A Stable System of Exchange Rate—Implications of the Choice of Regime

Atish Ghosh

Strategic Issues, IMF

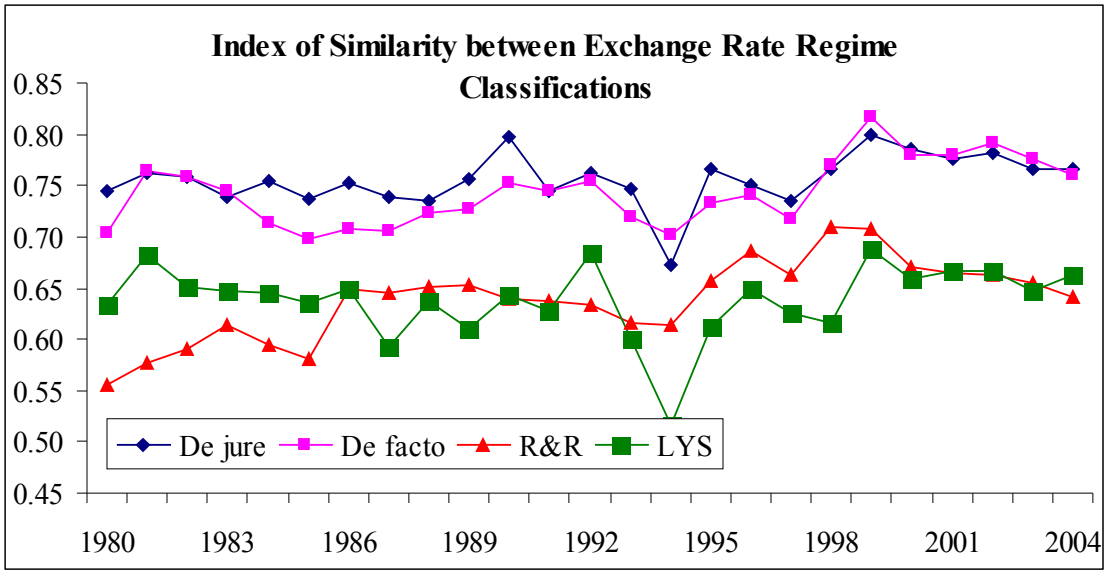
Views expressed herein are those of the author and do not necessarily reflect the views of the IMF

Stable System of Exchange Rates

- Three elements of systemic stability—
- Choice of regime appropriate to achieving domestic macroeconomic goals
  - Macroeconomic policies
  - Inflation
  - Output growth and volatility
  - Crises
- Choice of regime conducive to smooth and efficient interaction with other countries
  - External adjustment
  - Goods market integration
  - Capital flows
- Systemic issues
  - Key exchange rates, global imbalances, reserve currencies

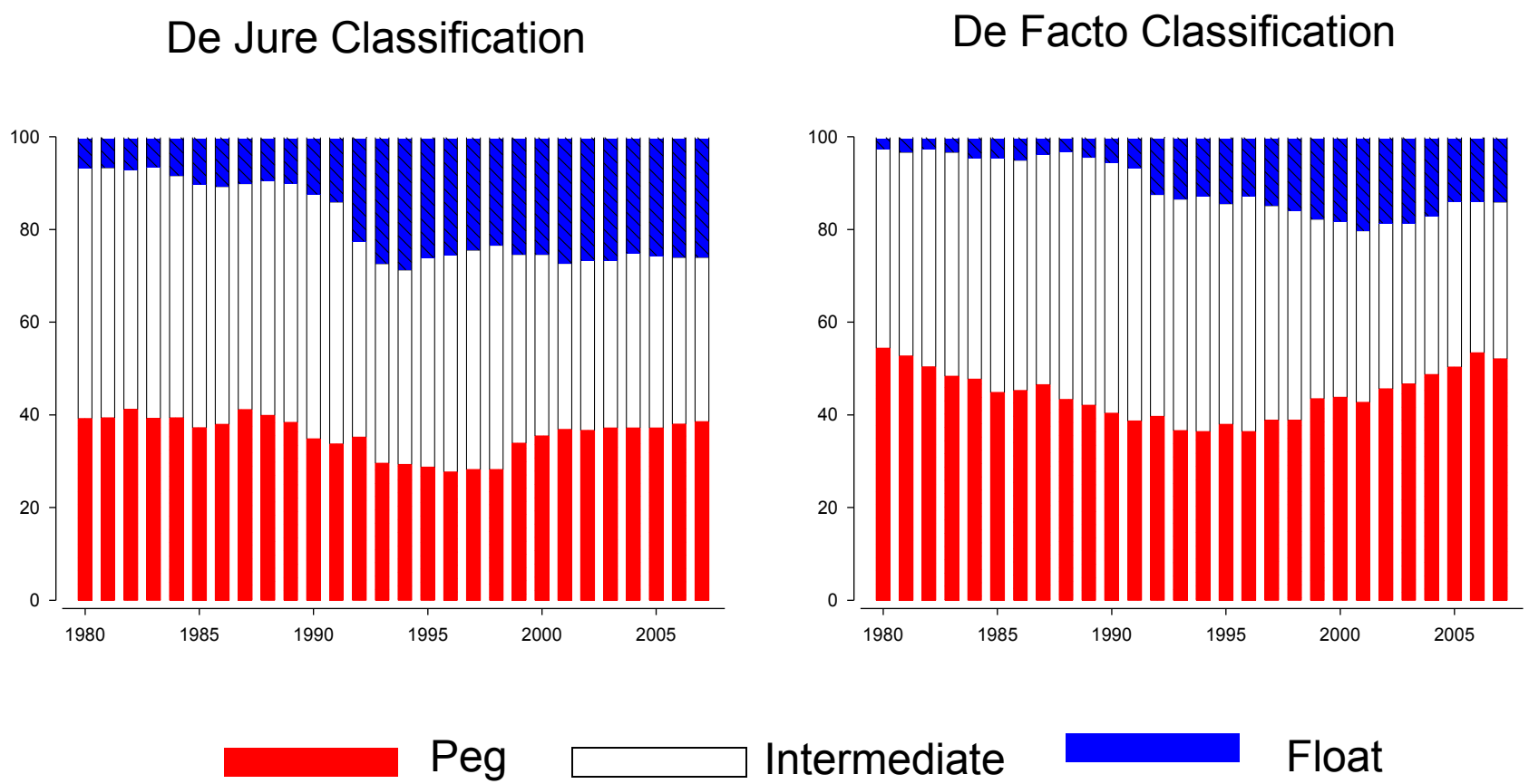
Regime Classification and Data

- De jure vs. de facto classifications



- Sample: 1980-2007; 140 advanced, emerging market, and developing countries

Regime Trends



Regime Trends

- Some hollowing out, but not strict bi-polar
- Floating regimes have become more popular in EMEs, especially de jure
- Divergence de jure floats and de facto pegs

	De Jure Classification		
De Facto Classification	Peg	Int	Flt
Pegged	1588	477	81
Intermediate	92	1677	392
Floating	19	53	476
Total	1,699	2,207	949
Percentage consensus	**93.5**	**76.0**	**50.2**

