The Illusive Quest: Do International Capital Controls Contribute to Financial Stability?

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Controversy over liberalization of international capital flows

"Was the IMF as guilty of ramming accelerated capital account liberalization down countries' throats as is sometimes alleged? A wide polling of 'old timers' yields mixed results. Overall, my sense is that whereas certain antiglobalization polemics grossly overstate the charge, it still has some currency….These days, everyone agrees that a more eclectic approach to capital account liberalization is required."

Kenneth Rogoff (Dec 2002)
IMF Economic Counsellor

- **The Controversial Role of Capital Account Liberalization versus capital controls**
  - **Supporters of capital account liberalization:**
    - The short-run and long-run benefits of capital flows
    - *Many countries hit by currency crises and sudden stops, despite having capital controls*
      - *El Salvador*'s crises of 1986 and 1990 (having capital controls); no currency crises during 1996-1997 (controls liberalized)
      - *Kenya*'s six crises during 1975-97 (having capital controls)
      - *India's* currency crises in early 1990s (having controls)
  - **Negative impact of capital account liberalization:**
    - Emerging markets liberalized their capital accounts (reduced capital controls) and subsequently experienced currency crises and sudden stops in the 1990s
    - *Crises of Mexico (1994-95) and of Asia (1997-98)*

Why might controls **not** be effective?

Institutional factors:

- Capital controls ineffective due to weak administrative/legal enforcement
- Globalization makes enforcement ever more difficult

Behavioral factors (incentives and signaling):

- Capital controls are distortionary, providing perverse incentives and weakening the economy…eventually leading to greater economic instability
- **Bartolini and Drazen (1997 AER)--** capital controls signal inconsistent and poorly designed government policies– induce capital outflows and cause currency instability

Empirical evidence: capital account liberalization, currency crises, and capital account contractions

- **Empirical Literature on CM Liberalization**
  - **Country-specific studies**
  - **Cross-country studies**
    - **Glick and Hutchison (2004)**
      - Large panel data set of developing economies, probit models of currency crises with capital controls as (one of many) explanatory variables (67 countries)
      - *positive* correlation between capital controls and the occurrence of currency crises
      - Supports Drazen and Bartolini's prediction
    - Glick, Guo and Hutchison (2006)
      - Control for sample selection bias using propensity score matching technique—same result
    - Eichengreen et al. (2006) finds no effect (or wrong direction) of capital controls on sudden stops
    - Edwards (2007) finds capital controls lowers likelihood of capital account contractions

Research Questions:

- Capital controls:
  - Do they insulate economies from currency crises and capital flow reversals?
  - Have their impact changed over time?
    - Due to financial globalization?
    - Due to erosion of controls? Problem with *de jure* measurement of controls
  - Have controls influenced the vulnerability of financial stability to economic downturns and real exchange rate overvaluations?

Research Design

- Model of Currency Crises and Capital Flow contractions
  - Basic Empirical Models in Literature
  - Probability models (Probit)
- Test for significance of Capital controls
  - Are the effects changing over time due to globalization and other factors?
  - Test changes over time
- Do capital controls erode or decay with time irrespective of globalization?
  - Develop a measure of capital control “depreciation”
  - Test this measure in probability of crisis or capital account reversal
- How does the presence of capital controls interact with other variables and influence their impact on currency crises and capital flow contracts?
  - How has this changed over time?

Data and Definitions

- Definition of currency crises (XRP)
  - "large" changes in a monthly index of currency pressure, measured as a weighted average of (real) currency depreciation and reserve losses

    (if > (mean+2 std. dev.) and >5% in magnitude)
  - captures both successful and unsuccessful currency attacks
- Definition of capital flow contractions (CFC)
  - At least 3% of GDP decline in net capital inflows during a one-year period
  - Note: not necessary sudden stop or reversal (Edwards definition)…frequent occurrence and includes sudden stops and smaller contractions

Data and Definitions (continued)

