Quantitative Macroeconomics

Problem Set 2
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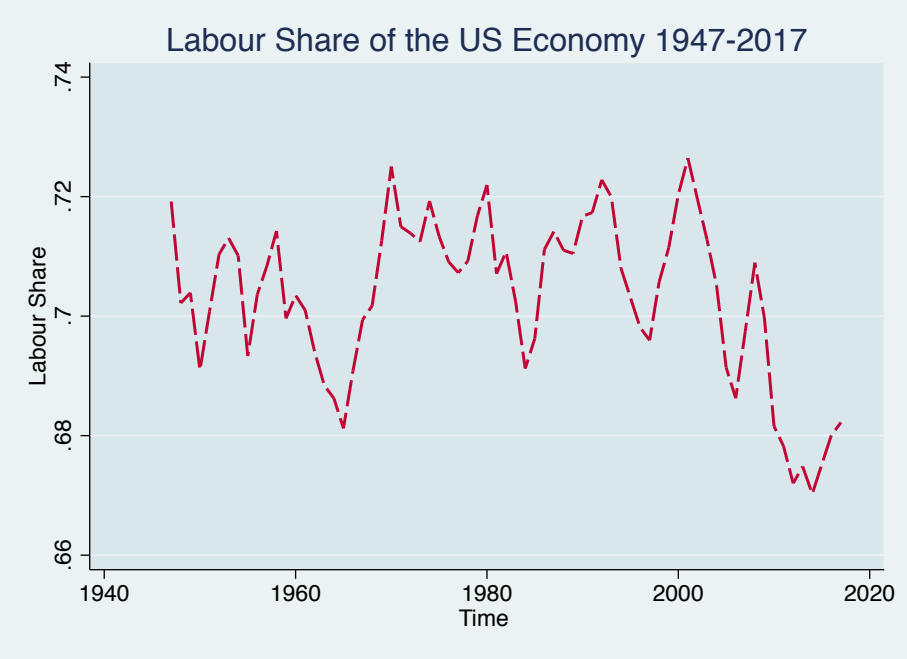
Compute the Labour Share for the US Economy[1]

The graph below computes the labour share of the US economy from the period of 1947-2017. The data was taken from the *National Income and Product Accounts, Bureau of Economic Analysis.*



To compute the labour share I use the moethod discussed in class. I use *Compensation of Employees* as a measure for wH, where w are the wages and H are the number of hours worked. This measure of compensation includes *wages and salaries* as well as *social security contributions.*

The other measure that has a component of Labour is *Proprieters' Income.* However, this component presents a complication, which is that a certain share, say θ is *Comepensation of Employees*' and $(1-\theta)$ is *capital income.*

To include this measure into comepnsation of employees, I take the following approach. First,

$$\theta = \frac{Compensation of Employees_{nationawide}}{National Income - Proprieters' Income}$$