Inflation

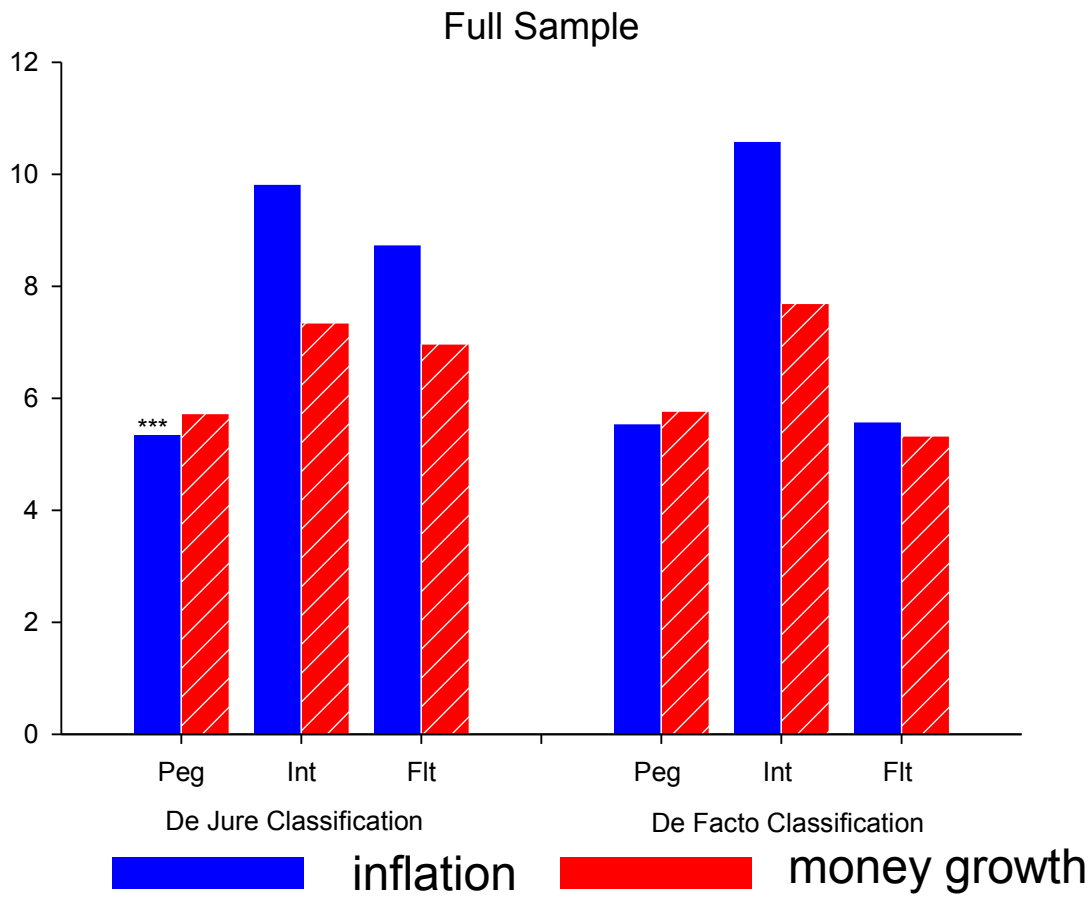
Inflation (in percent per year)						
	De jure			De Facto		
	Peg	Int	Flt	Peg	Int	Flt
All countries	8.0	10.8	13.6	11.0	15.5	9.5
Advanced	2.7	6.7	3.6	2.7	7.5	2.8
Emerging market	11.6	12.9	17.1	11.0	15.5	10.4
Developing	8.1	11.1	17.4	8.2	13.2	15.9

Table 2 Inflation Regression 1/

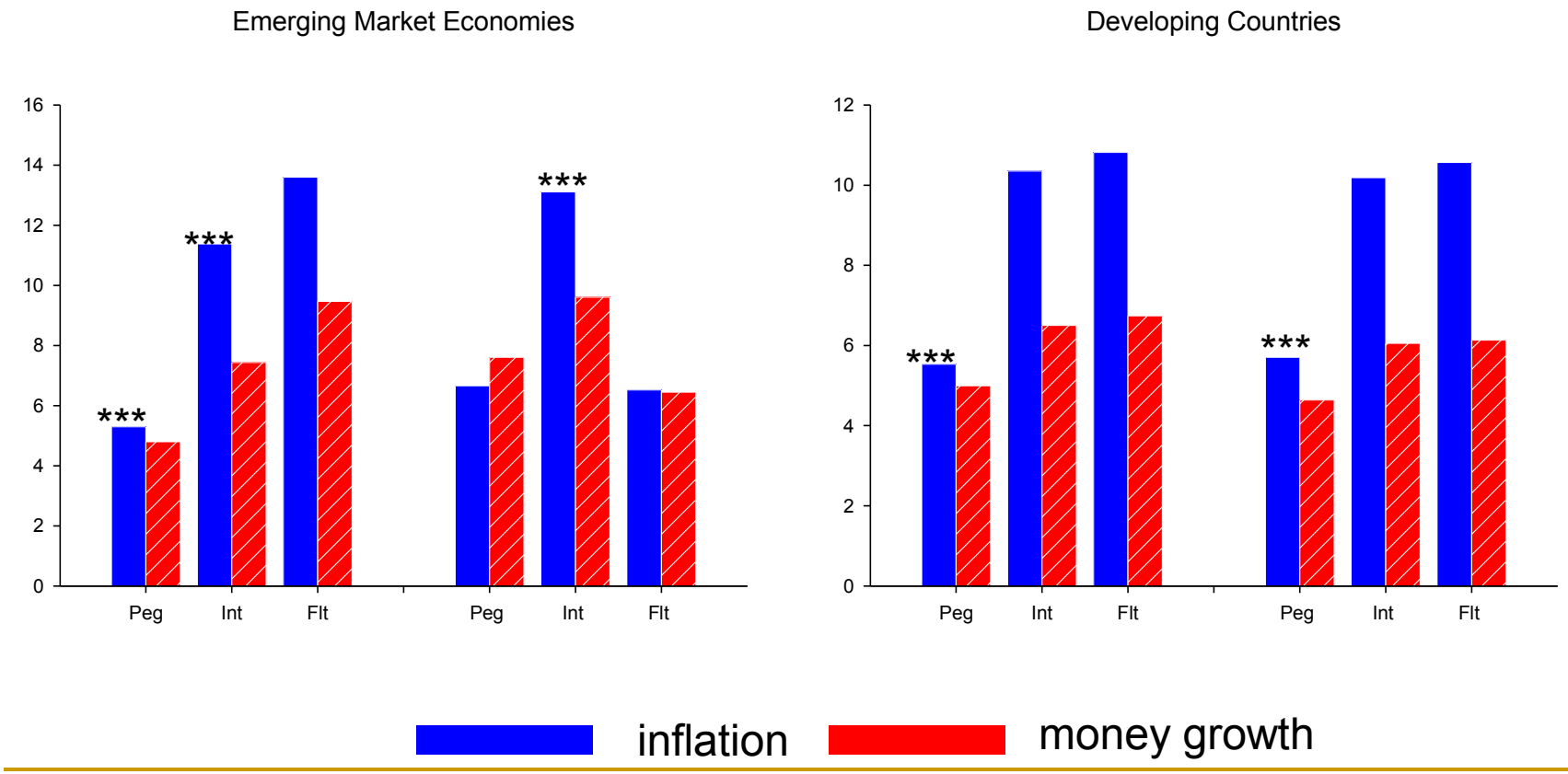
5 $_{Peg}$Peg $_{Int}$Int $_{Mon}$ m GDP Open CBTurn TT Fisc. Bal.

