

Markov Switching regressions of Q4/Q4 appreciation of US dollar

Menzie Chinn, April 13, 2015

Sample: 1974-2014, end quarter is average of monthly data.

Series: Real value of US dollar, trade weighted basis, from Federal Reserve.

Crisis dummy: takes on value of unity in 2008.

Baseline results

Dependent Variable: DLR_Y

Method: Switching Regression (Markov Switching)

Date: 04/12/15 Time: 19:58

Sample (adjusted): 1974 2014

Included observations: 41 after adjustments

Number of states: 2

Initial probabilities obtained from ergodic solution

Ordinary standard errors & covariance using numeric Hessian

Random search: 25 starting values with 10 iterations using 1 standard deviation (rng=kn, seed=250060149)

Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Regime 1				
C	0.030283	0.010173	2.976828	0.0029
Regime 2				
C	-0.097096	0.016850	-5.762218	0.0000
Common				
FINCRISIS	0.201560	0.049259	4.091872	0.0000
LOG(SIGMA)	-3.168247	0.146955	-21.55930	0.0000
Transition Matrix Parameters				
P11-C	1.440351	0.587822	2.450319	0.0143
P21-C	-0.248775	0.635802	-0.391278	0.6956
Mean dependent var	-0.004647	S.D. dependent var		0.074177
S.E. of regression	0.071101	Sum squared resid		0.187050
Durbin-Watson stat	1.685704	Log likelihood		54.12832
Akaike info criterion	-2.347723	Schwarz criterion		-2.096956
Hannan-Quinn criter.	-2.256407			

Equation: DOLLAR_SWITCHFIN_ANN
 Date: 04/13/15 Time: 15:16
 Transition summary: Constant Markov transition probabilities and expected durations
 Sample (adjusted): 1974 2014
 Included observations: 41 after adjustments

Constant transition probabilities:
 $P(i, k) = P(s(t) = k | s(t-1) = i)$
 (row = i / column = j)

	1	2
1	0.808509	0.191491
2	0.438125	0.561875

Constant expected durations:

	1	2
	5.222176	2.282454

Move to semi-annual data, allowing for AR(1)

Dependent Variable: DLR2_A
 Method: Switching Regression (Markov Switching)
 Date: 04/13/15 Time: 15:32
 Sample (adjusted): 1974S1 2014S2
 Included observations: 82 after adjustments
 Number of states: 2
 Initial probabilities obtained from ergodic solution
 Ordinary standard errors & covariance using numeric Hessian
 Random search: 25 starting values with 10 iterations using 1 standard deviation (rng=kn, seed=1534136927)
 Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Regime 1				
C	0.039072	0.010036	3.893038	0.0001
Regime 2				
C	-0.118626	0.017726	-6.692348	0.0000
Common				
FINCRISIS	0.151002	0.045759	3.299950	0.0010
AR(1)	-0.181061	0.150673	-1.201684	0.2295
LOG(SIGMA)	-2.751198	0.107892	-25.49956	0.0000

Transition Matrix Parameters

P11-C	1.563225	0.452511	3.454555	0.0006
P21-C	-0.369758	0.531425	-0.695786	0.4866
Mean dependent var	-0.004647	S.D. dependent var	0.099736	
S.E. of regression	0.098900	Sum squared resid	0.753161	
Durbin-Watson stat	1.950130	Log likelihood	80.01754	
Akaike info criterion	-1.780916	Schwarz criterion	-1.575464	
Hannan-Quinn criter.	-1.698430			
Inverted AR Roots	-0.18			

