Homework #1

Brady Bulls

February 14 2024

1. Consider the following Classical Economy

The variables and functions are as follows:

Variables

- **Aggregate Capital Stock:** $\bar{K}$ = 200
- **Aggregate Labor Supply:** $\bar{L}$ = 200
- **Government Spending:** $\bar{G}$ = 40
- **Tax Collection:** $\bar{T}$ = 40

Functions

- **Production Function:** $Y = K^{0.4}L^{0.6}$
- **Investment Function:** $I = 45 - 100r$
- **Consumption Function:** $C = 8 + 0.7Y_d$

A. Define the term Competitive Equilibrium.

Competitive equilibrium is the point that the entirety of the market has reached its equilibrium point. That is, all four of the macro-economic markets *(the goods market, the capital market, the loan-able funds market, and the labor market)* have all coalesced.

B. What is Walra's law?

Walras law states that with n markets, if the $n-1$ market reaches equilibrium, then the n^{th} market will also be in equilibrium. In more common terms, if you know that all but one market is in equilibrium, you can be certain the last market is also in equilibrium.

C. Find the competitive equilibrium by leaving out the loan-able funds market in initial calculations. Then verify *Walra's Law* by showing that the loan-able funds market clears. Draw diagrams which show the supply and demand curves for each of the markets and show the competitive pries and allocations.

The Capital Market:

