Class 13

Econ 402

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Class 13 Outline

- More on the Natural Rate of Unemployment
  - Job Flows and the NRU in Excel
  - Estimating the NRU and its Sources (King and Morley, 2007)
- Shapiro-Stiglitz Model of Efficiency Wages
- Policy and the Natural Rate
- Summary of Classical Model

Phelps' (1994) Definition

[The 'natural rate of unemployment' is defined as] the current equilibrium steady-state rate, given the current capital stock and any other state variables. (It is the unemployment rate that, if it were the actual rate at the moment, would make the current rate of change of the associated equilibrium unemployment rate path equal zero.) In [this] theory, then, the equilibrium path of the unemployment rate is driven by a natural rate that is a variable of the system rather than a constant or a forcing function of time. The endogenous natural rate becomes the moving target that the equilibrium path constantly pursues.

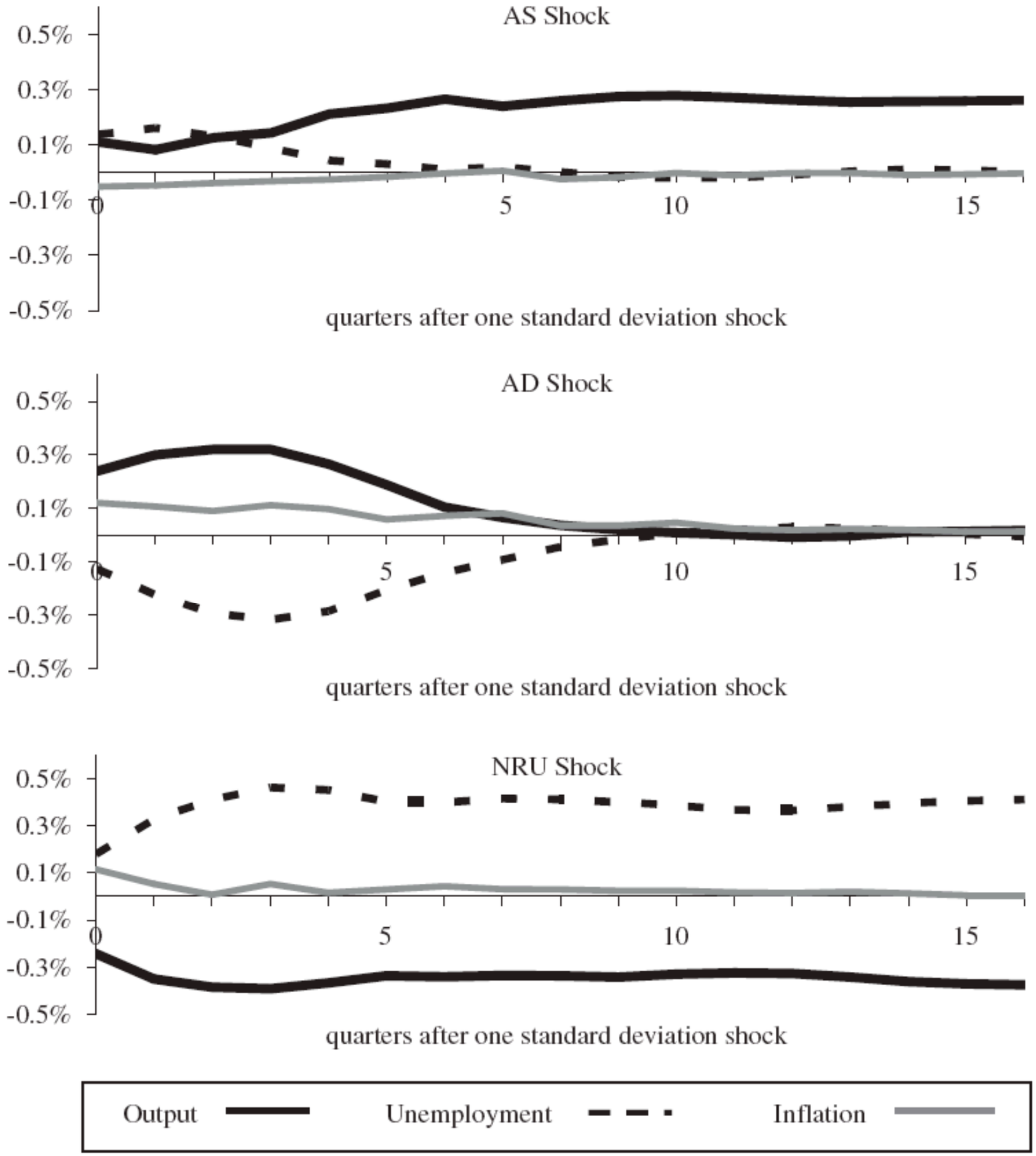

Fig. 1. Impulse response functions for structural shocks.

