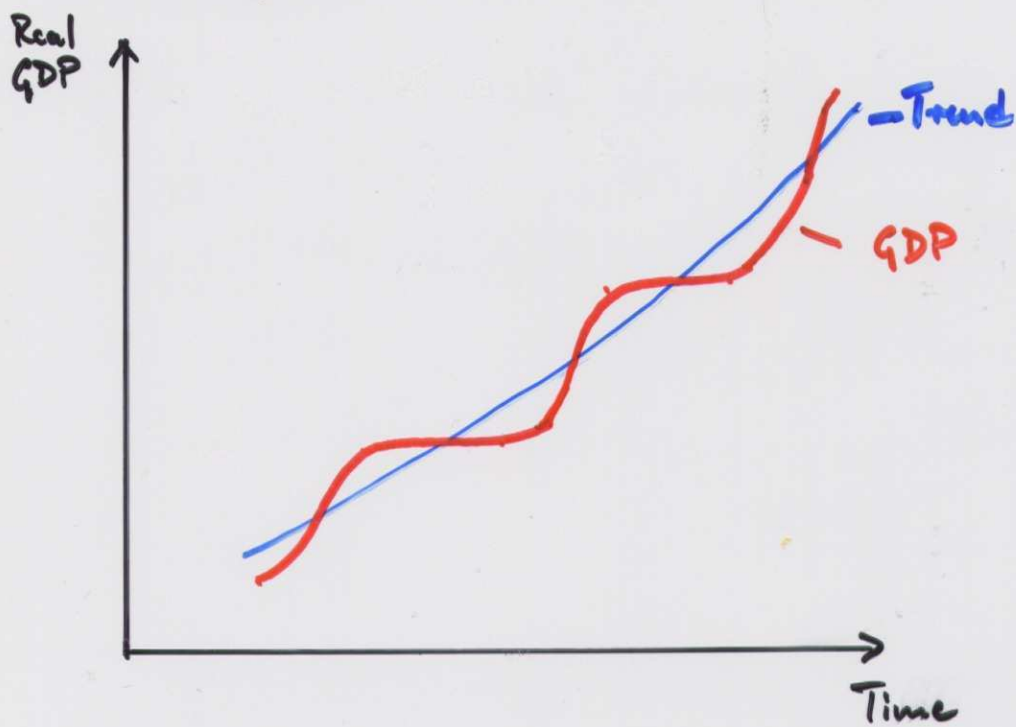


Business cycles



Some facts

- Fact 1:** Cyclical movement of real GDP growth
= average duration 5 to 8 years
- Fact 2:** Business cycle fluctuations are small compared to average GDP and overall growth
- Fact 3:** Components of private expenditures procyclical, government consumption acyclical.
- Fact 4:** Leading variables: inventories, capacity utilization, stock prices, real money balances
Lagging variables: inflation, unemployment
Coincident variables: interest rates
- Fact 5:** Investment - more volatile than GDP
Consumption - less volatile than GDP

Correlations of macroeconomic variables with output

	<u>EU</u>	<u>Japan</u>	<u>USA</u>
$\text{Corr}(Y_t, C_t)$	0.84	0.49	0.85
$\text{Corr}(Y_t, I_t)$	0.89	0.81	0.90
$\text{Corr}(Y_t, G_t)$	0.11	-0.13	0.09
$\text{Corr}(Y_t, Ex_t)$	0.79	-0.10	0.18
$\text{Corr}(Y_t, Inv_t)$	0.92	0.16	0.56
$\text{Corr}(Y_{t+1}, P_t)$	-0.76	-0.27	-0.59
$\text{Corr}(Y_t, \pi_t)$	0.09	0.17	0.19

