

The Trilemma, International Currencies, Capital Controls and Financial Development

Menzie D. Chinn

University of Wisconsin, Madison
and NBER

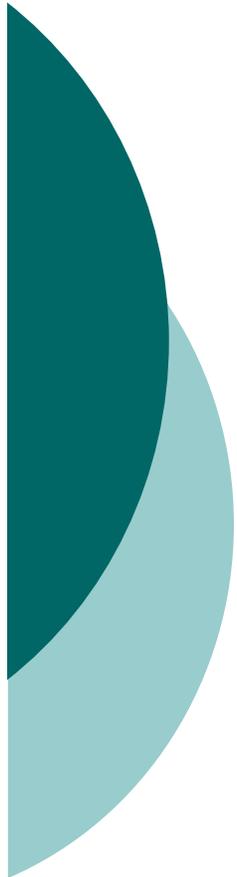
Central German Doctoral Program
Economics

Leipzig Universität
December 17-22, 2015



Outline of Week

1. Trilemma
2. ***Trilemma vs. Dilemma/Capital Controls***
3. Capital Controls/Financial Development/Int'l Currencies
4. International Currencies



The Trilemma and Dilemma



Klein and Shambaugh (2015)

- Seek to show the relative importance of capital controls vs. exchange rate regimes for insulation of interest rates



Key equations

$$(1) R_{it} = R_{bit} + \% \Delta E^e_{it} + \rho_{it}$$

$$(2) R_{it} = R_{bit} + \% \Delta E^e_{it} + \rho_{it} + \tau_{it}$$

$$(3) \Delta R_{it} = \alpha + \beta \Delta R_{bit} + \mu_{it}$$

Regression coefficient

$$(3) \quad \Delta R_{it} = \alpha + \beta \Delta R_{bit} + \mu_{it}$$

$$(4) \quad \hat{\beta} = \beta + \frac{\text{Cov}(\Delta R_{bit}, \mu_{it})}{\text{Var}(\Delta R_{bit})}$$

$$(\text{Cov}(\Delta R_{bit}, \Delta v_{it}) > 0)$$

If common shocks

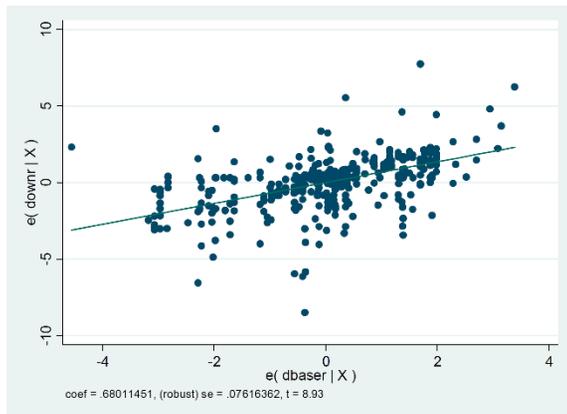
$$(\text{Cov}(\Delta R_{bit}, \Delta(\% \Delta E^e_{it})) > 0)$$

If base rate increase
Breaks peg

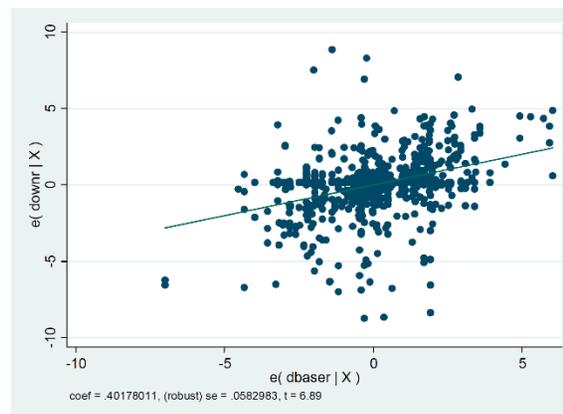
$$(\text{Cov}(\Delta R_{bit}, \Delta \rho_{it}) > 0)$$

If enhanced for pegs

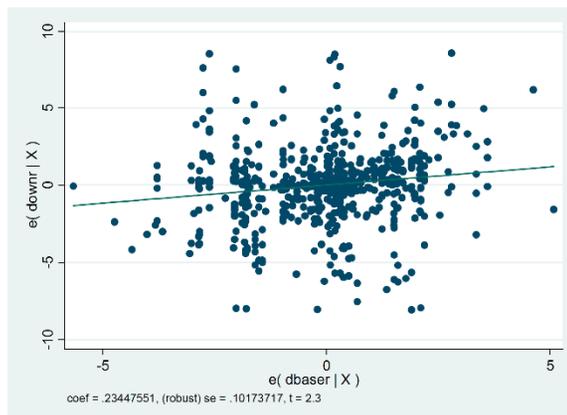
Figure 3: scatters of change in own interest rate and change in base interest rate across samples



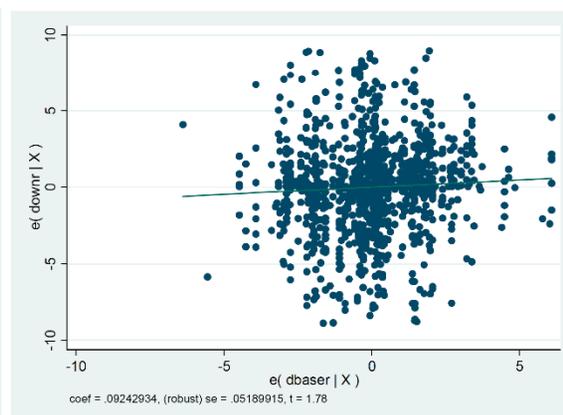
Open pegs



closed pegs



Open non pegs



closed nonpegs



Distribution of Exchange Rate Regimes

Table 1A: Exchange Rate Categorization

	Peg	Soft Peg	Float	Total
Chinn-Ito Data Set	1,400	804	922	3,126
1973 – 2011	45%	26%	29%	
Gates Walls Data Set	480	401	395	1,276
1995 – 2011	38%	31%	31%	

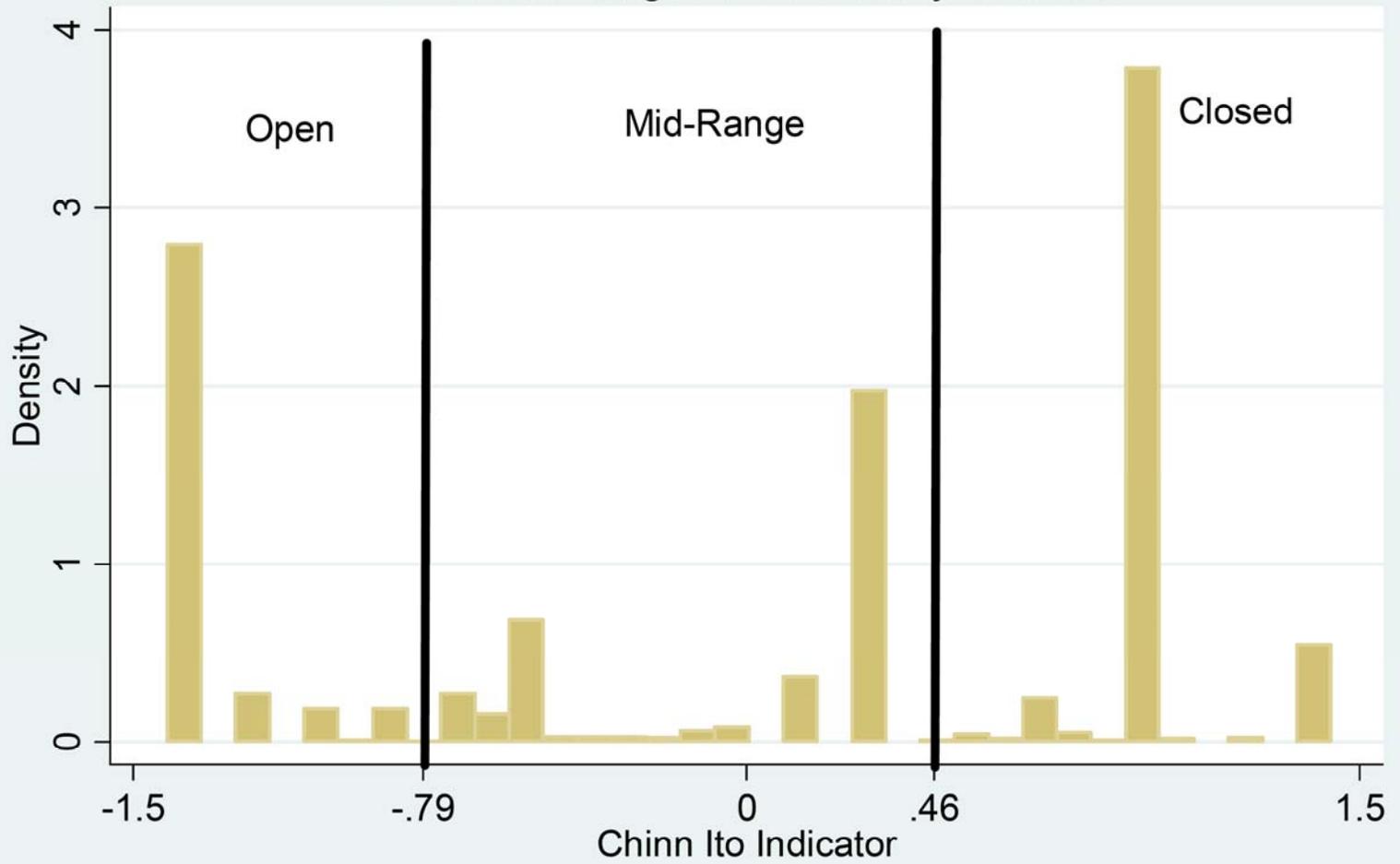
$$(5) \Delta R_{it} = \alpha + \beta_R \Delta R_{bit} + \beta_{RP} P_{it} \Delta R_{bit} + \beta_P P_{it} + \mu_{it}$$

