

External Liabilities And Crisis Risk

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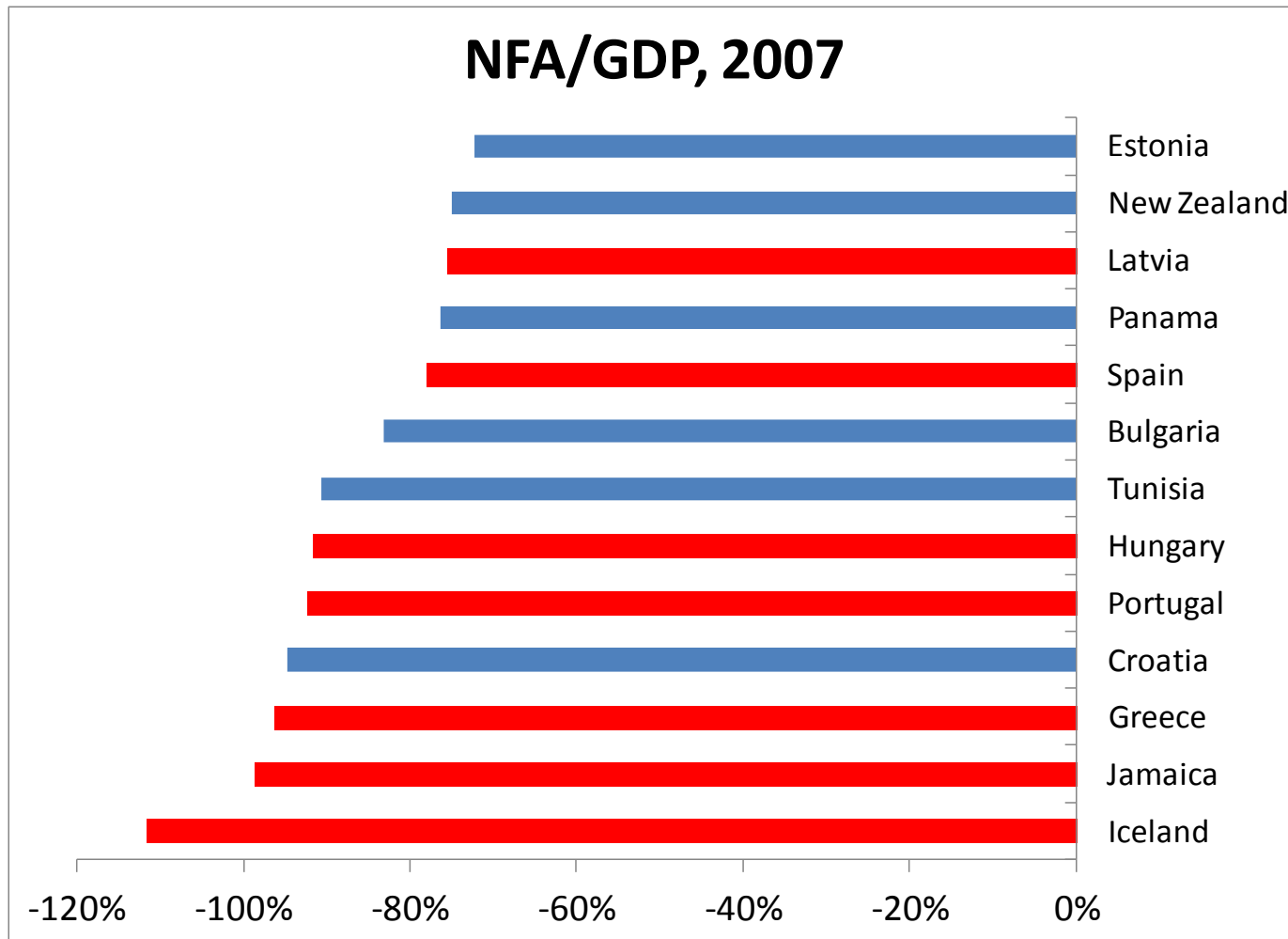
International Monetary Fund

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International Monetary Fund and CEPR

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Motivation



Literature

- Extensive literature on crises and crisis prediction...
- ...but little attention to relation between net external position and probability of crisis (Valdes et al.; Gourinchas-Obstfeld)

Questions

- Is there a systematic link between NFA and external crises?
- Does the composition of the external balance sheet matter?
 - ▣ Net debt (Reserves+Debt claims-Debt liabilities)
 - ▣ Net equity (Net FDI + net portfolio equity)
- Are there “thresholds” for NFA and its composition beyond which the likelihood of crises is particularly high?