	De Jure Classification		De Facto Classification	
	Direct Effect 2/	Total Effect 2/	Direct Effect 2/	Total Effect 2/
[1] All countries				
Constant	0.031 ***	0.031 ***	0.015 *	0.015 *
Pegged regimes	-0.020 ***	-0.046 ***	-0.007	-0.002
Intermediate regimes	0.004	0.003	0.020	0.055 ***
Money growth	0.376 ***	0.376 ***	0.373 ***	0.373 ***
GDP growth	-0.463 ***	-0.463 ***	-0.436 ***	-0.436 ***
Openness	-0.021 ***	-0.021 ***	-0.019 ***	-0.019 ***
Central bank turnover rate	0.052 ***	0.052 ***	0.048 ***	0.048 ***
Terms of trade growth	0.001	0.001	0.013	0.013
Fiscal balance (in pct. of GDP)	-0.077 *	-0.077 *	-0.152 ***	-0.152 ***
Number of observations, R^2	2174	0.47	2065	0.48

Inflation

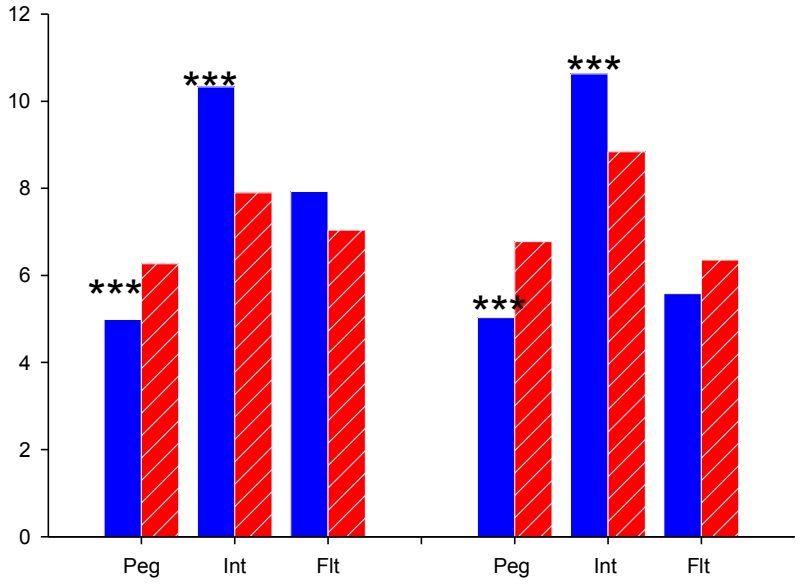

Full Sample
12
10
8
6
4
2
0
***
Peg
Int
Flt
Peg
Int
Flt
De Jure Classification
De Facto Classification
inflation
money growth

Inflation

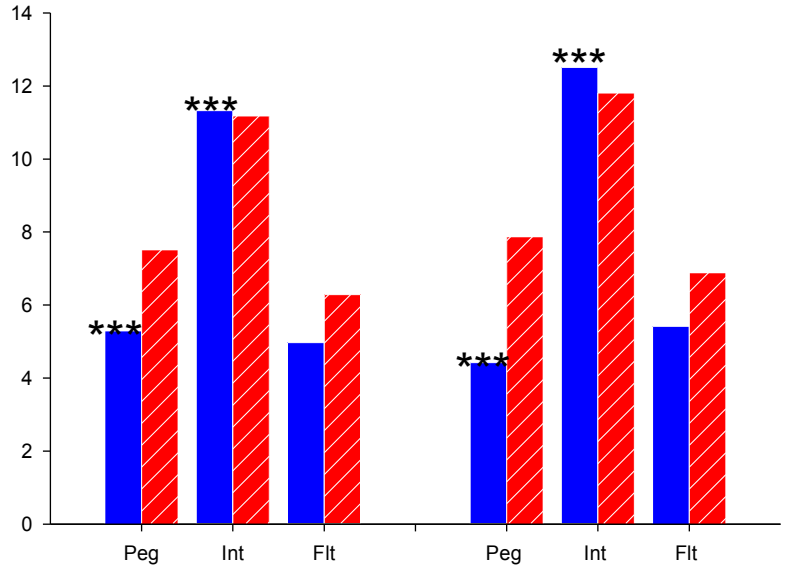

Emerging Market Economies
Developing Countries
16
14
12
10
8
6
4
2
0
12
10
8
6
4
2
0
***
***
***
***
Peg
Int
Flt
Peg
Int
Flt
Peg
Int
Flt
Peg
Int
Flt
inflation
money growth

Inflation

De jure and De facto Concensus Classification--Full Sample

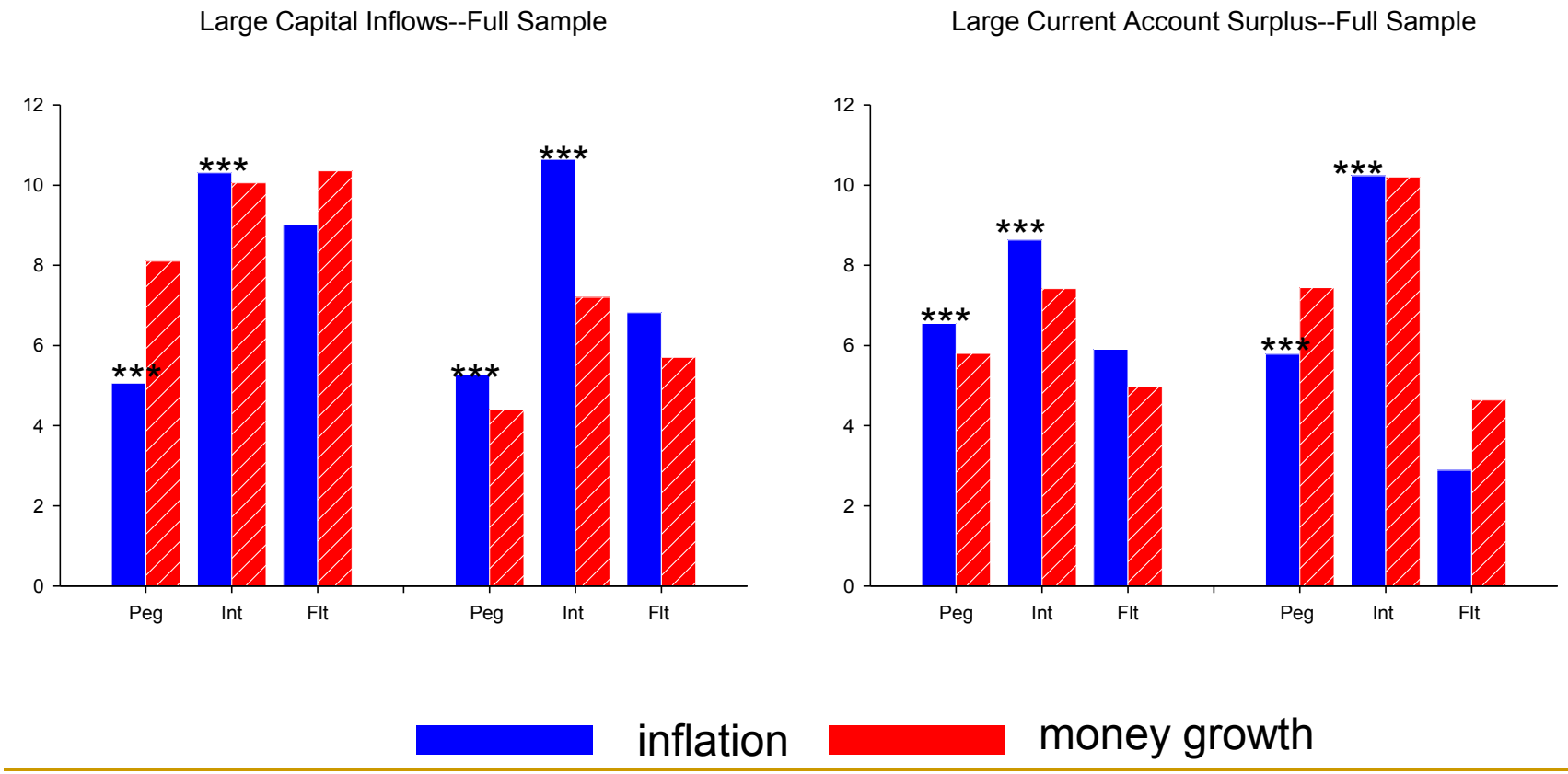


Comparison to IT Floating Regimes--EME Sample



inflation money growth

Inflation—Capital Inflows and Current Account Surpluses



Output Growth

Output Growth (per capita, in percent per year)						
	De jure			De Facto		
	Peg	Int	Flt	Peg	Int	Flt
All countries	1.4	1.9	1.4	1.6	1.7	1.5
Advanced	2.5	2.3	1.9	2.5	2.2	1.9
Emerging market	1.2	2.4	1.5	1.7	2.2	1.6
Developing	1.3	1.5	1.1	1.4	1.4	1.1