- **Measure of Restrictions on international payments**
  - IMF Annual Report on Exchange Arrangements and Exchange Restrictions (EAER)
  - 1975-04: EAER measure of "restrictions on payment for capital transactions"; Chinn-Ito meaure
  - First principle component of liberalization
  - Rebase to closed capital account (kaclosed, 0 to 100)

- "Duration-based" measure of closed capital account
  - Rate of depreciation– rate of decay of effectiveness– half life of 5 years

$$1/\exp(0.2 * \text{duration}),$$

Data and Definitions (continued)

- **Data Sample**
  - annual data availability determines sample
  - 69 developing economies, 1975-04
  - both crisis and non-crisis countries
- Base model
  - Credit growth (lagged)
  - Real GDP growth (lagged)
  - Real exchange rate overvaluation (lagged)
    - Construction
  - Current Account/GDP (lagged)
  - Other variables (not reported)

Descriptive Statistics

Table 1. Currency Crises and Capital Controls, Unconditional Frequency (in percent)

	1975-2006	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2006
Currency crises[a]	15.76	12.17	16.90	22.59	18.58	17.52	10.74	5.56
(Number of crises)	(308)	(32)	(48)	(68)	(60)	(58)	(35)	(7)
Capital Flow Contractions	19.54	12.36	23.91	20.37	18.24	19.44	20.47	(N.A.)
(Number of Contractions)	(342)	(22)	(71)	(66)	(60)	(62)	(61)	(N.A.)
Capital controls[b1]	67.96	71.17	75.77	77.89	71.63	59.41	53.05	(N.A.)
Capital controls[b2]	43.7	48.28	46.17	44.74	41.51	46.52	35.77	(N.A.)

a Number of crises divided by total country-years with available data. Number of crises in parentheses.
Currency crisis measure is "xrp_nw"
b1: kaclosed, b2: kaclosed_dur (average of capital controls)

Base model estimates: capital control measure

- Currency crises
- Capital flow contractions

Table 2: Determinants of Currency Crises

Explanatory Variable	1975-2004	1975-1994	1995-2004
	xrp_nw	***xrp_nw***	***xrp_nw***
Capital account controls (t) (**kaclosed**)	0.14587 (3.936)***	0.11665 (2.040)**	0.14815 (3.015)***
Credit growth (t-1)	0.01076 (0.416)	0.01451 (0.466)	0.00589 (0.113)
Current account/GDP (t-1)	-0.12531 (0.850)	-0.0693 (0.358)	-0.25967 (1.189)
Real overvaluation (t-1)	0.13194 (3.448)***	0.14454 (3.063)***	0.15333 (2.102)***
Real GDP growth (t-1)	-1.02153 (5.509)***	-0.88291 (3.558)***	-1.16942 (4.289)***
Summary Statistics			
No. of Crises	235	152	83
No. of Observations	1495	918	577
Log likelihood	-598.837	-387.711	-210.016
Goodness-of-fit (25% cutoff) [a]			
% of obs. correctly called	81	80	85
% of crises correctly called	25	22	29
% of non-crises correctly called	91	91	95
Goodness-of-fit (10% cutoff) [a]			
% of obs. correctly called	44	37	57
% of crises correctly called	84	89	77
% of non-crises correctly called	36	27	54

Table 3 : Determinants of Capital Account Contractions

Explanatory Variable	1975-2004	1975-1994	1995-2004
	CAC	*CAC*	*CAC*
Capital account controls (t) (**kaclosed**)	-0.033 (0.870)	-0.03194 (0.567)	-0.07644 (1.375)
Credit growth (t-1)	-0.028 (0.829)	-0.03262 (0.853)	-0.03484 (0.427)
Current account/GDP (t-1)	-0.62769 (4.044)***	-0.74709 (3.750)***	-0.34632 (1.355)
Real overvaluation (t-1)	0.06959 (1.506)	0.05274 (0.967)	0.1719 (1.808)*
Real GDP growth (t-1)	-1.13809 (5.363)***	-1.16325 (4.430)***	-0.9674 (2.549)**
Summary Statistics			
No. of Crises	278	173	105
No. of Observations	1468	915	553
Log likelihood	-673.912	-418.71	-260.13
Goodness-of-fit (25% cutoff) [a]			
%of obs. correctly called	77	77	76
%of crises correctly called	28	32	28
%of non-crises correctly called	89	87	88
Goodness-of-fit (10% cutoff) [a]			
%of obs. correctly called	27	29	24
%of crises correctly called	88	87	90
%of non-crises correctly called	13	15	8