Table 1
Variance decompositions

	Output			Inflation			Unemployment rate		
	AS shock (%)	AD shock (%)	NRU shock (%)	AS shock (%)	AD shock (%)	NRU shock (%)	AS shock (%)	AD shock (%)	NRU shock (%)
0 (shock qtr)	9	45	46	8	48	44	29	23	48
4	9	37	54	9	68	23	6	30	64
8	18	25	56	8	69	22	4	22	74
:	:	:	:	:	:	:	:	:	:
20	28	11	61	8	69	23	2	11	87
:	:	:	:	:	:	:	:	:	:
40	31	6	63	8	69	23	1	6	93
:	:	:	:	:	:	:	:	:	:
∞	33	0	67	—	—	—	0	0	100

Notes: The table reports the relative importance of the three structural shocks in our estimated structural VAR model for variation in output, inflation, and the unemployment rate at different horizons. Because inflation is assumed to be stationary, none of the shocks has effects on inflation at the infinite horizon.

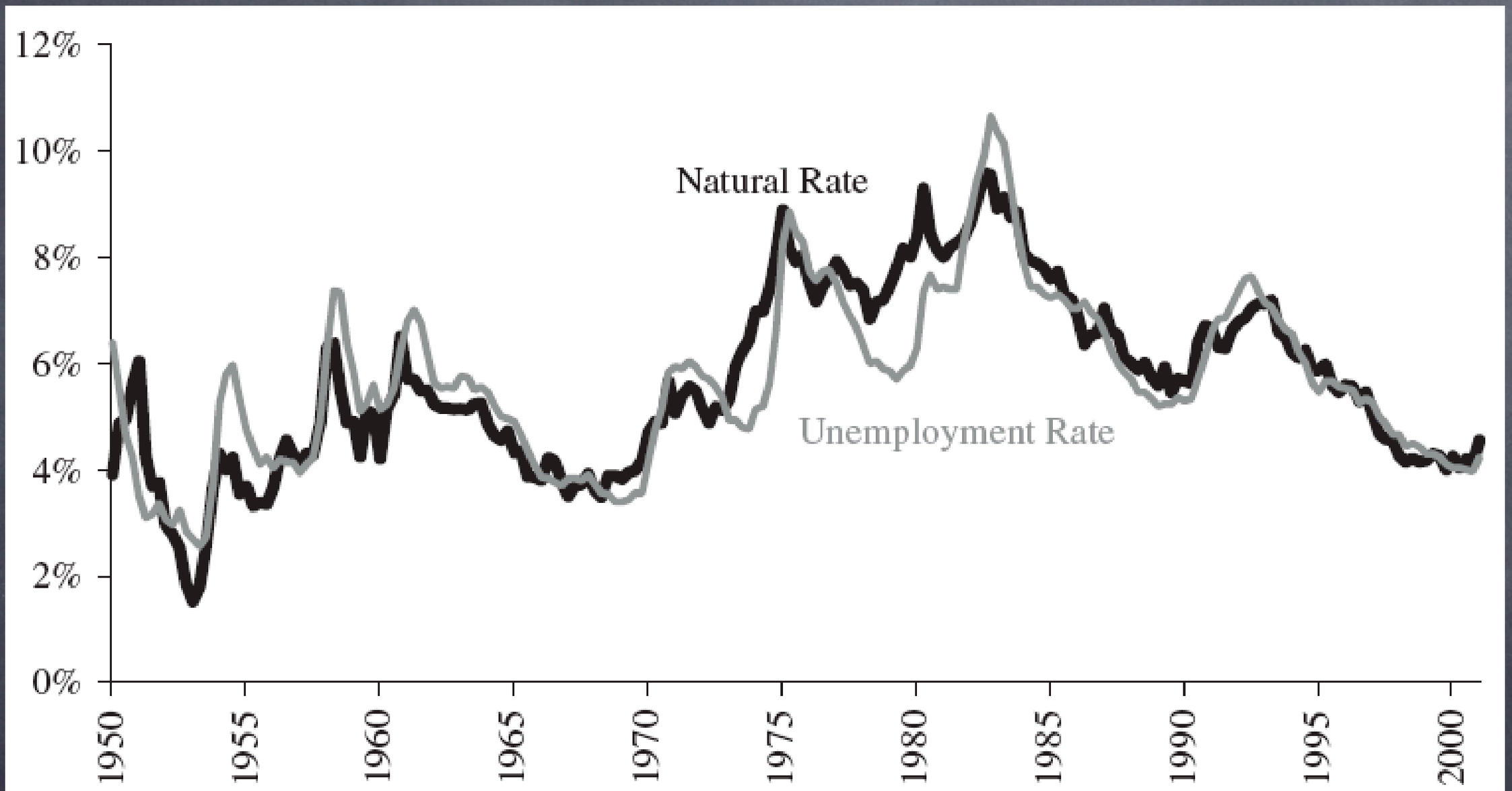

Fig. 2. The natural rate of unemployment.