Indirect Effects of Regime on Output Growth 1/				
	De Jure		De Facto	
	Peg	Int	Peg	Int
Comp. real exch. 2/	-0.15 ***	0.06 **	-0.03	0.15 ***
Real exch. vol. 3/	-0.94 ***	0.00	-1.34 ***	-0.33
Price vol. 3/	0.20	-0.34 ***	0.17	-0.31 ***
Inflation	-0.01	0.03 ***	0.00	0.05 ***
Trade openness	0.36 ***	0.13 ***	0.38 ***	0.13 ***

1/ Relative to floating regimes; includes other controls from growth regression
2/ Higher value indicates more competitive (less overvalued) real exchange rate
3/ Volatility measured as standard deviation of monthly growth rates

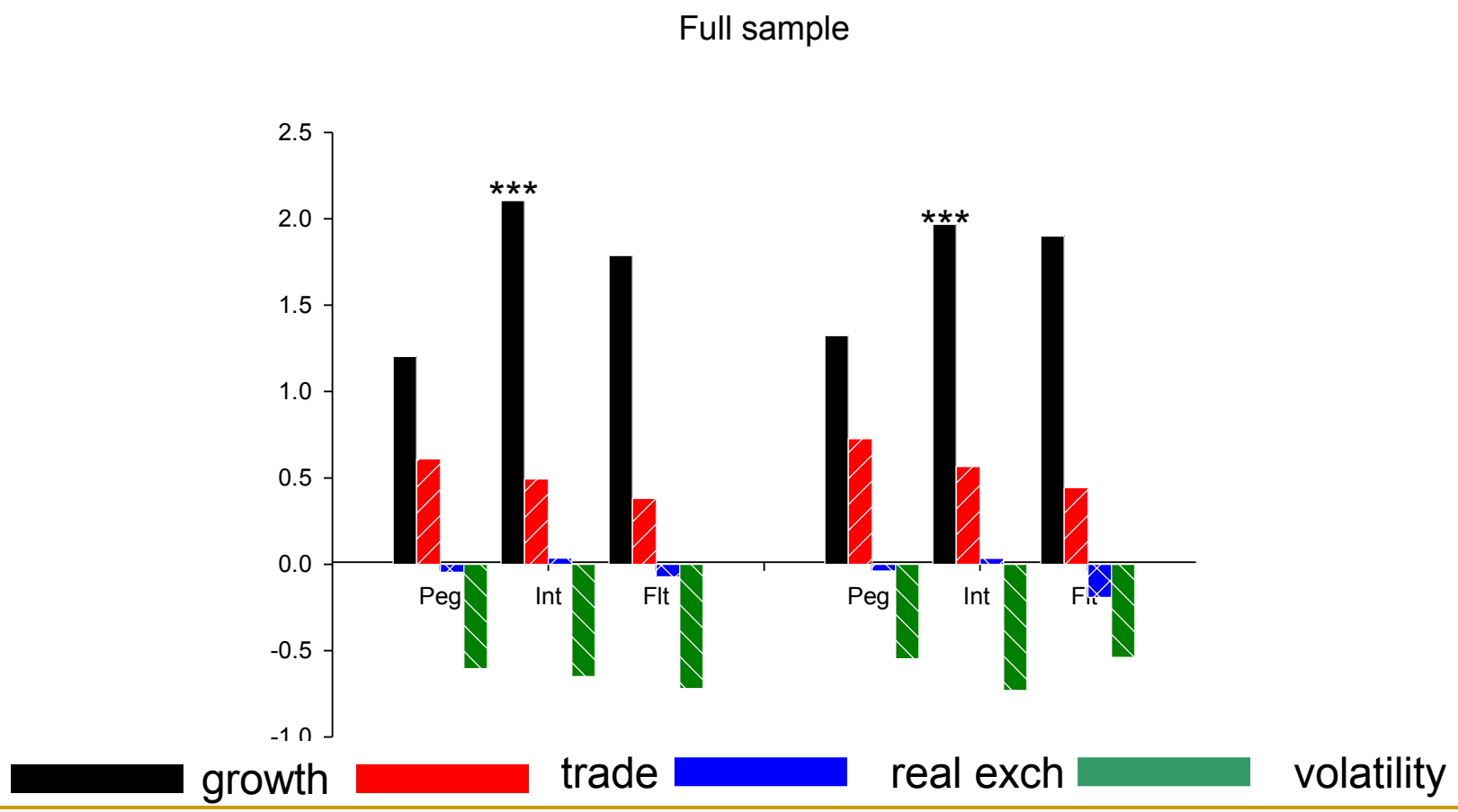
Output Growth

Table 3 Growth Base Regression 1/

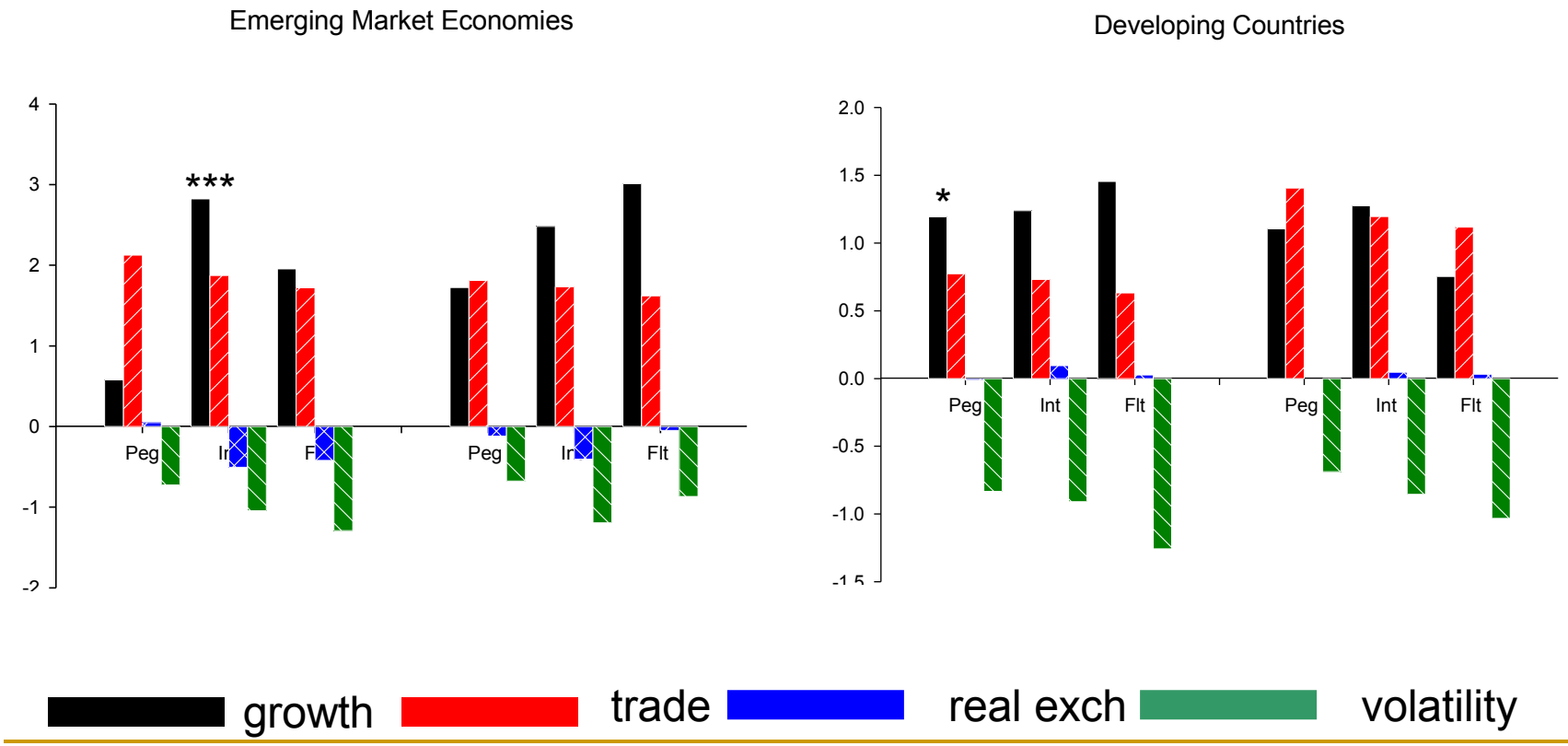
y^{pc} $_{Peg}$Peg $_{Int}$Int $_{Mon}$ m GDP Open CB Turn TT Fisc. bal.