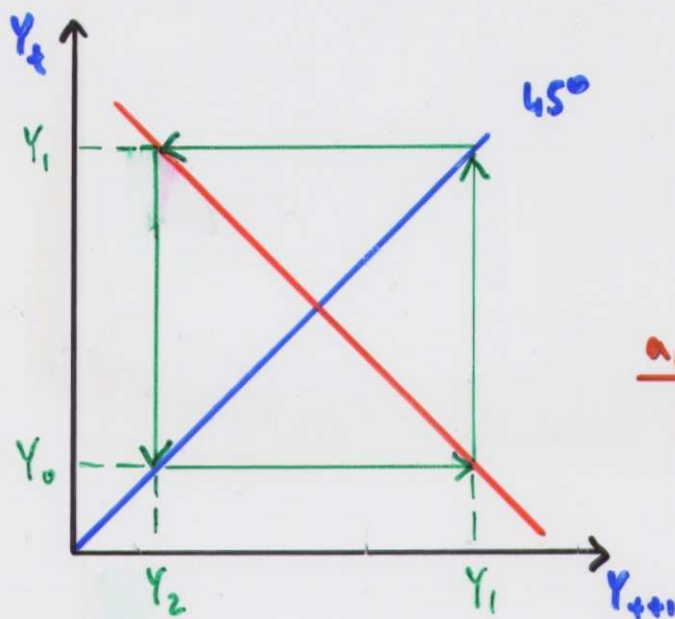
- EU: UK, France, Germany, Italy
- Data: quarterly time series, 1957 - 1989

Recall:

$$\bullet \text{Corr}(X, Y) = \frac{\text{Cov}(X, Y)}{\sqrt{\text{Var}(X) \text{Var}(Y)}}$$

$$\bullet -1 \leq \text{Corr}(X, Y) \leq 1$$

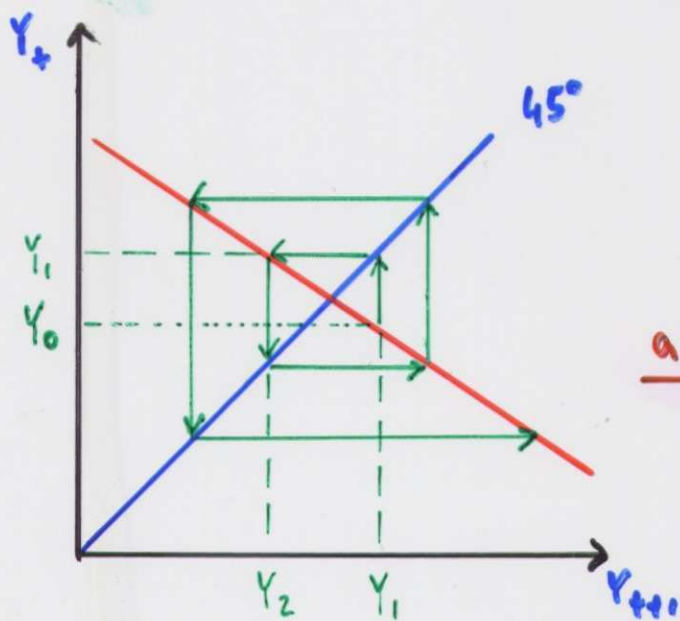
Deterministic interpretation of business cycles



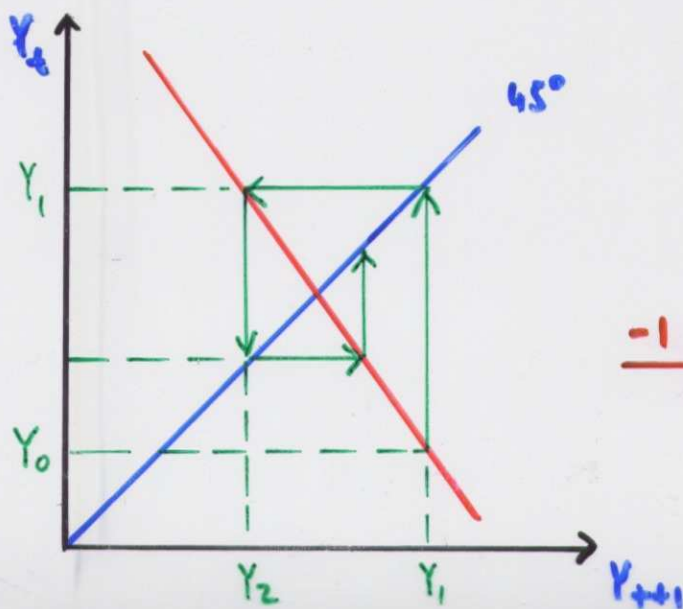
$$Y_{t+1} = a_0 + a_1 Y_t$$

$$\Leftrightarrow Y_t = -\frac{a_0}{a_1} + \frac{1}{a_1} Y_{t+1}$$

$a_1 = -1$



$a_1 < -1$



$-1 < a_1 < 0$