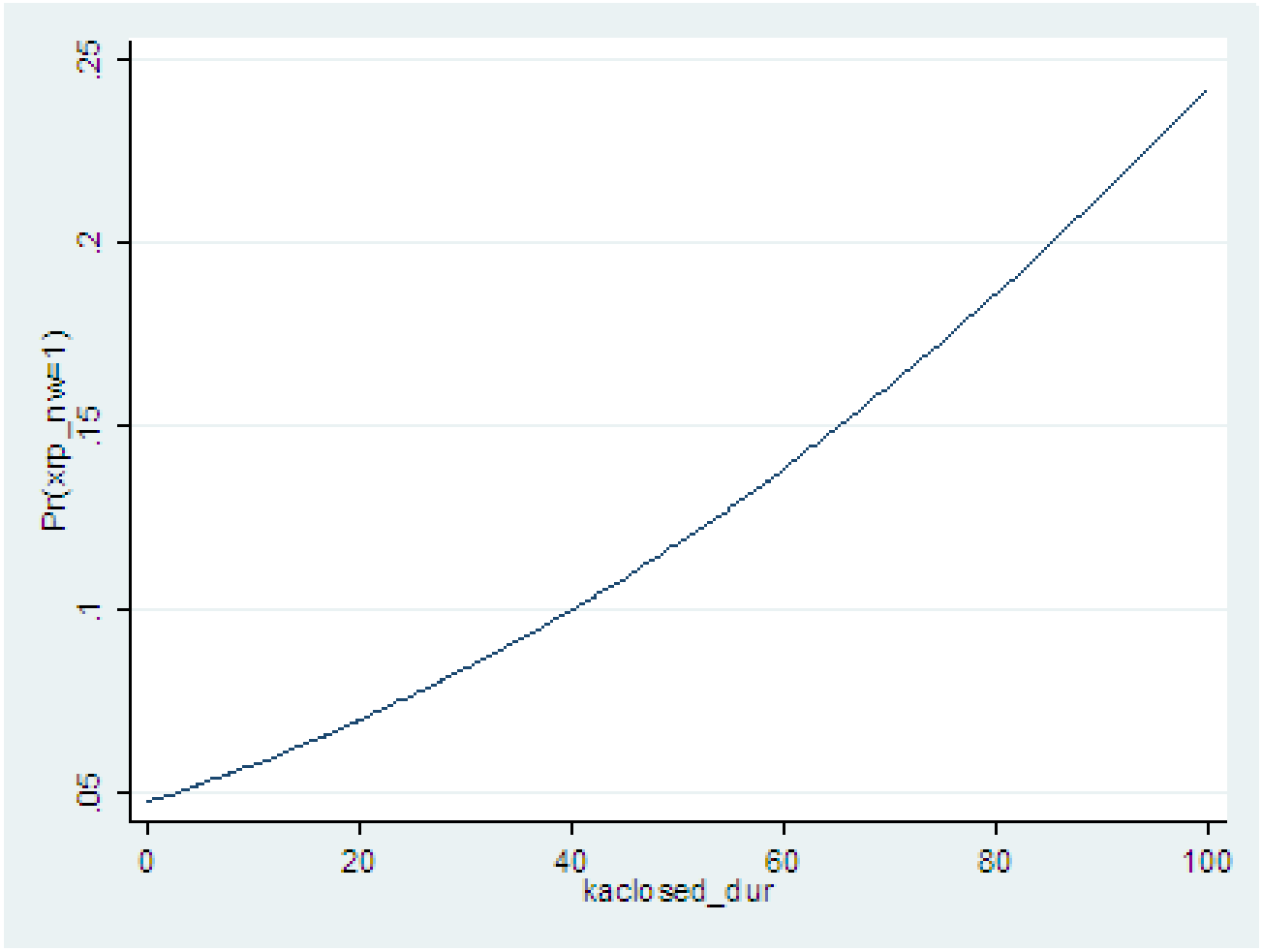
Estimates using duration-adjusted measure

