Comments on "Evaluation of Exchange-Rate and Capital-Market Liberalization Regimes in the Presence of Sudden Stops" by Assaf Razin and Yona Rubinstein

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1. Summary

- This paper looks at the effects of exchange rate and capital control regimes on growth.

- The claim is that the effects can be positive or negative depending on the probability of balance-of-payment crises.

- Failure to distinguish between the two gives the wrong impression of no effect (a puzzle in the literature).

- A 32 year panel of 100 countries is used to estimate a growth equation that, besides policy regime dummies and controls, includes as an additional explanatory variable a probability of crisis specific to each country and year.

- The probability-of-crisis variable is obtained by fitting a (probit) model to sample frequencies of observed crises depending on policy regime dummies and controls.

- So the growth equation for a single policy dummy is

$$Growth = \gamma PolicyDummy + \phi \Pr Crisis$$
$$+Controls + Error$$

where
$$\Pr Crisis = \Phi\left(\alpha PolicyDummy + \beta x\right).$$

- Thus, the effect on growth of changing the policy dummy from 0 to 1 is made of a direct effect (γ) and an indirect effect due to the change in the crisis probability:

$$PolicyEffect = \gamma + \phi\left[\Phi\left(\alpha + \beta x\right) - \Phi\left(\beta x\right)\right]$$

- Estimates are $\gamma > 0$, $\alpha > 0$, and $\phi < 0$.

- If the baseline crisis probability $\Phi\left(\beta x\right)$ is close to 1 or 0
$$PolicyEffect \approx \gamma,$$
but for intermediate values of $\Phi\left(\beta x\right)$, the estimated policy effect is negative because it is dominated by the negative impact of the probability increase.

- The policy conclusion is that an exchange rate regime or a capital control regime may be good or bad for macro performance depending on a country's fundamentals as captured by the crisis probability.

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2. Assessment

- The paper puts forward an interesting new idea and an econometric approach to deal with it.

- The idea is well motivated in recent theoretical developments, and the empirical results are consistent with the suggested interpretation.

- So my overall assessment is positive.

- Three limitations are:
  1) focus on short-term effects
  2) measurement difficulties
  3) weak identification

1) *Focus on short-term effects*

- The analysis focuses on the effects of policy regime switches on next period's growth.

- The authors try to distinguish between regime switches and regime levels without much success.

- An alternative would be to organize the data set as a panel of durations in particular regimes, and consider the effects of regime switches on growth at different points in the spell (or on average growth over the spell).

2) *Measurement problems*

- The approach raises some measurement difficulties associated with having to deal with crisis probabilities.

- A more stringent definition of what is called a crisis will reduce its probability.

- Lack of quantitative indicators of fundamentals may create discrepancies with the probabilities used by market participants.

3) *Identification of the growth equation*

- Exclusion restrictions are needed for identification in the absence of functional form restrictions, but no case is made for a compelling instrument on a priori grounds.

- To see the problem, suppose we do not have a strong belief that policy effects are constant, so that we entertain a more general growth equation of the form
$$Growth = \gamma(z)\, PolicyDummy + \phi(z)\Pr Crisis$$
$$+\pi(z) + Error$$
where $\gamma(z)$ and $\pi(z)$ are arbitrary functions of controls.

- The crisis probability is linear in the policy dummy by construction
$$\Pr Crisis = p_0(x) + \delta(x)\, PolicyDummy$$
where $p_0(x) = \Phi(\beta x)$ and $\delta(x) = \Phi(\alpha + \beta x) - \Phi(\beta x)$.

- Therefore, if the controls in the two equations coincide ($z = x$), $\delta(x)$ will be absorbed into $\gamma(z)$ and there is no way to distinguish direct from indirect effects.

- So what we need is a determinant of the crisis probability that is excluded from the growth equation.

- Using external foreign debt as an exclusive determinant of the probability, results are similar to those without instruments, so the presumption is that identification is not due to the instrument but to functional form restrictions.

3. The econometric model

- *Potential endogeneity of policy switches*

  (a) Lagging policy states makes sense as a way of introducing a lag in response, but not for addressing endogeneity.

  (b) If we were interested in the contemporaneous effect but worried about endogeneity, replacing the variable by its lag is problematic because coefficients change.

  (c) To avoid it, one would use lagged switches as instruments for current ones.

  (d) Endogeneity of switches is addressed by including country effects. However, switches are likely to be correlated with time-varying shocks to growth, more so than with time-invariant country effects.

- *Do standard errors need adjustment?* The claim that they don't is only valid if we pretend that probabilities are known without error by the econometrician and the economic agent. Otherwise, agents will take into account the uncertainty in probabilities.

- *Lagged latent propensities versus lagged realized crises.* An alternative specification is to use lagged latent propensities to sudden stop crises as opposed to lagged realized crises.

- *Comments on Box 2.* There seems to be lack of correspondence between various aspects of the formal model described in Box 2 and the one used in the main body of the paper.

  (a) Current growth appears as a determinant of the latent variable indicating a crisis prone state of the economy.

  (b) The growth equation includes predicted latent variables as opposed to predicted probabilities.

  (c) As for the confounding effect of policy regimes, I would say that in direct estimates of average effects there is a cancellation of opposite effects and they will be close to zero if
  $$\gamma \approx -\phi E \left[\Phi \left(\alpha + \beta x \right) - \Phi \left(\beta x \right) \right].$$

4. Interpretation of crises effects: expected or actual?

- One interpretation of results is that the probability of crisis (whether it materializes or not) has a negative impact on growth.

- Another interpretation is that it is the actual occurrence of crisis that has a negative impact on growth.

- These two interpretations are empirically indistinguishable within the current framework because the growth equation is linear in the probability.

- To see this, note that $\Pr Crisis$ is the same as expected crisis and drop the expectation in the growth equation to get:

$$Growth = \gamma PolicyDummy + \phi CrisisDummy$$
$$+ Controls + NewError$$

  The new error contains the original one and the crisis dummy error, rendering $CrisisDummy$ an endogenous explanatory variable, so that instrumental variables are needed for identification (either external or nonlinear interactions of included variables).

- Either way, we see that the resulting estimates are equally compatible with the observed and the expected crises interpretations.

4. Results and robustness tests

- *Value of exclusion restrictions.* A useful check is to estimate the equation with the observed crisis dummy by IV using only external instruments like external foreign debt.

- *Analysis of estimated probabilities.* I missed a description of the estimated probabilities of crises.

  (a) In principle, they should provide information of relevant segments along the U shape curves of policy effects implied by the model.

  (b) Moreover, the fitted probabilities in the paper could be compared with those based on market information (e.g. option prices, forward discounts or premia, etc.) for selected countries, as a specification check.

  (c) Related to this, it would be nice to report the policy effect at sample values for selected countries.

- *Nonlinearities.* The linear probability model will not be able to produce the U shapes shown in the figures.

  – The precise form of that shape does depend on the specification of the crisis equation.

  – One possibility would be to look at a histogram of residuals from a real interest rate equation to check the appropriateness of the normality assumption.