Crisis definition

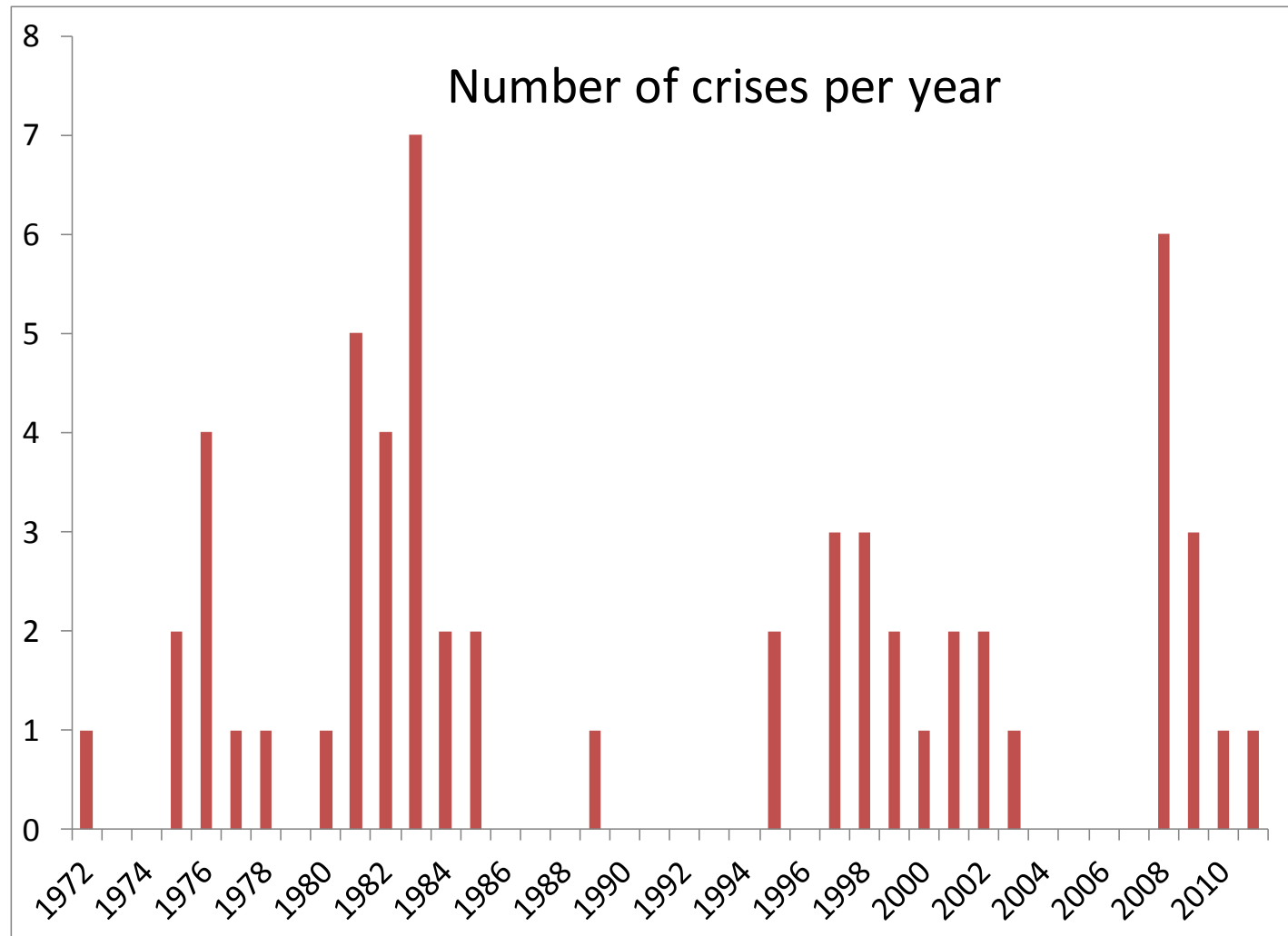
- External default
- IMF program in excess of 200 percent of quota

