Class 8

Econ 402
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Class 8 Outline

- More on Money Demand, Money Supply, and the Quantity Theory of Money

- Hyperinflation and the Cagan Model

- The Classical Dichotomy

Money Demand

- Under the QTM, velocity is constant

- Equivalent to Demand for "Real Balances" (M/P) depending on Real Income (Y) according to (M/P)d = k*Y, where k=1/V

- Money => Nominal GDP/Real GDP => P

- Money Growth => Nominal GDP Growth – Real GDP Growth => Inflation

Money Demand (II)

- The Classical Model extends the QTM by assuming Demand for M/P depends on the nominal interest rate (i) and Real Income (Y)

- Money => Real Money Supply => P adjusts to bring about equilibrium between Real Money Supply and Real Money Demand

- Key Point #1: Same result as QTM, but specific mechanism (supply/demand in money market)
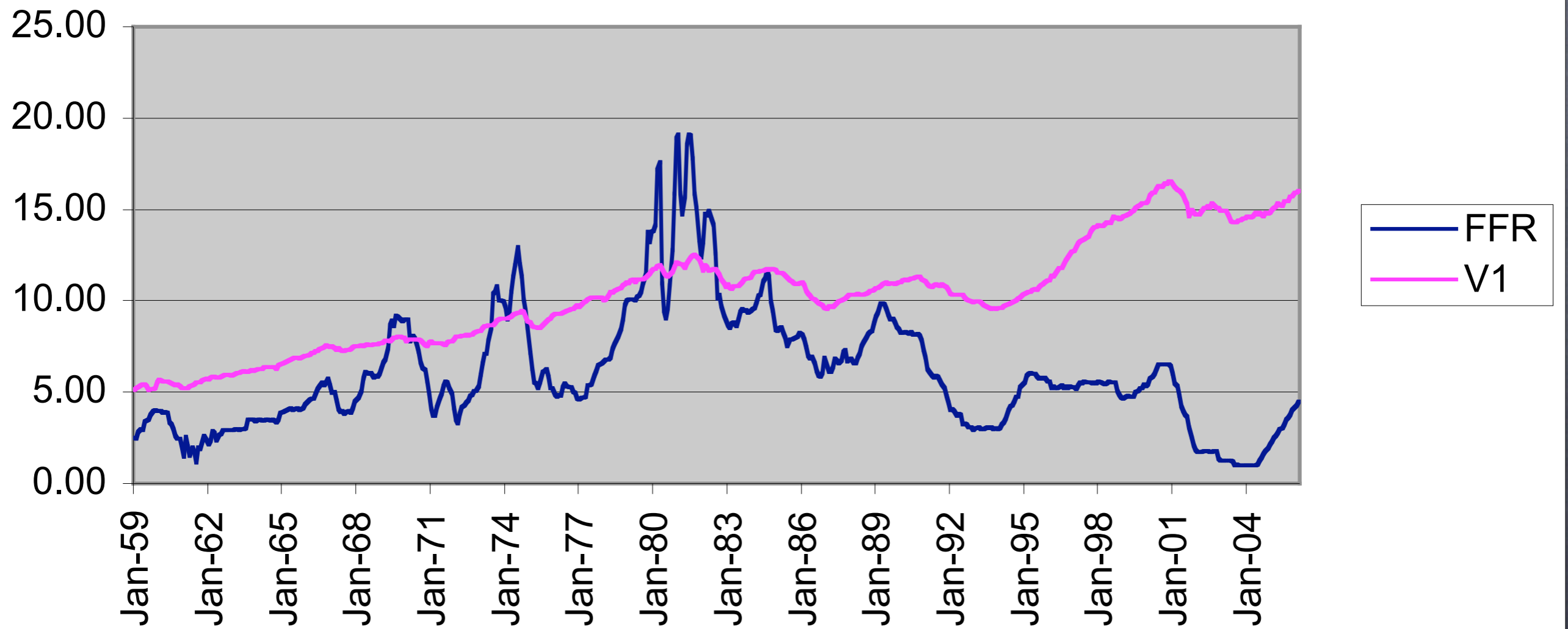
Money Demand (III)

- Also, Expected Inflation => i => Real Money Demand => P adjusts to bring about equilibrium

- What direction?

