Money, Inflation and Interest

The Nominal Side
A Key (Plausible) Assumption

• At least two assets exist
  • (Otherwise portfolio allocations are trivial)
    – Money:
      • a) liquid
      • b) (nominally) safe, with
      • c) zero (or low) return
    – Bonds: illiquid, risky, higher return
    – Can also have stocks, land, commodities, ...

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Roles of Money

1. *Medium of Exchange* (Jevons: in facilitating transactions, money allows one to avoid “double coincidence of wants”)

2. *Unit of Account* (facilitates measurement)
   - \(\frac{n(n-1)}{2} > n\) so that \#nominal prices\(\ll\)#relative prices

3. *Store of Value* (Samuelson: money allows transfer of purchasing power over time)
   - Mostly theoretical argument since superior substitutes exist (bonds, stocks) which aren’t affected so much by inflation
Measures of Money

• Currency (most narrow and liquid measure, no return)
• M1 (add demand deposits: less liquid, higher return, ...), default measure of money
• M2 (add savings deposits, ...)
• M3 (add money market accounts, repos ...)

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Money Demand

• Q: Why hold money instead of bonds? (Portfolio choice)

  1. Demand for real purchasing power (prices matter 1:1)
  2. Positively related to real income/consumption (facilitate transactions), big effect empirically (≈1)
  3. Negatively related to opportunity cost (bonds earn nominal interest rate), small effect empirically
Money Supply

• How does government set money supply; exogenously?

• Assume central bank sets money supply
  – Central Banks often now independent of finance ministry/government for rich countries, some LDCs
    • A recent innovation for most
    • Monetary independence akin to judicial independence
  – Goals of Central Bank: set monetary policy to hit targets, typically:
    1. Inflation targets (often explicit, but only recently)
    2. Smooth business cycles
    3. Maintain integrity of financial system (avoid bank runs, financial crises)
Equilibrium

• Money Supply equals Money Demand
  – Algebraically $M^s = P \cdot L(y, i)$
  – “Walras’ Law” states this is also bonds market equilibrium (with two assets, money & bonds)
    • Hence can ignore bonds market, focus only on money market
Quantity Theory: A Long Run Theory of Inflation

• $M = kPy$ or $MV = PY$, where $V$ is velocity of money
  – Recall equilibrium: $M^s = P*L(y, i)$
  – Assume $y$ effect =1

• In rates of change, $\%\Delta M + \%\Delta V = \%\Delta P + \%\Delta Y$

• Excessive money growth causes inflation
  – Money growth which exceeds difference between “velocity drift” and growth (both exogenous) is inflationary
Notes on Quantity Theory

• Does not fit well in the short run
• Friedman: “inflation is always and everywhere a monetary phenomenon”
Inflation

• Fact: Even moderate inflation is unpopular

• Q: Why should central bank print money and cause inflation?

• A: There must be costs of not printing money
  – Temporarily ignore short-run business cycle issues (later!)
  – *Seigniorage* (government revenue) a benefit of money creation; costs little to print money
Effects of Inflation

• “Inflation tax” a redistribution from money-holders to government
  – Can shrink real balances to minimize this cost
  – Then society incurs “shoe-leather” costs (small)

• In evaluating inflation, critical to distinguish expected and unanticipated inflation
  – Expected inflation often handled at low cost
Potential Costs of Inflation

• High inflation associated with *dispersed relative prices*?
• Inflation usually compromises *tax systems*
• High inflation historically also *variable*
• Still, economists basically unsuccessful in finding high costs of expected inflation; “menu costs” small
  – But society clearly abhors inflation; economists just don’t understand the phenomenon well
More on Potential Costs

• In hyperinflation (>1000% p/a or 50% monthly), money loses role as efficient medium of exchange – economy shrinks
  – Hyperinflations rare, especially now

• Unexpected Inflation redistributes wealth towards nominal debt holders and away from nominal asset holders
  – Debts often large after wars
Mechanisms to Avoid (Inflationary) Wealth Redistributions

1. Create *Independent Central Bank* with *Inflation Target* (Germany/NZ)
2. Debt denominated in *Foreign Currency* (Argentina)
3. *Indexed or “Real”* debt (TIPS)
4. *Short-Term* debt has to be “rolled over” frequently (Italy)
5. Building inflationary expectations into nominal interest rates (“Fisher” effect)
Nominal and Real Interest Rates

• “Fisher Effect” states nominal interest rate is the sum of expected inflation and expected real interest rate: \( i = \% \Delta p^e + r^e \)

• Fisher Effect works reasonably in long run, not in short run (except during hyperinflations)
Key Takeaways

• Money is demanded to facilitate transactions and thus by price levels and real income
• Money is supplied by the central bank (often independent of the government), typically to hit an inflation target
• The Quantity Theory states that excessive money growth eventually causes inflation
• Creditors can protect themselves from anticipated inflation via a variety of mechanisms, including building in expected inflation into the interest rate (the Fisher Effect)