Test exercise 3

(a) Use general-to-specific to come to a model. Start by regressing the federal funds rate on the other 7 variables and eliminate 1 variable at a time.
The following is my result.

Dependent Variables: Interest rate Sample size:660			
Coefficient (P-value)			
	1	2	3
Constant	-0.221161 (0.367)	-0.290851 (0.21830)	-0.240119 (0.2976)
Commodity price	-0.005521 (0.0638)	-0.006514 (0.02130)	-0.007501 (0.00460)
Housing starts	-0.019411 (0.000)	-0.021023 (0.000)	-0.02053 (0.000)
Inflation	0.696059 (0.000)	0.693309 (0.000)	0.717527 (0.000)
Personal Consumption expenditure	0.34438 (0.000)	0.368561 (0.000)	0.340525 (0.000)
Personal income	0.246999 (0.0001)	0.251581 (0.000)	0.240242 (0.0001)
Production	-0.057743 (0.1483)	-0.02546 (0.32320)	
Unemployment	0.102481 (0.2899)		
R squre	0.6386	0.6379	0.6373

So the final model is

$$i_t = -0.0075cp_t - 0.02053hs_t + 0.71752\pi_t + 0.340525pce_t + 0.2402pi_t$$
$$p = (0.00460) \quad (0.00000) \quad (0.00000) \quad (0.00000) \quad (0.00010)$$
$$R^2 = 0.637361$$

With i_t the Federal Fund interest rate, cp_t the Commodity price, hs_t the Housing starts, π_t the inflation rate, pce_t the Personal Consumption expenditure, pi_t the Personal income.

(b)) Use specific-to-general to come to a model. Start by regressing the federal funds rate on only a constant and add 1 variable at a time. Is the model the same as in (a)?

And In this problem, I regressed the federal fund rate on the constant and a variable, then add a variable at a time. After adding the variable, I check the p value of the variable and delete the one that is insignificant.

The following is my result.

Dependent Variables: Interest rate Sample size:660					
	Coefficient (P-value)				
	1	2	3	4	5
Constant	5.401743 (0.000)	5.435799 (0.000)	1.676666 (0.000)	0.101247 (0.67)	0.021219 (0.92660)
Commodity price	-0.011526 (0.0061)	-0.007700 (0.0677)			
Housing starts		-0.028747 (0.000)	-0.003841 (0.3625)		
Inflation			0.938290 (0.000)	0.715754 (0.000)	0.87542 (0.000)
Personal Comsumption expenditure				0.356161 (0.000)	0.181177 (0.0007)
Personal income					0.305409 (0.000)
Production					
Unemployment					
R squre	0.011362	0.0429	0.5603	0.604208	0.619465

Dependent Variables: Interest rate Sample size:660				
	Coefficient (P-value)			
	6	7	8	9
Constant	-0.051711 (0.8260)	0.099322 (0.6785)	-0.02105 (0.9268)	-0.240119 (0.2976)
Commodity price			-0.008483 (0.0016)	-0.007501 (0.0046)
Housing starts				-0.02053 (0.000)
Inflation	0.838272 (0.000)	0.890226 (0.000)	0.837752 (0.000)	0.717527 (0.000)
Personal Comsumption expenditure	0.224317 (0.000)	0.147753 (0.0142)	0.221367 (0.0001)	0.340525 (0.000)

Personal income	0.319872 (0.000)	0.288959 (0.000)	0.284055 (0.000)	0.240242 (0.0001)
Production	-0.036942 (0.1327)			
Unemployment		0.072181 (0.2367)		
R squre	0.62078	0.620278	0.625227	0.637361

The model is

$$i_t = -0.0075 cp_t - 0.02053 hs_t + 0.71752 \pi_t + 0.340525 pce_t + 0.2402 pi_t$$
$$p = (0.00460) \quad (0.00000) \quad (0.00000) \quad (0.00000) \quad (0.00010)$$
$$R^2 = 0.637361$$

With i_t the Federal Fund interest rate, cp_t the Commodity price, hs_t the Housing starts, π_t the inflation rate, pce_t the Personal Consumption expenditure, pi_t the Personal income.

And the model is the same with the model in (a)

(c) Compare your model from (a) and the Taylor rule of equation (1). Consider R^2 , AIC and BIC. Which of the models do you prefer?

Under the Taylor rule of equation (1), regressing the Federal fund interest rate on the inflation and the production.

$$i_t = 1.2489 + 0.974976 \pi_t + 0.09472 y_t$$
$$p = (0.0000) \quad (0.0000) \quad (0.0000)$$
$$R^2 = 0.574701$$

	Model from a	Model from Taylor
R^2	0.637361	0.574701
AIC	8.067125361	8.217417887
BIC	8.107963905	8.237837159

After consider these three, I would prefer Model from a.

(d) Test the Taylor rule of equation (1) using the RESET test, Chow break and forecast test (with in both tests as break date January 1985) and a Jarque-Bera test. What do you conclude?

These test result are presented as follow:

Model from Taylor		
	Test statistic	p value
RESET($\rho = 1$)	2.53712	0.1117
Chow Break	6.02903	0.0005
Chow Forecast	0.896926	0.8378
Jarque-Bera	12.4404	0.001985

From the result, we can conclude that the RESET test is not rejected, which means the model does not include square term. And the Chow Break test is rejected, which means the data have break. The Chow Forecast is not rejected, which means the data have no break. And finally, the Jarque-Bera test is not rejected, indicating that the residual is normal distribute.