Table 2: 2 x 2 Classification of Exchange Rate and Capital Control Regimes (OLS)

	Peg	Non-Peg	Open vs Non-Open
Open	0.68*** 433 (0.08) [0.28]	0.23** 581 (0.10) [0.02]	0.27*** (0.07)
Non-Open	0.40*** 967 (0.06) [0.14]	0.09* 1,145 (0.05) [0.00]	
Peg vs. Non-Peg	0.33*** (0.06)		
KEY	Coef.	N	
	(s.e.)	[R²]	
Sub-Sample regressions of the form: $\Delta R_{it} = \alpha + \beta \Delta R_{bit} + \mu_{it}$ Chinn-Ito trivariate classification for capital controls. Sample: 1973-2011 Entries in marginal column and row based on an interaction regression *** p<0.01, ** p<0.05, * p<0.10			



Figure 2: Chinn-Ito Capital Account Indicators
Values and Ranges for 3 Dummy Variables



3 x 3 classification

Table 3: 3 x 3 Classification of Exchange Rate and Capital Control Regimes (OLS)								
	Peg		Soft Peg		Float		vs. Mid-Open	vs. Closed
Open	0.68***	433	0.32**	301	0.17	280	0.06	0.29***
	(0.08)	[0.28]	(0.13)	[0.04]	(0.14)	[0.01]	(0.08)	(0.09)
Mid-Open	0.54***	438	0.38***	273	0.07	250		
	(0.06)	[0.22]	(0.08)	[0.05]	(0.08)	[0.00]		
Closed	0.25***	529	0.18*	230	-0.06	392	0.22***	
	(0.07)	[0.07]	(0.10)	[0.01]	(0.11)	[0.00]	(0.06)	
vs. Soft Peg	0.19***				0.22***			
	(0.07)				(0.08)			
vs. Float	0.41***						KEY	Coef. N
	(0.07)							(s.e.) [R²]
Sub-Sample regressions of the form: $\Delta R_{it} = \alpha + \beta \Delta R_{bit} + \mu_{it}$								
Chinn-Ito trivariate classification for capital controls. Sample: 1973-2011								
Entries in marginal columns and rows based on an interaction regression								
*** p<0.01, ** p<0.05, * p<0.10								

A soft peg is defined as occurring when a country-year observation is not classified as a peg, but the bilateral exchange rate with the base country fluctuates by less than +/-5 percent in a given year, or when there is no month where the exchange rate changed by more than 2 percent up or down

Walls and Gates Capital Controls

Table 5A: Subsample Regressions by Open / Gates / Walls Capital Controls Classification Based on 5 Asset Categories

	Open	Open Gates	Any Closed Gates	Limited Gates	Comprehensive Gates	Walls
$\Delta R_{bi,t}$ (peg) (s.e.)	0.69*** (0.08)	0.51** (0.23)	0.54*** (0.15)	0.93*** (0.11)	0.26 (0.20)	0.45** (0.19)
$\Delta R_{bi,t}$ (non-peg) (s.e.)	0.10 (0.17)	0.08 (0.31)	-0.05 (0.13)	0.09 (0.17)	-0.14 (0.16)	0.35** (0.16)
Peg Minus Non-Peg	0.56*** (0.19)	0.51** (0.23)	0.58*** (0.17)	0.84*** (0.24)	0.40* (0.20)	0.10 (0.24)
R²	0.06	0.03	0.02	0.09	0.01	0.07
N	410	105	527	205	322	234

Subsample regressions of the form: $\Delta R_{it} = \alpha + \beta_R \Delta R_{bit} + \beta_{RP} P_{it} \Delta R_{bit} + \beta_P P_{it} + \mu_{it}$ for 1995-2011

Coefficient listed for $\Delta R_{bi,t}$ (peg) is $\beta_R + \beta_{RP}$ and coefficient for $\Delta R_{bi,t}$ is β_R

*** p<0.01, ** p<0.05, * p<0.10.

Open Gates – Gate countries with no controls in that year.

Any Closed Gates – Gate countries with any controls in that year.

Limited Gates – Gate countries with half or fewer categories controlled in that year.

Comprehensive Gates – Gate countries with more than half of categories controlled in that year



Monetary Autonomy Redefined

$$(6) R_{it} = \alpha + \gamma(Y_{it} - Y_{it}^*) + \sigma(\pi_{it} - \pi_{it}^*).$$

$$(7) \Delta R_{it} = \gamma(\Delta Y_{it}) + \sigma(\Delta \pi_{it}).$$

$$(8) \Delta R_{it} = \alpha + \beta \Delta R_{bit} + \gamma(\Delta Y_{it-1}) + \sigma(\Delta \pi_{it-1}) + \mu_{it}.$$

Monetary Autonomy Redefined

Table 7: Autonomy for What? Advanced Country Subsamples			
	Peg	Soft Peg	Float
ΔR_{bit}	0.94*** (0.10)	0.78*** (0.11)	0.54*** (0.14)
$\Delta\pi_{t-1}$	0.10 (0.07)	0.09 (0.07)	0.12 (0.09)
$\Delta \ln Y_{t-1}$	-3.72 (4.47)	14.37*** (4.74)	15.48** (5.38)
F-stat	1.69	6.93***	4.27**
N	171	127	123
R²	0.55	0.43	0.27
Emerging Market Subsamples			
	Peg	Soft Peg	Float
ΔR_{bit}	0.72*** (0.18)	0.06 (0.19)	0.10 (0.16)
$\Delta\pi_{t-1}$	0.02 (0.06)	-0.10 (0.07)	-0.22 (0.09)
$\Delta \ln Y_{t-1}$	13.82** (6.35)	24.61*** (8.56)	26.59*** (7.95)
F-stat	2.46	4.27**	10.97***
N	101	130	111
R²	0.29	0.09	0.20

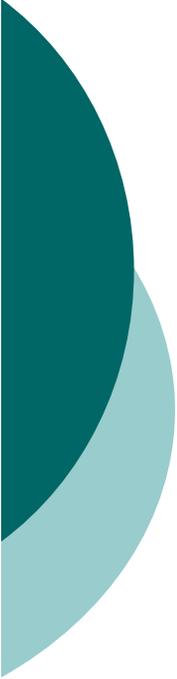
*** p<0.01, ** p<0.05, * p<0.10

Note: subsamples for 1990-2011 for open and mid-open capital accounts based on Chinn-Ito trivariate classification. Regression takes the form: $\Delta R_{it} = \alpha + \beta \Delta R_{bit} + \gamma (\Delta Y_{it-1}) + \sigma (\Delta \pi_{it-1}) + \mu_{it}$



