

Econometric Methods III - Problem Set 3

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Question 1. Detrending

See handwritten solutions

Question 2. Stylized Facts of the Real Business Cycle

1. - 2. Loading and transforming the data

This gives us the three time-series for Output ($rgdpc_t$), Consumption ($rcpc_t$) and Investment ($ripc_t$). We plot in Figure 1 shown below the three series to give as an impression whether we transformed the data correctly. In line with economic theory, we see that consumption is less volatile and investment much more volatile than output.

3. - 5. Hodrick-Prescott-Filter

We display our results for this exercise in Table 1 shown below.

6. - 8. Hamilton-Filter

We display our results for this exercise in Table 2 shown below.

As a check on the correct application of the two filters, we plot the two resulting cyclical components for each of the three series below in Figure 2 for Output, in Figure 3 for Consumption and in Figure 4 for Investment. As expected, we find that the HP filter is smoother than the Hamilton filter.

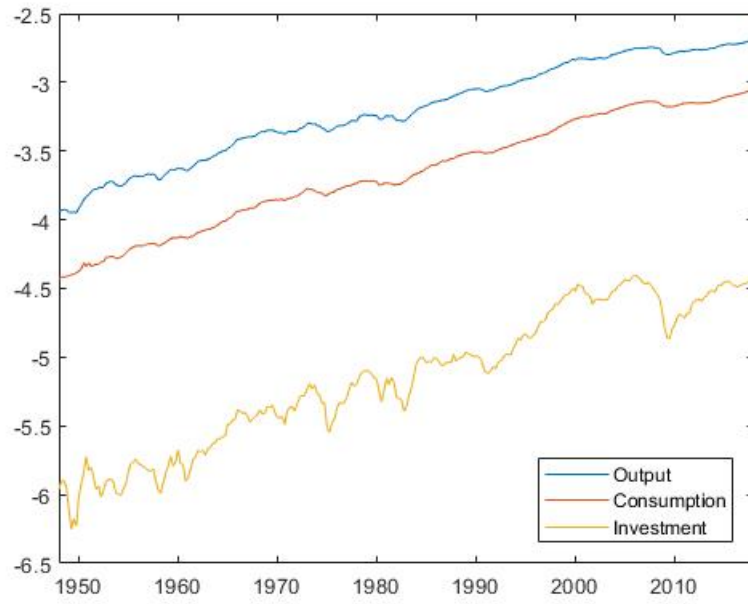


Figure 1: Transformed series

Table 1: Results from HP Filter

Series	St.Dev.	Autocorr.	Corr. with yt	Corr. with yt-4	Corr. with yt+4
Output	0.01628	0.85018	1	0.099524	0.099524
Consumption	0.012167	0.81055	0.78004	-0.050983	0.28918
Investment	0.072536	0.80627	0.85046	-0.14378	0.17655

Table 2: Results from Hamilton Filter

Series	St.Dev.	Autocorr.	Corr. with yt	Corr. with yt-4	Corr. with yt+4
Output	0.039073	0.92606	1	0.61159	0.61159
Consumption	0.033683	0.91485	0.83331	0.50862	0.58532
Investment	0.13212	0.89506	0.72626	0.1622	0.60183

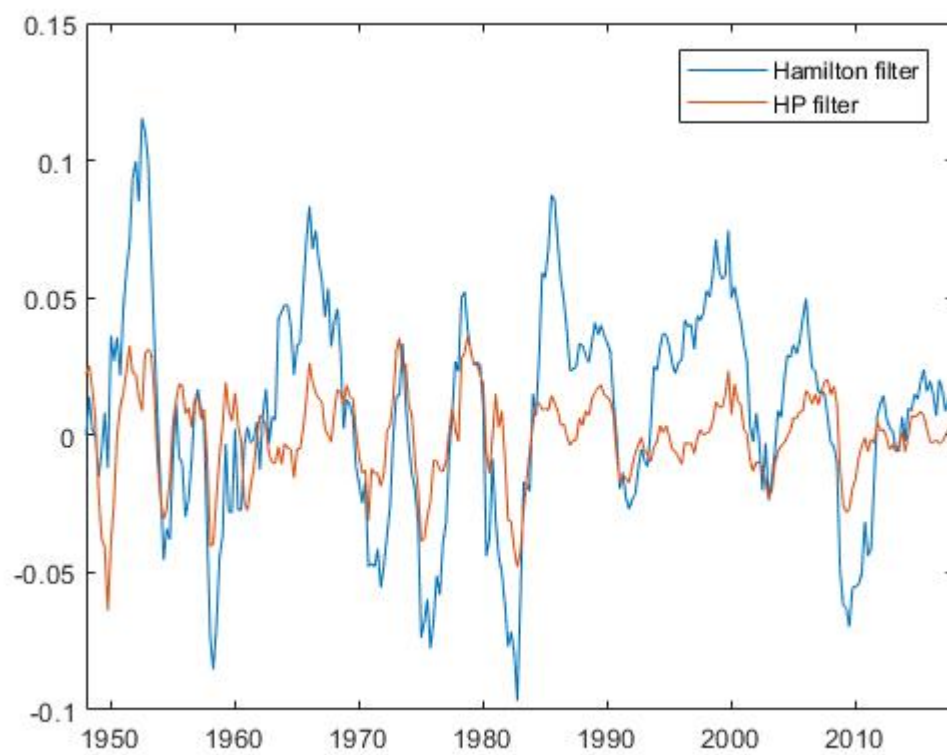


Figure 2: Output ($rgdpc_t$)

