

***Cross-Country Causes and  
Consequences of the Crisis:  
An Update***

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# Objective

- Update Rose and Spiegel (2009a, b) “RS”
- Search for simple quantitative models of macroeconomic, financial indicators of ‘Great Recession’ of 2008-09
- Retain cross-country approach

# Methodology

- Check sensitivity of most successful results of others.
- These vary in different dimensions:
  - (10) Crisis Causes
  - (7) Indicators of Crisis Intensity
  - (6) Country Samples

But not in estimation (almost all OLS!)

# Findings

- 'Great Recession' progressive; countries with higher income suffer worse crises (as in RS)
- Few other robust results, except
  - Current Account surplus provides insulation

# Rose and Spiegel (2009a, b)

- Objective: link causes and consequences of ‘Great Recession’ across countries
- Cross-Sectional approach (only “easier” problem of *crisis incidence, not timing*)
- Data gathered in Spring 2009

# RS Considered Broad Range Crisis Causes

- Over 80 “national” causes/vulnerabilities
- Over 40 “international” linkages
- All dated 2006 (or earlier)

# RS Modeling Strategy

- Link causes to multiple crisis consequences
  - 4 Crisis Manifestations – 2008 changes in: a) Real GDP; b) National Stock Market; c) SDR Exchange Rate; and d) Country Credit Rating
- MIMIC model to account for measurement error

# RS: Few Robust Linkages

- 2003-06 larger stock market run-up: bigger crisis
- Higher 2006 real GDP per capita: bigger crisis



# Negative Conclusion of RS

- Reliable Early Warning System (EWS) difficult if can't even model cross-country incidence!