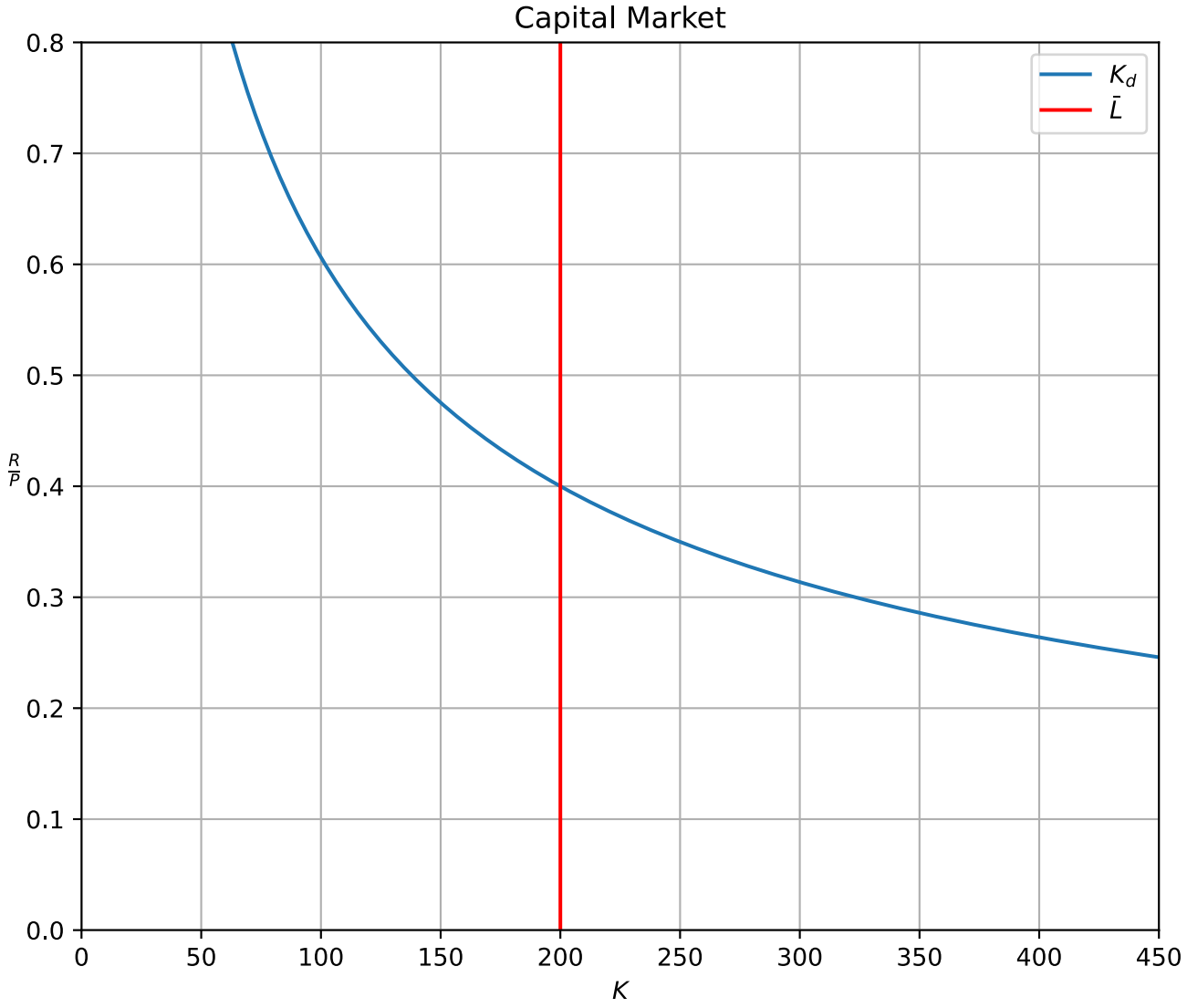
Given: $\bar{L} = 200$ $\bar{K} = 200$

$$[1]\ Max \prod_K = PK^{0.4}L^{0.6} - KR - WL$$

$$[2]\ 0.4PK^{-0.6}L^{0.6} - R = 0$$

$$[3]\ \frac{R}{P} = 0.4\left(\frac{L}{K}\right)^{0.6}$$

$$[4]\ \frac{R}{P} = 0.4\left(\frac{200}{200}\right)^{0.6} = 0.40$$



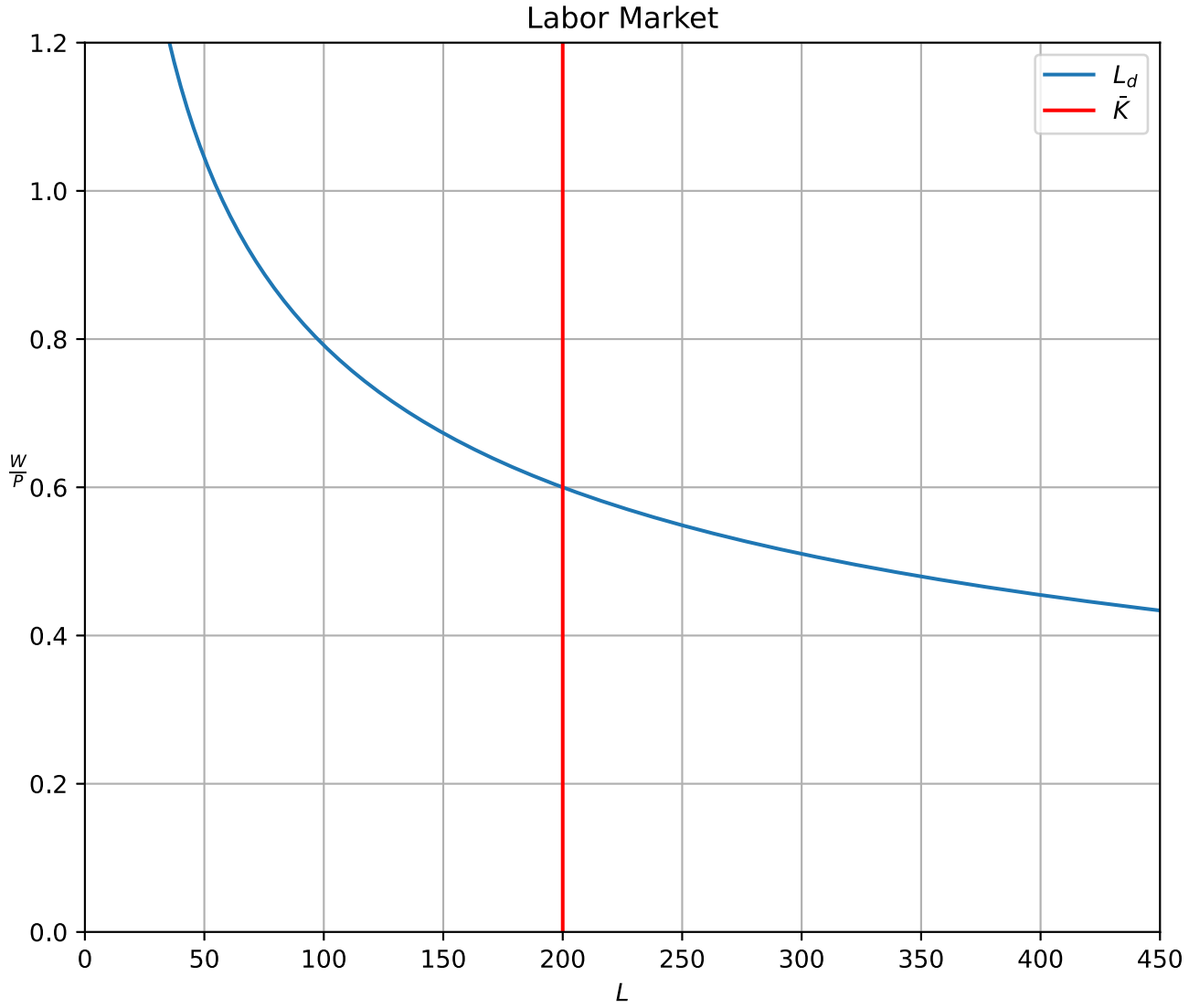
The Labor Market:

$$[1]\ Max \prod_{L} = PK^{0.4}L^{0.6} - KR - WL$$

$$[2]\ 0.6PK^{0.4}L^{-0.4} - W = 0$$

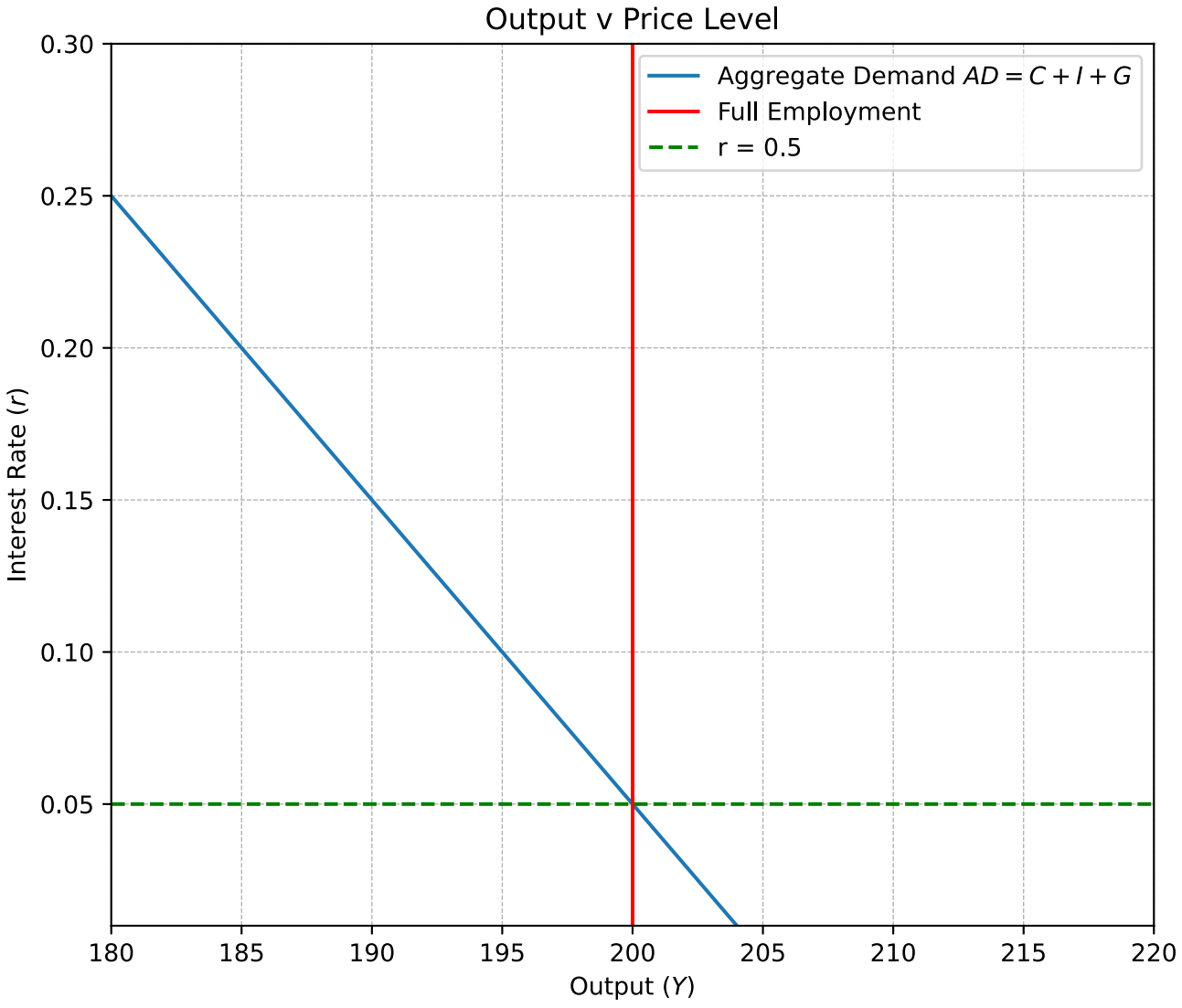
$$[3]\ \frac{W}{P} = 0.6\left(\frac{L}{K}\right)^{0.6}$$

$$[4]\ \frac{W}{P} = 0.6\left(\frac{200}{200}\right)^{0.4} = 0.60$$



The Goods Market:

1. $C = 8 + 0.7Y_d$
2.
3.


Output v Price Level
Aggregate Demand $AD = C + I + G$
Full Employment
r = 0.5
Interest Rate (r)
Output (Y)
0.30
0.25
0.20
0.15
0.10
0.05
180
185
190
195
200
205
210
215
220