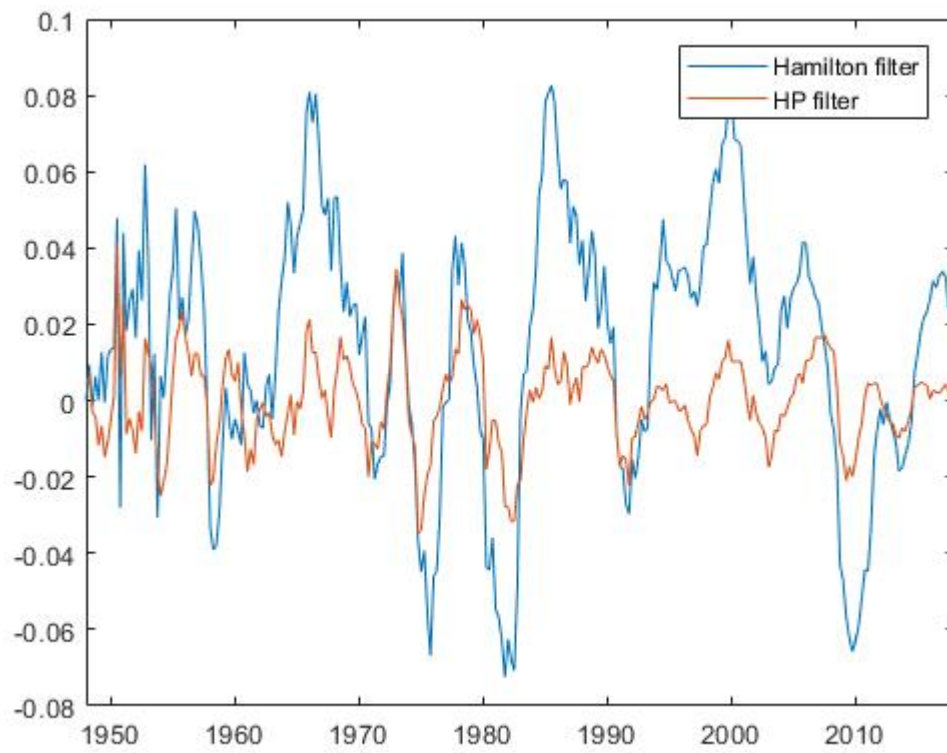


Figure 3: Consumption ($rcpc_t$)

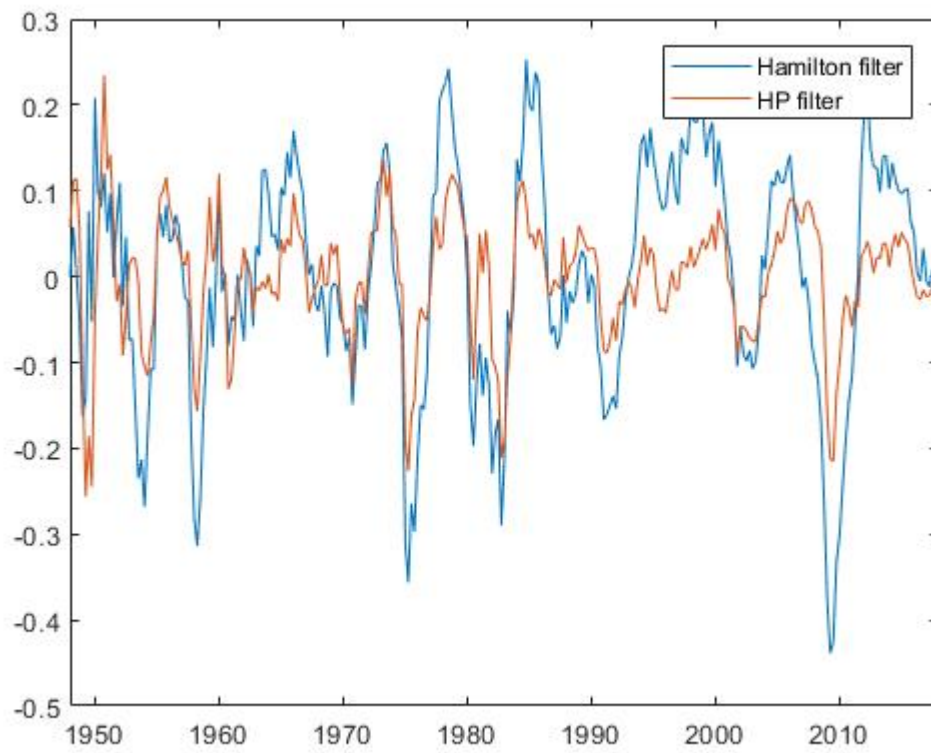


Figure 4: Investment (rip_t)