Money and Kyotaki-Wright

Subject: MTP

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| **MONEY**  **1. MONEY, WEALTH, INCOME**  **2. WHY WE NEED MONEY**  **A. MEDIUM OF EXCHANGE**  **B. UNIT OF ACCOUNT**  **C. STORE OF VALUE (IMPERFECT)**  **3. HOW THE PAYMENT SYSTEM WORKS**  **A. WHAT IS IT**  **+ HISTORY**  **B. HOW MUCH MONEY**  **IS AROUND?**  **KYOTAKI-WRIGHT**  **1. AIM**  **2. KEY FEATURES OF OUR MODEL**  **3. ENDOWMENTS**  **4. PREFERENCES**  **5. TECHNOLOGY**  **6. SEARCH AND TRADING PROCESS**  **A. MARKET DYNAMICS: MONEY TRADERS VS COMMODITY TRADERS**  **B. DEGREE OF ACCEPTABILITY**  **7. OPTIMAL STRATEGY AND PAYOFFS**  **8. CUTOFF CONDITION**  **9. BEST RESPONSE CURVE (IN BLUE) AND EQUILIBIRA (A, B, C)** | **Money:** Stock of assets accepted in payment for goods (ex. Currency, bank deposits). Commodity money vs Fiat, Fiat has no intrinsic value.  **Wealth:** Stock of all resources owned by an individual (currency and bank deposits + bonds, houses, etc 🡪 Money is part of wealth)  **Income**: Flow of earnings per unit of time  What distinguishes money from other assets as stocks, bonds and houses?  **For something to function effectively as money**  1. it must be widely accepted  2. it must be easily standardized (difficult to evaluate gold purity)  3. it must be divisible  4. it must be easy to carry  5. it must not deteriorate quickly  When entering a shop I know they will accept it in exchange for goods. Why barter is not a medium of exchange as good as money? Barter is founded on double coincidence of wants, you have to find someone who likes what you have. Problems:  High transaction costs (time, effort, not everyone will accept) + Specializing is a risk (with money from shoes you can buy everything, but living on shoes exchange may be difficult)  **Money is used to measure value in the economy**  Ex. My wealth amounts to 400 shirts 😐, or better 20.000 Euros ☺  This saves us a lot of time. Bc in a barter economy with N goods we need to consider N·(N-1)/2 prices, in an economy with money with N goods need to consider N prices (common unit of account)  **Money is a way to transfer purchasing power over time.** “If I work today and earn 100 Euro, I can hold the money and spend tomorrow”. Howerver money is an imperfect store of value (due to inflation rate), while other assets pay interest (bonds) or provide services (houses). Why holding money to store value and not gold/houses? Liquidity  **Method of conducting transactions in the economy**  **Cronology:**  1. Initially, people carry around bags of gold (it has value to everyone, making it universally acceptable) 🡪 the exchange occurs if the seller believes the gold is legit = Transaction cost  2. To reduce/eliminate costs, the government can produce gold coins of guaranteed purity and weight  3. The Gov. accepts gold from the public in exchange for “gold certificates” = pieces of paper that can be redeemed for k quantity of gold  4. Eventually no one carries gold around at all; the gold-backed government certificates become the monetary standard  5. As long as everyone accepts certificates no one will ever redeem the certificates for gold. Here gov credibility is key.  6. The certificates become fiat money: issued by gov as legal tender (legally it must be accepted) but not convertible into gold  7. Now we are using less paper money and more e-money  **ECB publishes 3 monetary aggregates (FED does not publish M3)**  –  M1: currency + transactions deposits (overnight)  –  M2: M1 + other short/medium term deposits  –  M3: M2 + marketable instruments (repurchase agreements and money market funds shares) + debt securities up to 2 years  **Why are monetary aggregates growing over time?**  1. Reflects increasing aggregate value of produced goods (produce more)  2. Inflation (higher prices for produced products)  **Explain the role of money as medium of exchange, i.e. why intrinsically worthless items can emerge as a means of exchange**  **Key Features:**  1. Money has no intrinsic value  2. Search approach: the KW model adopts a decentralized framework (trade does not happen instantaneously in a centralized market) 🡪 agents are engaged in a continuous, costly and uncertain, search process to find trading partners.  3. Strategic approach to money: when deciding whether to accept to trade an object other than the one I desire for my own consumption I must conjecture as to the probability that other agents will accept it from me in the future  🡪 Expected Result: Even items with no intrinsic value can serve as money if there's a common belief they will be accepted  **Economy populated by a large number of infinite-lived equal agents with endowments** (guarantees stationarity and symmetry).  - M agents are endowed with 1u of Fiat money: something no one ever consumes, with no intrinsic value  - 1- M agents are endowed with 1u of a real commodity  **Consumption taste (x), defined as:**  1.  The proportion of agents that can consume any given good. Ex: 1/5 of the agents can consume good 1.  2.  The proportion of goods that can be consumed by any given agent. Ex: agent A can only consume 1/5 of the all goods  If you randomly pick a good, only x fraction of agents will want it.  ---> If agent A can consume good 1 🡪 utility U>0, while consuming other goods (or money) yields the agent U = 0  **Tech:**  1. CB can’t produce money  2. Agents cannot consume their own output or endowment and by assumption they don’t like their endow/prod  3. If you consume one good in t you will produce one in t+1 🡪 Agents who have not consumed cannot produce  4. Money and goods are costlessly storable  5. No transaction cost  **Trading process:** Agents with money (money traders) and agents with consumption goods (commodity traders) look for other agents with whom to trade 🡪 all traders meet pairwise and at random, one meeting per period per agent and no transaction costs.  Note that, given these assumptions, in equilibrium each agent can only have either one unit of money or one consumption good. This also implies there is always a fraction M of agents with money and a fraction 1-M with goods/commodities.  **a. Money Traders**  I. What he wants  An agent with one unit of money seeks to exchange his unit of money with one consumption good he likes.  II. What makes the exchange happen  The agent with money meets an agent with one good he likes + The randomly located agent is willing to accept money in exchange for the good  In case the agent exchanges money with a consumption good, consumes it with utility U, and produce a new consumption good to exchange in t+1. If instead there is no exchange, the agent does not consume, keeps the unit of money and tries to exchange it next period  **b. Commodity Trader**  I. What he wants  An agent with one consumption good seeks to exchange his good with one consumption good he likes or with one unit of money.  II. What makes the exchange happen  --> Trade for goods, This exchange occurs only if there is a “double coincidence of wants”:  The agent with a good meets an agent with one good he likes + The randomly located agent likes the offered good  ---> Trade for money, This exchange occurs only if:  The agent with a good meets an agent with money and he is willing to accept money for the good + The randomly located agent likes the offered good  **Commodity goods:** will always be accepted in exchange by *some* agents (x), since their consumption generates utility for x agents 🡪 probability the good is accepted: exogenous, x  **Money:** will be accepted by an agent only if he expects to be able to use it in exchanges, that is, only if he expects that also other agents will accept money in exchange for the goods they like (Π = prob. a randomly located agent accepts money (endogenous))  Key decision: Money or good I do not like? why should you ever prefer money if has no value over barter? Obvious! If you receive a good you don’t know if in t+1 the guy with the good you like will like your good. Instead, if you receive money and you know next time it will be accepted in t+1 by the guy holding the good you like.  OPTIMAL STRAT:  Accept a good if it is a good that he likes (i.e., with probability x)  Accept money with probability π when the other agents accept it with probability Π (symmetry imposes π = Π)  EXPECTED PAYOFFS  A diagram of mathematical equations  Description automatically generated  \*if there is disutility from holding money you subtract ζ from the future value of holding money  **A white background with black text  Description automatically generated**  Set VC – VM to 0 to obtain the cutoff condition (Π\*): 0 = Π - x  **A diagram of a graph  Description automatically generated**  As you can see the sign of the difference (VC – VM) depends on the acceptance probability of goods (x) and the acceptance probability of money (Π). Three possible strategies for the individual (define best response curve):  1. Π < x 🡪 VC > VM: Agent never accepts money in exchange of a real commodity π=0. Money is accepted with a lower probability than barter.  2. Π > x 🡪 VC < VM: Agent always accepts money in exchange of a real commodity π=1 Money is accepted with a greater probability than a barter offer, than it is easier to trade using money than barter  3. Π = x 🡪 VC = VM: Agent is indifferent between money and a real commodity π is anything between 0 and 1  Money is accepted with the same probability than a barter offer, than it is equally easy to trade using money or barter  45 degree line is used to show there is symmetry ( π =Π). See: on the 45 degree line π =Π. The 45-degree line on this graph represents all points where traders' beliefs exactly match the actual outcomes. Hence, we have three equilibrium points  🡪 3 possible Equilibria  1. Nonmonetary equilibrium (Π=0): Agents expects that money will not be accepted, so they never accept it. Money is valueless and is not used. Point A in Figure.  2. Pure monetary equilibrium (Π=1): Agents expects that money will be accepted, so they always take it. Money is universally acceptable. Point C in Figure.  3. Mixed monetary equilibrium (Π=x): Agents are indifferent between accepting and rejecting money as long as other agents take it with probability Π=x. Money is only partially acceptable. Point B in Figure. |

**Ex. formulas derivation (tricky). Considering cost of holding money ξ**

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