

Material

We're only going to cover a single thing today, but it encompasses everything from consumer theory:

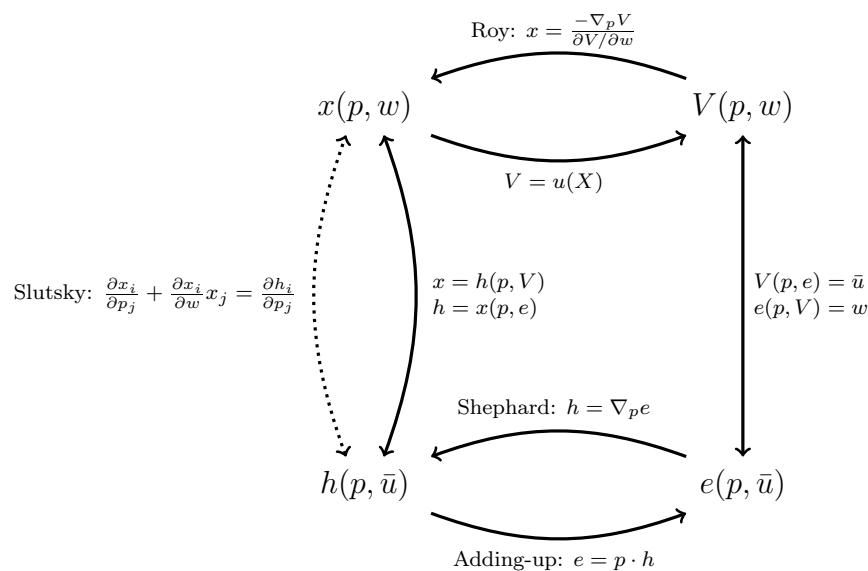


Figure 1: Relationships Between UMP and EMP

Practice Question

1. **June 2025 Microeconomics Q Exam (Part II)** Consider a consumer who has utility $u(x_1, \dots, x_L, h)$ over the amounts of consumption (x_1, \dots, x_L) of goods $1, \dots, L$, and hours worked h . The utility function $u(\cdot)$ is continuous and strictly increasing in each x_ℓ , and is weakly decreasing in h . Prices are given by $p = (p_1, \dots, p_L)$. The wage rate is normalized to 1 throughout, so that the consumer can spend amount h to purchase consumption goods. Consumption and labor hours have to be non-negative, but assume that there is no upper bound on labor hours h .

- (a) Write down the “work-minimization problem”: the problem of minimizing the hours of work subject to achieving a given level of utility and subject to the budget constraint.

Call the value h^* of this problem the “minimal-work function”. Does it have similar properties to the expenditure function? In particular:

- (b) Is the “minimal-work function” non-decreasing in p_i for $i \in \{1, \dots, L\}$? (Hint: If (x_1, \dots, x_L, h) satisfies all constraints under higher prices, would it still satisfy all constraints under lower prices?).
- (c) Is the “minimal-work function” homogeneous of degree 1 in p ? (Hint: if you doubled the prices of all goods, would the minimal-work-hours double? Try e.g. with $u(x_1, h) = x_1^2/h$.)
- (d) What would your answer to (b) and (c) be if you knew that the utility function is constant in work hours h ?

Prove your answers. For negative answers you can provide a counter-example. You do not need to re-prove known properties of the standard expenditure function.