Conclusion

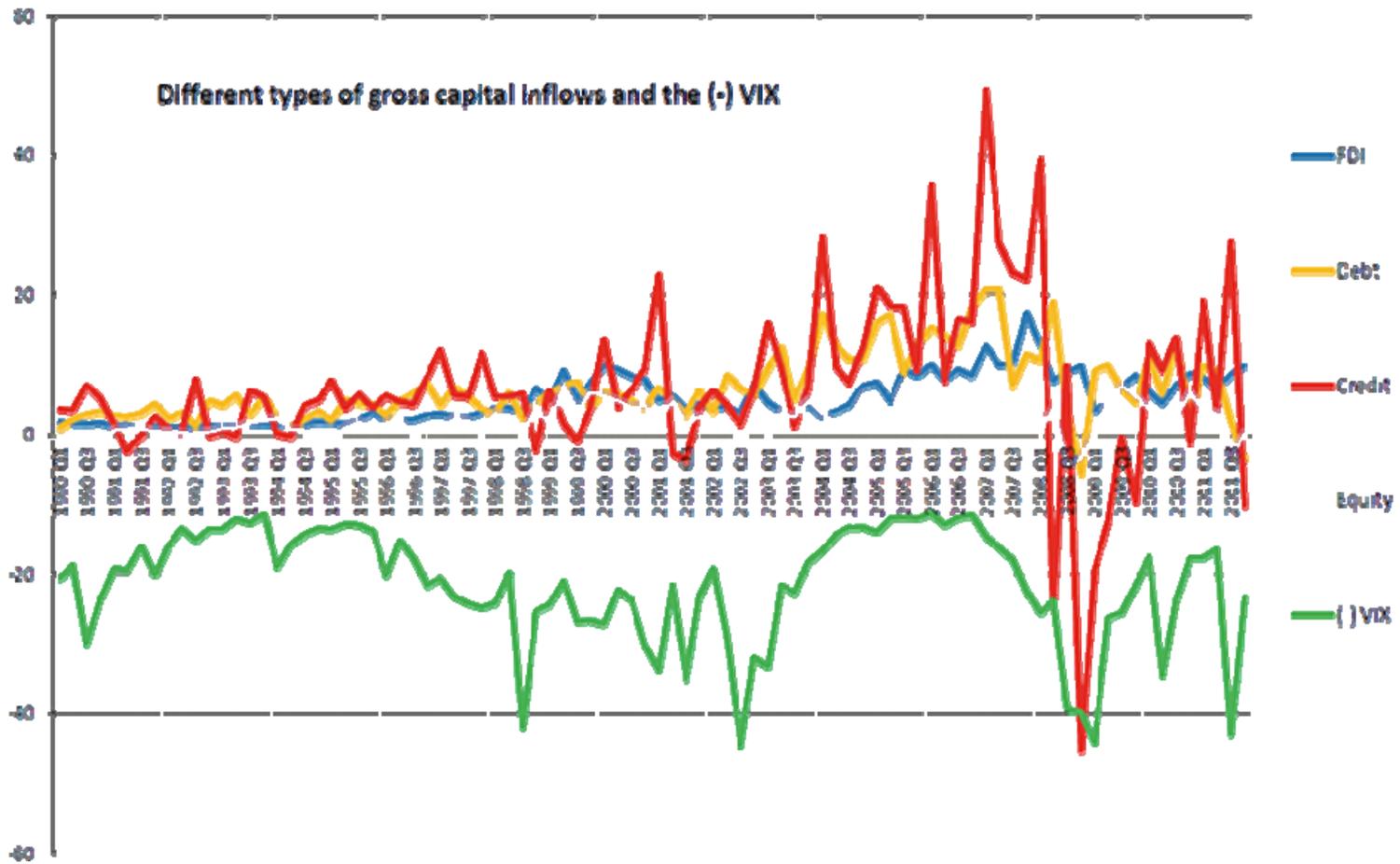
- Thus, the main message of our paper is the re-affirmation of the standard result from international macroeconomics; the simplest and most certain means for achieving some measure of monetary autonomy is to allow the exchange rate to float or to institute broad longstanding capital controls.



Helene Rey (2013)

a “dilemma,” an “irreconcilable duo”: independent monetary policies are possible if and only if the capital account is managed, directly or indirectly via macroprudential policies.

A Global Financial Cycle?





Flows and VIX

Table 2a
Unconditional Correlations of Liability Flows With the VIX,
Quarterly, 1990:Q1 to 2012:Q4

Correlations inflows /VIX	North America	Latin America	Central, Eastern Europe	Western Europe	Emerging Asia	Asia	Africa
Equity	-0.03	-0.29	-0.34	-0.36	-0.11	-0.34	-0.23
FDI	0.09	0.23	0.10	0.09	0.08	0.17	0.06
Debt	-0.23	-0.17	-0.28	-0.16	-0.29	-0.08	-0.23
Credit	-0.22	-0.10	-0.14	-0.21	-0.24	0.06	-0.13

Table 2b
Conditional Correlations of Liability Flows With the VIX,
Quarterly, 1990:Q1 to 2012:Q4

Correlations inflows / VIX	North America	Latin America	Central, Eastern Europe	Western Europe	Emerging Asia	Asia	Africa
Equity	-0.06	-0.31	-0.32	-0.38	-0.08	-0.34	-0.25
FDI	0.10	0.35	0.07	0.06	0.08	0.16	0.07
Debt	-0.30	-0.15	-0.36	-0.23	-0.28	-0.06	-0.22
Credit	-0.29	-0.15	-0.16	-0.24	-0.26	0.09	-0.14

Table 2c
Conditional Correlations of Credit and Leverage Measures With
the VIX, Quarterly, 1990 to 2012

Correlations credit / VIX	North America	Latin America	Central, Eastern Europe	Western Europe	Emerging Asia	Asia	Africa
Domestic credit growth	-0.26	-0.14	-0.14	-0.11	-0.01	-0.30	0.01
Leverage	-0.17	0.05	0.30	-0.09	-0.12	-0.25	0.03
Leverage growth	-0.32	0.06	0.07	-0.21	-0.06	-0.31	0.01

Note: The conditioning variables are the world real short rate and the world growth rate.



Estimate a Simple VAR

2 lag recursive VAR (Cholesky decomposition)

following seven variables (in this order): US GDP, US GDP deflator (GDPDEF), global credit (logged)(CREDIT), global credit inflows (INFLOWS), European banks leverage (defined as the median of EU bank leverage) (EULEV), fed funds target rate (FFR) and VIX (logged).⁸

Response of VIX to

Chart 3a

25 bp Increase to the Effective Federal Funds Rate

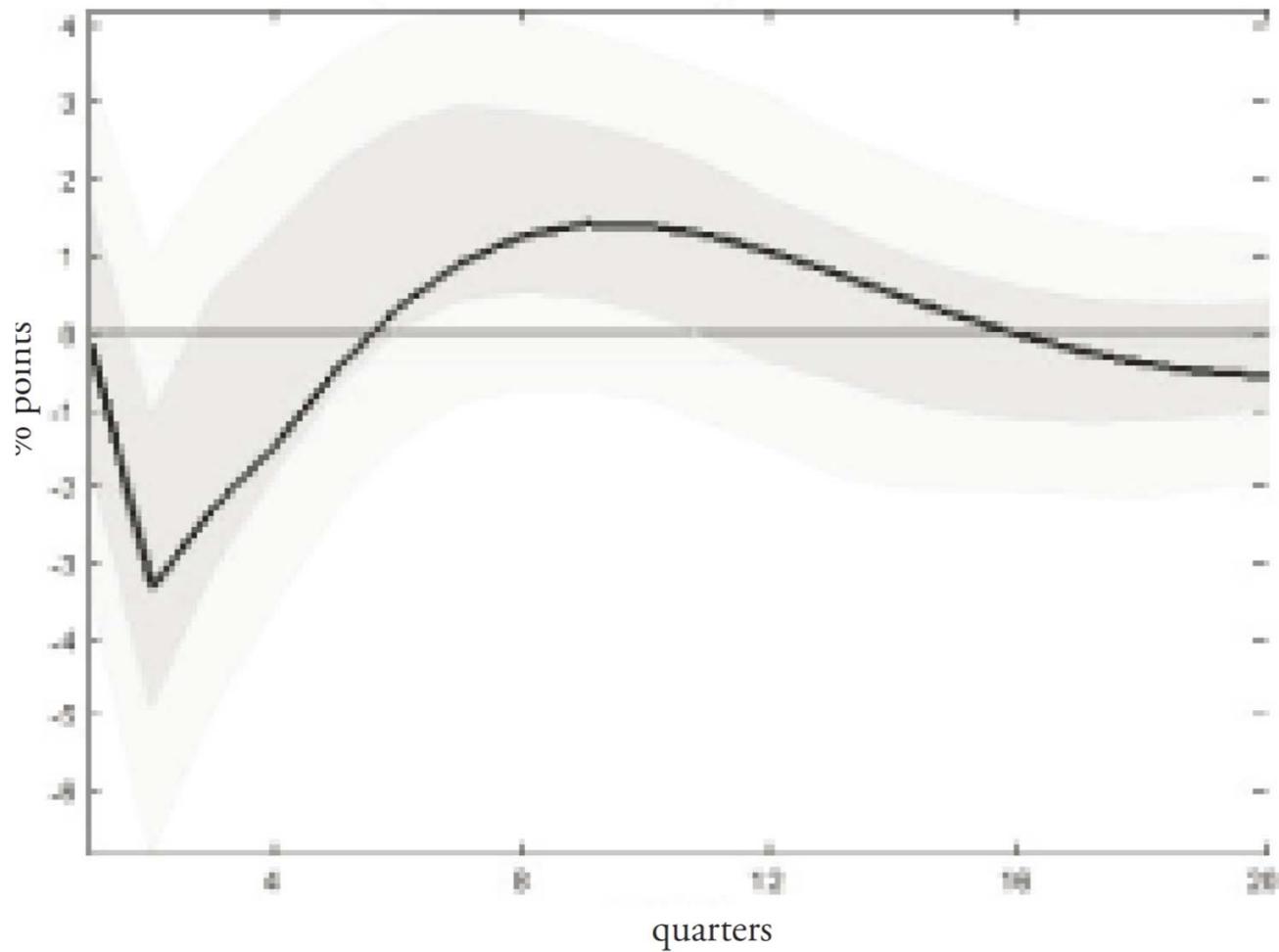
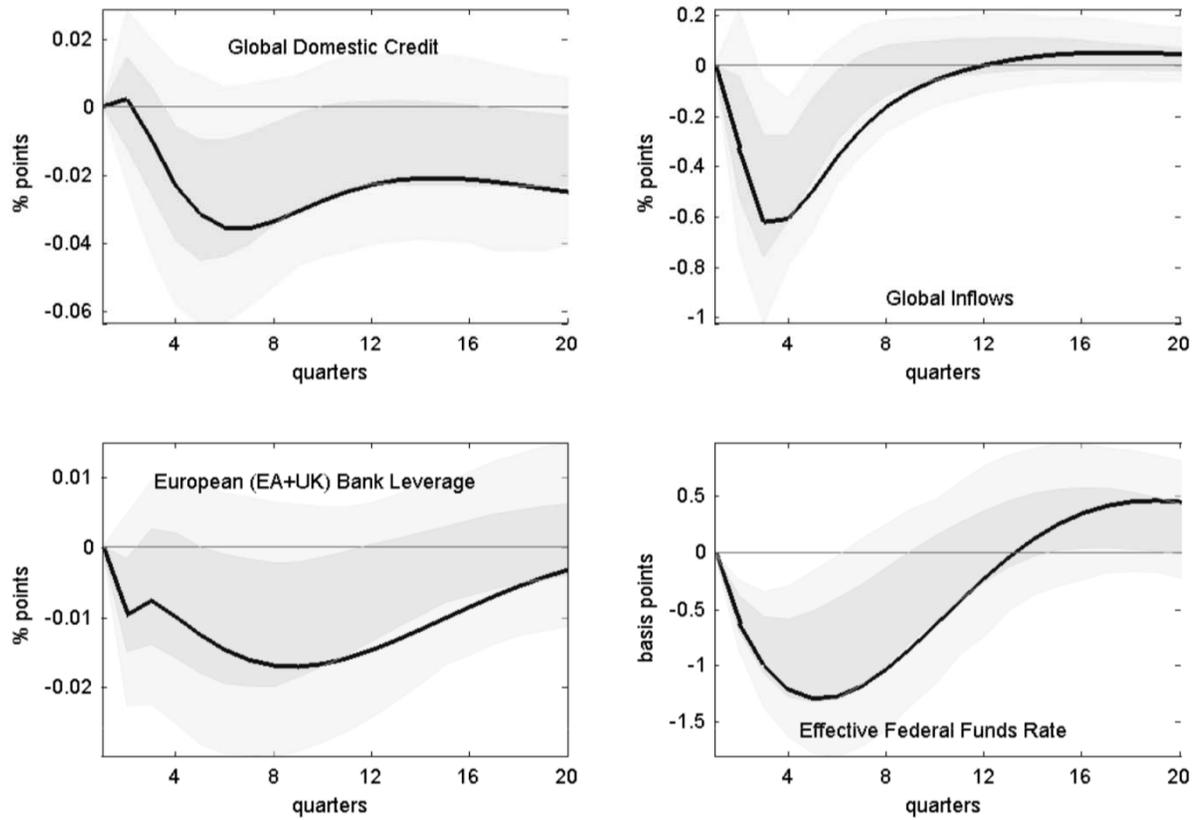




