

Quiz #2 (09/12/2018)

- The budget of Francisca is entirely spent on Pepsi and Hot Dogs during the months of January and February, and then she needs to borrow money from her friends for the rest of the spring semester!

	Jan	Feb
P_1	\$6	\$8
P_2	\$7	\$6
x_1	5	2
x_2	2	4

Where:

$x^0 = (x_1^0, x_2^0)$ is the consumption of Pepsi (good 1) and Hot Dogs (good 2) in January.

$x^1 = (x_1^1, x_2^1)$ is the consumption of Pepsi (good 1) and Hot Dogs (good 2) in February.

$p^0 = (p_1^0, p_2^0)$ is the price of Pepsi (good 1) and Hot Dogs (good 2) in January.

$p^1 = (p_1^1, p_2^1)$ is the price of Pepsi (good 1) and Hot Dogs (good 2) in February.

- (a) Determine if her consumption bundle during February, x^1 , is affordable at January prices p^0 , i.e., check if $p^0 x^1 < p^0 x^0$. **(30 points)**

Budget in January is

$$p^0 x^0 = \$6 \times 5 + \$7 \times 2 = 30 + 14 = 44$$

and

$$p^0 x^1 = \$6 \times 2 + \$7 \times 4 = 12 + 28 = 40$$

Hence, bundle x^1 is affordable at January prices since $40 < 44$.

- (b) Determine if her consumption bundle during January, x^0 , is affordable at February prices p^1 , i.e., check if $p^1 x^0 < p^1 x^1$. **(30 points)**

Budget in February is

$$p^1 x^1 = \$8 \times 2 + \$6 \times 4 = 16 + 24 = 40$$

and

$$p^1 x^0 = \$8 \times 5 + \$6 \times 2 = 40 + 12 = 52$$

Hence, Bundle x^0 is not affordable at February prices since $52 \not< 40$.

- (c) Based on your answers on part (a) and (b), do her preferences violate WARP? *Please use a graph to answer this part.* **(40 points)**

Let us first identify the budget line for January:

$$44 = 6x_1 + 7x_2$$

Solving for x_2 we obtain

$$x_2 = \frac{44}{7} - \frac{6}{7}x_1$$

Second, the budget line for February is:

$$40 = 8x_1 + 6x_2$$

Solving for x_2 we obtain

$$x_2 = \frac{40}{6} - \frac{8}{6}x_1$$

Finally, the interception point between these two budget lines is

$$\frac{44}{7} - \frac{6}{7}x_1 = \frac{40}{6} - \frac{8}{6}x_1$$

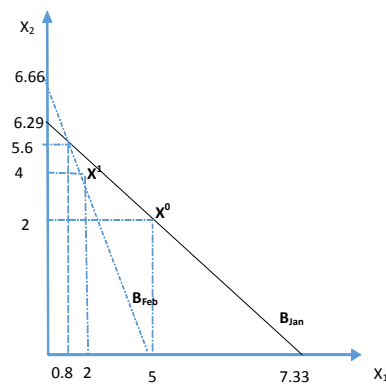
Solving for x_1 we obtain

$$x_1 = \frac{16}{20} = 0.8$$

and

$$x_2 = \frac{40}{6} - \frac{8}{6} \frac{16}{20} = 5.6$$

Graphically



Hence, WARP is satisfied.