Problem set 4

Faaya Abate Fulas

Question 1

a, False. The participation rate has steadily increased over time due to the increasing participation rate of women since the 1950s

b, False. The percentage is greater than 1%

c, True. The percentage is close to 4%. 2% go from unemployment to employm and 1.9% go from U to being out of the labor force.

d, True. From okun's law, periods of positive output growth rate (expansions) a associated with lower unemployment rates

e, False. The reservation wage is the wage that would make them indifferent be working or being unemployed so they'd have to be paid higher than that to choose being employed

f, False. Individual workers and firms can be the wage setters where wages set on a case-by-case basis.

g, True. Paying workers above their reservation wage is beneficial to firms bec it increases their productivity and decreases the turnover rate.

h, True. The actual unemployment rate can be manipulated by policy interventio in the short-run but the natural unemployment rate is the average rate of unemployment in the medium-run and can't be controlled by short-run polic changes.

Question 2

$$\pi_t - \pi_t^e = 0.1 - 2u_t \quad ; \quad \pi_t^e = \pi_{t-1} \quad ; \quad \pi_{t-1} = 0$$
$$; \quad u_t = 0.04 \quad (\text{cons ow}$$

a, $\pi_t = \pi_t^e + (0.1 - 2u_t) \quad ; \quad \pi_t^e = \pi_{t-1}$

$= 0 + (0.1 - 2(0.04)) = \underline{0.02} \quad \therefore 2\%$

$\pi_{t+1} = \pi_{t+1}^e + (0.1 - 2u_{t+1}) \quad ; \quad \pi_{t+1}^e = \pi_t$

$= 0.02 + (0.1 - 2(0.04)) = \underline{0.04} \quad \therefore 4\%$

$\pi_{t+2} = \pi_{t+2}^e + (0.1 - 2u_{t+2}) \quad ; \quad \pi_{t+2}^e = \pi_{t+1}$

$= 0.04 + (0.1 - 2(0.04)) = \underline{0.06} \quad \therefore 6\%$

$\pi_{t+3} = \pi_{t+3}^e + (0.1 - 2u_{t+3}) \quad ; \quad \pi_{t+3}^e = \pi_{t+2}$

$= 0.06 + (0.1 - 2(0.04)) = \underline{0.08} \quad \therefore 8\%$

b, This means for half of the workers who have indexed labor contracts, wages depend on the actual inflation rate.

$$\Rightarrow \pi_t = \tfrac{1}{2}\pi_t + \tfrac{1}{2}\pi_t^e + (0.1 - 2u_t)$$
$$\Rightarrow \boxed{\pi_t = \pi_t^e + 0.2 - 4u_t}$$

c, $\pi_t = \pi_t^e + (0.2 - 4u_t) \quad ; \quad \pi_t^e = \pi_{t-1}$

$= 0 + (0.2 - 4(0.04)) = \underline{0.04} \quad \therefore 4\%$

$\pi_{t+1} = \pi_{t+1}^e + (0.2 - 4u_{t+1}) \quad ; \quad \pi_{t+1}^e = \pi_t$

$= 0.04 + (0.2 - 4(0.04)) = \underline{0.08} \quad \therefore 8\%$

$\pi_{t+2} = \pi_{t+2}^e + (0.2 - 4u_{t+2}) \quad ; \quad \pi_{t+2}^e = \pi_{t+1}$

$= 0.08 + (0.2 - 4(0.04)) = \underline{0.12} \quad \therefore 12\%$

$\pi_{t+3} = \pi_{t+3}^e + (0.2 - 4u_{t+3}) \quad ; \quad \pi_{t+3}^e = \pi_{t+2}$

$= 0.12 + (0.2 - 4(0.04)) = \underline{0.16} \quad \therefore 16\%$

d, Inflation calculated with wage indexation, (c) is higher than without (a). This impl that price levels increase more rapidly in response to low levels of unemp when wages are indexed since the wages are constantly being adjusted ambient inflation rate. So, higher inflation rate leads to higher wages which to an even higher inflation rate and the cycle continues. This happens with indexation too. But the reaction is not instantaneous so inflation isn't as high.

Question 3

$$\pi_t - \pi_t^e = -\alpha(u_t - u_n)$$

a, $t = 1929$; $u_t = 3.2\%$; $\pi_t = 0$; $\pi_t^e = 0$

$$\pi_t - \pi_t^e = -\alpha(u_t - u_n)$$
$$\Rightarrow u_n = u_t = \underline{3.2\%}$$

b, No. The observed decrease in actual inflation between 1929 and 1932 is more consistent with a decreasing expected inflation rate

c, $\pi_{1929}^e = 0$ implies $u_n = \underline{3.2\%}$ (from a)

$$\pi_{1930}^e = -1\% \Rightarrow \alpha = \frac{\pi_t - \pi_t^e}{u_n - u_t} = \frac{\pi_{1930} - \pi_{1930}^e}{u_n - u_{1930}} = \frac{-2.5 + 1}{3.2 - 8.7} = \underline{0.27}$$

d, $\pi_t^e = \pi_t + 0.27(u_t - 3.2)$ ... in %

$\pi_{1931}^e = -9.2 + 0.27(15.9 - 3.2) = -5.78\%$

$\pi_{1932}^e = -10.8 + 0.27(23.6 - 3.2) = -5.29\%$

$\pi_{1933}^e = -5.2 + 0.27(24.6 - 3.2) = 0.58\%$

→ Given that people had observed the inflation rate dip even lower, to -10.8% in 1932, it's unlikely that their expected inflation rate would be as high as 0.58% for 1933. Therefore the assumption that u_n was constant during that period must be wrong.

e $u_t = u_n - \frac{1}{\alpha}\pi_t = 3.2 - 3.6\pi_t$ ... in % $\pi_t^e = 0$ for all t

$u_{1929} = \underline{3.2\%}$; $u_{1930} = 3.2 - 3.6(-2.5) = \underline{12.36\%}$

$u_{1931} = 3.2 - 3.6(-9.2) = \underline{36.73\%}$; $u_{1932} = 3.2 - 3.6(-10.8) = \underline{42.8\%}$

$u_{1933} = 3.2 - 3.6(-5.2) = \underline{21.92\%}$

The Great depression would have been more severe. $\pi_t^e = 0$ means wages aren't adjust to the observed deflation. Therefore, a much higher rate of unemployment is required for the wage setting relation to hold.