- Key Point #2: Money and Inflation Expectations both can cause Inflation

- More difficult to model
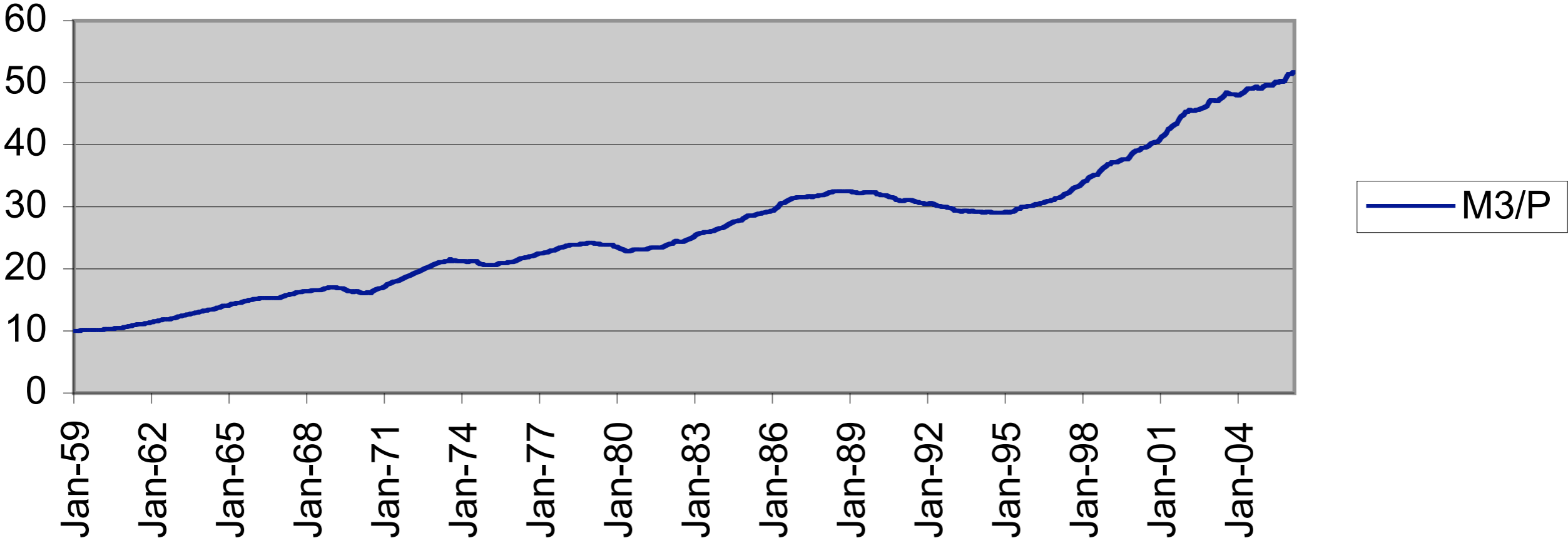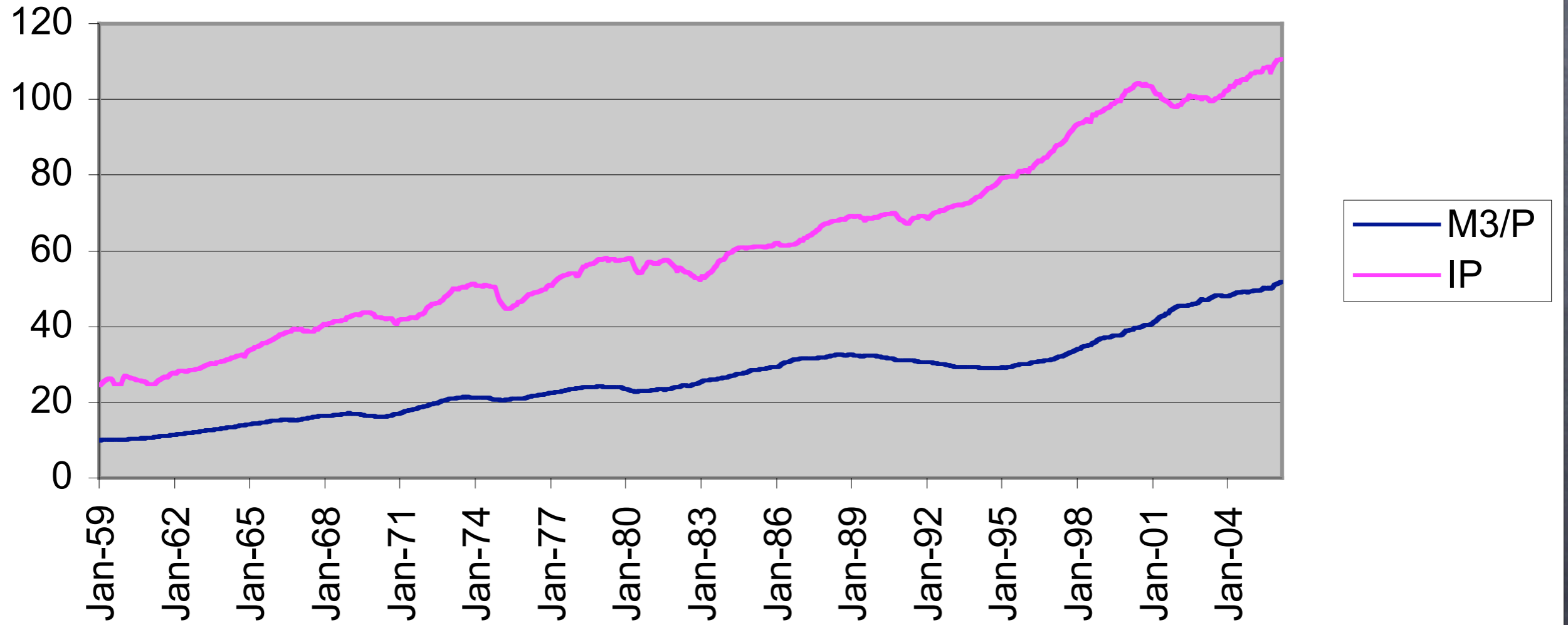
What Influences Money Supply?

