Problem Set 2

Quantitative Macro

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1 Labor Share' puzzles

How the national income was distributed among social groups was a core question for classical economists. That was because they thought in a primitive model of heterogeneous agents, in which capitalists had a higher propensity to save (meaning, actually, to invest) and then the higher the capital share, the higher the investment and thus, the growth and the welfare. This is a sketch of the Ricardian distribution-growth model. Later, factors shares have been used as a proxy for inequality, based on the idea of the very high concentration of capital property. Anyway, factorial distribution is always a hot topic in macroeconomics.

However, how we measure factors share is a non-trivial issue. Regarding the labor share, although in principle seems a simple ratio (labor compensation over total income)a number of questions have been raised: what should be included in the numerator? (e.g. Is a Wall Street CEO a worker? What about pensions? Are the stock options of the of corporate officers labor income? Etc.); what should be included in the denominator (e.g. How to deal with the lack of labor income in the housing sector? How to manage the lack of capital income in the government sector? How should treat production taxes and subsidies? Etc.) (for these issues, see traditional works as Krueger (1999) or Gomme and Ruppert (2004)). Among all these open questions, in this homework we will exclusively focus on one of the most delicate issues: how to impute the self-employed income either to capital or to labor income.

To deal with measurement problem, we will raised 7 different methods to get the labor share. We include a brief explanation and apply them to the US and Spain over the long run.

Method 1: Naive LS

$$LS_1 = \frac{CE}{NI} \tag{1}$$

where CE is the compensation of employees and NI the national income. The idea is that all self-employed income are kind of capital income (at the end of the day, self-employees own their own means of production).

Method 2: Extended LS

$$LS_2 = \frac{CE + PI}{NI} \tag{2}$$

where PI is the proprietors income (meaning the self-employed income). This makes the opposite assumption than 1: self-employees are nothing but workers, all their income they get is due to their own effort.

Method 3: Naively adjusted LS

First trial for dividing the self-employed income between capital and labor. The algorithm is as follows:

- First, get the labor share of the economy excluding PI:

  $\text{LS}_a = \frac{CE}{NI-PI}$

- Second, apply this labor share to PI to get the labor income of self-employed:

  $\text{LS}_a PI = \frac{CE}{NI-PI} PI$

- Finally, add the labor income of self-employed to the labor income of workers and get the labor share:

  $\text{LS}_a PI + CE = (CE * PI + CE * NI - CE * PI) \frac{1}{NI-PI} = CE * NI \frac{1}{NI-PI}$

Now, divide by the national income and get the indicador:

$$LS_3 = \frac{CE}{NI - PI} = LS_a \tag{3}$$

Then, what this third indicator does is just to substract self-employed income from the denominator (we should stop at the very first step!).

Method 4: Gomme and Ruppert (2004)

It consists of a system of two equations:

$\text{Y}_L = CE + LS(PI + T)$

$\text{Y}_L = LS(CE + KI + PI + T)$

where T are taxes and KI are capital income (rental income, corporate profits, net interest, business current transfers payments); PI + T stands for ambiguous income (dealing also with the problem of imputation of taxes, to get factors shares that sum up to one). Solving the system, we get the following indicator:

$$LS_4 = \frac{CE}{CE + KI} \tag{4}$$

Method 5: Wage average

An alternative method, which is the one that is used by Ameco, and also by Domme and Ruppert to replicate BLS results, is to get the average wage-earners wage and apply it to the whole employee population (which is made of wage-earners and self-employees).

$$LS_5 = \frac{\frac{CE}{W} E}{NI} \tag{5}$$

where W are the number of wage-earners and E the total number of employees.

Method 6: Corporate LS

A different alternative is try to infere the economywide LS by getting it from a sector without self-employed income problem. Indeed, the non-financial corporate business sector does not include neither proprietors' income nor rental income, avoiding the issues of self-employees (and also the problem of accounting for labor income in the housing sector). We use two indicators:

$$LS_6 = \frac{CE}{Y} \tag{6}$$

where CE stands for the compesantion of employees of the corporate sector, and Y for the sectorial income.