	De Jure Classification				De Facto Classification		
	Direct Effect		Total Effect 2/		Direct	Total Effect 2/	
	coef.	t-stat.	coef.	t-stat.	coef.	coef.	t-stat.
[1] All countries			Baseline Regression				
Constant	0.022	1.05	-0.005	-0.29	0.012	-0.007	-0.40
Pegged regimes	-0.008	-2.64 ***	-0.004	-1.90 *	-0.005	-0.001	-0.22
Intermediate regimes	0.003	1.16	0.006	2.91 ***	0.003	0.005	2.05 **
Initial per capita income	-0.011	-6.29 ***	-0.011	-6.29 ***	-0.010 ***	-0.010	-5.56 ***
Population growth (in pct.)	-0.034	-5.10 ***	-0.034	-5.10 ***	-0.032 ***	-0.032	-4.84 ***
Average years of schooling	0.003	4.50 ***	0.003	4.50 ***	0.003 ***	0.003	5.07 ***
Terms of trade growth	0.011	0.82	0.011	0.82	0.014	0.014	1.17
Real exchange rate volatility (in pct.)	0.000	-1.57	0.000	-1.57	-0.001 *	-0.001	-1.76 *
Price volatility (in pct.)	-0.002	-2.34 **	-0.002	-2.34 **	-0.001 *	-0.001	-1.86 *
Competitiveness	0.008	2.89 ***	0.008	2.89 ***	0.008 ***	0.008	2.80 ***
Investment (in pct. of GDP)	0.018	4.00 ***	0.018	4.00 ***	0.016 ***	0.016	3.51 ***
Inflation (in pct.)	-0.025	-1.62	-0.025	-1.62	-0.028 *	-0.028	-1.81 *
Fiscal balance (in pct. of GDP)	0.087	3.12 ***	0.087	3.12 ***	0.079 ***	0.079	2.70 ***
Government spending (in pct. of GDP)	-0.008	-2.77 ***	-0.008	-2.77 ***	-0.009 ***	-0.009	-2.84 ***
Openness	0.006	2.65 ***	0.006	2.65 ***	0.008 ***	0.008	3.02 ***
Number of observations, R^2	1742	0.18	1742	0.18	1667	1667	0.18