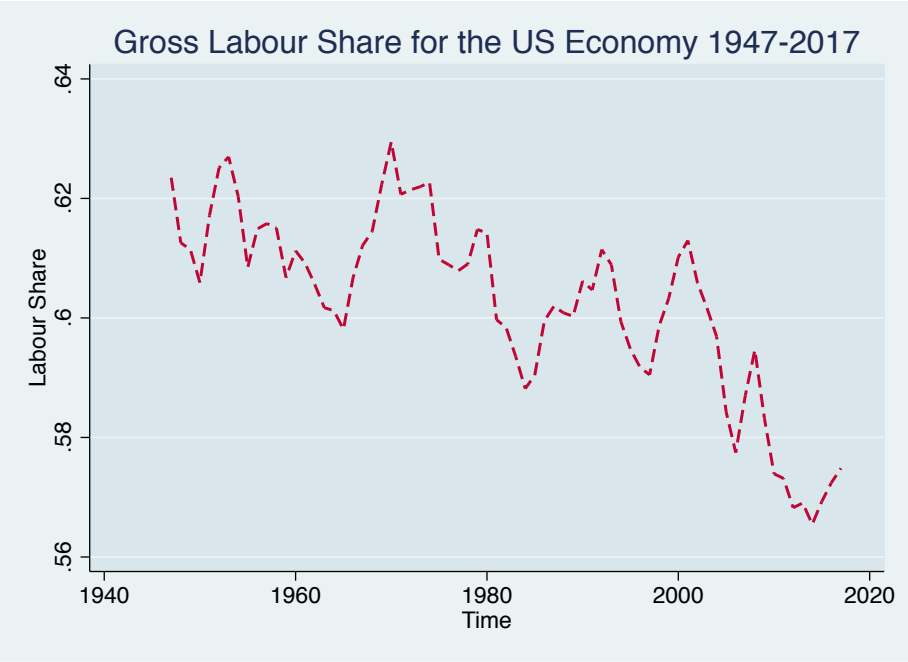
Second,

$$\text{Share of Labour Income in PI} = \theta * PI$$

We then add this θPI to CE. Giving the compensation for employment and self-employment. We then take tha ratio of this final CE with respect to National Income to compute the value of Labour Share. For the US, we can see that labour share in the last 70 years has been between 0.6 and 0.75.

[1] I compile this document for the Net and Gross Labour Share.

Gross Labour Share for the whole economy for the US



Using the measure for the Gross Domestic Product which is adjusted for the depreciation, we find a clear downward trend in the labour share of the economy. While using the Net Labnour Share seems to be flat for the US. The Gross share gives a clearer trend of the labour share. The way that this is calculated is exactly the same as above. However, now the measures include Depreciation in their computation.

Corporate sector for the US

We find that this feature is also replicated in the Corporate Sector of the Economy. Where 60 - 70% of the income of the corporate sector is Compensation of Employees (as shown in the graph below).

The interesting difference between the two labour shares is that while in the period from 1970 - 2000, the labour share nationwide fluctuates around the 7-7.2 band. The same period witnesses an increase in the labour share of the corporate sector. The more puzzling question however remains the decline in the labour share nationawide and in the corporate sector from the late 1990s. This has been a topic widely discussed in the literature. However, no definite conclusions have been drawn about the reason for the decline. One of the reasons often cited is the fact that there is more "Robotisation" of jobs. That is, replacing capital with low skilled labour. However, whether that explains the decline in the corporate sector is another matter of contention. As usually, the corporate sector requires "high skill" labour. One which cannot be easily replaced with "robots".

Another reason that this remains a puzzle is because labour share can be calculated in different ways. For instance, it could be the case that instead of splitting porprieters' income into wages and rent, one could simply use it in rental income. Implicity imposing that self-employment is "capital".

Third, the "stability" of the labour share prior to the 1980s disguises substantial movements within the industries. Whereas now, the decline is dominated by the trade and manufacturing sectors (Elsby et al. (2016)).

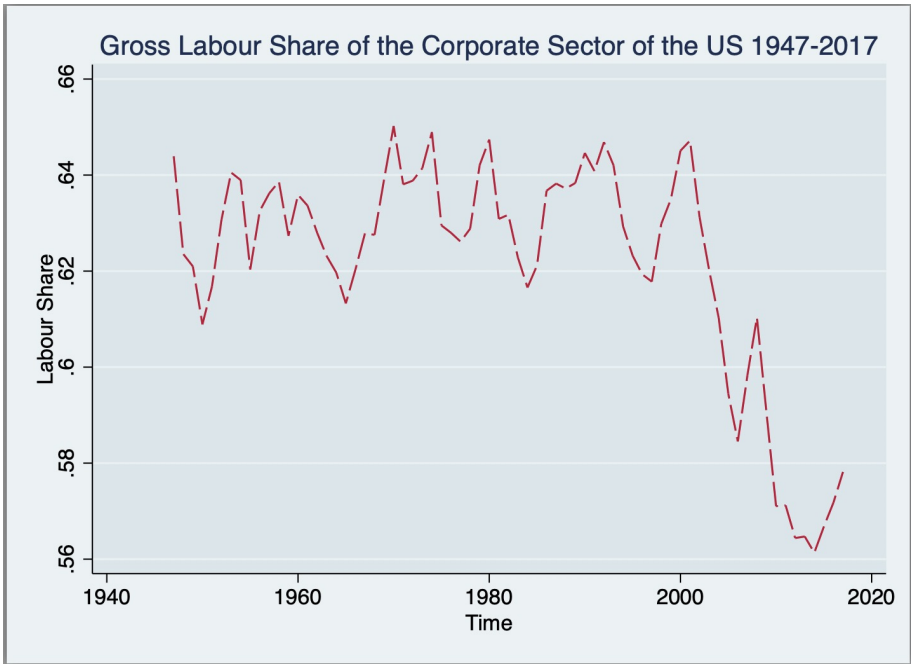
Therefore, to untangle the nature of labour share and the reason on its decline is far more complex than what can be inferred at first sight.