Table 4 : Determinants of Currency Crises: Duration-Adjusted Capital Controls

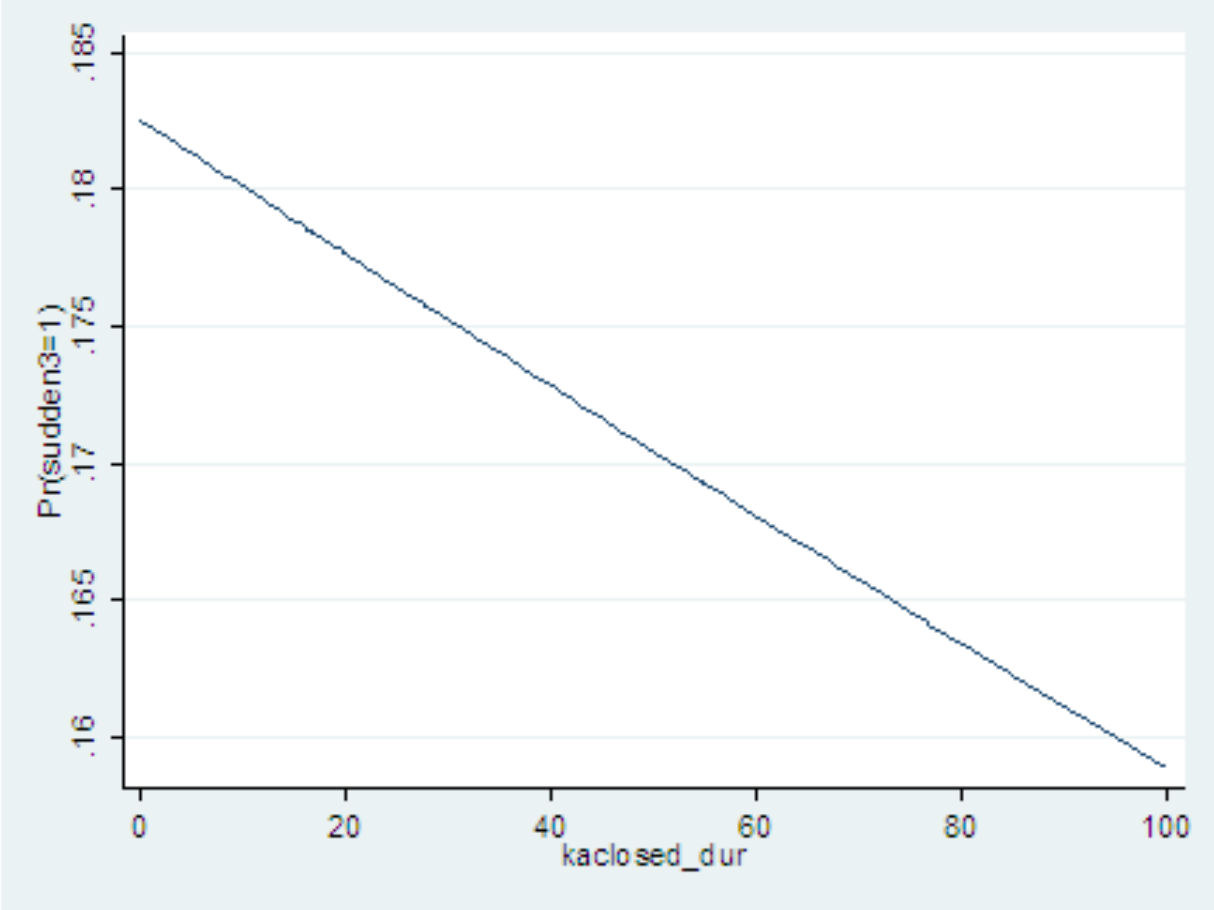
Explanatory Variable	1975-2004	1975-1994	1995-2004
	xrp_nw	***xrp_nw***	***xrp_nw***
Capital account controls (t)	0.13706	0.09236	0.16974
(**kaclosed_dur**)	(3.862)***	(1.883)*	(3.238)***
Credit growth (t-1)	0.01552	0.01288	0.01116
	(0.602)	(0.411)	(0.210)
Current account/GDP (t-1)	-0.14017	-0.09034	-0.20548
	(0.959)	(0.470)	(0.939)
Real overvaluation (t-1)	0.14262	0.15207	0.14852
	(3.677)***	(3.197)***	(2.048)**
Real GDP growth (t-1)	-1.01074	-0.87866	-1.14344
	(5.429)***	(3.528)***	(4.188)***
Summary Statistics			
No. of Crises	235	152	83
No. of Observations	1495	918	577
Log likelihood	-599.625	-388.149	-209.211
Goodness-of-fit (25% cutoff) [a]			
% of obs. correctly called	81	80	86
% of crises correctly called	23	24	29
% of non-crises correctly called	92	91	96
Goodness-of-fit (10% cutoff) [a]			
% of obs. correctly called	44	37	59
% of crises correctly called	86	89	72
% of non-crises correctly called	36	26	57