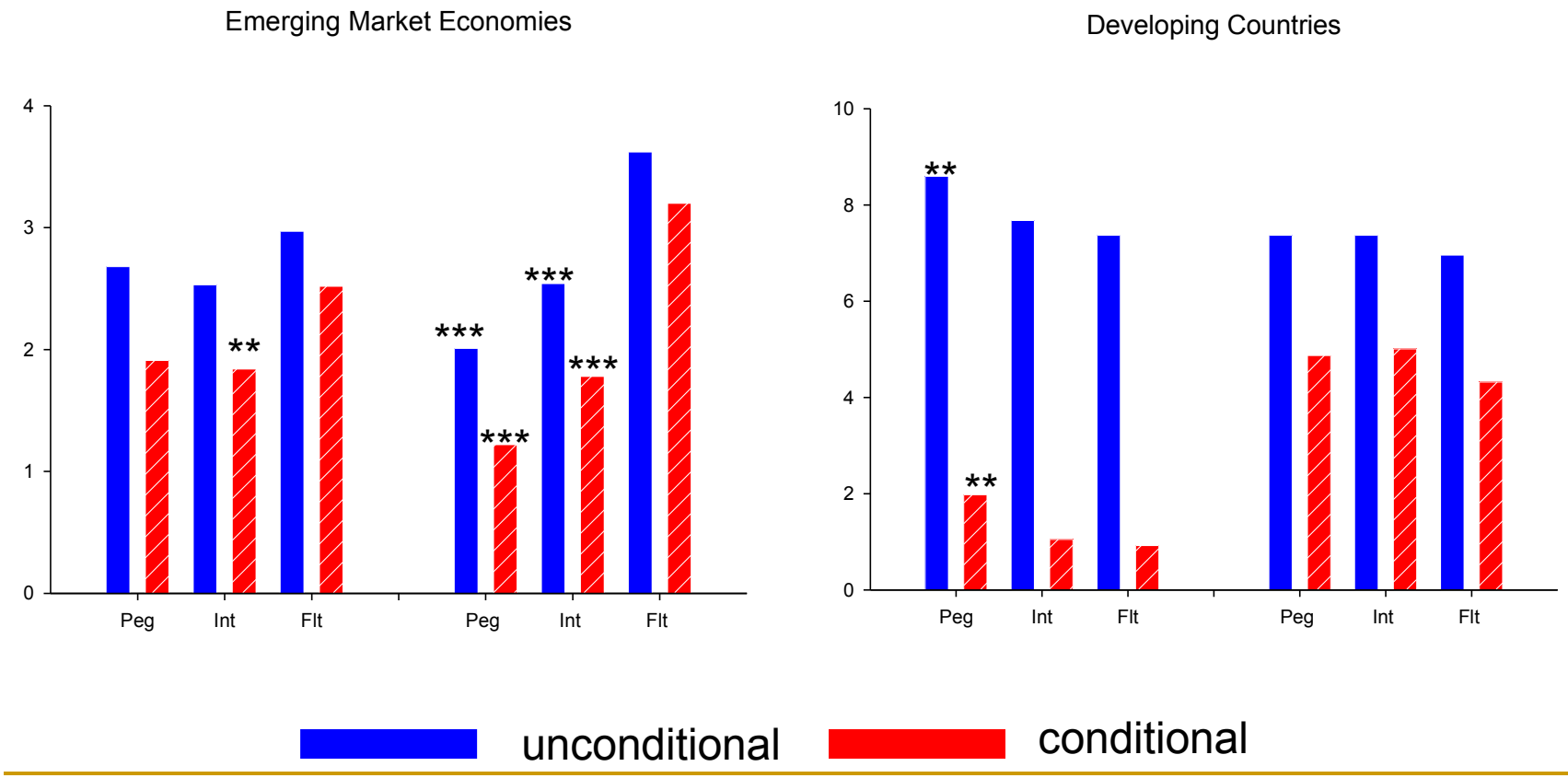
Output Growth



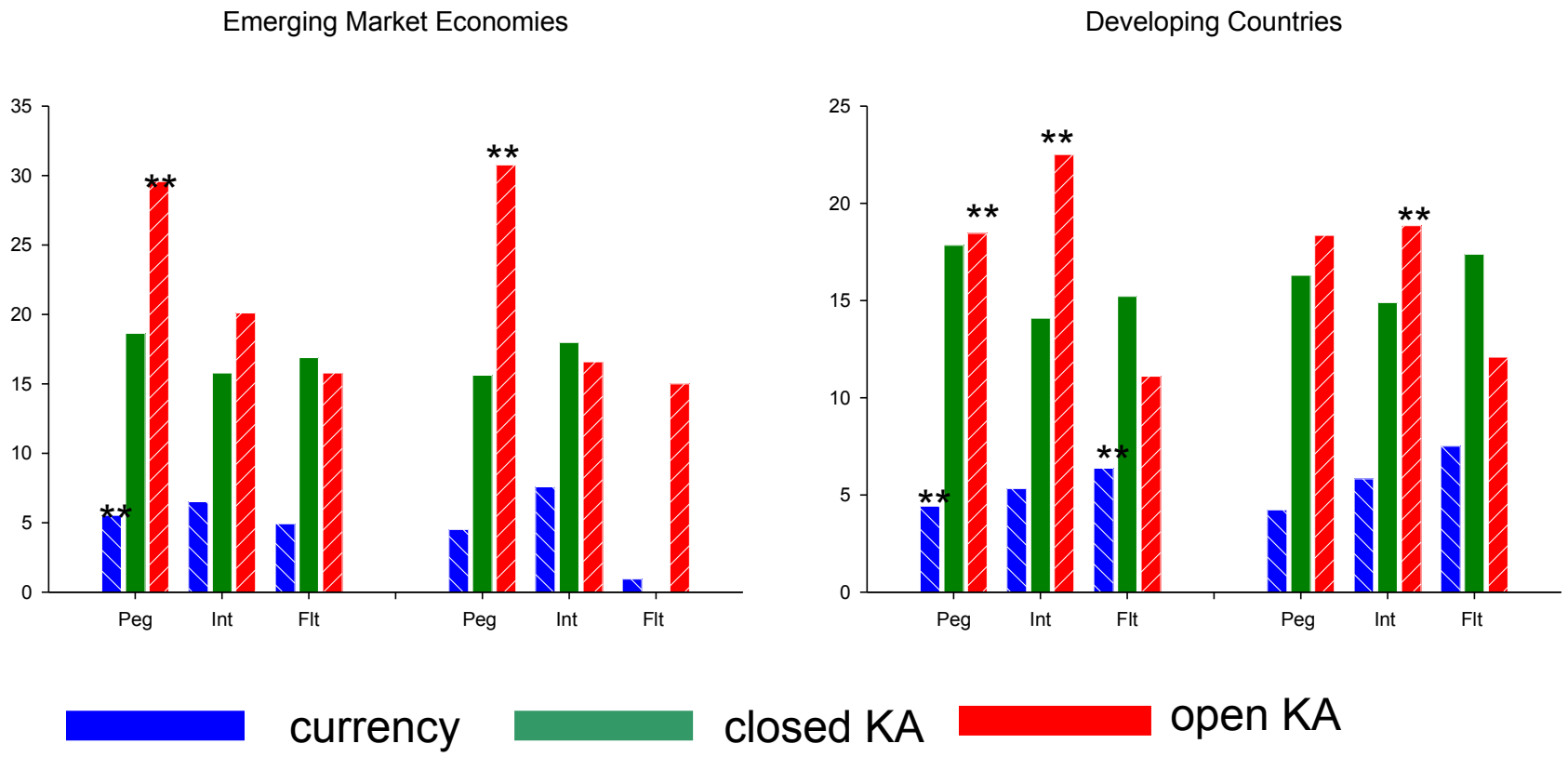
Output Growth



Output Volatility



Susceptibility to crises



External Adjustment

Current Account Balances (in percent of GDP)						
	De Jure			De Facto		
	Peg	Int	Flt	Peg	Int	Flt
Advanced						
Surpluses	5.4	5.0	4.2	5.3	4.5	5.0
Deficits	-4.4	-3.3	-3.8	-3.7	-3.4	-3.9
Emerging market						
Surpluses	7.9	4.1	2.6	5.9	4.2	2.4
Deficits	-5.7	-4.5	-3.4	-5.5	-4.4	-2.7
Developing						
Surpluses	6.2	8.4	6.1	7.0	7.7	4.6
Deficits	-10.7	-8.3	-8.4	-10.2	-8.6	-7.1

External Adjustment

Table 2. Current Account Reversals (in percent)

	De Jure Classification				De Facto Classification			
	Balance prior to reversal 2/				Balance prior to reversal 2/			
	Mean	Upper quartile	Lower quartile	Frequency 3/	Mean	Upper quartile	Lower quartile	Frequency 3/
Emerging markets								
Surplus reversal								
Pegged regimes	10.9	14.8	8.4	0.9	10.4	9.4	14.8	0.8
Intermediate regimes	9.1	12.2	5.3	0.9	8.8	7.7	11.7	1.0
Floating regimes	5.0	6.0	4.1	0.3	…	…	…	0.0
Deficit reversal								
Pegged regimes	-10.6	-6.5	-12.5	0.7	-11.4	-9.7	-8.5	0.8
Intermediate regimes	-9.2	-6.5	-11.0	2.0 **	-8.6	-8.0	-6.4	1.9 **
Floating regimes	-10.3	-7.2	-13.5	0.7	…	…	…	0.0
Developing countries								
Surplus reversal								
Pegged regimes	12.3	14.2	7.2	1.4	11.5	9.9	14.2	0.9
Intermediate regimes	10.5	10.2	5.1	0.9	11.7	6.6	14.5	1.0
Floating regimes	6.6	8.5	5.1	0.5	6.6	6.3	8.5	1.1
Deficit reversal								
Pegged regimes	-22.2	-11.2	-23.2	4.9	-20.6	-14.3	-9.6	4.6
Intermediate regimes	-19.7	-8.5	-17.4	2.8	-20.8	-13.1	-9.9	2.9 *
Floating regimes	-13.7	-8.8	-18.2	3.1 *	-10.4	-9.9	-9.1	2.9

1/ Current account reversals defined as in Freund (2005). A minimum threshold of 2 (-2) was used to identify surplus (deficit) reversals for advanced economies, and of 4(-4) for emerging market and developing countries.
2/ Maximum surplus or deficit prior to the reversal, in percent of GDP
3/ Frequency as a proportion of exchange rate regime observations
4/ Asterisks denote differences from pegged regime proportions that are significant at the 10 (*), 5 (**), and 1 (***) percen