Gross Labour Share of the Corporate Sector of the US Economy

Akin to the labour share in the whole US Economy, we find that the labour Share in the Corporate Sector declines noticibly in the period after the 1990s. Even though this trend in not clearly visible in the net labour share. We are able to notice it when using the Gross Labour Share measure. The computation of this measure is done by computing:

$$LS = \frac{CE}{Y}$$

We use the naive method to compute the Labour Share for the Corporate Sector because the Corporate Sector does not include Propieters' Income, unlike the nationwide measure for Labour Share.



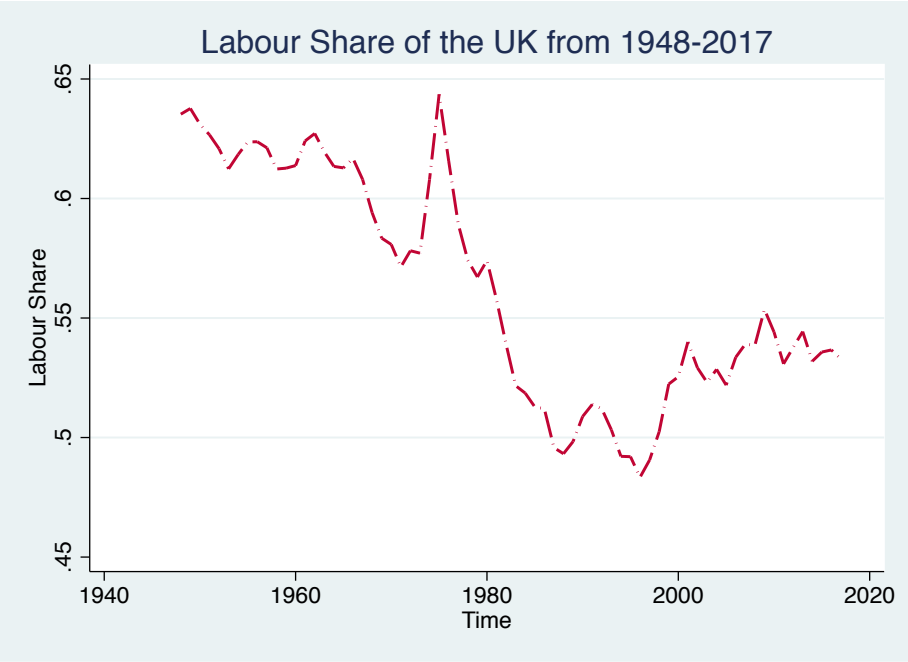
Compute the Labour Share for the UK and Japan