- The Classical Model assumes that M is exogenous

- What might explain changes in M?

  - Under gold standard, discoveries of gold

  - Under fiat money, "seigniorage"

Seigniorage

- When a government cannot raise taxes or sell bonds, it often resorts to printing money to finance spending

- What, then, does it mean to say money causes inflation?

"The Cash Nexus"

- All deeper "causes" must operate through money to generate inflation

- Operational notion of causality
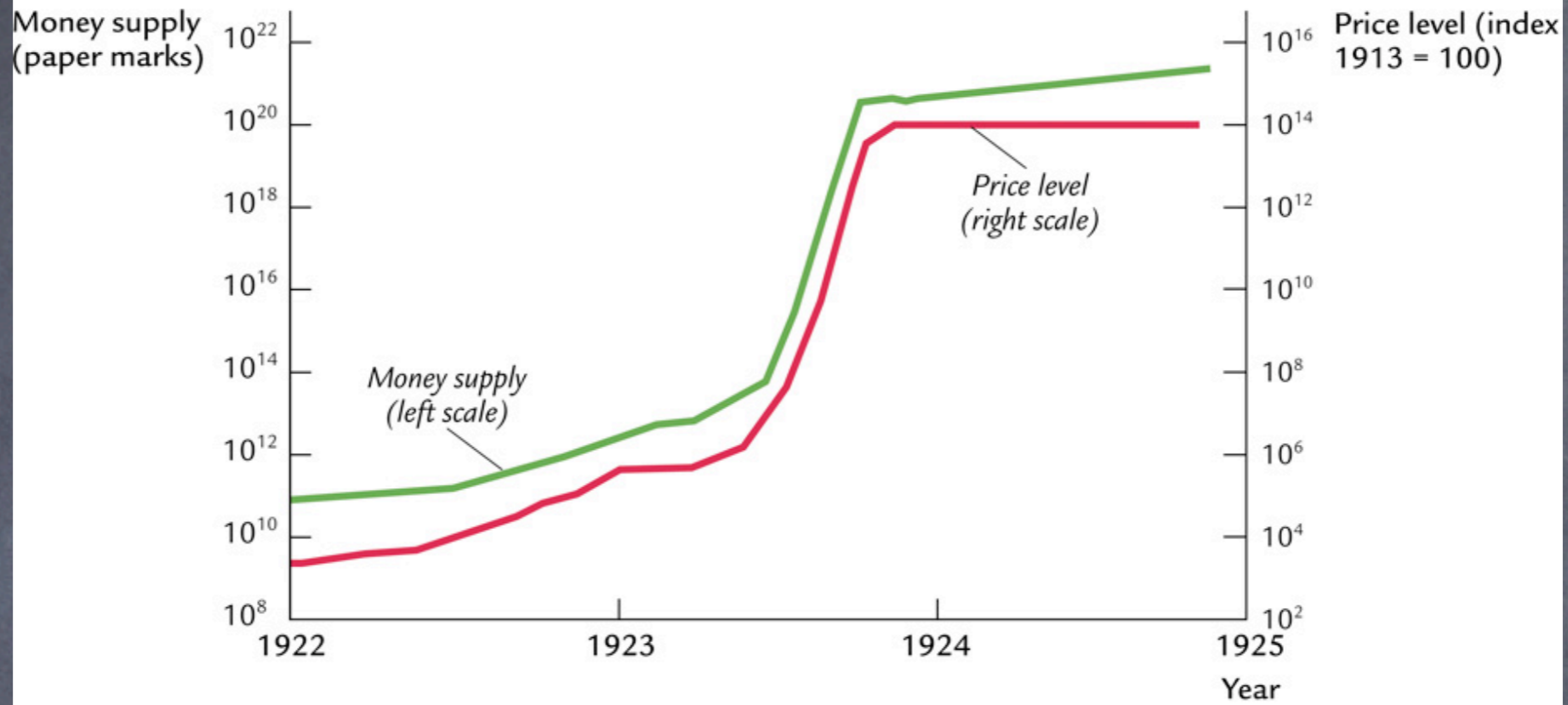
Hyperinflation

- Note that seigniorage currently accounts for less than 3% of US government revenues

- However, easiest to see that money causes inflation in the extreme case of "hyperinflation" when seigniorage is significant

A few examples of hyperinflation

	money growth (%)	inflation (%)
Israel, 1983-85	295	275
Poland, 1989-90	344	400
Brazil, 1987-94	1350	1323
Argentina, 1988-90	1264	1912
Peru, 1988-90	2974	3849
Nicaragua, 1987-91	4991	5261
Bolivia, 1984-85	4208	6515

German Hyperinflation

(a) Money and Prices

Money supply (paper marks): 10^{22}, 10^{20}, 10^{18}, 10^{16}, 10^{14}, 10^{12}, 10^{10}, 10^8

Price level (index 1913 = 100): 10^{16}, 10^{14}, 10^{12}, 10^{10}, 10^8, 10^6, 10^4, 10^2

Price level (right scale)

Money supply (left scale)

1922   1923   1924   1925

Year

(b) Inflation and Real Money Balances

Index of real balances (January 1922 = 100): 120, 100, 80, 60, 40, 20, 0

Monthly inflation rate (logarithmic scale): 100,000, 10,000, 1,000, 100, 10, 0

Real balances (left scale)

Monthly inflation rate (right scale)

