Baumol-Tobin Model of Money Demand

- Individuals purchase Y over a fixed time interval with money. Money as cash or deposits.
- Opportunity cost of holding money (as cash) is i.
- Cost of withdrawing money (from deposits) is K.
- B-T model answers the question as to how much and how often should funds be withdrawn to finance the purchase of Y given the associated costs.

Baumol-Tobin Model of Money Demand

- The goal is to minimize costs of financing the purchase. Suppose individual withdraws M units of money each time.
- If agent withdraws once, average money holding is given as (M + 0)/2 = M/2.
- Total costs = withdrawal cost + opportunity cost (of holding money)
- Withdrawal cost = $K \cdot \frac{Y}{M}$.
- Opportunity cost = $i \cdot \frac{M}{2}$

Baumol-Tobin Model of Money Demand

Total cost $= K \cdot \frac{Y}{M} + i \cdot \frac{M}{2}$.

We can minimise this by taking the derivative with respect to M:

$$-K \cdot \frac{Y}{M^2} + \frac{i}{2} = 0 \rightarrow M = \sqrt{\frac{2KY}{i}} \rightarrow \frac{M}{2} = \sqrt{\frac{KY}{2i}}$$

- Average holdings create the money demand

$$M^d = \sqrt{\frac{KY}{2i}}$$