Chart 3b
Responses to a 1 Percent Increase in the VIX





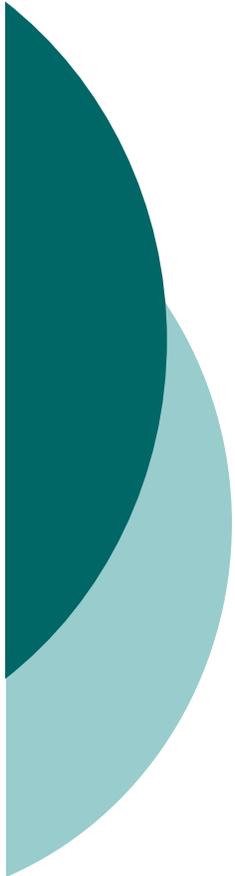
Conclusions (I)

- 1) An increase in the effective federal funds rate (FFR) leads to an increase in the VIX after about five quarters and until 11 quarters (Chart 3a).
- 2) An increase in the VIX leads to a fall in European banks leverage (Chart 3b).
- 3) A fall in the VIX leads to an increase in cross-border credit flows up to six quarters (Chart 3b).
- 4) An increase in the VIX leads to a fall in global domestic credit from four quarters onward (Chart 3b).
- 5) An increase in the VIX leads to decline in the FFR (Chart 3b).



Conclusions (II)

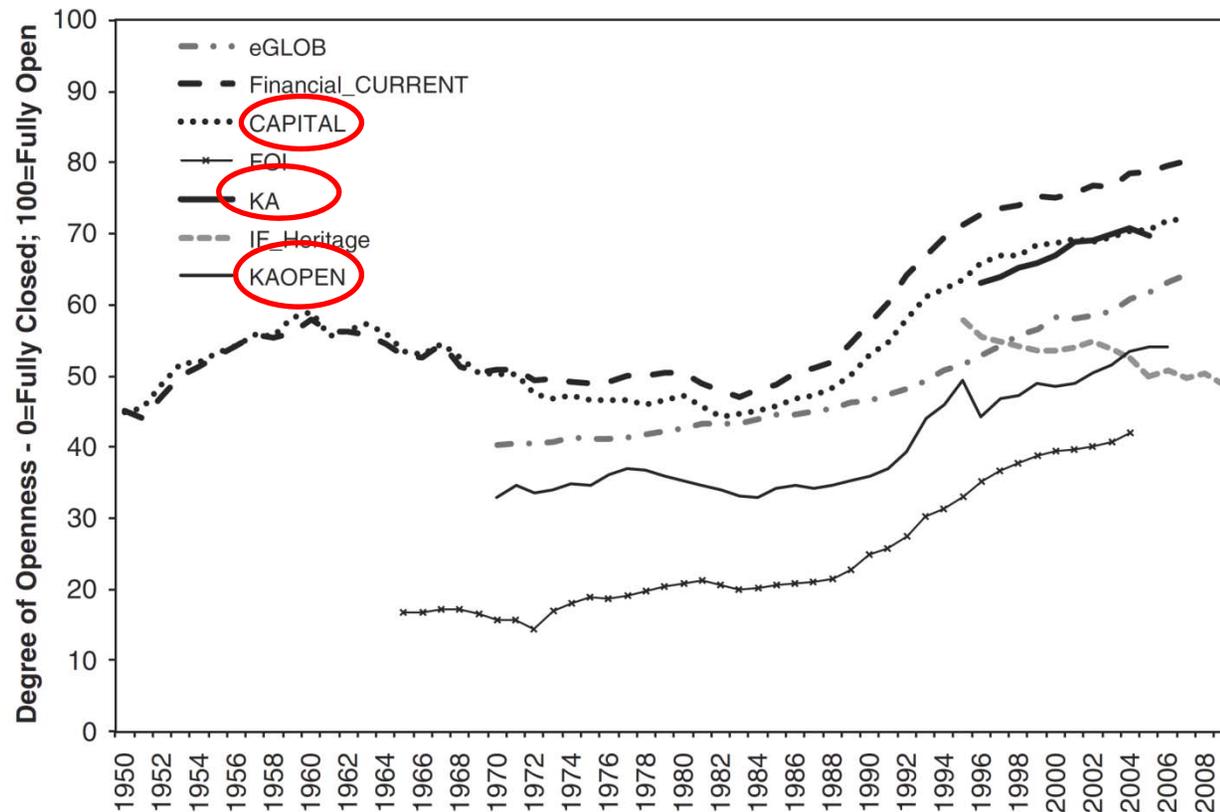
- 6) An increase in the FFR leads to a fall in EU bank leverage after 15 quarters (Chart 4, Appendix D).
- 7) An increase in the FFR leads to a fall in gross credit flows after 12 quarters (Chart 4, Appendix D).
- 8) An increase in EU banks leverage is associated with an increase in domestic credit from a one quarter horizon (Chart 4, Appendix D).
- 9) An increase in EU banks leverage is associated with a fall in the VIX after about eight quarters (Chart 4, Appendix D).



Capital Controls Measured

Comparison of Extant Measures

Figure 1. Global Averages of Capital Account and Current Account Indicators Rescaled 0 to 100–1950–2009



Source: Quinn, Schindler, Toyoda, *IMF Economic Review* (2011)

Comparison of Extant Measures

Table 1. Comparison of Nine Measures of Financial Current and Capital Account Openness in Five Countries, 2004

Measure, Scale, Sample	U.K.	U.S.	People's Republic of China	Brazil	India	Type of Measure. Other Comments.
CAPITAL 0–100 122 nations, 1948–2007	100 (tied 1st out of 7 ranks)	100 (tied 1st out of 7 ranks)	25 (tied 7th out of 7 ranks)	50 (tied 4th out of 7 ranks)	50 (tied 4th out of 7 ranks)	De jure, Ordinal, Capital account. Based on coding of <i>AREAER</i> text from 1948 to 2007. Scoring includes information about restrictions on residents and nonresidents. Takes into account severity of restrictions balancing across all categories of financial transactions.
KAOPEN –1.80 to 2.54 181 nations, 1970–2006	2.54 (tied 1st out of 21 ranks)	2.54 (tied 1st out of 21 ranks)	–1.15 (tied 20th out of 21 ranks)	0.73 (tied 10th out of 21 ranks)	–1.15 (tied 20th out of 21 ranks)	De jure, Categorical, Financial current and Capital account. Based upon principal component analysis of binary indicators in <i>AREAER</i> , which are “multiple exchange rates,” “current account,” “surrender of export proceeds,” and five-year average of IMF_BINARY (called SHARE, as in Klein, 2003).
EQUITY 0,1; 95 nations 1980–99	1	1	n.a.	1 (from 1991)	1 (from 11/1992)	De jure, Categorical, Equity markets. Binary measure of Official Equity Market Liberalization based on chronology of events compiled by BHL (2005). A score of “1” indicates the date by which foreign investors may own equity in a market.
FOI 0–12 172 nations, 1965–2007	10 (tied 3rd out of 13 ranks)	8 (tied 5th out of 13 ranks)	1 (tied 12th out of 13 ranks)	4 (tied 9th out of 13 ranks)	1 (tied 12th out of 13 ranks)	De jure, Categorical, Financial Current and Capital account. Brune’s coding of <i>AREAER</i> text from 1965 to 2004. Extension of Johnston and Tamirisa (1998) methodology backward from 1997 to 1965. Binary subcomponents of <i>AREAER</i> are added to produce a score.