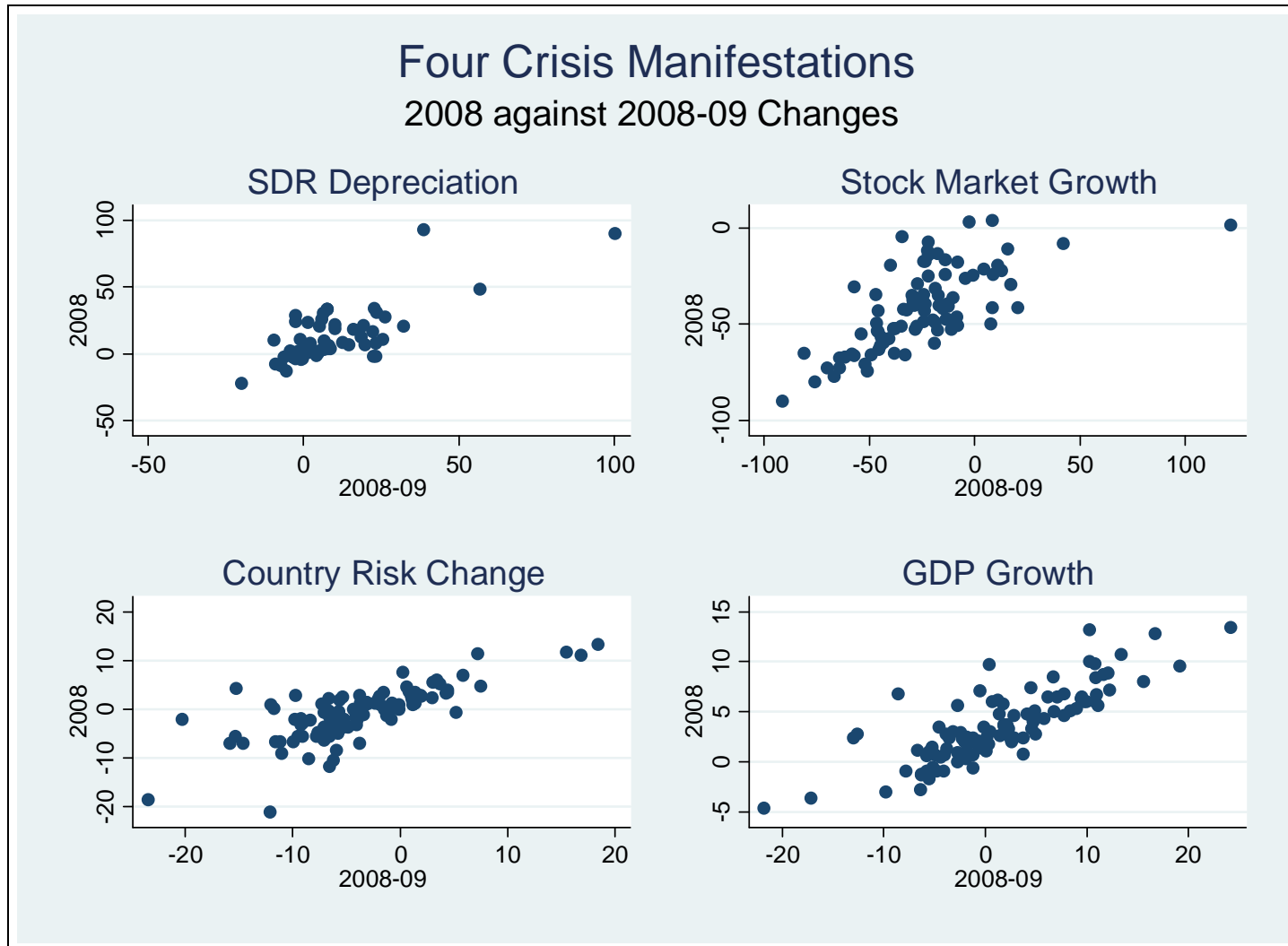
# Two Reasons to Question Reliability

- What about more recent data?
- Others have found (a few) more positive results ... ?

# Cross-Sectional Data Set

- Same 107 countries as RS
- All countries/territories with real GDP per capita at least \$10,000 in 2003
- All countries/territories with real GDP per capita at least \$4,000 in 2003 *and* population at least 1 million

# 2008-09 and 2008 Data *Highly* Correlated



# RS with New Data

- MIMIC model

$$y_{i,j} = \beta_j \xi_i + \nu_i$$

$$\xi_i = \gamma_k x_{i,k} + \zeta_i$$

# Parameterization for Updating RS

- Four Consequences – 2008-09 changes in: a) GDP; b) stocks; c) country credit rating; d) SDR exchange rate
- Three Successful Crisis Causes from RS:
  - 2006 Real GDP per capita as control
  - 2003-06 stock market run-up
  - Proportion 2006 trade with US

## Table 1: 2008-09 MIMIC Estimates

<b>Log Real GDP per capita, 2006</b>	-16.4** (3.9)	-12.9* (5.4)	-6.4 (5.2)	-8.6 (13.9)
<b>Growth in Market Capitalization 2003-06</b>	-8.3** (3.2)	-8.9** (3.45)	-10.7** (3.2)	-8.6 (5.3)
<b>Trade with USA, % total 2006 trade</b>	.32 (.20)	.36 (.21)	.61** (.21)	.25 (.41)
<b>Current Account %GDP, 2006</b>		.2 (.3)	.2 (.3)	.1 (1.1)
<b>Credit Market Regulation, 2006</b>		-2.0 (3.4)	2.0 (3.1)	-2.1 (5.9)
<b>Growth in Bank Credit %GDP, 2000-06</b>		-.14 (.11)	-.23** (.08)	-.1 (.4)
<b>Real House Price growth, 2000-06</b>			-.01 (.05)	
<b>ST External Debt % GDP, 2006</b>				-.6 (.9)
<b>Observations</b>	81	75	43	38

# Results Similar to RS

- Negative, usually significant effects on real GDP per capita and stock market growth
- Little else
- But MIMIC methodology may be special



# Emerging Literature

- Four Big Differences from RS
  1. Measures of Crisis Intensity
  2. Potential Causes (Covariates)
  3. Estimator linking causes, intensity
  4. Country Sample

