Assignment 1: Crises

Download the JST macro panel dataset (http://www.macrohistory.net/data/#DownloadData).

I. Prediction

Estimate logit models for crisis prediction of the form:

$$\ln\left(\frac{P(y_{it}=1)}{1-P(y_{it}=1)}\right) = X_{it}'\beta$$

y_{it} *binary crisis indicator* (*crisis dummy*), X_{it} *regressor matrix* (*predictors*), β *coefficient vector*, e_{it} *error term*

I.1 Load data, produce charts with aggregate trends for credit/GDP and money/GDP

I.2 Estimate a logit model with five lags of log changes in real credit as a predictor and test for joint significance of five lags credit growth

I.3 Compare in-sample and out of sample ROC, estimating the model until 1984 and predicting crisis for post-1984 years.

I.4 Compare the baseline model to

a) a logit model with narrow money as a predictor
b) a logit model with asset prices as predictors
c) a logit model with the current account
d) a logit model with all predictors.

I.5 Experiment with other predictor variables: are there any that increase the AUC in a significant way?

II: Costs of crises

Estimate the conditional cumulative path variables $y_{i,t}^{k},\ k = 1, \dots, K$, during normal recessions and compare it to their conditional cumulative path during recessions associated with financial crises.

Formally:

$$\mathrm{CR}(\Delta_h y^k_{i,t(r)+h}, \delta) = E_{i,t(r)}\left(\Delta_h y^k_{i,t(r)+h} \middle| x_{i,t(r)} = \bar{x} + \delta\right) - E_{i,t(r)}\left(\Delta_h y^k_{i,t(r)+h} \middle| x_{i,t(r)} = \bar{x}\right),$$
$$h = 1, \dots, H$$

t(r) refers to a peak in economic activity, $\Delta_h y^k_{i,t(r)}$ *cumulative* $h-$*year change of variable* k, $x_{i,t(r)}$ *treatment variables* (*i.e. the normal and financial recession dummies*), δ *change in treatment variables*

Estimate the cumulative paths through a sequence of fixed effect regressions:

$$\Delta_h y^k_{i,t(r)+h} = \alpha^k_{i,h} + \beta^k_h N_{i,t} + \gamma^k_h F_{i,t} + u^k_{i,t+h}, \qquad k = 1, \dots, K; \;\; h = 1, \dots, H$$

$\alpha^k_{i,h}$ *country fixed effect*, $N_{i,t}$ *normal recession dummy*, $F_{i,t}$ *financial recession dummy*, $u_{i,t}$ *error term.*

II.1 Compare the path of real GDP per capita over the five years following the onset of a normal recession $\{\beta_h\}_{h=1,\dots,5}$ and a financial recessions $\{\gamma_h\}_{h=1,\dots,5}$.

II.2 Has this cost of financial recessions become more severe over time?

II.3 Plot the cumulative paths of real per capita consumption, real per capita investment, real interest rates, real credit and CPI inflation.

II.4 Are costs higher when private debt is high?

II. 5 Are costs higher when the exchange rate is fixed?

II. 6 Can you find other factors that increase the costs of crises?