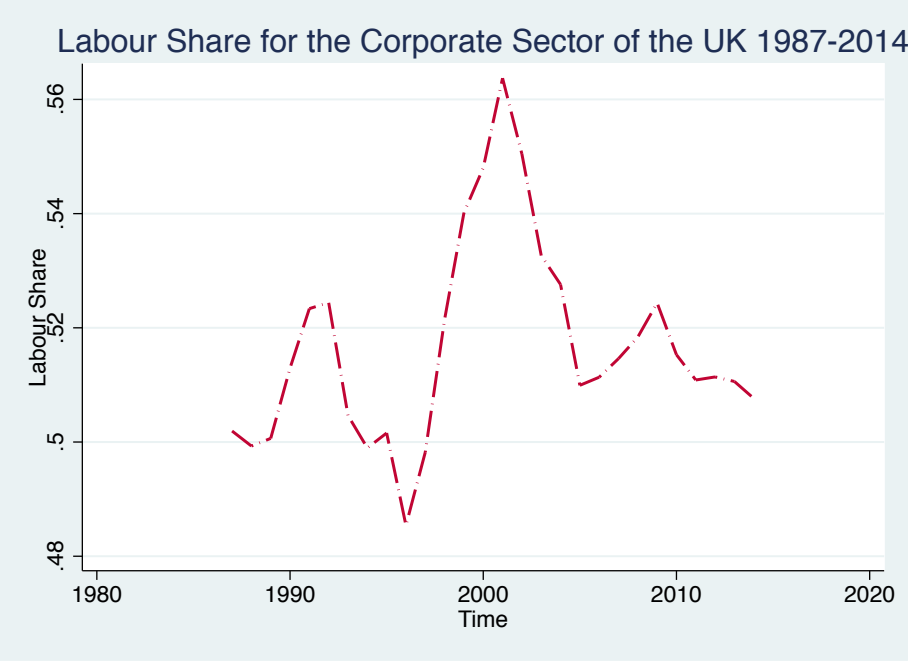
Before explaining the construction of the measure for these two countries. I would like to emphasise that while I am Indian (and British) and did want to use Indian data to perform this exercise I was unable to do so. The reasons are twofold. First, in 2016 India changed the way it calculated its GDP and the growth rate of the economy (resulting in a contraversy surrounding the computational procedures). This lead to the fact that India needed to create the back series because of the change in methodology, which has yet to be undertaken (Mostl because there is no agreement about the methodology that was used to create the new data). Second, India discountinued calculating National Accounts using the Income approach two decades ago. The last year for which we have data using the income approach is 1994. Thus, making it impossible for me to perform this exercise using Indian data.

Let us first note, the method that I have used to calculate the labour share for the UK and Japan is the same as the US. In the case of the UK, we find that the borad categories of National Accounting do not vary significantly from the US. However, there are some key differences. To begin with, the UK when computing Compensation of Employees has two different definitions. One is Compensation of Employees: Resources, the other is Compensation of Employees: Uses. The difference in the actually data of the two methods is negligible. Nonetheless, they imply two different interpretations.

For the purposes of this exercise, I decided to use Compensation of Employees: Uses to compute the Labour Share. The reason being that Uses is akin to actual usage of the income for employees and thus seemed like a more appropriate choice. Furthermore, the calculation for Compensation of Employees is identical to the US where it entails wages & salaries along with social security contributions.

Another differece between the computations for the US and the UK is the "*Mixed Income*" category. In the case of the UK, it is calculated including households which are self-emploted but also Not for Profit organisations. Nonetheless, the following graphs illustrate the labour share nationwide and for the corporate sector in the UK.

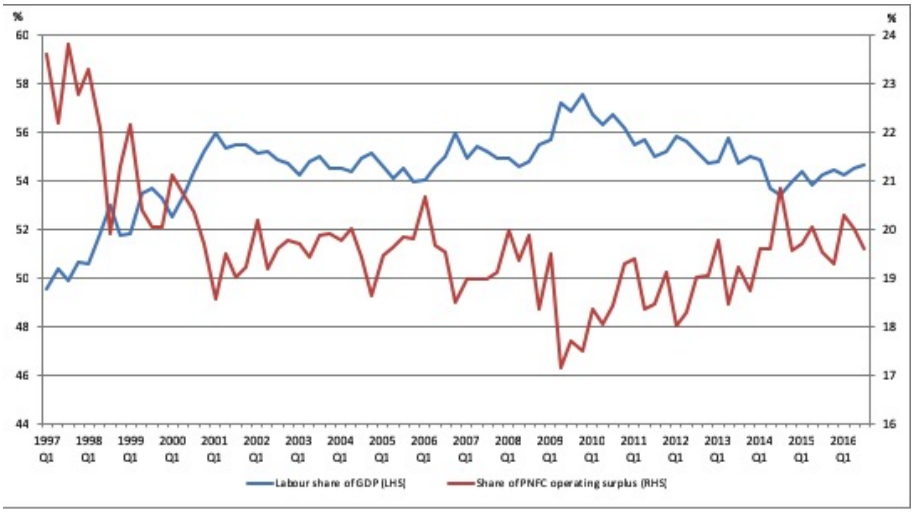




One limitation of the British data is that for the corporate sector, data was only available from the late 1980s, making it difficult to construct a 'relaiable' measure of labour share in the corporate sector due to the limited sample size.