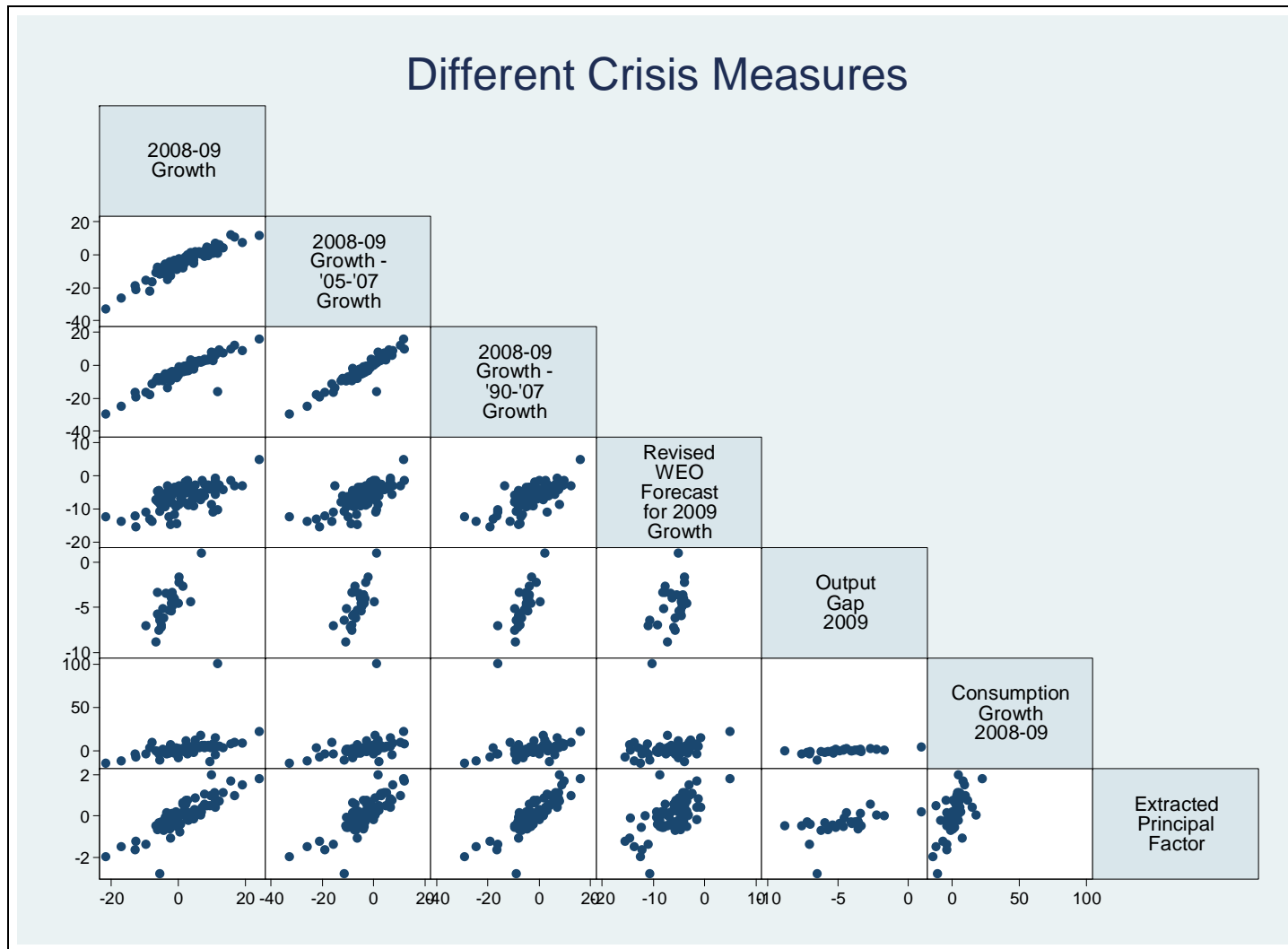
# Key References

- Berkmen, Gelos, Rennhack, Walsh (2009) “BGRW”
- Blanchard, Faruqee and Das (2010) “BFD”
- Claessens, Dell’Arriccia, Igan, Laeven (2010) “CDIL”
- Frankel and Saravelos (2010) “FS”
- Giannone, Lenza and Reichlin (2010) “GLR”
- Lane and Milesi-Fettetti (2010) “LMF”

# Measures of Crisis Intensity (All Univariate)

1. Default: Real 2008-09 GDP growth (from *EIU*)
2. Real GDP growth change, 2008-09 - 2005-07 (LMF)
3. Real GDP growth change, 2008-09 - 1990-07 (BFD)
4. Revision to WEO 2009 growth forecast (BGRW)
5. 2009 output gap (from *OECD*)
6. 2008-09 consumption growth
7. First Principal Factor from 4 RS variables

# Crisis Intensity Measures Correlated



	<b>2008-09 Growth</b>	<b>2008-09 Growth - '05-'07 Growth</b>	<b>2008-09 Growth - '90-'07 Growth</b>	<b>Revised WEO 2009 Growth Forecast</b>	<b>Output Gap 2009</b>	<b>Consumption Growth 2008-09</b>
<b>2008-09 Growth - '05-'07 Growth</b>	.93					
<b>2008-09 Growth - '90-'07 Growth</b>	.92	.94				
<b>Revised WEO 2009 Growth Forecast</b>	.60	.69	.69			
<b>Output Gap 2009</b>	.78	.71	.77	.35		
<b>Consumption Growth 2008-09</b>	.43	.36	.14	.08	.61	
<b>Extracted Principal Factor</b>	.86	.81	.85	.62	.50	.65
<b>Observations</b>	106	99	99	102	28	93