Also, robustness tests with currency crises

Stylized facts

- Sample of advanced economies and emerging markets (68 countries).
- Total of 60 crises (of which 13 post-2007)
- Dropping recent observations for Iceland (NFL above 500 percent of GDP) and Ireland (high NFL, but extreme values in net debt vs net equity because of mutual fund industry)
- ...so total crises in empirical work=58 (78 broader definition)

Crises are clustered



Crisis characteristics: recent crises (I)

Country	year	NFA	Net debt	Net equity	Net portf. eq.	Net FDI
Ecuador	2008	-27%	-4%	-22%	0%	-22%
Hungary	2008	-97%	-46%	-52%	-6%	-46%
Latvia	2008	-80%	-46%	-34%	0%	-35%
Pakistan	2008	-38%	-16%	-22%	-5%	-17%
Turkey	2008	-48%	-17%	-31%	-10%	-22%
Ukraine	2008	-19%	5%	-24%	-1%	-22%
Dominican Republic	2009	-47%	-10%	-37%	0%	-37%
Romania	2009	-49%	-15%	-33%	-1%	-33%
Serbia	2009	-60%	-26%	-34%	-1%	-32%
Greece	2010	-89%	-88%	-2%	-1%	-1%
Portugal	2011	-116%	-85%	-31%	-12%	-20%
Crisis median		-39%	-24%	-10%	0%	-8%
Crisis mean		-43%	-28%	-14%	-2%	-12%
Whole sample mean		-18%	-5%	-13%	-1%	-12%

Crisis characteristics: recent crises (II)

Country	year	Reserves/ GDP	CA balance	REER gap	IMF debt (% of quota)
Ecuador	2008	6%	4%	-12%	0
Hungary	2008	18%	-7%	11%	406
Latvia	2008	19%	-23%	8%	422
Pakistan	2008	10%	-6%	2%	273
Turkey	2008	11%	-6%	19%	465
Ukraine	2008	22%	-3%	7%	223
Dominican Republic	2009	5%	-8%	11%	223
Romania	2009	18%	-13%	13%	591
Serbia	2009	23%	-20%	12%	218
Greece	2010	0%	-13%	5%	1110
Portugal	2011	2%	-10%	-1%	1117
Crisis median		5%	-5%	5%	219
Crisis mean		7%	-6%	5%	258
Whole sample mean		19%	-1%	0%	22

Regression results: NFA, net debt, net equity

	(1)	(2)	(3)	(4)
NFA	-0.882*** (0.191)			
Net debt		-1.669*** (0.265)	-1.206*** (0.291)	-1.414*** (0.437)
Net equity		-0.161 (0.279)	0.460 (0.329)	0.913** (0.392)
CA			-7.737*** (1.494)	-7.575*** (2.025)
Other			
Obs.	2,032	2,032	2,032	2,032
Ps. R2	0.05	0.08	0.13	0.26

Regression results: other regressors

Other variables	
FX reserves / GDP	-2.183* (1.294)
Rel. GDP per capita	-1.961*** (0.308)
Log “VOX”	2.433** (1.173)
Credit spread	0.335** (0.158)
Real exch. rate gap	2.040*** (0.476)
Observations	2,032
Pseudo R2	0.26

Regression results: net equity vs net FDI

VARIABLES	(4)	(5)
Net debt / GDP	-1.414*** (0.437)	-1.371*** (0.447)
Net equity / GDP	0.913** (0.392)	
Net portf. equity/GDP		-0.664 (0.645)
Net FDI / GDP		1.091*** (0.421)
Current account / GDP	-7.575*** (2.025)	-7.814*** (1.996)
Other controls		
Observations	2,032	2,032
Pseudo R2	0.26	0.27

