

Problem Set 2: Quantative Macroeconomics

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1 Labor Share for the United States (1947-2017)

We know the that output consists of:

$$Income = wH + rK, \quad (1)$$

where the labor part wH includes CE(compensation of employees), and the capital part rK includes: RI (rental income), CP (corporate profits), NI (net interest), T-S(taxes - subsidies), PI (proprietors' income) etc.

The problem arises in PI, since it also includes labor part.

The labor share is calculated as:

$$\text{Labor Share} = \frac{\text{Employee compensation} + \text{Proprietors' labor compensation}}{\text{Output}} \quad (2)$$

The main source of data for BEA estimates of employee compensation is the BLS Quarterly Census of Employment and Wages (QCEW).

Proprietors' labor compensation makes up the other portion of labor compensation.

To separate this combination of proprietors' labor and capital income, it is necessary to make an assumption about how proprietors' income is divided into these two components.

We will need to estimate following:

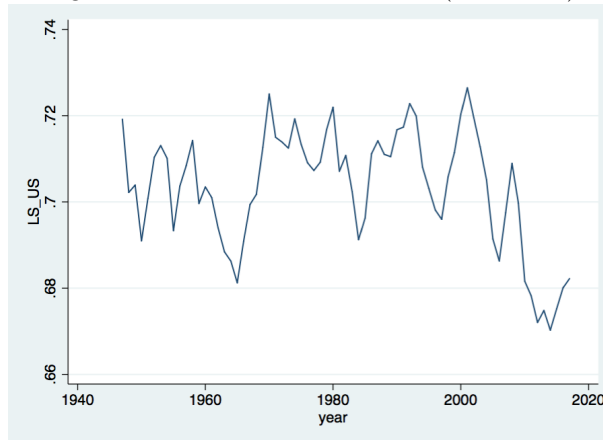
$\theta = \frac{wH}{Y - PI}$, so that we can separate the term PI: labor part of PI is equal to θPI .

Therefore, labor share is:

$$LS = \frac{CE + \theta * PI}{Y} \quad (3)$$

The results of labor share calculation for US are presented in Figure 1.

Figure 1. Labor Share for the US (1947-2017)



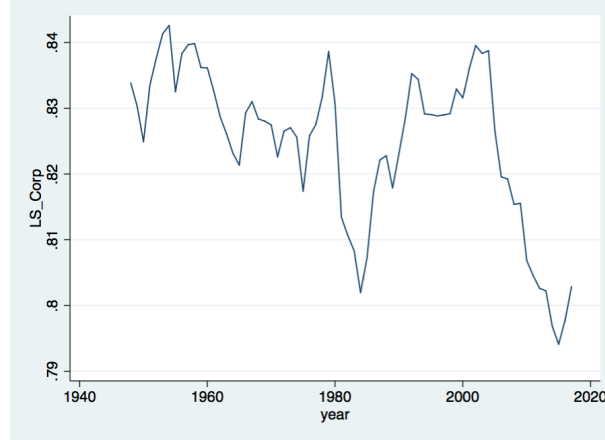
2 Labor Share for the corporate sector for the United States (1947-2017).

Following same logic as before we compute the labor share in corporate sector using data by sectors in US.

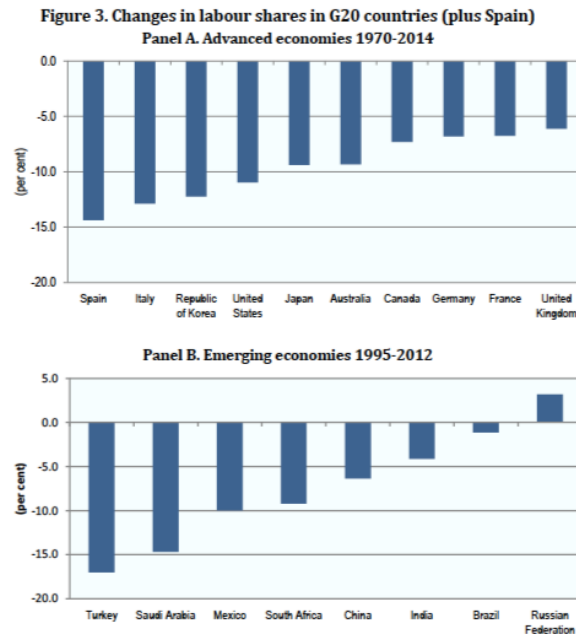
$$\text{Labor Share in Corporate Sector} = \frac{\text{Employee compensation in corporate} + \theta * \text{Corporate profits}}{\text{Corporate business Output}} \quad (4)$$

The results of labor share calculation for US are presented in Figure 2.

Figure 2. Labor Share in Corporate Sector for the US (1947-2017)



Also looking at some statistics by OECD, we can see dynamics for the US and the Russian Federation. Russia is the only country with increasing share of labor in last years.



Most studies that have documented the fall in the labour income share since the 1980s have also tried to understand its causes. One possibility that has been studied is that trends in the labour share are determined by a compositional shift in employment from labour-intensive to more capital-intensive sectors, where labour shares are lower.

3 Labor Share for the Russian Federation (1994-2017)

Russian national accounts includes following variables: goods and services account; production account; generation of income account; primary income distribution account; secondary income distribution account; the account of use of the apartment income; capital account.

To calculate labor share I used (1) generation of income account, which includes Compensation of employees, and (2) primary income distribution account, which includes proprietors income.

Therefore I constructed the formula for labor share as following:

$$\text{Labor Share in Russia} = \frac{\text{Employee compensation} + \text{Proprietors income}}{\text{Output}} \quad (5)$$

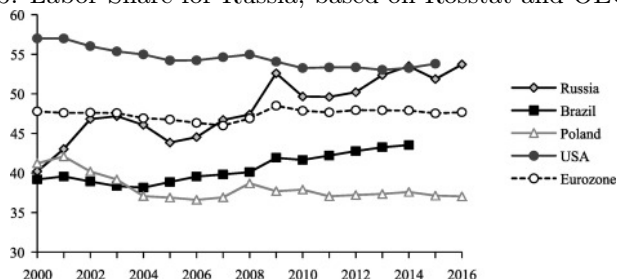
Figure 4. Labor Share for Russia (1994-2016)



Another important aspect of the Russian labor market is that it is one of the few in the world where the share of labor income in GDP has grown in recent years (Brazil is another example; however, its trend is considerably less pronounced).

In the [article](#) 'Macroeconomic and structural properties of the Russian labor market: A cross-country comparison' by E.Gurvich and E.vakulenko, the estimations are similar to mine (See Figure 5) .

Figure 5. Labor Share for Russia, based on Rosstat and OECD data



Though, according to the [data](#) of the Global Economy agency, labor force participation rate is on average 62.75% with minimum in 1998 - 58.86%.

This might be due to different methods of calculation, though the gap of errors is too big.

As for the corporate sector, there is no data in such kind of division with compliance of employees. There is data only on government structures and households' accounts.

So I tried to calculate labor share in government sector, but data are available from the year 2007.