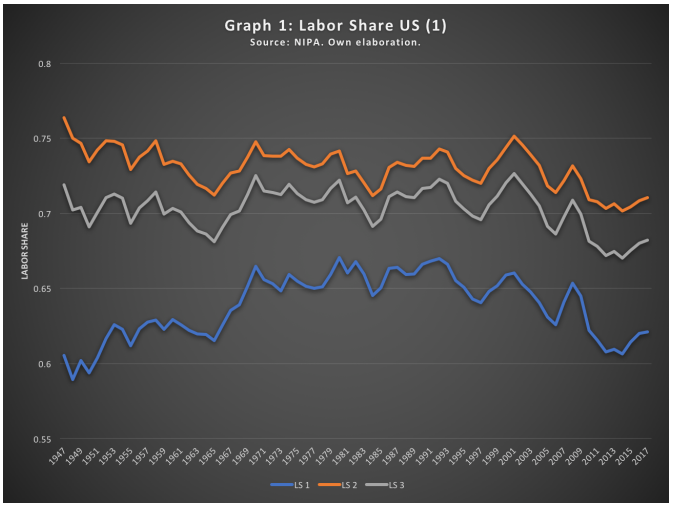
$$LS_7 = \frac{CE}{CE + KI} \tag{7}$$

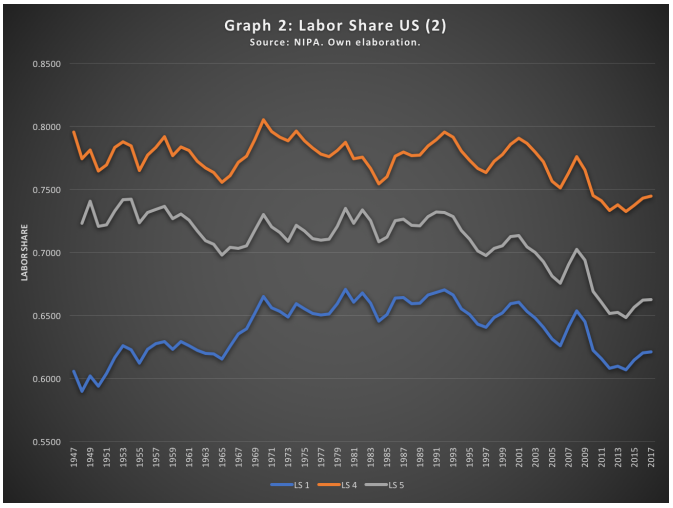
where KI are corporate profits and net payment of interests (following the idea of method 4).

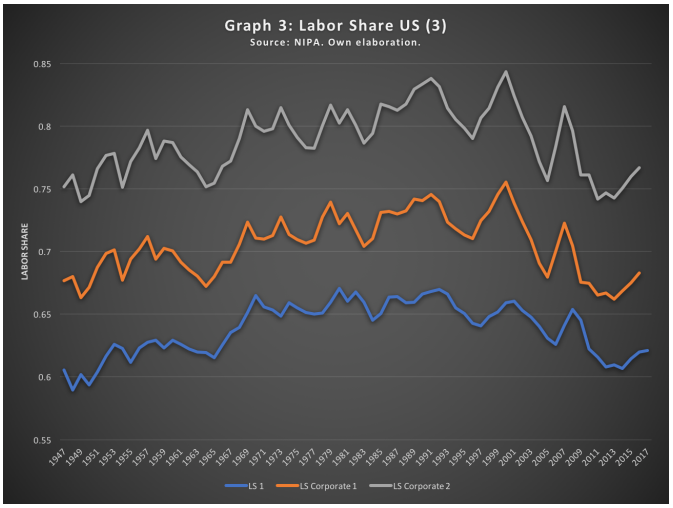
2 The secular LS trend in the US

Now, we will apply the previous indicator to the United States. The data comes from both the NIPA and the Labor Force Statistics from the CPS (from the Bureau of Labor Statistics (BLS)).

Graph 1, 2 and 3 plot the naive LS with different corrections (graph 1 with those suggested in class, graph 2 with the new we suggested, graph 3 with the second exercise instructions).

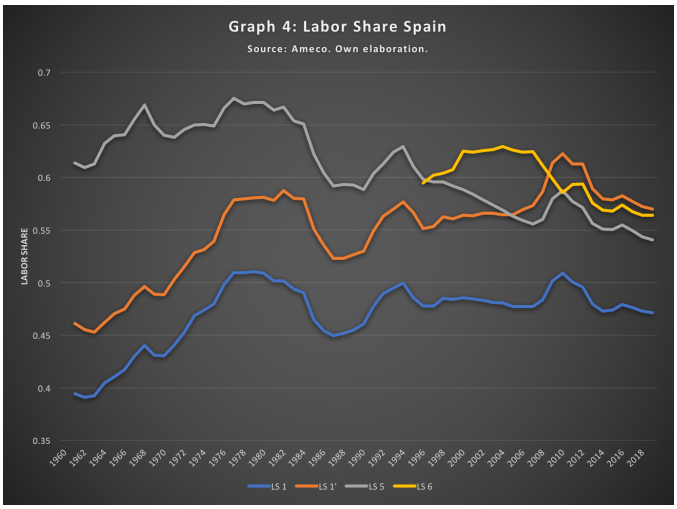






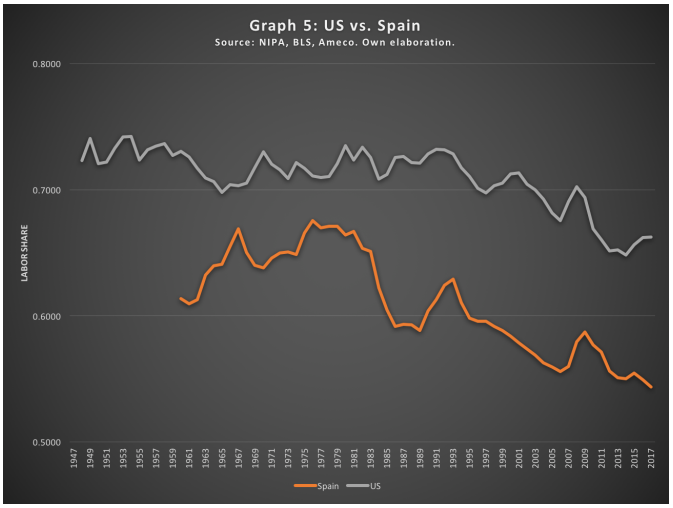
3 The long-run LS trend in Spain

For Spain, we got the data from Ameco. The main problem is that the self-employed income is not reported. Instead, they reported adjusted labor share using the method 5. We have replicated their results and plot with an unadjusted labor share, which is made following the method 1, tried with two different denominators (LS 1 uses GDP (same as LS 5) and LS 1' uses the net national income).



4 Comparison and conclusion

Due to data availability, only method 5 allows us to make a proper comparison between the American and Spanish trends. It is plotted in graph 5.



Now, we can make some comments on the long-run trend of the LS:

- The allegedly stability of LS is not an immutable truth.
- The adjusted measure (method 5) is very clear: there is a remarkable decline in the LS starting around the 80s.
- However, the LS trend is sensible to the measurement method we use. There is no a perfect method and more work is needed.