Computing the Aggregate Demand Curve

Pascal Michaillat
https://pascalmichaillat.org/c2/

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

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

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:

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

Through matching: # services sold = # services purchased

trades given by matching function

service sold $= f(x) \cdot k = m(k, v)$

services purchased $= q(x) \cdot v = m(k, v)$

$= c \cdot [1 + \tau(x)]$ (by definition of $\tau(x)$)

$= y$

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

Plug into budget constraint.

$$\boxed{m = \mu}$$

Combining FOC from household problem w/ aggregate budget constraint.

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

service purchased / demanded by households

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