Non-linear effects…

Graph 1 Probability of Currency Crisis given Capital Account Restrictions



Graph 2 Probability of Capital Account Contraction given Capital Account Restrictions

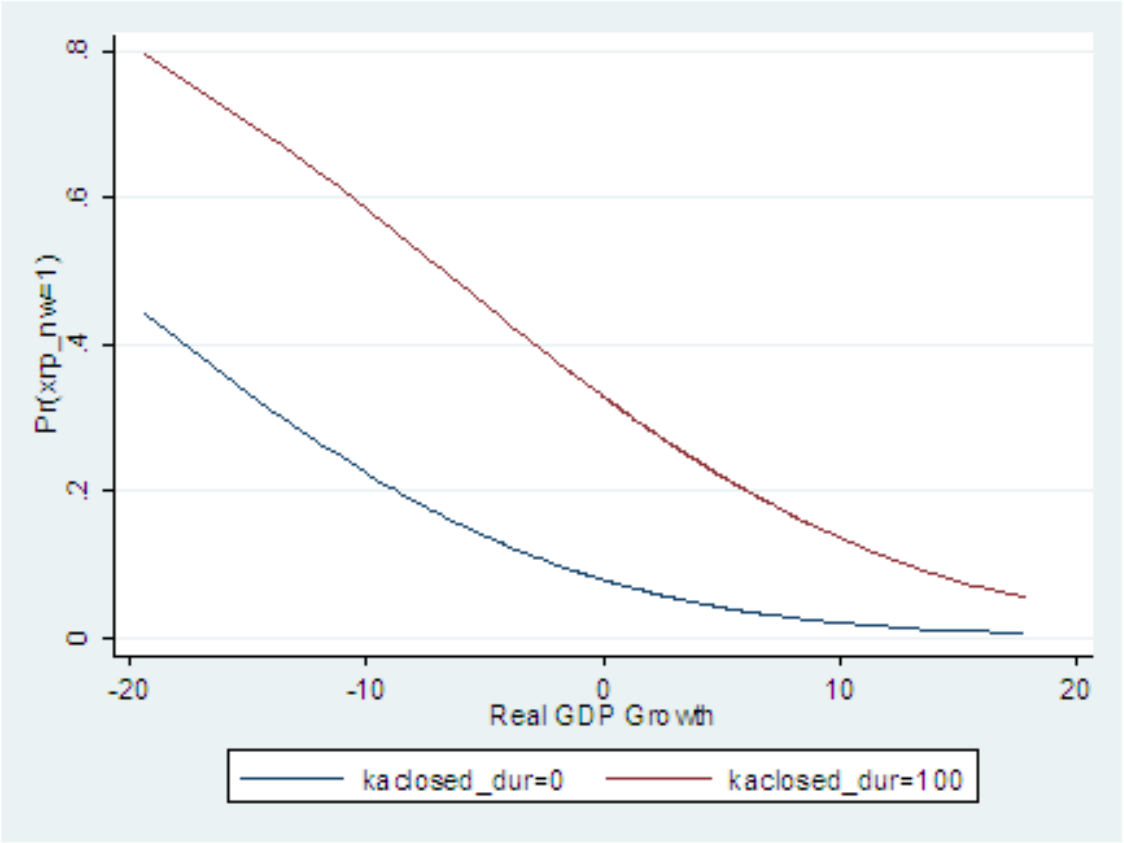


Impacts of real gdp growth