# Causes: Many Unsuccessful Attempts

- Credit %GDP
- Debt %GDP
- Domestic Banking Sector Characteristics
- Fiscal Policy
- Trade Flows
- Capital Flows

# Causes: Some Successes (Investigate All)

- House Price Appreciation (CDIL)
- Credit Growth (BGRW, CDIL, LMF)
- Credit Market Regulation (GLR)
- Current Account %GDP (CDIL, LMF)
- Financial Leverage (BGRW)
- Fixed Exchange Rate Regime (BFD, LMF)
- Reserves (FS, Obstfeld et al for depreciation)
- Short-Term External Debt (BGRW)
- Trading Partner Growth (BFD, LMF)

# Different Country Samples

1. Full sample (107)
2. (51) World Bank High Income
3. (74) IMF non-Advanced
4. (89) non-Oil Exporters
5. (91) non-Small Financial Centers
6. (51) non-oil, non-FC High/Upper-Middle Income



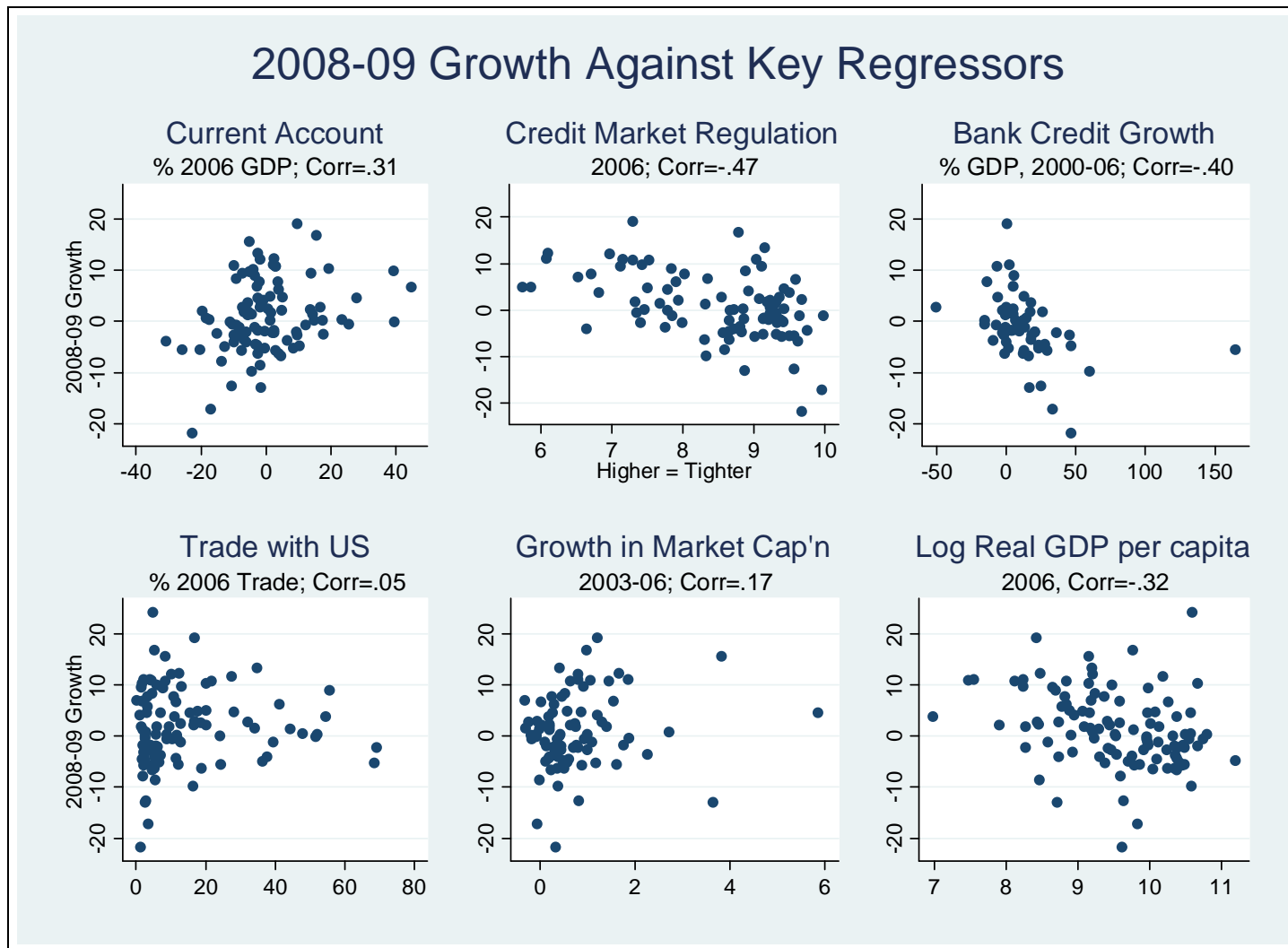
# Countries

Albania	Algeria <sup>c</sup>	Antigua & Barbuda <sup>a</sup>	Argentina
Armenia	Australia <sup>a, b</sup>	Austria <sup>a, b</sup>	Bahamas <sup>a, d</sup>
Bahrain <sup>a, c, d</sup>	Barbados <sup>a, d</sup>	Belarus	Belgium <sup>a, b, d</sup>
Bermuda <sup>a, d</sup>	Botswana	Brazil	Brunei Darussalam <sup>a, c</sup>
Bulgaria	Canada <sup>a, b</sup>	Chile	China
Colombia	Costa Rica	Croatia	Cuba
Cyprus <sup>a, b</sup>	Czech Rep <sup>a, b</sup>	Denmark <sup>a, b</sup>	Dominican Rep
Ecuador <sup>c</sup>	Egypt	El Salvador	Eq. Guinea <sup>a, c</sup>
Estonia <sup>a</sup>	Finland <sup>a, b</sup>	France <sup>a, b</sup>	Gabon <sup>c</sup>
Georgia	Germany <sup>a, b</sup>	Greece <sup>a, b</sup>	Guyana
Haiti	Hong Kong <sup>a, b, d</sup>	Hungary <sup>a</sup>	Iceland <sup>a, b, d</sup>
Indonesia	Iran <sup>c</sup>	Ireland <sup>a, b, d</sup>	Israel <sup>a, b</sup>
Italy <sup>a, b</sup>	Jamaica	Japan <sup>a, b</sup>	Kazakhstan <sup>c</sup>
Korea <sup>a, b, d</sup>	Kuwait <sup>a, c</sup>	Kyrgyz Republic	Latvia
Lebanon	Libya <sup>c</sup>	Lithuania	Luxembourg <sup>a, b, d</sup>
Macau <sup>a, d</sup>	Macedonia	Malaysia	Malta <sup>a, b, d</sup>
