

Macro Theory – Exercise 4
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There are measures $\lambda_i > 0$ of individuals for i belonging to countable set I . The utility of a type i individual is the expected value of $u(c, h)$ where $(c, h) \in C \times H$. For simplicity the sets C and H are finite. Let k_i be a type i person's endowment of capital.

The output of a type i individual if that person works h hours and employs k units of capital is $h k^\theta$.

- i. Specify an appropriate commodity space S . The space should have be the lowest dimensional one that is appropriate.
- ii. Briefly state what condition being satisfied is implicit in the use of the word “appropriate” in the previous sentence. Explain why failure of this condition to be satisfied would cause problems for competitive analysis.
- iii. Specify the consumption possibility set and the utility function of a type i individual.
- iv. Specify the aggregate production possibility set for this economy. Define constant returns to scale and verify that constant returns to scale holds for this production possibility set.
- v. Write down the program that maximizes a weighted-average of the utilities of the types where all types receive a strictly positive weight, $\varphi_i > 0$. Specify the transfers that support an allocation that solves this program as a competitive equilibrium with transfers as a function of the optimal allocation being supported and the data. Note data means the given, which are preferences and technology.