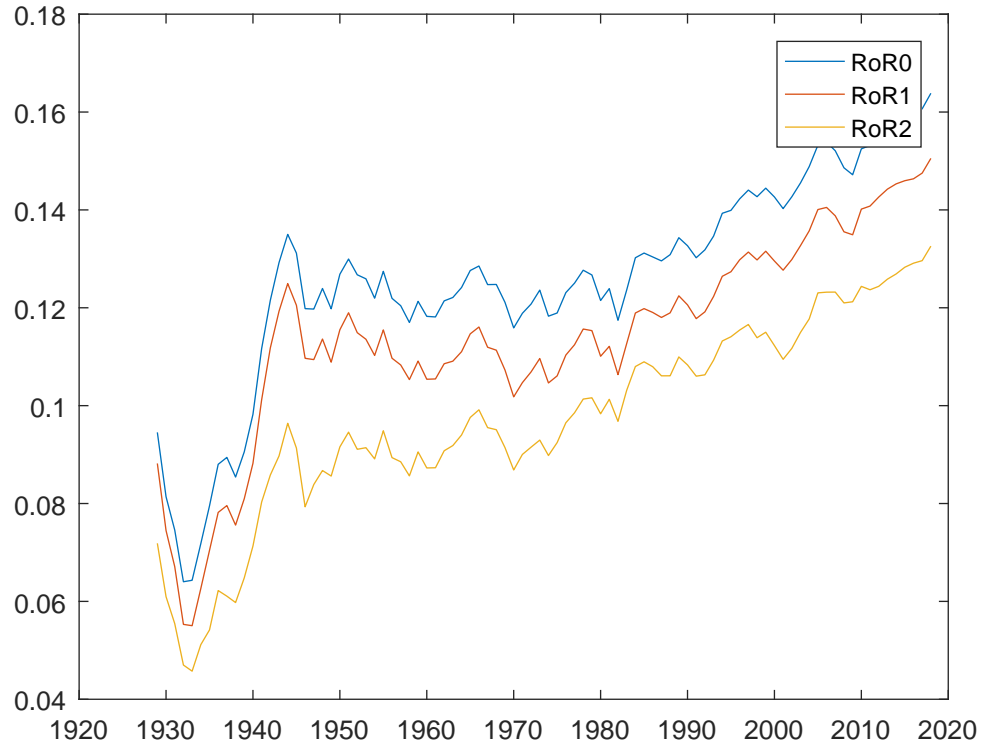
share of income. The increase in the the share of IPP over GDP that was shown in question 1 counteracts the fall in the labour share after 1970 that can be observed in question 1. Consequently the labour share has fallen less and is higher in recent years using the pre-SNA93 definition of GDP compared to the current definition.

Q 3



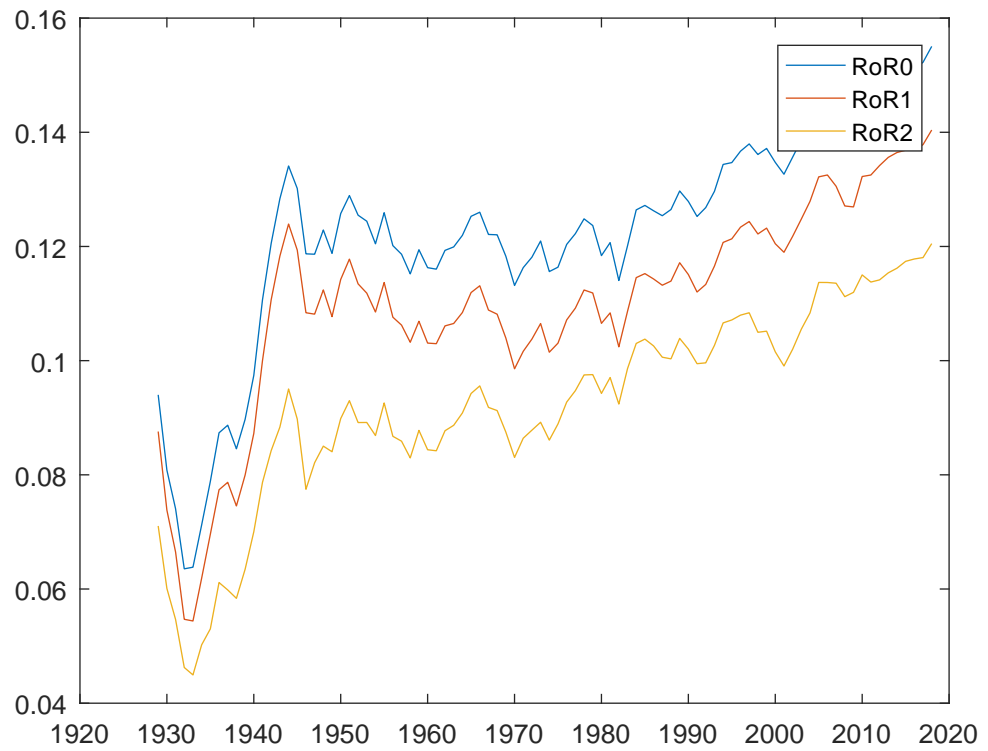
The above figure shows the development of the labour share in income for the corporate sector only. As there is no data available for NMI and IPP for the corporate sector, only LS_0 and LS_1 are reported. Overall the labour share of income is higher in the corporate sector than in the whole economy, furthermore the decline seems to start 20-30 years later.

Q 4



Finally I calculate the rate of return on capital through the equation $r = \frac{rK}{K}$, where rK is calculated using each of the three different estimates for the labour (and therefore capital) share of income. GDP and fixed assets are furthermore in real terms using the appropriate deflator for both variables.

The results show an increase in the return to capital since 1970, corresponding to the fall in the labour share in that same period.



Using again the pre-SNA93 proxys for LS, the increase in the RoR is flatter then before. This was expected as the the fall in LS was smaller using the old definition of GDP.