Mauritius	Mexico	Morocco	Namibia
Netherlands <sup>a, b</sup>	Netherlands Antilles <sup>a, d</sup>	New Zealand <sup>a, b</sup>	Norway <sup>a, b</sup>
Papua New Guinea	Oman <sup>a, c</sup>	Panama	Paraguay
Peru	Poland	Portugal <sup>a, b</sup>	Puerto Rico <sup>a</sup>
Qatar <sup>a, c</sup>	Romania	Russia <sup>c</sup>	Saudi Arabia <sup>a, c</sup>
Seychelles	Singapore <sup>a, b, d</sup>	Slovakia <sup>a, b</sup>	Slovenia <sup>a, b</sup>
South Africa	Spain <sup>a, b</sup>	Sri Lanka	St. Kitts & Nevis
Swaziland	Sweden <sup>a, b</sup>	Switzerland <sup>a, b, d</sup>	Taiwan <sup>a, b, d</sup>
Thailand	Trinidad & Tobago <sup>a, c</sup>	Tunisia	Turkey
Turkmenistan <sup>c</sup>	UK <sup>a, b</sup>	Ukraine	United Arab Emirates <sup>a, c</sup>
United States <sup>a, b</sup>	Uruguay	Venezuela <sup>c</sup>	

# Causes of Crisis Intensity

- Begin to link causes to manifestations using simple bivariate OLS
  - Causes from 2006 (relevant time horizon for policy; reduce endogenous policy problem)
  - Include intercept
  - Control for Log 2006 real GDP per capita
  - Different Measures of Crisis Intensity
  - Different Country Samples

# Informal Graphical Evidence



## Effect of Exchange Rate Regime (Dummy for 2006 Fix)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	-1.42 (1.41)	.51 (1.92)	-1.79 (1.91)	-3.07* (1.48)	-1.62 (1.55)	-2.29 (2.01)
2008-09 Growth - '05-'07 Growth	-2.11 (1.46)	-.25 (1.72)	-2.50 (1.99)	-3.21 (1.62)	-2.42 (1.60)	-3.54 (2.24)
2008-09 Growth - '90-'07 Growth	-2.08 (1.42)	-.60 (1.81)	-2.48 (1.95)	-2.96 (1.53)	-2.38 (1.56)	-2.76 (2.10)
Revised WEO 2009 Growth Forecast	.16 (.72)	1.15 (.98)	-.13 (.91)	-.39 (.80)	-.29 (.73)	-1.10 (.95)
Output Gap 2009	-.73 (.71)	-.62 (.70)	n/a	-.73 (.71)	-.55 (.78)	-.55 (.78)
Consumption Growth 2008-09	.36 (2.39)	3.46 (4.64)	-1.06 (2.73)	-1.47 (1.13)	.38 (2.62)	-1.86 (1.39)
Extracted Principal Factor	-.14 (.17)	.01 (.21)	-.17 (.24)	-.26 (.18)	-.22 (.17)	-.21 (.22)