Robustness tests

- Additional controls
 - Public debt / GDP
 - Exchange rate regime
 - Trade openness/GDP
 - Institutions
 - Domestic credit growth
 - Capital controls
 - Vox * (1-K-controls)
 - Growth

Robustness tests (2)

- Scale NFA and components by exports
- Broader crisis definition
- Net debt liabilities, CA deficits, REER appreciation raise crisis prob
- Reserves, FDI reduce crisis prob
- Unsettled world financial markets increase crisis prob

Robustness tests table

VARIABLES	(1) NFA scaled by exports	(4) EM sample excl. Jordan	(5) Includes MYS and RUS 1998 as crises	(7) Broader crisis definition	(8) Broader crisis definition, 1970-2006
Net debt	-0.330*** (0.0751)	-2.134*** (0.498)	-1.324*** (0.443)	-1.121*** (0.392)	-1.400*** (0.473)
Net port. eq.	-0.313* (0.173)	-2.116 (1.919)	-0.916* (0.490)	-0.586 (0.490)	-0.814 (0.513)
Net FDI	0.0299 (0.167)	1.544*** (0.553)	1.170*** (0.417)	1.306*** (0.337)	1.381*** (0.368)
Current account / GDP	-5.941*** (1.482)	-6.967*** (2.220)	-7.861*** (1.932)	-6.567*** (1.890)	-6.327** (2.525)
FX reserves	-0.547 (0.344)	-3.262* (1.683)	-2.156* (1.195)	-2.159** (1.037)	-3.185** (1.616)
Rel. GDP per capita	-1.680*** (0.346)	0.412 (0.807)	-2.006*** (0.315)	-1.550*** (0.274)	-1.513*** (0.299)
“VOX”	2.170* (1.155)	2.616* (1.568)	2.797** (1.183)	2.404** (1.007)	3.407*** (1.177)
Credit spread	0.370** (0.164)	0.442*** (0.167)	0.293* (0.161)	0.261** (0.115)	0.295** (0.130)
Real exchange rate gap	2.036*** (0.475)	1.999*** (0.493)	2.147*** (0.487)	1.978*** (0.535)	2.329*** (0.549)
Observations	2,027	989	2,033	2,005	1,689
Pseudo R-squared	0.25	0.24	0.26	0.22	0.23

Marginal effects (regression to 2007)

	MARG	Std Error	t stat
Net debt	-1.2%	0.5%	-2.22
Net portf eq	-0.7%	0.4%	-1.51
Net FDI	1.1%	0.5%	2
Lagged CA	-5.0%	2.5%	-2.05
Reserves	-2.0%	1.4%	-1.4
Rel GDPPC	-1.3%	0.5%	-2.49
VOX	3.7%	1.8%	2.04
Credit spread	0.3%	0.1%	2
REER gap	1.5%	0.7%	2.32

Predictive power

name	year	crisis	Predicted	Predicted
Brazil	2009	0	22.1%	9.1%
Dominican Republic	2009	1	23.8%	10.4%
Ecuador	2008	1	0.1%	0.2%
Estonia	2009	0	20.7%	8.3%
Greece	2008	0	26.0%	26.8%
Greece	2009	0	74.6%	44.0%
Greece	2010	1	75.4%	52.3%
Guatemala	2009	0	23.8%	10.1%
Hungary	2008	1	1.1%	2.2%
Latvia	2008	1	14.3%	16.8%
Lithuania	2009	0	33.0%	14.3%
Pakistan	2008	1	3.6%	5.7%
Portugal	2009	0	67.2%	38.1%
Portugal	2010	0	70.9%	49.6%
Portugal	2011	1	29.0%	24.1%
Romania	2009	1	24.3%	10.4%
Serbia	2009	1	49.4%	25.5%
Spain	2009	0	59.7%	30.5%
Spain	2010	0	59.0%	37.1%
Turkey	2008	1	3.2%	5.1%
Ukraine	2008	1	0.2%	0.5%

Conclusions

- Net external position matters for crisis risk
 - ▣ Net debt liabilities increase crisis risk
 - ▣ Not so net equity (particularly FDI)
 - ▣ CA deficit, REER appreciation raise crisis risk
 - ▣ ...and so do unsettled global financial market conditions