- Given low and high levels of capital account
- Estimates for most recent period
- Estimates for both currency crisis and capital account contraction likelihood

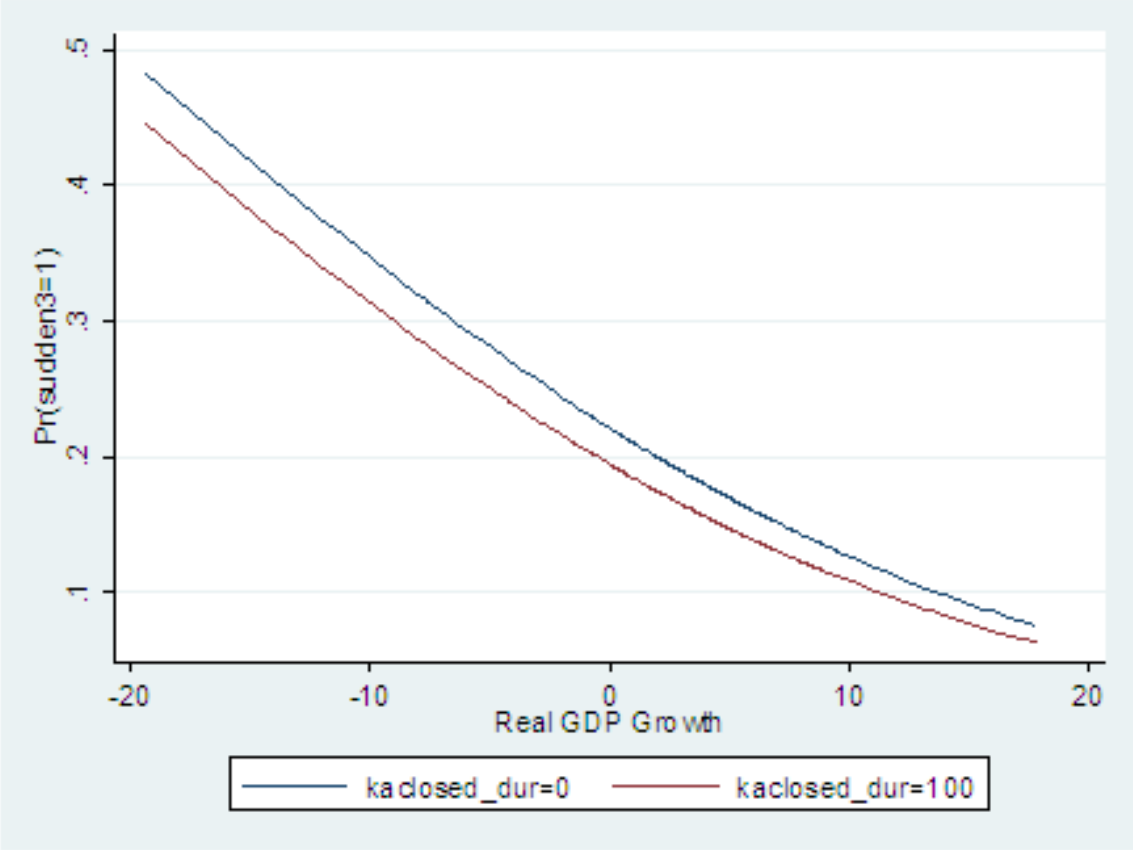
Graph 3 Probability of Currency Crisis given Real GDP Growth