Source: Quinn, Schindler, Toyoda, *IMF Economic Review* (2011)

Comparison of Extant Measures

TABLE 1 (continued)

Measure, Scale, Sample	U.K.	U.S.	People's Republic of China	Brazil	India	Type of Measure. Other Comments.
eGlobe—KOF 20–99 141 nations, 1970–2007	77.7 (28th out of 141)	67 (50th out of 141)	56 (86th out of 141)	58.7 (79th out of 141)	36.7 (130th out of 141)	De jure, Categorical/ordinal, Blended de facto/de jure.. Based on “actual flows” of trade, FDI, portfolio, and remittances, plus “restrictions” on imports, tariffs, taxes on trade and capital account restrictions. Political and social globalization measures also available.
TOTAL 39% to 19,975% 145, 1970–2007	715% (111th out of 145)	254% (55th out of 145)	83% (126th out of 145)	95% (tied, 117th out of 145)	58% (139th out of 145)	De facto. An extensive and comprehensive measure of a country’s aggregate assets and liabilities (summed) over its gross domestic product. Composition includes FDI, equity investment, external debt, and official reserves controlling for valuation.
IF_HERITAGE Changing scale 183;1995–2010	70 (tied for 2nd out of 5 ranks)	70 (tied for 2nd out of 5 ranks)	30 (tied for 4th out of 5 ranks)	50 (tied for 3rd out of 5 ranks)	50 (tied for 3rd out of 5 ranks)	De jure, Categorical/ordinal, “Investment Freedoms.” Assessment of policies governing domestic and international investments including investment restrictions, national treatment, and payment restrictions. Scale intervals change in 2007 and 2010.
KA (overall) 0–1 91 nations; 1995–2005	1 (tied for 1st out of 17 ranks)	0.875 (tied for 3rd out of 17 ranks)	0 (tied for 17th out of 17 ranks)	0.67 (tied for 6th out of 17 ranks)	0.42 (tied for 10th out of 17 ranks)	De jure, Ordinal, Capital account. Coding of <i>AREAER</i> text from 1995 to 2005. Scoring includes information about restrictions on six types of instruments; the direction of flows; and the residency of agents. 19 discrete categories available.
Inward FDI as % of GDP (World FDI)_ 153, 1970–2009	2.58% 97th (7.62% 3rd)	1.56% 133rd (18.5% 1st)	3.13% 85th (8.25% 2nd)	2.73% 92nd (2.46% 11th)	0.83% 146th (0.8% 22nd)	De facto. An extensive and comprehensive measure of a country’s inward FDI as a % of either gross domestic product or World FDI. Three differing definitions of FDI are embedded, creating structural breaks in the data. Source: United Nations Conference on Trade and Development.

Comparison of Extant Measures

Table 2. Correlations of De Jure and De Facto Indicators of Capital Account or Financial Current Account Openness 1966 (or First Date) to 2007—Annual and Five-Year Observations

(a) Annual Changes

ΔFOI	1.00													
ΔCAP	0.20	1.00												
ΔCUR	0.21	0.51	1.00											
ΔWW	0.05	0.09	0.15	1.00										
ΔKAOPEN	0.20	0.23	0.29	0.02	1.00									
ΔEGLOB	0.04	0.10	0.11	0.05	0.06	1.00								
ΔTOTAL	-0.02	0.01	0.03	-0.05	0.01	0.02	1.00							
ΔFDI/GDP	0.01	0.01	0.00	-0.05	0.01	0.15	0.09	1.00						
ΔFDI/WI	0.02	0.00	-0.01	-0.02	0.01	0.02	0.02	0.02	1.00					
ΔEQUITY	0.02	0.10	0.07	0.04	0.03	0.02	-0.01	-0.01	-0.02	1.00				
ΔIF_HERIT	0.01	0.03	-0.02	-0.05	0.01	0.04	0.03	0.04	0.04	-0.09	1.00			
ΔKA	0.11	0.31	0.25	-0.05	0.19	0.09	-0.02	0.02	-0.01	-0.00	0.03	1.00		
ΔFORU	-0.07	-0.01	-0.03	-0.05	0.03	0.09	-0.03	-0.01	0.04	0.16	0.01	0.02	1.00	
	ΔFOI	ΔCAP	ΔCUR	ΔWW	ΔKAOPEN	ΔEGLOB	ΔTOTAL	ΔFDI/GP	ΔFDI/W	ΔEQUITY	ΔHerit	ΔKA	ΔFORU	

(b) Five-Year Changes

ΔFOI	1.00													
ΔCAP	0.61	1.00												
ΔCUR	0.56	0.74	1.00											
ΔWW	0.17	0.24	0.35	1.00										
ΔKAOPEN	0.67	0.55	0.54	0.13	1.00									
ΔEGLOB	0.35	0.37	0.34	0.11	0.24	1.00								
ΔTOTAL	-0.01	0.03	0.00	-0.04	-0.03	-0.04	1.00							
ΔFDI/GDP	0.03	0.05	0.05	-0.03	0.03	0.24	0.08	1.00						
ΔFDI/WI	0.03	0.00	-0.03	-0.05	0.03	0.03	0.02	-0.01	1.00					
ΔEQUITY	0.18	0.26	0.24	0.15	0.23	0.12	-0.04	-0.01	-0.03	1.00				
ΔIF_HERIT	0.10	0.14	0.08	0.08	0.10	0.17	0.06	0.09	0.06	0.09	1.00			
ΔKA	0.72	0.66	0.57	-0.11	0.57	0.37	0.07	0.07	-0.02	—	0.05	1.00		
ΔFORU	0.12	0.19	0.30	-0.10	0.14	0.22	0.00	-0.11	0.06	0.05	0.20	0.28	1.00	
	ΔFOI	ΔCAP	ΔCUR	ΔWW	ΔKAOPEN	ΔEGLOB	ΔTOTAL	ΔFDI/GDP	ΔFDI/W	ΔEQUITY	ΔHerit	ΔKA	ΔFORU	

Notes: The correlations are pair-wise Pearson correlations, with statistically significant coefficients (two-tail test) at the 0.05 *p*-value or beyond in bold. See Table 1 for definitions and descriptions of the indicators; in addition, FORU is from Edison and Warnock (2003); WW is from Wacziarg and Welch (2008).

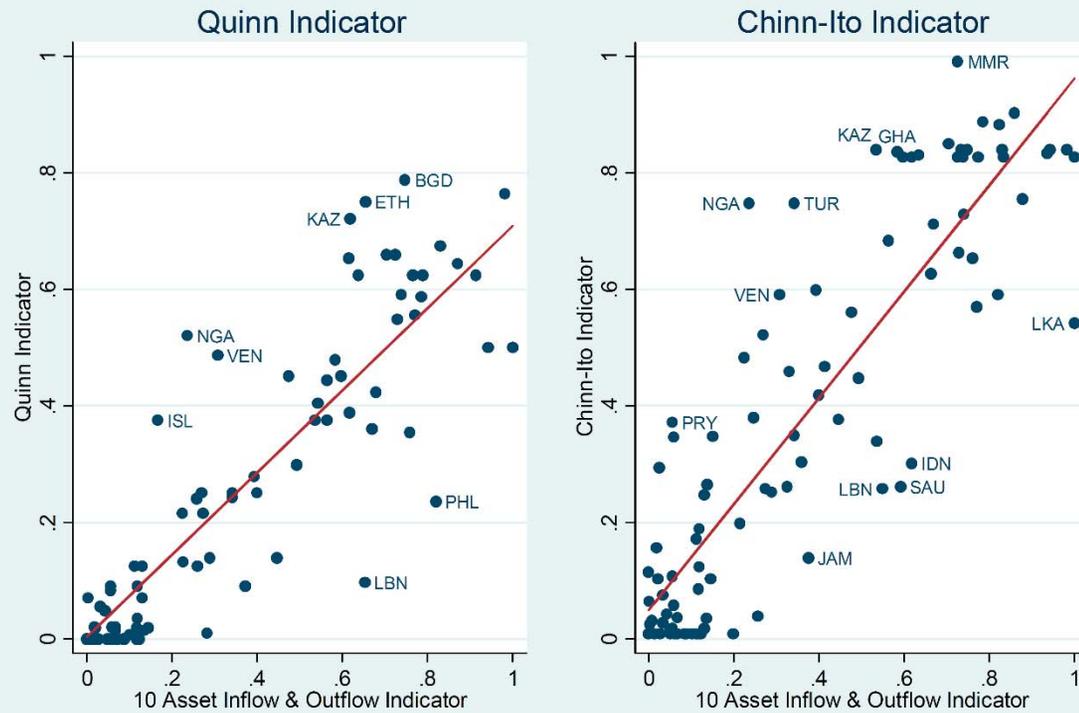


Key Advances in Measuring

- IMF Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).
- Narrative descriptions regarding multiple regimes, surrender of export proceeds, current account, capital account restrictions, coded (arbitrarily) into 0/1
- With accounting of 1996 (AREAER 1997), finer categories for capital account available, as well as in/out differentiation
- Schindler (2009), updated in **XXXXXX**

