1. Motivation

Literature review:
- Costly adjustment processes succeeding changes in the world capital movements have been analyzed several times in the literature, see e.g. Calvo and Mendoza (1996), Cashin and McDermott (1996), Calvo et al. (2003) and Ansari (2004).
- Via Probit Regressions the determinants of current account reversals are analyzed for large panels of countries, see e.g. Merti-Ferre (1999).
- As not all countries experience a reversal, country specific dummies (fixed effects) can not be used to control for heterogeneity.

This study is about:
- Use of Bayesian methodology for assessing the determinants of reversals under a parsimonious yet flexible form of country specific heterogeneity and account for possible correlation in unobserved heterogeneity via serially correlated errors.
- Highlight changes in estimated costs when serial correlation and heterogeneity are taken into account.
- Check the robustness of results against different definitions of current account reversals, which rely on a 3% (I and II) or 5% (I and IV) reduction of current account deficit and different dynamic restrictions (I and III vs. II and IV).

2. Data

Data is obtained from the World Bank World Development Indicators 2005 (WDI) and the Global Development Finance 2004 (GDF) databases. These databases provide annual data ranging from 1970-2004 for a total of 208 (WDI) and 135 (GDF) countries, respectively. Not all variables are available for each country and each year, thus resulting in an unbalanced panel with less than the possible 135 countries included. In accordance with the literature macroeconomic as well as external and global variables are used as explaining variables for reversals and determinants of growth.

3. Probit and Treatment Model

- Probit model for reversals:
  \[ \delta_t = \begin{cases} \mathbb{I}, & \text{if } \delta_{t+1} \geq 0 \\ 0, & \text{if } 0 < \delta_{t+1} \leq \delta_t \end{cases} \tag{1} \]
- Treatment model of economic growth:
  \[ g_t = Z_{it} \varepsilon_t + e_t = X_{it} \alpha_t + e_t \tag{2} \]
  where the \( e_t = (e_{it} e_{it}) \sim N(0, \Sigma), \Sigma_{21} = 0 \).
- Modelling unobserved Heterogeneity via Random Coefficients:
  \[ \alpha_t \sim N(\alpha_0 W_0), \beta_t \sim N(\beta_0 W_0) \tag{3} \]
- Accounting for Persistence via serially correlated errors:
  \[ e_{it} = \rho e_{i,t-1} + u_{it} \tag{4} \]
  where \( u_{it} \) is a iid white noise (0,1) process. Thus, all errors for country \( i \) are jointly normal distributed. The covariance matrix of the reversal errors of individual \( i \) is given as \( \Omega_i = \left( \varepsilon_i, h_j \right) \left( \varepsilon_i, h_j \right)^T - S_i \mathbb{1} \times 1 + S_i \mathbb{1} \times 1 ).\]
  \[ \omega_{it} = w_{it} / 1 - \rho \tag{5} \]

4. Bayesian Estimation

The Bayesian estimation approach via Gibbs sampling, see Albert and Chib (1993), allows a flexible handling of the discussed model features. The high dimensionality of the likelihood integral provides another argument in favor of MCMC methods, as they are well suited for high dimensional integration. In a Bayesian setup the joint posterior of the parameters is proportional to the product of likelihood and prior distribution. Parameter estimates are obtained as sample moments of simulated draws from the posterior distribution. The significance of a parameter estimate is assessed via the 95% highest density region of a posterior distribution.

5. Empirical Results: Probit Regressions

The following Table provides the Estimation results for the probit specification allowing for country specific heterogeneity and serially correlated errors. Standard errors are given in parentheses. Bold figures indicate the 90% highest density region does not include zero. Bold figures with * indicate the 95% highest density region does not include zero.

6. Identification of Reversals

The ability of the different specifications assessed using the following estimated probability to predict a reversal
\[ \prod_{t=1}^{T} \prod_{i=1}^{N} \left[ \phi \left( \varepsilon_{it} \left| \mu_{it}, \rho \right. \right) + \Phi \left( \varepsilon_{it} \left| \mu_{it}, \rho \right. \right) \right] \geq 0.5, \]
where all components are delivered as a byproduct of the Gibbs Sampler.

7. Country specific Heterogeneity

The upper panel gives the sampled country specific random coefficients delivered as a byproduct of the Gibbs output, left tagged current account deficit, middle level of reserves, right official transfers. The lower panel gives the mean effect of these variables.

8. Empirical Results: Treatment Regressions

The Table below reports the Bayesian estimation results of a Treatment specification allowing for heterogeneity and serially correlated errors. Economic costs of reversals vary over the different reversal definitions and no correlation between the two equations is found for schemes I and III.

9. Conclusion

- Model specifications with serial correlation and random coefficients are preferred according to the marginal likelihood.
- Country specific heterogeneity stresses the importance of external variables in explaining current account reversals.
- Costs of current account reversals are reduced, when heterogeneity is taken into account.