1922   1923   1924   1925

Year
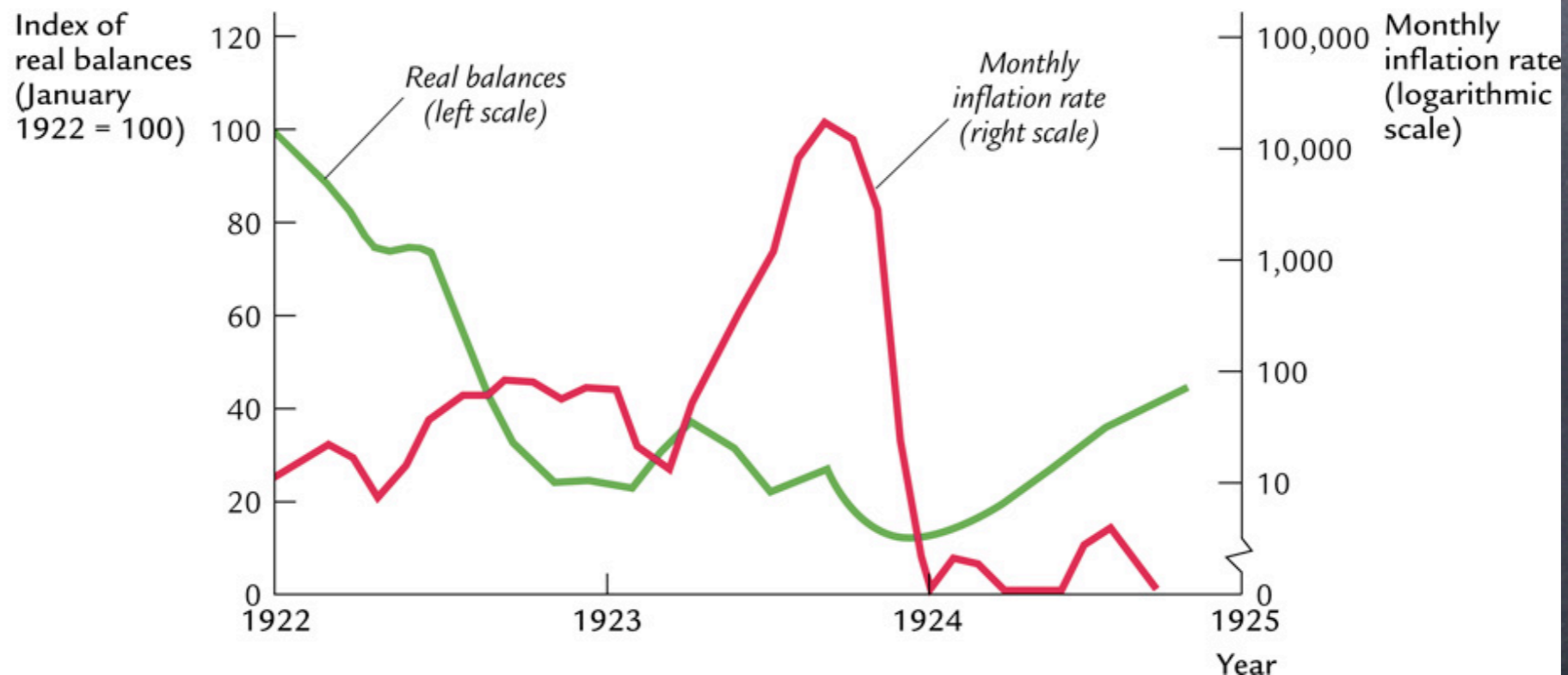
German Hyperinflation

- Clearly, QTM holds

- Also, it appears that real money demand depends on inflation expectations

- What determines inflation expectations?

Cagan Model

- Money demand implies current price level depends on current money and future price level

- Solving model => price depends on current and future money

- Thus, inflation expectations depend on expectations of future money growth

Central Banking in Theory and Practice

- QTM might make Fed's job look easy

- However, they don't only have to control money supply

- They also have to manage public expectations of inflation by managing their expectations of future money growth (see German hyperinflation)

- Under rational expectations, Fed can use a money growth rule to "pin down" expectations of future money in terms of current/past money (credibility)

The Classical Dichotomy

- Real variables: measured in physical units -- quantities and relative prices (e.g., real GDP, real wage, real interest rate)

- Nominal variables: measured in money units (e.g., nominal wage, nominal interest rate, price level)

- Next time: The Open Economy (Chapter 5 of Mankiw)

- Midterm 1 on Thursday, February 21st. Practice Questions posted on class website