Heterogeneity

Figure 4: Comparison of Aggregate Indicators



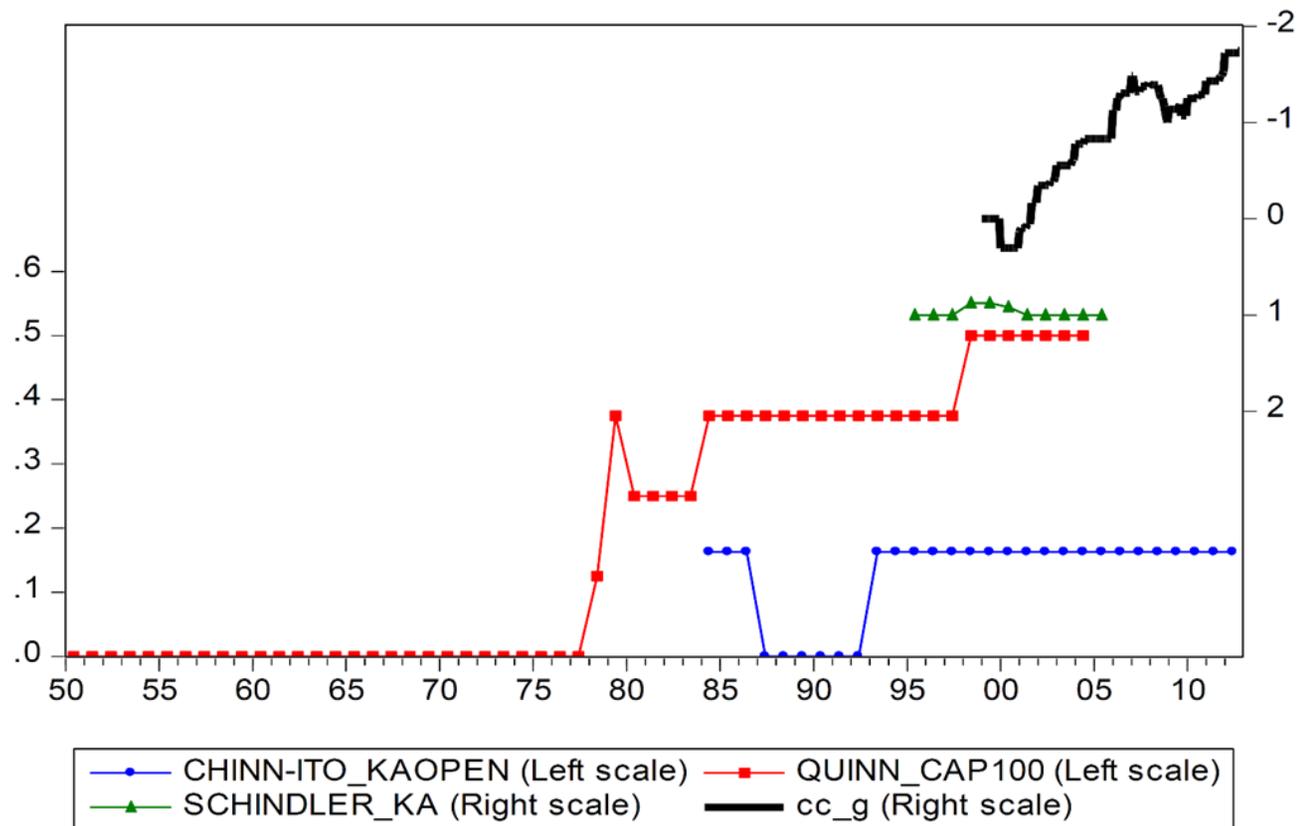
$$Quinn_i = 0.004_{(0.019)} + 0.71_{(0.041)} KC10_i \quad R^2 = 0.77; n = 90$$

$$ChinnIto_i = 0.049_{(0.025)} + 0.91_{(0.051)} KC10_i \quad R^2 = 0.77; n = 99.$$

Source: Fernandez, Klein, Rebucci, Schiller, Uribe, *IMF WP 15/80*

China: Nuance

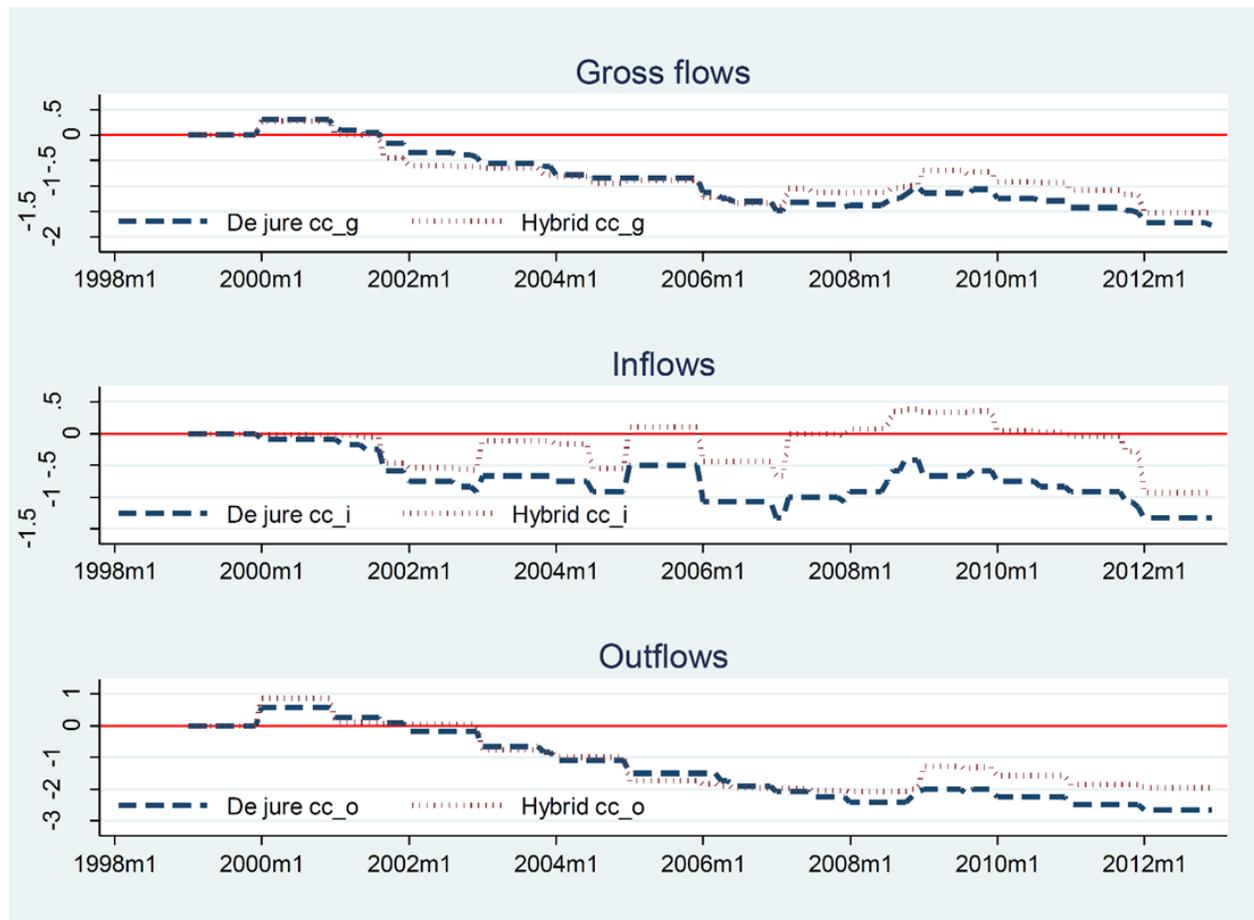
Figure 1: Comparison to other *de jure* indices



Source: Chen and Qian (2015)

More on China

Figure 6: *De jure* and hybrid indices by flow types



Source: Chen and Qian (2015)



Additional Transformations

- One issue is the time dimension
- Using moving average to minimize measurement error (Klein)
- Alternative is to use persistence: Gates and Walls (Klein, *BPEA*, 2012).