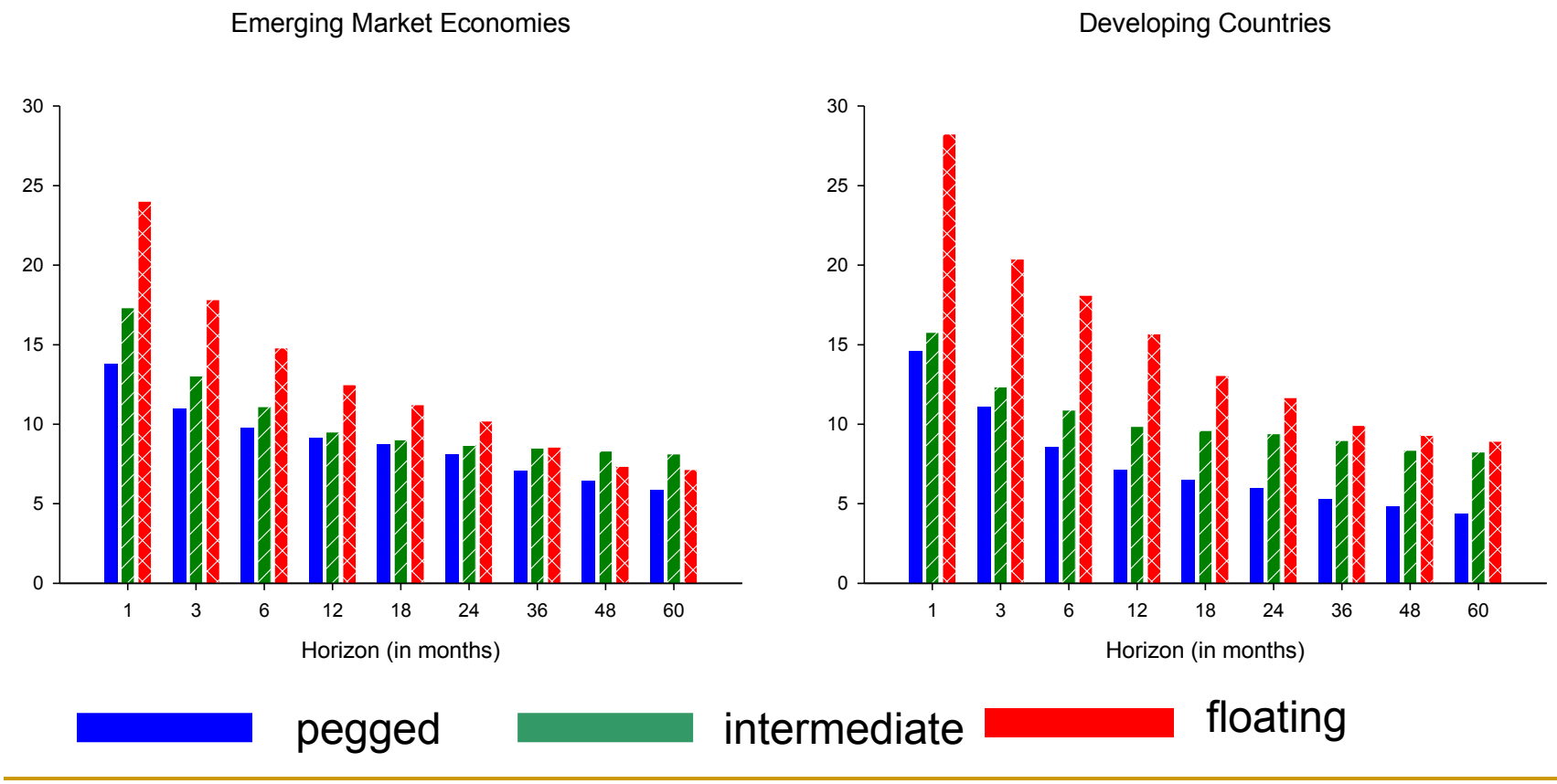
External Adjustment

Deficit: $CA = \pi_0 + \pi_1 CA(-1) + \pi_2 CA(-1)*1[CA(-1)<q.25] + \pi$

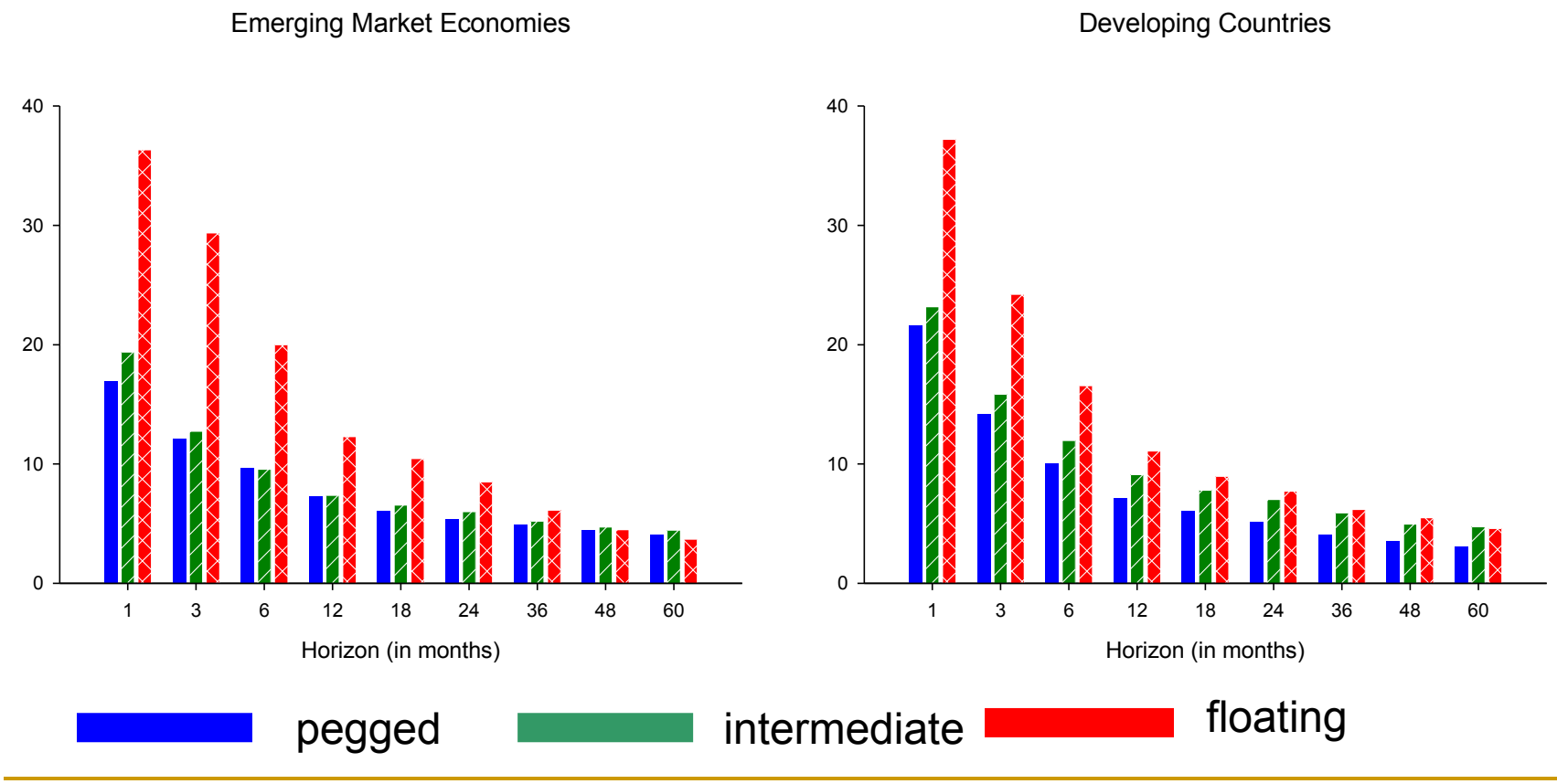
Surplus: $CA = \pi_0 + \pi_1 CA(-1) + \pi_2 CA(-1)*1[CA(-1)>q.75] + \pi$

