

Computing the Aggregate Demand Curve

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Aggregate demand: Amount of service that households purchase so as to maximize their utility, given price of service p and market tightness x .

Notation $y^d(x, p)$

To max. utility, household consumes

$$c = \left(\frac{x}{1 + \tau(x)} \right)^{\frac{\varepsilon}{\varepsilon - 1}} \cdot \frac{m}{p}$$

To max utility, household purchases $c \cdot [1 + \tau(x)]$.

$$y = \frac{x^{\varepsilon}}{[1 + \tau(x)]^{\varepsilon - 1}} \cdot \frac{m}{p}$$

Budget constraints of all households:

$$m + p \cdot [1 + \tau(x)] c = \mu + p \cdot f(n) \cdot k$$

Through matching. # services sold = # services purchased
trades given by matching function

$$\# \text{ service sold} = f(x) \cdot k = m(k, v)$$

$$\begin{aligned} \# \text{ service purchased} &= q(x) \cdot v = m(k, v) \\ &= c \cdot [1 + \tau(x)] \quad \left(\begin{array}{l} \text{by definition} \\ \text{of } \tau(x) \end{array} \right) \\ &= y \end{aligned}$$

$$\rightarrow f(x) \cdot k = [1 + \tau(x)] \cdot c$$

Plug into budget constraint.

$$m = \mu$$

Combining FOC from household problem w/
aggregate budget constraint.

$$y = \frac{x^{\frac{\varepsilon}{\varepsilon-1}}}{[1 + \tau(x)]^{\frac{\varepsilon}{\varepsilon-1}}} \cdot \frac{\mu}{p} = y^d(x, p)$$

service purchased/demanded by households

$y^d(x, p)$ is the AD curve