Economics 2B
Suggested Solutions - Tutorial 7

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Abstract

This guide is supposed to be complementary to the official solutions supplied by the lecturer. All errors are my own.

Question 1

The solutions here are quite detailed, so I thought I'd just talk a little about the PC in $\triangle\pi, Y$ space.

Let's start with deriving it. Take the backward looking PC and rewrite:

$$\begin{aligned} \pi_t &= \pi_{t-1} + \alpha(Y_t - Y_n) && (1) \\ \pi_t - \pi_{t-1} &= \alpha(Y_t - Y_n) && (2) \\ \triangle\pi_t &= \alpha(Y_t - Y_n) && (3) \end{aligned}$$

Remember, on the old PC, the most important point was the point $Y_t = Y_n$, where realized inflation was equal to expectations. Now in this PC, things are exactly the same: if $Y_t = Y_n$ then $\pi_t = \pi_t^e = \pi_{t-1}$ which is exactly the point where $\triangle\pi_t = 0$. So now we can draw our new PC:

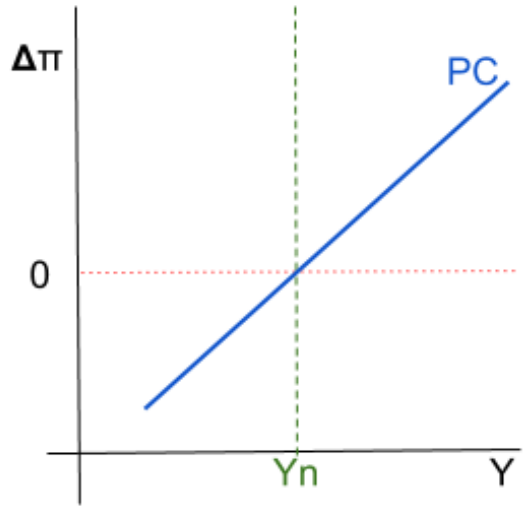
The analysis basically proceeds the same way as before - the IS curve shifts out, pushing output above the natural level, and inflation rises, exemplified by a positive change in inflation:

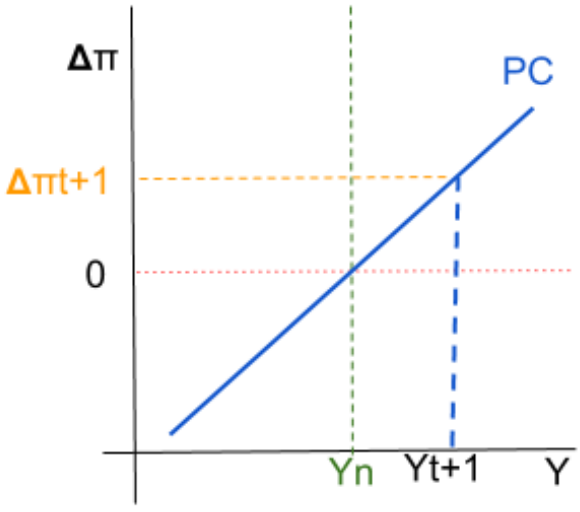
The great thing about this way of drawing the PC is that we do not have to update our graph as expectations adapt - our y-axis already takes care of that for us! Consider for example the second period:

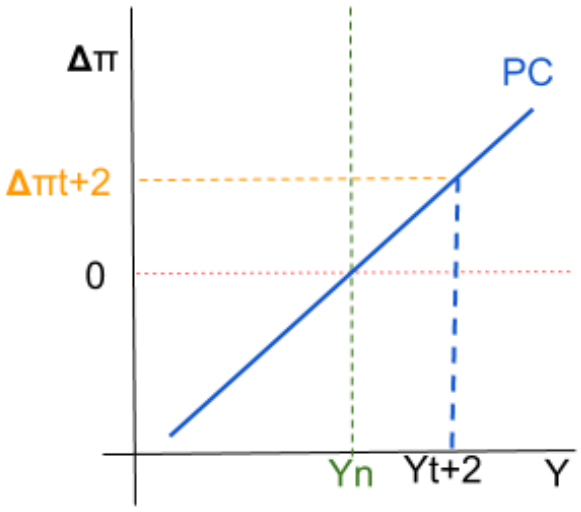
The downside of this PC representation is, that it is easy to loose track of the actual level of inflation. For example, what is the level of inflation in $t+2$?

$$\pi_{t+2} = \pi_{t+1} + \triangle\pi_{t+2} = \pi_t + \triangle\pi_{t+1} + \triangle\pi_{t+2} \quad (4)$$

see? It can get quite hard to keep track of all this, so sometimes it's simpler to stick to the inflation level representation. Especially when the question requires the CB to bring inflation back to the initial (or target) level. For example in


Δπ
PC
0
Yn
Y


Δπ
PC
Δπt+1
0
Yn
Yt+1
Y



the scenario, where the central bank wants to bring inflation back to target in period 2:

$$\pi_{t+2} = \pi_{t+1} + \triangle\pi_{t+2} = \pi^T + \triangle\pi_{t+1} + \triangle\pi_{t+2} \tag{5}$$

this implies that if the CB wants to achieve their target they need to set:

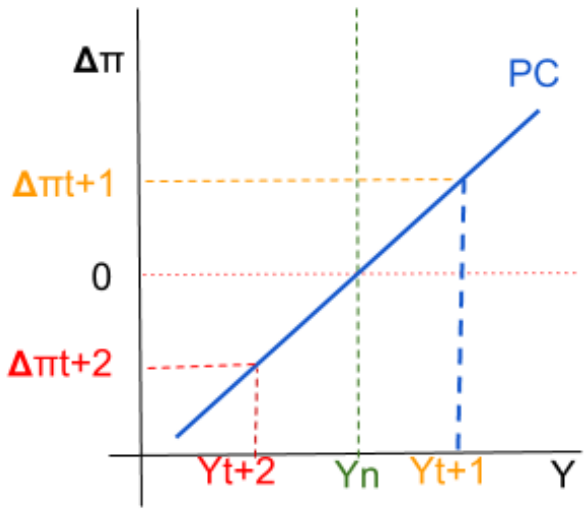
$$\triangle\pi_{t+2} = -\triangle\pi_{t+1} \tag{6}$$

I want to finish off with a warning: **DO NOT USE THIS REPRESENTATION IF EXPECTATIONS ARE ANCHORED!!!!**

Let's try:

$$\begin{aligned} \pi_t &= \bar{\pi} + \alpha(Y_t - Y_n) && (7)\\ \pi_t - \pi_{t-1} &= (\bar{\pi} + \alpha(Y_t - Y_n)) - (\bar{\pi} + \alpha(Y_{t-1} - Y_n)) && (8)\\ \triangle\pi_t &= \alpha(Y_t - Y_{t-1}) && (9) \end{aligned}$$

note that here the change in inflation doesn't depend on the output gap, but rather on the difference in actual output. Keeping track of this is going to be super tricky beyond the initial period, so best not try it.


Δπ
PC
Δπt+1
0
Δπt+2
Yt+2
Yn
Yt+1
Y

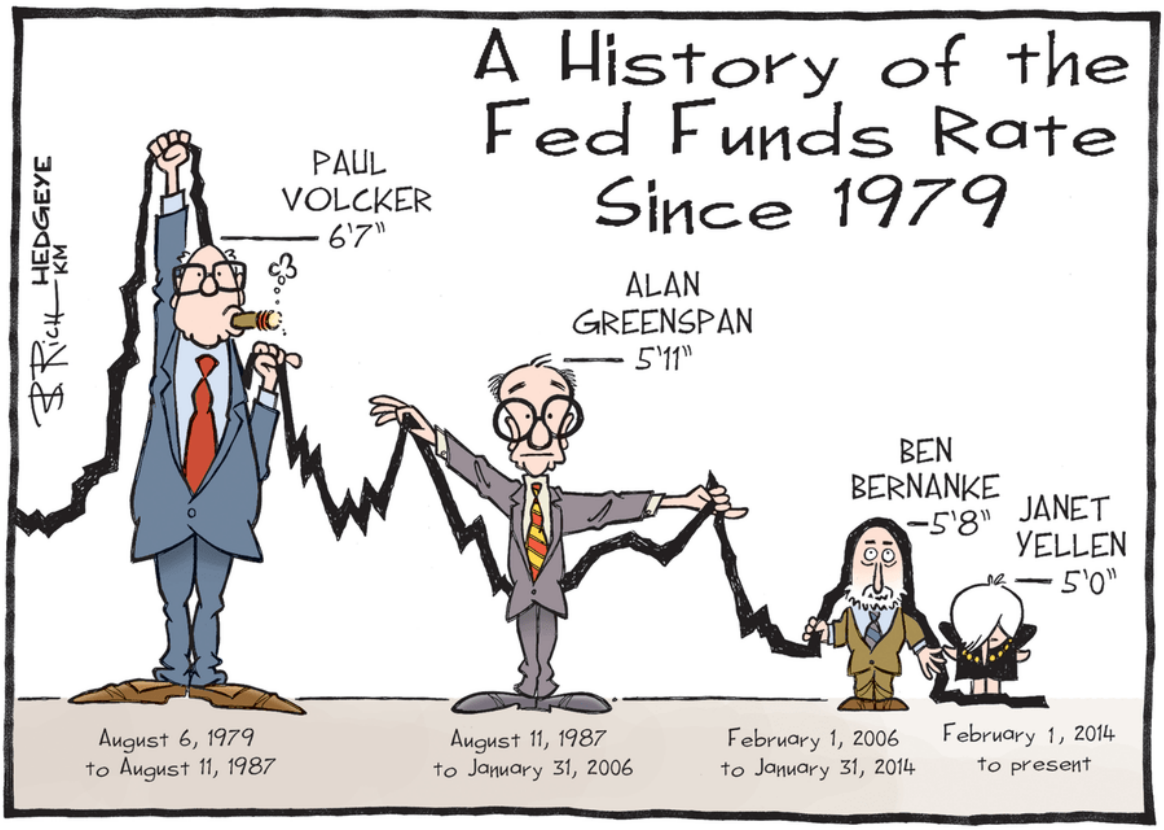


Figure 1: Source: https://www.globalstrikemedia.com/