## Effect of Current Account (2006, % GDP)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	.23** (.05)	.21** (.06)	.26** (.06)	.25** (.07)	.22** (.06)	.27* (.12)
2008-09 Growth - '05-'07 Growth	.20** (.06)	.17* (.07)	.26** (.08)	.26** (.09)	.21** (.07)	.33* (.14)
2008-09 Growth - '90-'07 Growth	.21** (.06)	.17* (.07)	.26** (.08)	.23* (.09)	.22** (.07)	.28 (.14)
Revised WEO 2009 Growth Forecast	.02 (.03)	.02 (.03)	.05 (.03)	.01 (.05)	.02 (.03)	.01 (.07)
Output Gap 2009	.07 (.04)	.07* (.03)	n/a	.07 (.04)	.04 (.07)	.04 (.07)
Consumption Growth 2008-09	.18* (.07)	.16 (.11)	.20* (.09)	.25** (.07)	.19* (.08)	.26** (.09)
Extracted Principal Factor	.03** (.01)	.02* (.01)	.03** (.01)	.03** (.01)	.02** (.01)	.02 (.02)

## Effect of Trading Partner Growth (2005-07)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	14.8 (65.4)	211.7 (88.1)	-33.0 (87.1)	-51.6 (64.4)	-12.6 (85.1)	-21.9 (169.0)
2008-09 Growth - '05-'07 Growth	-46.9 (71.7)	156.3 (89.3)	-83.6 (99.0)	-106.9 (71.8)	-79.6 (92.8)	-89.4 (194.9)
2008-09 Growth - '90-'07 Growth	-52.9 (68.2)	141.2 (86.2)	-95.6 (92.1)	-99.4 (65.3)	-89.0 (88.3)	-98.3 (179.2)
Revised WEO 2009 Growth Forecast	73.9 (26.9)	-66.8 (42.9)	-58.7 (34.2)	-110.2** (27.4)	-66.6* (32.1)	-85.8 (71.5)
Output Gap 2009	29.2 (43.1)	16.2 (41.5)	n/a	29.2 (43.1)	11.1 (48.7)	11.1 (48.7)
Consumption Growth 2008-09	45.6 (85.2)	245.2 (149.8)	-35.1 (93.5)	-63.5 (53.4)	76.3 (124.6)	-95.5 (117.9)
Extracted Principal Factor	1.0 (8.6)	20.2 (6.5)	-14.4 (14.7)	-1.7 (9.5)	-10.9 (12.4)	-12.5 (16.5)

## Effect of Credit Market Regulation (2006, *EFW*)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	-2.38** (.68)	-1.15 (1.37)	-2.95** (.82)	-2.76** (.77)	-2.56** (.71)	-2.22 (1.12)
2008-09 Growth - '05-'07 Growth	-2.54** (.78)	-1.30 (1.56)	-3.10** (.91)	-2.84** (.91)	-2.75** (.81)	-2.51 (1.27)
2008-09 Growth - '90-'07 Growth	-2.72** (.74)	-1.17 (1.57)	-3.38** (.88)	-3.07** (.85)	-2.97** (.75)	-2.82* (1.24)
Revised WEO 2009 Growth Forecast	-1.02** (.34)	-.21 (.72)	-1.33** (.36)	-.97* (.38)	-1.13** (.35)	-.89 (.53)
Output Gap 2009	-.87 (.49)	-.55 (.44)	n/a	-.87 (.49)	-1.07* (.50)	-1.07* (.50)
Consumption Growth 2008-09	-1.63** (.61)	-.77 (1.17)	-1.93* (.74)	-1.46* (.63)	-1.60* (.63)	-1.46 (.74)
Extracted Principal Factor	-.21** (.07)	-.08 (.14)	-.27** (.08)	-.22** (.07)	-.21** (.07)	-.20 (.10)