Semi-annual, no AR(1) NOTE: Regime 1 is now depreciation

Dependent Variable: DLR2_A
 Method: Switching Regression (Markov Switching)
 Date: 04/13/15 Time: 15:33
 Sample: 1973S2 2014S2
 Included observations: 83
 Number of states: 2
 Initial probabilities obtained from ergodic solution
 Ordinary standard errors & covariance using numeric Hessian
 Random search: 25 starting values with 10 iterations using 1 standard deviation (rng=kn, seed=501784489)
 Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Regime 1				
C	-0.119541	0.020810	-5.744434	0.0000
Regime 2				
C	0.036951	0.012629	2.925894	0.0034
Common				
FINCRISIS	0.157784	0.051127	3.086101	0.0020
LOG(SIGMA)	-2.719883	0.116577	-23.33115	0.0000
Transition Matrix Parameters				
P11-C	0.286631	0.558448	0.513264	0.6078
P21-C	-1.578178	0.496749	-3.177015	0.0015
Mean dependent var	-0.004532	S.D. dependent var	0.099132	
S.E. of regression	0.098097	Sum squared resid	0.760217	
Durbin-Watson stat	2.084305	Log likelihood	80.81884	
Akaike info criterion	-1.802864	Schwarz criterion	-1.628008	
Hannan-Quinn criter.	-1.732616			

Equation: UNTITLED

Date: 04/13/15 Time: 15:34

Transition summary: Constant Markov transition probabilities and expected durations

Sample: 1973S2 2014S2

Included observations: 83

Constant transition probabilities:

$P(i, k) = P(s(t) = k \mid s(t-1) = i)$

(row = i / column = j)

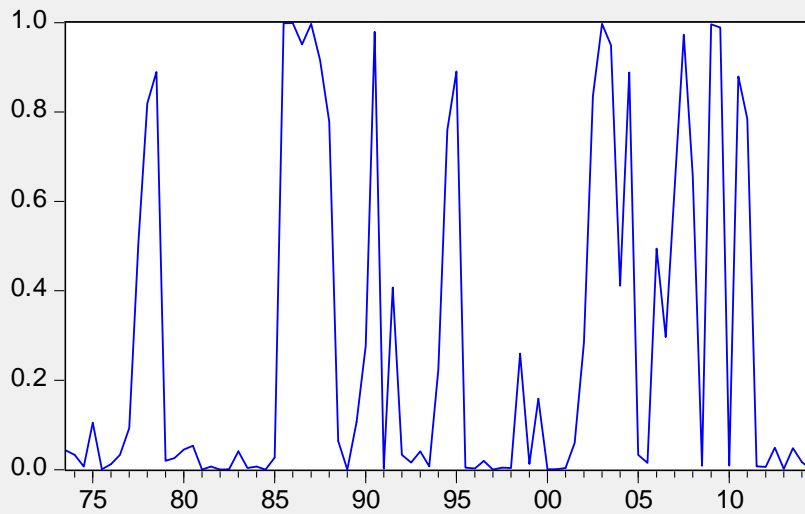
	1	2
1	0.571171	0.428829
2	0.171054	0.828946

Constant expected durations:

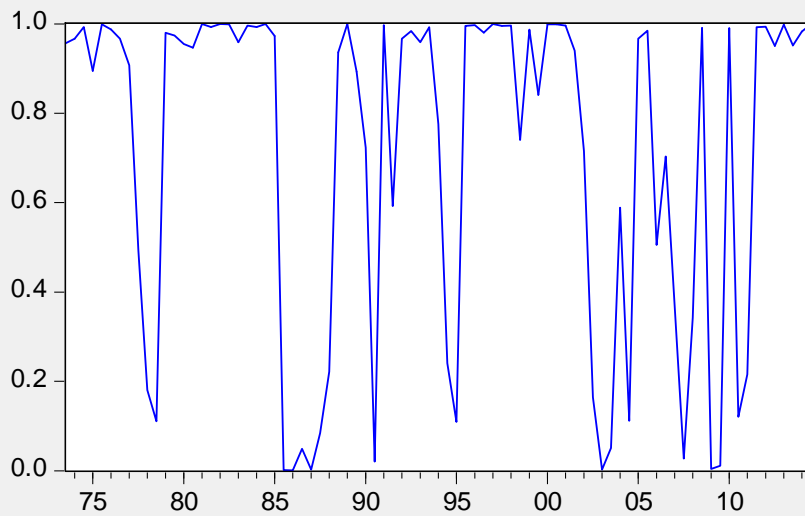
	1	2
	2.331933	5.846116

Smoothed Regime Probabilities

$P(S(t)=1)$



$P(S(t)=2)$



Note: Regime 2 is appreciation in this set of results.