

AS/AD, GDP and the PPF¹ In-Class Problem²

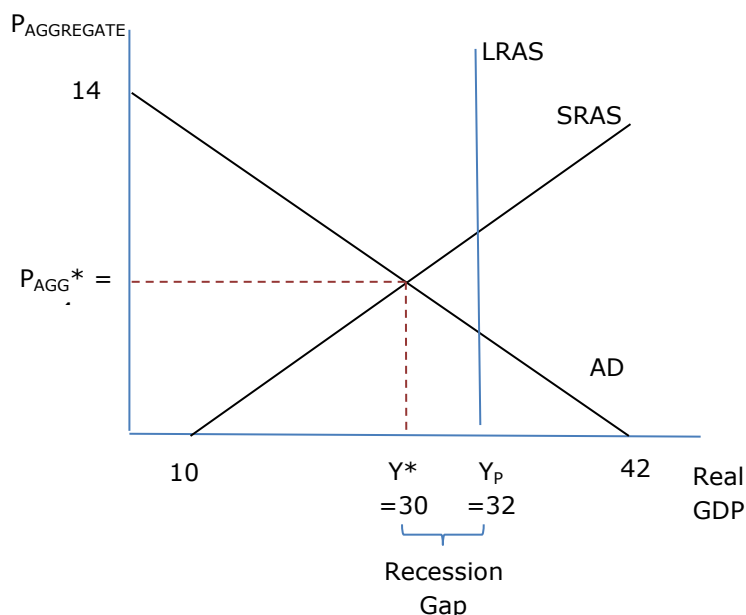
Suppose the nation of Milligan experienced an aggregate economy parameterized by the following equations: $AD = 42 - 3P_{\text{aggregate}}$, $SRAS = 10 + 5P_{\text{aggregate}}$, and $LRAS = 32$.

- a) Provide a complete AS/AD model for this economy with all relevant points labeled and indicate the economy's relative condition (recession, expansion, depression, inflation, etc). This should absolutely include the nation's Real GDP and some form of indexed price level.**

$AD = SRAS$ $42 - 3P_{\text{AGG}} = 10 + 5P_{\text{AGG}}$ $8P_{\text{AGG}} = 32$ $P_{\text{AGG}}^* = 4$	$\text{Real GDP} = 10 + 5(4) = 30 = \text{Real GDP}^*$ <p style="text-align: center;">or</p> $\text{Real GDP} = 42 - 3(4) = 30 = \text{Real GDP}^*$
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Set the intercepts:

$SRAS = 10 + 5P_{\text{AGG}}$ $P_{\text{AGG}} = 0 \quad SRAS = 10 + 5(0)$ $SRAS = 10$ $SRAS = 0 \quad 0 = 10 + 5P_{\text{AGG}}$ $5P_{\text{AGG}} = -10$ $P_{\text{AGG}} = -2$	$AD = 42 - 3P_{\text{AGG}}$ $P_{\text{AGG}} = 0 \quad AD = 42 - 3(0)$ $AD = 42$ $AD = 0 \quad 0 = 42 - 3P_{\text{AGG}}$ $3P_{\text{AGG}} = 42$ $P_{\text{AGG}} = 14$
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¹ This In-Class Problem is intended to present an abbreviated discussion of the included economic concepts and is not intended to be a full or complete representation of them or the underlying economic foundations from which they are built.

² This problem was developed by Rick Haskell (rick.haskell@utah.edu), Ph.D. Student, Department of Economics, College of Social and Behavioral Sciences, The University of Utah, Salt Lake City, Utah (2014).

b) Assume that 70% of the nation's Real GDP was comprised of gross consumption (including household, corporate and all government spending) and the other 30% was gross investment. Show this on a production possibilities frontier reflective of price levels $P_K = 5$ and $P_C = 3$.

Recall that $Y^* = 30$ and that $Y_P = 32$. Y_P is the level of the nation's output if all productive resources are being used efficiently, which sounds a lot like the PPF; it is the dollar value of the PPF, even though the PPF is expressed in terms of units of output, in this case K and C. Y^* is the level of the nation's output, so in this case we see that it is operating at less than optimal efficiency ($Y^* < Y_P$), or in recession.

To find the intercept values of K and C on the PPF, simply divide Y_P by P_K and P_C .

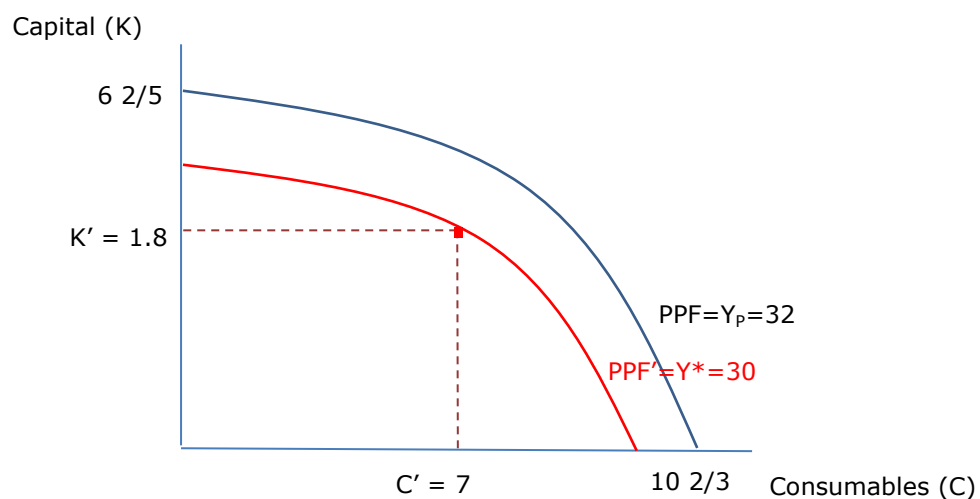
$$\frac{Y_P}{P_K} = \frac{32}{5} = 6 \frac{2}{5} = K \qquad \frac{Y_P}{P_C} = \frac{32}{3} = 10 \frac{2}{3} = C$$

To find the intercept values of K and C on a curve below the PPF, which we'll call PPF'. This will help us see where the country is actually operating, simply divide Y^* by P_K and P_C .

$$\frac{Y^*}{P_K} = \frac{30}{5} = 6 = K \qquad \frac{Y^*}{P_C} = \frac{30}{3} = 10 = C$$

If 70% of the nation's Real GDP was comprised on consumption, then we multiply the intercept value for C on PPF' by .70 and the intercept value for C on PPF' by .30:

$$10 * .70 = 7 = C' \qquad 6 * .30 = 1.8 = K'$$



c) Provide a graph showing the relationship between the PPF and the AS/AD models you've formed in parts a and b above. Label this as completely as you can. Hint: this should show some alignment between the two graphs.