Given Open (=0) and Closed (=100) Capital Account



Graph 4 Probability of Capital Account Contraction given Real GDP Growth

Given Open (=0) and Closed (=100) Capital Account

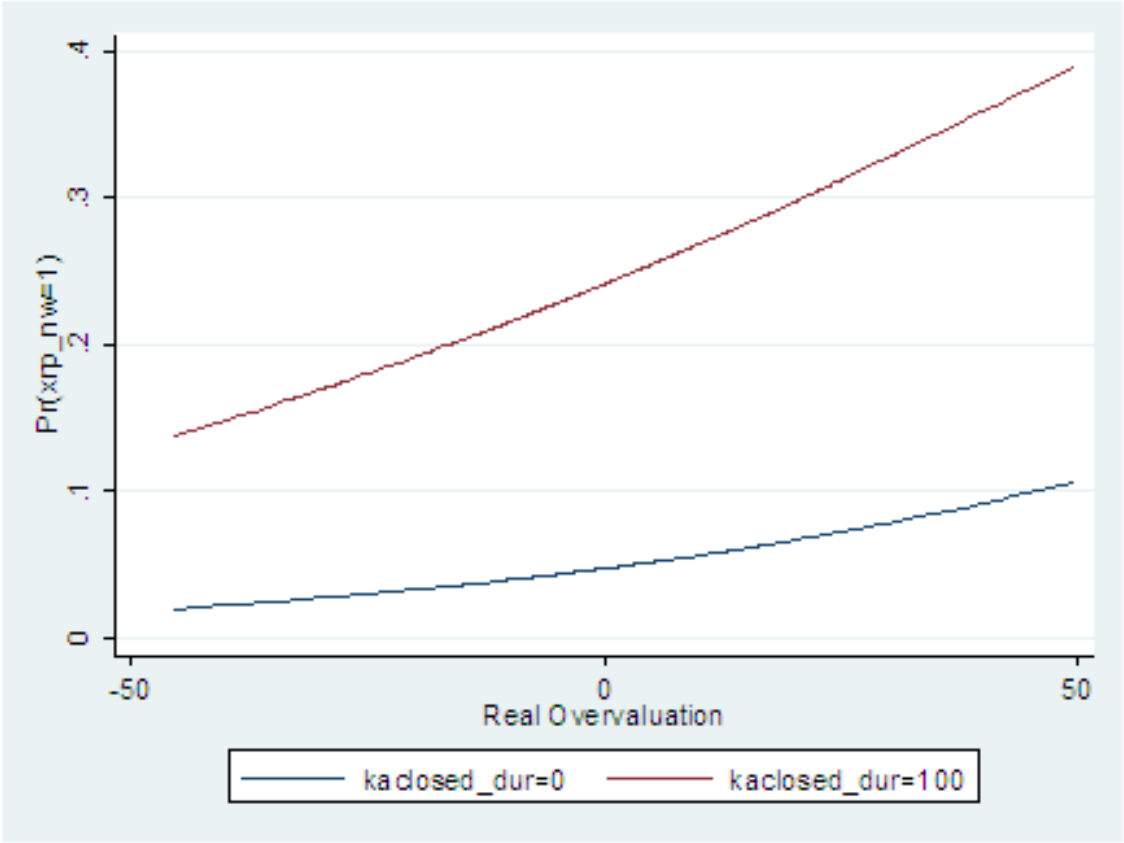


Impacts of real exchange rate overvaluation…

- Given low and high levels of capital account
- Estimates for most recent period
- Estimates for both currency crisis and capital account contraction likelihood