Like the US, we find that the corporate sector "mimics" the movement of the nationwide labour share. Another important aspect is that we see a decline in the labour share during the 1970s and 80s. Overlapping with a turbulent period in British history in the Thatcher era. It is surprising that the labour share in the UK starts to decline prior to The Great Recession but starts to recover toward the end of the 2000s. Again, this could be due to the accounting measure being used for the labour share. Moreover the fact that this data is in market prices, could be compounding an already complex problem.

Below is a graph that I have take from the Office of National Statistics, UK that compute the quarterly Labour Share for the corporate sector. And our results are very close to these estimates.



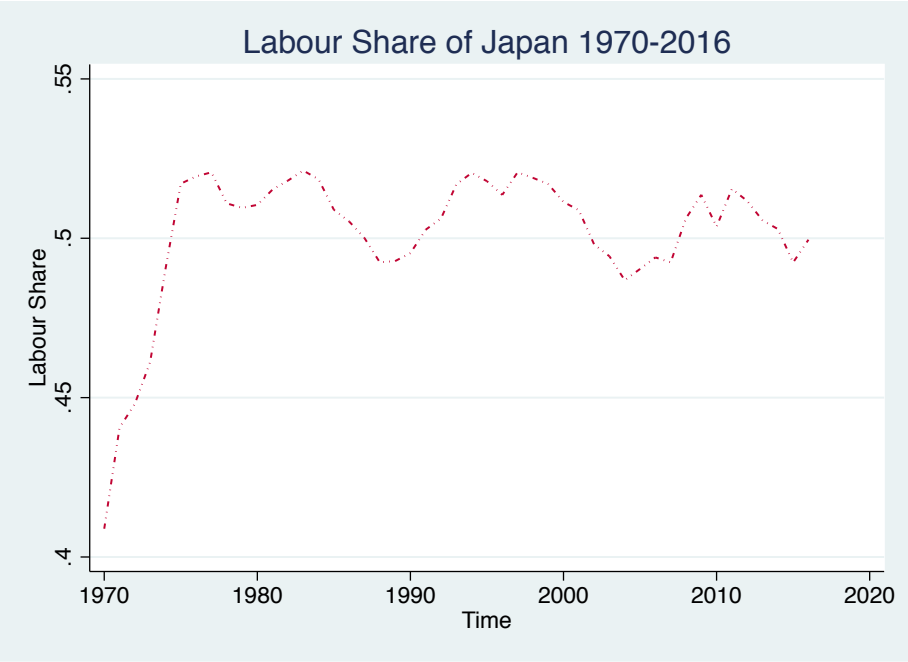
Computing the Gross Labour Share for the UK using Depreciation

I further try to use data for depreciation to calculate the *Gross Labour Share* of the Economy. The data for which I only have from 1987-2017. Using this we find a similar trend as in the data with the data not adjusted for the Depreciation. Which makes me believe that the actual data was already adjusted for depreciation. The following graph shows an upward trend in the Labour Share for this period. This upward trend is interesting given in this period a lot of OECD countries are experiencing a decline in the labour share. When comparing the actual values for the gross labour share and the net labour share, we find that there are negligible differences between the two. This could potentially be because the measure of depreciation is Governemnt Depreciation.

Labour Share for Japan

Finally, in the case of Japan, I am only able to contrsuct a nationwide labour share. This is because I had to collect the data for Japan from the *OECD database*, which did not give me a complete breakdown of the components and sectors. The following graph shows the evolution of the labour share for Japan.

Unfortunately for Japan, we are unable to find data for depreciation. This leads to us not being able to compute the Groo Labour Share. However, I would imagine that as is the case with the UK, we may not find considerable differences in the Labour share for the Japanese Economy. However, more can only be said with data detailing compensation of employees with depreciation.



We find that the labour share for Japan has been more or less constant between 1970 and 2016. Another drawback of this data is that I was not able to retrieve data from earlier periods. Allowing for only a limited comparison with the other two countries discussed above.