Table 2
Determinants of the natural rate

Model specifications
Model I—OLS, levels
Model II—2SLS, levels
Model III—OLS, first differences
Model IV—2SLS, first differences
Model V—2SLS, first differences, significant variables only
Model VI—2SLS, first differences, significant variables only, annual data

	Coefficients (t statistics)					
	Model I	Model II	Model III	Model IV	Model V	Model VI
Intercept	*−83.47*	*−91.55*	*−0.09*	−0.13	0.004	*−0.75*
	(−6.46)	*(−5.57)*	*(−1.72)*	(−1.52)	(0.16)	*(−3.68)*
% Sectoral shifts	*0.80*	*1.15*	*0.49*	*0.54*	*0.55*	*0.72*
	(5.45)	*(5.5)*	*(5.67)*	*(5.22)*	*(5.92)*	*(3.76)*
Real Unemp. benefits	*0.03*	*0.03*	*0.006*	*0.02*	*0.02*	*0.02*
	(11.71)	*(7.98)*	*(1.74)*	*(3.07)*	*(4.15)*	*(4.60)*
Labor-productivity growth	*−0.15*	0.15	*−0.11*	*−0.07*	*−0.08*	*−0.15*
	(−2.62)	(0.93)	*(−4.56)*	*(−2.09)*	*(−2.45)*	*(−1.79)*
Real hourly compensation	*0.11*	*0.11*	*0.09*	0.10		*0.15*
	(9.05)	*(7.18)*	*(2.49)*	(1.61)		*(3.57)*
Real 10-year treasury yield	*0.08*	*0.15*	*−0.03*	−0.003		
	(2.71)	*(3.74)*	*(−1.73)*	(−0.07)		
% Union membership	*−0.30*	*−0.31*	0.11	−0.10		*−0.33*
	(−4.57)	*(−3.73)*	(0.65)	(−0.47)		*(−1.75)*
Real minimum wage	*0.03*	*0.04*	0.006	0.009		*0.03*
	(4.83)	*(4.35)*	(0.62)	(0.84)		*(2.23)*
% Of workforce male	*0.67*	*0.82*	0.16	0.22		*0.60*
	(4.19)	*(4.15)*	(0.87)	(0.91)		*(1.76)*
% Of workforce under 25	*0.25*	*0.28*	−0.06	−0.003		
	(6.35)	*(5.81)*	(−0.51)	(−0.02)		
% Of workforce over 60	*−0.24*	*−0.49*	0.15	0.14		
	(−1.73)	*(−2.58)*	(0.62)	(0.47)		
Help-wanted index	−0.003	−0.008	0.003	−0.001		
	(−0.77)	(−1.49)	(0.81)	(−0.24)		
Growth rate of labor force	−0.03	0.18	−0.003	0.003		
	(−1.00)	(1.50)	(−0.17)	(0.11)		
Time trend	*−0.13*	*−0.12*				
	(−12.21)	*(−9.35)*				
R^2	0.909	0.882	0.350	0.281	0.265	0.687
Adjusted R^2	0.902	0.873	0.306	0.230	0.253	0.625
Durbin–Watson	0.654	1.013	2.250	2.267	2.213	2.047
Observations	187	183	186	182	182	43

Notes: The table reports regression results with our estimate of the natural rate as the dependent variable. All real quantities are measured in 1996 dollars. Italics type denotes statistical significance at the 10% level. t-statistics are reported in parentheses.

Sectoral Shifts

- Sum of abs. value of % quarterly change in composition of major employment sectors (manufacturing, construction, finance, government, mining, service, transportation and utilities, retail sales, and wholesale sales
- One standard deviation increase in sectoral shifts produces 0.18 percentage point increase in NRU