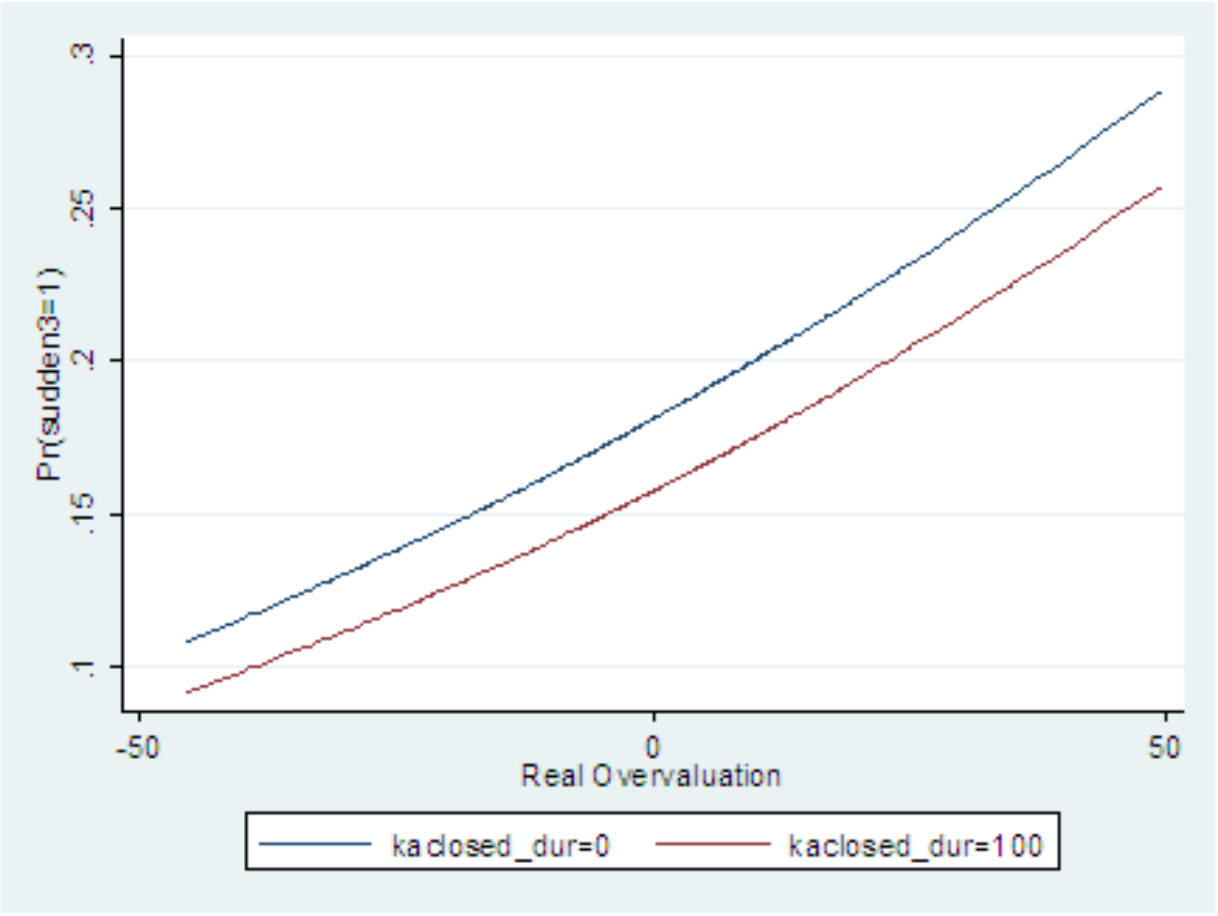
Graph 5 Probability of Currency Crisis given Real Overvaluations

Given Open (=0) and Closed (=100) Capital Account



Graph 6 Probability of Capital Account Contraction given Real Overvaluation

Given Open (=0) and Closed (=100) Capital Account



Conclusions

- Capital account control is associated with:
  - Higher likelihood of currency crisis
  - Lower likelihood of capital account contraction
- Effects are larger in more recent periods (post 1995)
- Effects are larger on currency crises when duration-based measure of controls is employed
- Big story:
  - Slowdowns in real GDP growth
  - Overvaluation of real exchange rates
  - Lead to Higher likelihoods of crisis or contraction of capital flow
  - Effects are growing over time
- Indirect effects of capital controls of capital controls on currency crises may be most important
- Controls:
  - Stabilize capital flows
  - Don’t hinder large speculative attacks