## Effect of Short-Term External Debt (2006, % GDP)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	-.27** (.10)	n/a	-.27** (.10)	-.30** (.11)	-.27** (.10)	-.25* (.12)
2008-09 Growth - '05-'07 Growth	-.32** (.12)	n/a	-.32** (.12)	-.35** (.12)	-.32** (.12)	-.21* (.13)
2008-09 Growth - '90-'07 Growth	-.28* (.12)	n/a	-.28* (.12)	-.30* (.12)	-.28* (.12)	-.24 (.13)
Revised WEO 2009 Growth Forecast	-.12** (.03)	n/a	-.12** (.03)	-.11** (.03)	-.12** (.03)	-.09* (.04)
Output Gap 2009	n/a	n/a	n/a	n/a	n/a	n/a
Consumption Growth 2008-09	-.12** (.03)	n/a	-.11 (.15)	-.10 (.15)	-.11 (.15)	-.04 (.16)
Extracted Principal Factor	-.04** (.01)	n/a	-.04** (.01)	-.04** (.01)	-.04** (.01)	-.03 (.01)



## Effect of Housing Price Change (2000-06)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	-.06** (.02)	-.04* (.02)	-.07* (.02)	-.06** (.02)	-.06** (.02)	-.06* (.02)
2008-09 Growth - '05-'07 Growth	-.08** (.02)	-.06* (.02)	-.09** (.02)	-.08** (.02)	-.08** (.02)	-.07* (.03)
2008-09 Growth - '90-'07 Growth	-.07** (.02)	-.06* (.02)	-.08** (.02)	-.07** (.02)	-.07** (.02)	-.07* (.03)
Revised WEO 2009 Growth Forecast	-.02** (.01)	-.02 (.01)	-.02* (.01)	-.02* (.01)	-.02* (.01)	-.02 (.01)
Output Gap 2009	-.00 (.01)	-.01 (.01)	n/a	-.00 (.01)	.00 (.01)	.00 (.01)
Consumption Growth 2008-09	-.05** (.01)	-.04** (.01)	-.04* (.01)	-.05** (.01)	-.04** (.01)	-.04** (.01)
Extracted Principal Factor	-.007** (.002)	-.005** (.002)	-.007** (.002)	-.007 (.002)	-.006** (.002)	-.005* (.002)

## Effect of Growth in Bank Credit (2000-06, % GDP)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	-.07** (.02)	-.07** (.03)	-.11** (.04)	-.06* (.03)	-.09** (.03)	-.07 (.04)
2008-09 Growth - '05-'07 Growth	-.06** (.02)	-.06* (.02)	-.11* (.05)	-.05 (.03)	-.08* (.03)	-.07 (.05)
2008-09 Growth - '90-'07 Growth	-.06* (.02)	-.05 (.02)	-.11* (.04)	-.05 (.03)	-.08* (.03)	-.08 (.05)
Revised WEO 2009 Growth Forecast	-.01 (.01)	-.02 (.01)	-.02 (.02)	-.01 (.01)	-.01 (.02)	-.01 (.02)
Output Gap 2009	-.01* (.01)	-.01* (.01)	n/a	-.01* (.01)	-.02 (.01)	-.02 (.01)
Consumption Growth 2008-09	-.11* (.05)	-.14 (.08)	-.15 (.10)	-.06** (.01)	-.13 (.08)	-.07 (.03)
Extracted Principal Factor	-.011** (.002)	-.011** (.002)	-.014** (.004)	-.010** (.002)	-.010** (.003)	-.007 (.005)

## Effect of Level of Bank Credit (2006, % GDP)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	-.02 (.01)	-.05** (.01)	-.01 (.02)	.01 (.01)	-.01 (.01)	.02 (.02)
2008-09 Growth - '05-'07 Growth	.00 (.01)	-.03 (.01)	.01 (.02)	.03* (.01)	.01 (.01)	.03* (.02)
2008-09 Growth - '90-'07 Growth	-.00 (.01)	-.02 (.02)	.01 (.02)	.02 (.01)	.01 (.01)	.02 (.01)
Revised WEO 2009 Growth Forecast	.01 (.01)	-.00 (.01)	.01 (.01)	.02* (.01)	.01* (.01)	.02* (.01)
Output Gap 2009	.00 (.01)	.00 (.01)	n/a	.00 (.01)	.01 (.01)	.01 (.01)
Consumption Growth 2008-09	-.06 (.04)	-.11 (.07)	-.07 (.07)	-.00 (.01)	-.06 (.04)	.01 (.01)
Extracted Principal Factor	-.002 (.002)	-.005* (.002)	.001 (.003)	.001 (.002)	-.000 (.002)	.003 (.002)