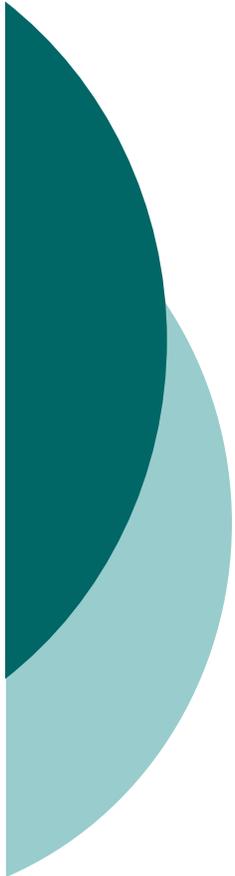


Klein's Gates/Walls

Table 1. Asset Categories

<i>Category</i>	<i>Definition</i>
Money market instruments	Debt securities with original maturity of 1 year or less, such as certificates of deposit and bills of exchange, treasury bills and other short-term government paper, bankers' acceptances, commercial paper, interbank deposits, and repurchase agreements
Bonds	Debt securities with original maturity of more than 1 year, such as bonds, notes, and debentures
Financial credits	Credits other than commercial credits granted by all residents, including banks, to nonresidents, or vice versa
Equities	Shares and other securities of a participating nature if not purchased for the purpose of acquiring a lasting economic interest in the management of the issuing enterprise
Collective investments	Assets in institutions for collective investment, such as mutual funds, unit trusts, and investment trusts
Direct investment	Assets created for the purpose of establishing a lasting economic relationship either abroad by residents or domestically by nonresidents, essentially for the purpose of producing goods and services, and in particular, assets that allow investor participation in the management of the enterprise. The category includes the creation or extension of a wholly owned enterprise, subsidiary, or branch and the acquisition of full or partial ownership of a new or existing enterprise that results in effective influence over its operations.

Source: Based on Schindler's (2009) cataloguing of information in the International Monetary Fund's *Annual Report on Exchange Arrangements and Exchange Restrictions*.



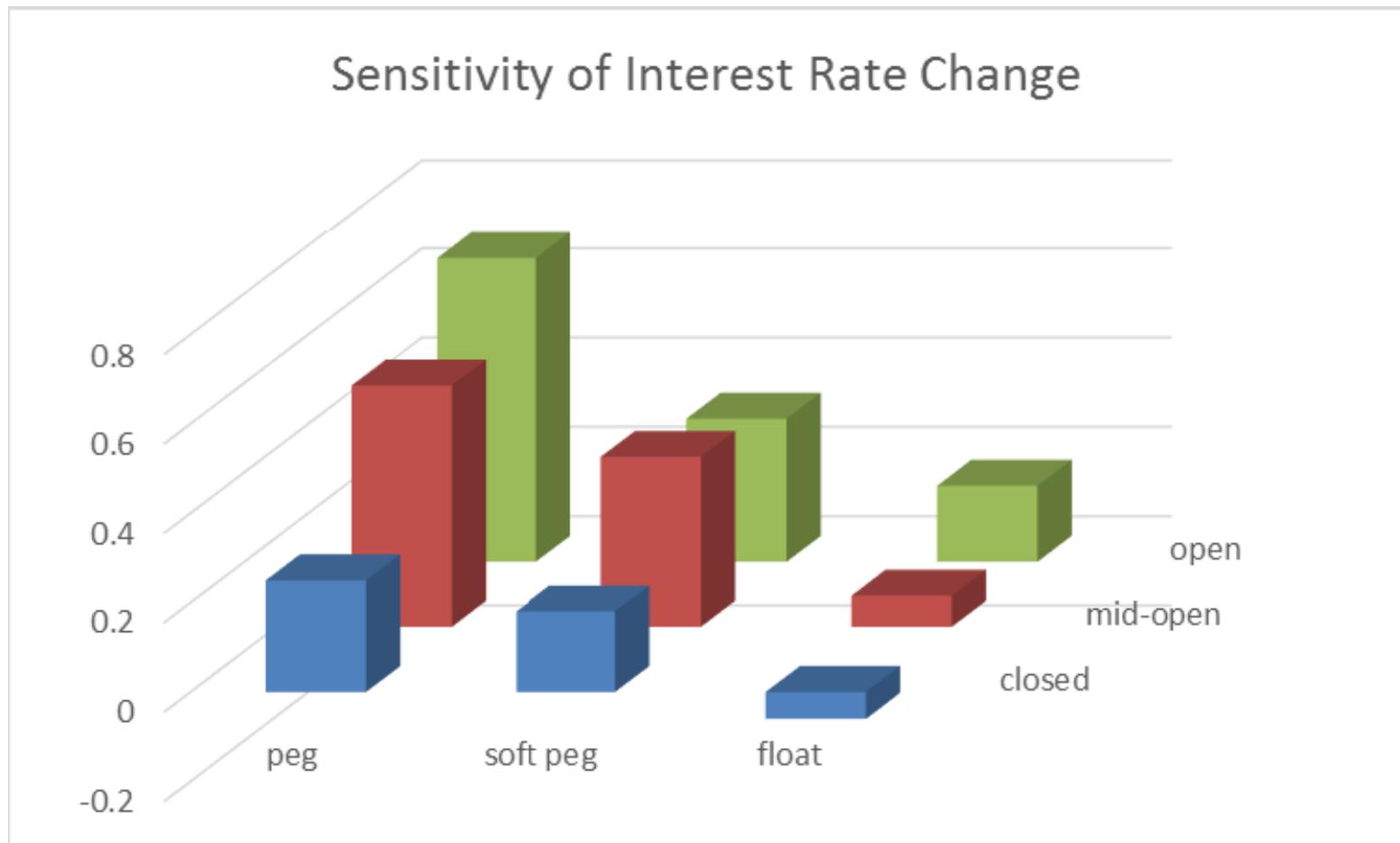
Capital Control Efficacy



What is the definition of “working”?

- Insulation from external influences
- Reduce capital inflows/outflows
- Reduce capital inflows/outflows at specific times
- Alter composition of capital inflows/outflows

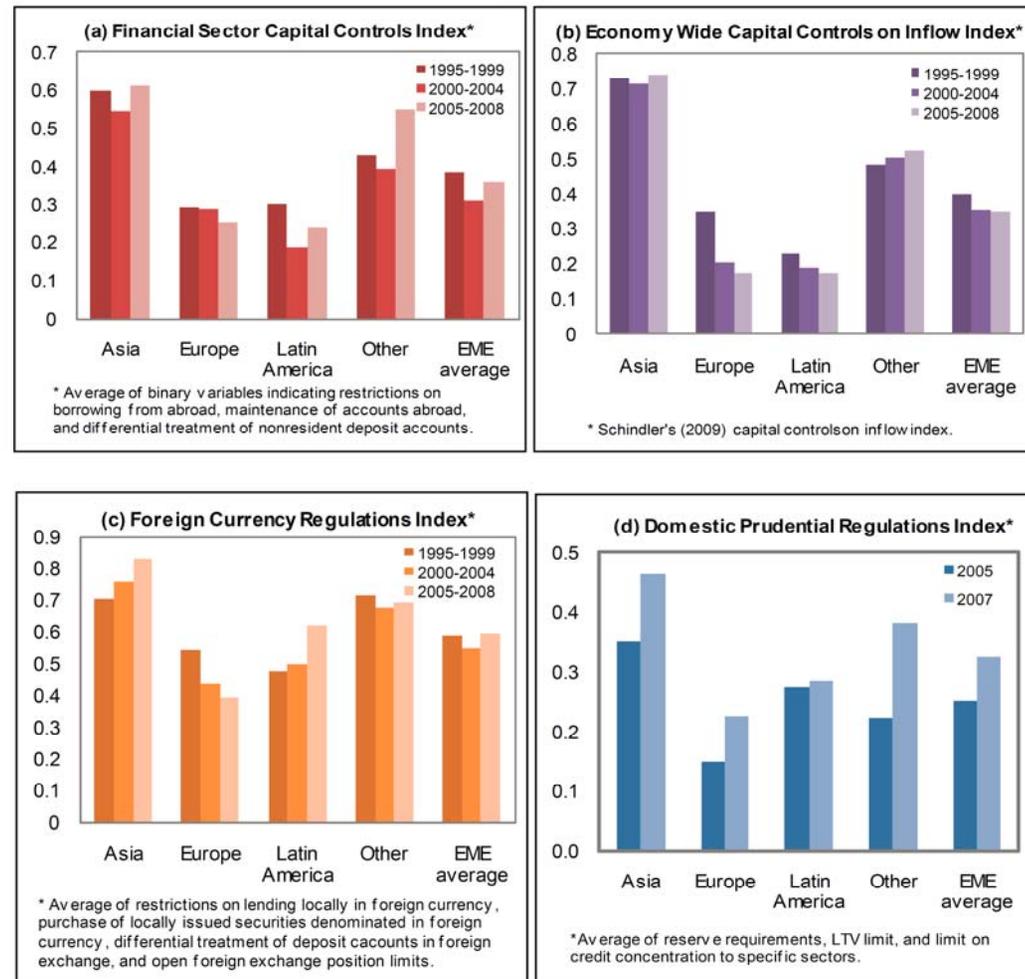
Capital Controls “Work” to Insulate Economies



Source: Klein and Shambaugh (2015)

What about Financial Openness More Generally

Figure 1. Capital Controls and Prudential Measures in EMEs, 1995-2008



Source: Authors' estimates based on IMF's AREAER and Schindler (2009).

Policy Measures and Debt Liab.