	De Jure Classification				De Facto Classification			
	Deficit		Surplus		Deficit		Surplus	
	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.	coef.	t-stat.
Pegged Exchange Rate Regimes								
CA_{t-1} [1/]	0.53	12.42 ***	0.50	9.30 ***	0.65	11.17 ***	0.51	9.90 ***
CA_{t-1} [1/] x 1(CA_{t-1}?q.25) [3/]	-0.01	-0.19	...		-0.11	-1.69 *	...	
CA_{t-1} [1/] x 1(CA_{t-1}?q.75) [3/]	...		0.16	1.59	...		0.30	2.94 ***
Number of observations	1054		1054		1298		1298	
Intermediate Exchange Rate Regimes								
CA_{t-1} [1/]	0.66	17.78 ***	0.16	1.27	0.58	12.30 ***	0.14	1.12
CA_{t-1} [1/] x 1(CA_{t-1}?q.25) [3/]	-0.44	-3.10 ***	...		-0.40	-2.88 ***	...	
CA_{t-1} [1/] x 1(CA_{t-1}?q.75) [3/]	...		0.73	4.98 ***	...		0.67	4.16 ***
Number of observations	1728		1728		1683		1683	
Floating Exchange Rate Regimes								
CA_{t-1} [1/]	0.51	4.56 ***	0.48	7.45 ***	0.51	7.71 ***	0.40	3.21 ***
CA_{t-1} [1/] x 1(CA_{t-1}?q.25) [3/]	-0.03	-0.29	...		-0.17	-1.24	...	
CA_{t-1} [1/] x 1(CA_{t-1}?q.75) [3/]	...		0.02	0.09	...		0.04	0.27
Number of observations	717		717		373		373	

Nominal Exchange rate volatility



Real Exchange rate volatility



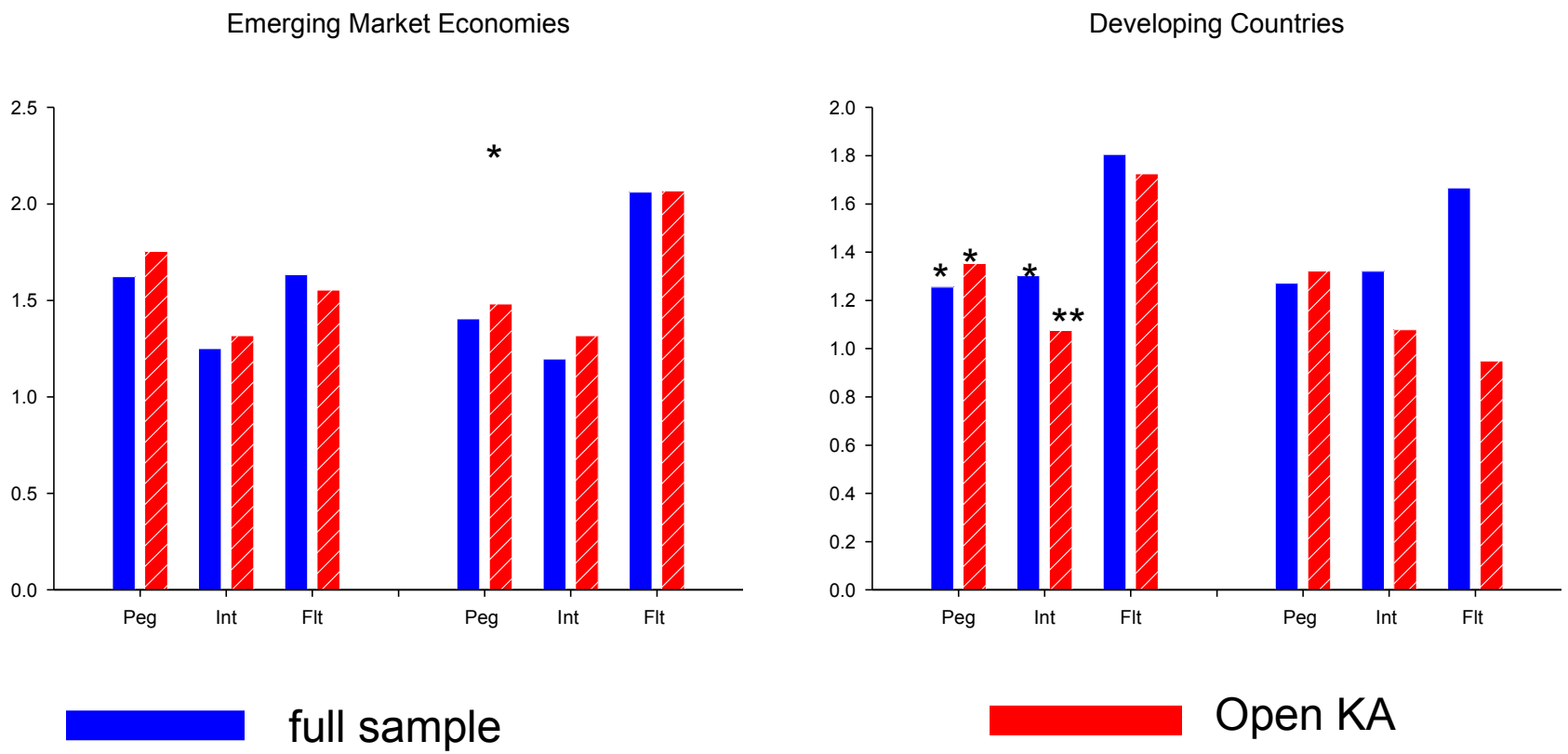
Impact on Trade

Table 1a. Baseline Regression, De Jure

Various Country Samples (1980-2006)

Sample:	World	Ind-Ind	Ind-Nind	Nind-Nind	AFR-world
Estimation:	HT	HT	HT	HT	HT
Specification:	(4)	(8)	(12)	(16)	(20)
cu	0.189**	0.232***	0.118	0.07	0.367
	(0.09)	(0.03)	(0.21)	-0.300	(0.24)
direct_noncu_dj	0.188**	0.11	0.124**	(0.60)	0.471***
	(0.08)	(0.07)	(0.06)	(1.06)	(0.14)
indirect_dj	-0.103***	-0.004	-0.027	-0.0808**	-0.032
	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
vol2_y_s	-0.009	-0.007	0.003	-0.111***	-0.013
	(0.01)	(0.01)	(0.01)	-0.03	(0.02)
vol2_y_l	-0.193***	-0.0294*	-0.129***	-0.193***	-0.280***
	(0.02)	(0.02)	(0.02)	-0.041	(0.04)
ldist	-2.136***	-0.381***	-1.107***	-2.665***	-2.674***
	(0.08)	(0.10)	(0.16)	-0.13	(0.19)
lrgdp	1.318***	0.371***	0.471***	1.234***	1.762***
	(0.03)	(0.05)	(0.04)	-0.043	(0.05)
lrgdppc	-0.0640**	0.840***	0.833***	-0.143***	-0.732***

Consumption-smoothing capital flows (ratio cons. vol. to output vol.)



Conclusions

- Inflation
  - Pegged exchange rates for emerging market/developing countries lacking other policy credibility mechanisms
  - Need de jure commitment to peg for credibility; just de facto peg does not capture low inflation benefit
  - Pegged exchange rates do not give lower inflation in countries with large current account surpluses
- Growth
  - No trade-off between growth and inflation: low inflation and volatility is one of the factors contributing to growth.
  - Balance between avoiding inflation, volatility, overvaluation of the real exchange rate.
  - Intermediate regimes (includes basket pegs) get best balance and exhibit highest growth (if can avoid inflation, with de jure intermediate). Pegged regimes can be suitable if the country can avoid overvaluation and capture low inflation performance.
- Financial crises
  - Currency crises and growth crises not less likely under floating regimes; for EMEs with open capital accounts, greater vulnerability to financial crisis under pegged/intermediate regimes—therefore, need stronger fundamentals “to compensate” if they want such regimes.

Conclusions (cont.)

- External adjustment
  - Imbalances more likely under pegged/intermediate regimes.
  - Deficit and surplus reversals costly.
  - For countries that are, or are becoming, systemically large, additional responsibility to avoid large imbalances (e.g., major EMEs with surpluses, and major commodity exporters with surpluses should have more flexible regimes).
- Trade integration
  - for regions seeking greater trade integration, limiting nominal and real exchange rate volatility is useful; the bloc itself can float vis a vis the rest of the world.
- Capital flows
  - Floating exchange rates may be associated with more volatile capital—countries with less developed financial markets may be better off with less flexible regimes.