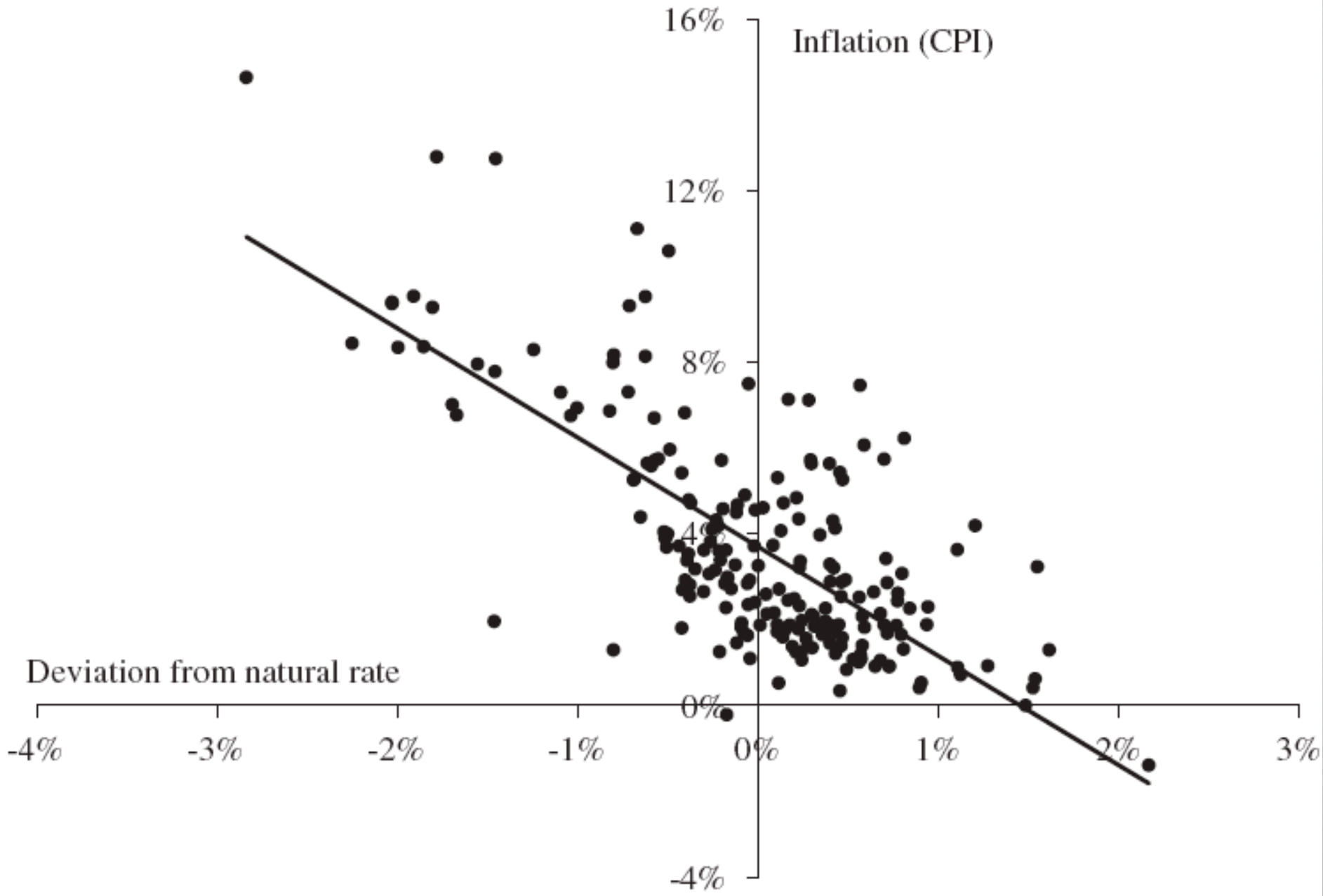

Fig. 3. Inflation versus cyclical unemployment.

Shapiro-Stiglitz Model of Efficiency Wages

- One representative firm, many workers
- Workers find effort costly
  - Payoff to working = W - E
  - Payoff to shirking = W

- Separation rate b (exogenous probability of leaving job beyond workers' control)
- Risk of shirking q (worker gets caught shirking and fired; q<1 assumes imperfect monitoring)

Results

- If firms pay market-clearing wage, all workers will shirk
- Firms will pay efficiency wage such that workers will choose not to shirk
- No shirking will be observed in equilibrium
- A lower q raises the efficiency wage

No shirking condition

- Value of working ≥ Value of shirking
- Value of working = (W-E)/b
- Value of shirking = W/(b+q)
- => W ≥ E + (b/q)xE

Efficiency Wage

- $W^* = E + (b/q)xE$
- If W^* > market-clearing wge, there will be structural unemployment
- Firms choose higher wage because it soles monitoring problem

Policy and the NRU

- Use the material in Chapter 6 and in class to come up with a policy or policies to try to reduce the natural rate of unemployment
- Note whether your policy targets frictional or structural unemployment

Summary of Classical Model

- (Generally) static model with flexible prices
- Determination of real wages, inflation, trade deficit, unemployment
- Impact of budget deficits on investment and trade deficit
- Impact of monetary policy on the price level

Limitations

- Despite being a long-run model, static structure does not explain economic growth
- Classical dichotomy does not capture interaction between real and nominal variables in the real world (e.g., Phillips Curve)
- Consumption function and investment function are too simple

- Hw#2 posted and due on Thursday, March 6
- Next time: Economic Growth (Chapter 7 of Mankiw)