	Recent crisis ^a												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Kcont	-11.517** (5.045)							-11.311* (6.656)	-9.395 (8.727)	-10.814* (6.086)	-12.946* (6.705)	-10.628* (5.286)	-9.691* (5.234)
Fincont1		-7.129 (5.719)						-1.094 (7.507)					
Fincont2			-10.578 (6.406)						-3.727 (10.544)				
Fxreg1				-7.970* (4.492)						-2.462 (5.733)			
Fxreg2					-8.614 (6.488)						0.850 (9.063)		
Domreg1						-2.680 (7.863)						-2.610 (7.555)	
Domreg2							-5.022 (8.240)						-3.817 (8.006)
Observations	38	35	35	37	37	32	30	35	35	37	37	32	30
R-squared	0.388	0.352	0.375	0.387	0.376	0.383	0.434	0.393	0.396	0.422	0.420	0.434	0.477



- **Recent crisis Panel data (1995-2008)b**

- a/ Dependent variable is share of debt liabilities in total liabilities in 2007 (in percent). Kcont, Fincontrol, and Fxreg are averaged over 2000-05. Domreg pertain to the measures in place in 2005. Constant, and a (lagged) composite index of external vulnerability (excluding debt liabilities), and an indicator of overall institutional quality (ICRG index) in 2007 included as controls in all regressions..

- b/ Dependent variable is share of debt liabilities in total liabilities (in percent). Kcont, Fincontrol, Fxreg and Domreg are lagged one year. Domreg is available for 2005 and 2007 only. Constant, and region specific and time effects included in all regressions. Lagged composite index of external vulnerability, (log of) real GDP per capita, institutional quality (ICRG) index and a proxy for financial market development (private credit to GDP) included as controls in all regressions.

- Clustered standard errors (on country level) reported in parentheses; *, **, and *** indicate significance at 10, 5, and 1 percent levels respectively.

- Notes: Kcont is Schindler's (2009) capital controls on inflow index.

- Fincont1 is the average of binary variables reflecting restrictions on financial sector's borrowing abroad, and differential treatment of nonresident accounts.

- Fincont2 is the average of binary variables reflecting restrictions on financial sector's borrowing abroad, maintenance of accounts abroad, and differential treatment of accounts held by nonresidents.

- Fxreg1 is the average of binary variables reflecting restrictions on financial sector's lending locally in foreign exchange, and differential treatment of deposit accounts in foreign exchange.

- Fxreg2 is the average of binary variables reflecting restrictions on financial sector's lending locally in foreign exchange, purchase of locally issued securities denominated in forex; differential treatment of deposit accounts in foreign

- exchange; and open FX position limits.

- Domreg1 is the average of reserve requirements and restrictions on concentration in sectors.

- Domreg2 is the average of reserve requirements, restrictions on concentration in specific sectors, and LTV ratios.

Policy Measures and Debt Liab.

	Panel data (1995-2008) ^b												
	14	15	16	17	18	19	20	21	22	23	24	25	26
Kcont	-9.856*** (3.475)							-10.307** (4.447)	-7.518 (4.975)	-9.586** (4.234)	-8.225*** (2.248)	-2.751 (4.443)	-2.977 (4.229)
Fincont1		-0.545 (3.201)						4.523 (4.614)					
Fincont2			-5.412 (3.430)						-1.956 (5.189)				
Fxreg1				-1.846 (3.152)						-1.542 (3.661)			
Fxreg2					-5.071 (3.912)						-4.835** (2.218)		
Domreg1						-4.434 (6.076)						-4.291 (6.402)	
Domreg2							1.663 (6.217)						-0.756 (6.653)
Observations	467	481	478	521	492	69	65	400	397	438	420	60	56
R-squared	0.468	0.471	0.474	0.445	0.416	0.264	0.291	0.479	0.467	0.452	0.440	0.268	0.315

Policy Measures and Foreign Currency Lending

	Recent crisis ^a												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Kcont	-38.888** (14.399)							-38.155** (15.638)	-37.782* (18.697)	-25.944** (12.034)	-15.863 (11.895)	-44.688** (17.704)	-44.306** (17.980)
Fincont1		-11.323 (18.468)						-6.792 (17.145)					
Fincont2			-22.901 (17.307)						-2.996 (22.260)				
Fxreg1				-37.459*** (10.136)						-22.700** (9.531)			
Fxreg2					-52.233*** (12.374)						-39.219*** (12.466)		
Domreg1						6.410 (17.680)						-1.742 (17.823)	
Domreg2							5.522 (16.755)						5.074 (17.862)
Observations	30	27	27	30	30	25	25	27	27	29	29	24	24
R-squared	0.599	0.484	0.504	0.597	0.660	0.410	0.408	0.615	0.612	0.649	0.694	0.643	0.644

a/ Dependent variable is FX credit to total credit in 2007. Kcont, Fincontrol, and Fxreg are averaged over 2003-05. Domreg pertain to the measures in place in 2005. Constant, lagged private credit to GDP, a dummy variable for the de facto exchange rate regime (=1 if fixed exchange rate; 0 otherwise), and institutional quality (ICRG) index included as control variables in all regressions.

b/ Dependent variable is FX credit to total credit. Kcont, Fincontrol, Fxreg, and Domreg are lagged by one year. Domreg is available for 2005 and 2007 only. Constant, and region specific and time effects included. Lagged private credit to GDP, lagged dummy variable for a de facto fixed exchange rate regime, (log) of real GDP per capita, and institutional quality (ICRG) index included as control variables in all regressions. Notes: Kcont is Schindler's (2009) capital controls on inflow index.

Policy Measures and Foreign Currency Lending

	Panel data (1995-2008) ^b												
	14	15	16	17	18	19	20	21	22	23	24	25	26
Kcont	-30.626*** (8.941)							-27.779*** (9.408)	-21.790** (9.614)	-17.197* (9.757)	-11.344 (9.832)	-33.889*** (10.800)	-33.731*** (10.859)
Fincont1		-4.937 (8.938)						-6.043 (8.670)					
Fincont2			-16.049 (10.023)						-17.050* (9.949)				
Fxreg1				-27.328*** (7.220)						-24.674*** (6.972)			
Fxreg2					-36.814*** (8.587)						-38.768*** (7.237)		
Domreg1						-2.304 (12.384)						-2.772 (15.563)	
Domreg2							1.310 (14.592)						3.212 (17.292)
Observations	356	373	372	408	402	60	59	309	308	344	342	52	51
R-squared	0.469	0.293	0.317	0.408	0.428	0.169	0.161	0.469	0.488	0.535	0.563	0.350	0.344

Policy Measures and Domestic Credit Booms

	Recent crisis ^a												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Kcont	-6.472 (7.049)							-8.294 (10.929)	-12.913 (10.562)	-3.541 (8.769)	-4.371 (8.081)	-8.036 (6.832)	-6.685 (7.612)
Fincont1		-0.256 (6.187)						4.122 (10.147)					
Fincont2			2.091 (5.882)						10.267 (9.677)				
Fxreg1				-1.417 (6.657)						-3.981 (6.493)			
Fxreg2					-3.795 (7.925)						-3.917 (7.821)		
Domreg1						-14.613** (6.545)						-13.049* (7.046)	
Domreg2							-13.195* (6.416)						-13.957* (7.471)
Observations	36	33	33	36	34	32	30	33	33	35	33	31	29
R-squared	0.478	0.469	0.470	0.463	0.467	0.521	0.529	0.485	0.503	0.481	0.482	0.534	0.564

a/ Dependent variable is the change in private credit to GDP over 2003-07. Kcont, Fincontrol, and Fxreg are averaged over 2003-05. Domreg1 and Domreg2 pertain to the measures in place in 2005. All regressions include a constant, institutional quality (ICRG) index, a dummy variable for de facto exchange rate regime (=1 if fixed exchange rate regime; 0 otherwise), and a dummy variable for public or private credit registries/bureaus in 2007.

b/ Dependent variable is the cumulative three year change in private credit to GDP. Kcont, Fincontrol, and Fxreg are averaged over three lags. Domreg is available for 2005 and 2007 only, and is lagged by one year. Constant, region specific and time effects, an institutional quality (ICRG) index, dummy variable for fixed exchange rate regime (=1 if fixed exchange rate regime; 0 otherwise), dummy variable for public or private credit registries/bureaus, lagged (log of) real GDP per capita, lagged real growth rate of GDP, and three-year lagged private credit to GDP as initial condition included in regressions.

Policy Measures and Domestic Credit Booms

	Panel data (1995-2008) ^b												
	14	15	16	17	18	19	20	21	22	23	24	25	26
Kcont	0.618 (3.293)							3.182 (4.345)	1.454 (4.636)	2.119 (3.171)	5.611 (3.605)	-6.895 (4.943)	-6.476 (4.913)
Fincont1		-1.351 (2.814)						-2.832 (3.873)					
Fincont2			1.788 (3.294)						1.096 (4.588)				
Fxreg1				0.831 (3.244)						-1.217 (3.455)			
Fxreg2					-2.311 (4.457)						-6.975 (5.548)		
Domreg1						-10.404** (4.270)						-10.506** (4.815)	
Domreg2							-7.605 (4.628)						-9.037* (5.259)
Observations	388	366	363	411	383	64	60	317	314	360	341	57	53
R-squared	0.326	0.350	0.349	0.326	0.345	0.442	0.442	0.364	0.360	0.337	0.363	0.408	0.417