Kiyotaki-Wright
Model Assumptions

- Unit measure of agents [0,1]. Infinite (or very large) population.
- Unit measure of goods produced [0,1]. Only one good.
- Discrete time $t = \{1,2, \ldots\}$, infinitely lived agents.
- Agents do not consume the good they produce. They trade it.

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Model Assumptions

- Each period, matches occur. Trade happens if *mutually beneficial*.
- Probability an individual is interested trade is x. So, probability of trade x^2.
- Successful trade gives utility u. Cost of production is k.
- We assume $u > k$ so that production occurs.

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Value Function

Expected utility (or value) can be calculated as

$$V = prob.\,of\ trade\ * gain\ from\ trade + \\ prob.\,of\ no\ trade\ * gain\ from\ no\ trade + \\ value\ next\ period$$

We have

$$V = x^2 * (u - k) + (1 - x^2) * 0 + \beta * V$$

$$\Rightarrow V = \frac{x^2(u-k)}{1-\beta}$$

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With Money

- A proportion M is endowed with money. $0 < M < 1$.
- Assume individual can hold either a unit of money or of good.
- Agents chooses to accept money with probability π, while believing that a random member of the population accepts money with probability Π .
- If agents own the good, they get V_C. If they own money, they get V_M.

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Value Function (with money)

To determine π, we need to compare V_C and V_M.

$$V_C = (1 - M)x^2(u - k) + \beta(Mx\pi V_M + (1 - Mx\pi)V_C)$$

$$V_M = (1 - M)x\Pi(u - k) + \beta((1 - M)x\Pi V_C + (1 - (1 - M)x\Pi)V_M)$$

$$V_M > V_C \quad \text{if} \quad \Pi > x \Rightarrow \pi = 1$$

$$V_M < V_C \quad \text{if} \quad \Pi < x \Rightarrow \pi = 0$$

$$V_M = V_C \quad \text{if} \quad \Pi = x \Rightarrow \pi \in [0,1]$$