## Effect of International Reserves (2006, % GDP)

	All	High Income	No Advanced	No Oil	No Fin'l Centers	No Poor, Oil, or FCs
2008-09 Growth	.068* (.028)	.068 (.042)	.066 (.045)	.075* (.036)	.066 (.036)	.007 (.075)
2008-09 Growth - '05-'07 Growth	.029 (.026)	-.015 (.022)	.057 (.041)	.028 (.033)	.045 (.033)	.017 (.080)
2008-09 Growth - '90-'07 Growth	.025 (.031)	-.019 (.022)	.035 (.053)	.016 (.029)	.032 (.044)	-.028 (.071)
Revised WEO 2009 Growth Forecast	-.047* (.019)	-.065** (.022)	-.034 (.027)	-.054* (.023)	-.042 (.024)	-.051 (.050)
Output Gap 2009	.082 (.052)	.067 (.051)	n/a	.082 (.052)	.082 (.052)	.082 (.052)
Consumption Growth 2008-09	.073 (.049)	.104 (.127)	.066 (.059)	.039* (.019)	.115 (.083)	.038 (.040)
Extracted Principal Factor	.007 (.005)	.007** (.002)	.006 (.010)	.0003 (.005)	.007 (.008)	-.003 (.010)

# Results

- Not easy to link crisis causes to intensity robustly
- Failures:
  - Exchange Rate Regime
  - Trading Partner Growth
  - Credit/GDP ratio
  - International Reserves

# Successes

- Current Accounts (surplus helps)
- Bank Credit Growth (less helps)
- Credit Market Regulation (tighter helps)
- Housing Price Growth (less helps – 45 observations!)
- Short Term External Debt (less helps – 52 obs)

# Including Causes Simultaneously

1. 2006 Current Account, % GDP
2. 2006 Credit Market Regulation
3. 2000-06 Growth in Bank Credit (% GDP)

## Extra Controls

1. log 2006 real GDP per capita
2. 2000-06 growth in stock market (% GDP)
3. Proportion 2006 trade with US

# Full Sample, Different Regressands

Dependent Variable:	Current Account %GDP, 2006	Credit Market Regulation, 2006	Bank Credit Growth %GDP, 2000-06	US Trade %Trade, 2006	Growth in Market Capitalization 2003-06	Log Real GDP per capita, 2006	R <sup>2</sup>	Obs
2008-09 Growth	.22** (.08)	-2.01** (.70)	-.012 (.025)	-.002 (.046)	.85 (.99)	-3.19** (.1.21)	.41	75
2008-09 Growth – '05-'07 Growth	.15 (.09)	-2.30** (.84)	-.027 (.024)	.021 (.053)	.80 (1.08)	-1.52 (1.52)	.29	74
2008-09 Growth – '90-'07 Growth	.17* (.08)	-2.50** (.77)	-.021 (.025)	.021 (.049)	1.00 (1.02)	-1.94 (1.29)	.36	74
Revised WEO 2009 Growth Forecast	-.03 (.04)	-.91* (.38)	-.017 (.010)	.049 (.019)	-.00 (.40)	.05 (.55)	.18	75
Output Gap 2009	.04 (.08)	-.77 (.55)	-.005 (.014)	-.021 (.038)	.59 (.82)	-1.01 (2.06)	.23	26
Consumption Growth 2008-09	.18 (.11)	-1.20* (.46)	-.025 (.015)	-.037 (.045)	-.11 (.43)	-.44 (.76)	.40	71
Extracted Principal Factor	.01 (.01)	-.14* (.06)	-.006* (.003)	.001 (.005)	-.07 (.09)	-.38** (.10)	.52	70



# Different Samples, 2008-09 Growth

Sample Period:	Current Account %GDP, 2006	Credit Market Regulation, 2006	Bank Credit Growth %GDP, 2000-06	US Trade %Trade, 2006	Growth in Market Capitalization 2003-06	Log Real GDP per capita, 2006	R <sup>2</sup>	Obs
All	.22** (.08)	-2.01** (.70)	-.012 (.025)	-.002 (.046)	.85 (.99)	-3.19** (1.21)	.41	75
Only High Income	.20 (.11)	-.03 (1.26)	-.020 (.025)	.014 (.061)	4.84 (2.42)	-4.27 (4.10)	.41	36
Drop Advanced Economies	.24 (.12)	-2.44** (.80)	-.065 (.068)	-.021 (.058)	1.03 (1.07)	-3.97 (2.38)	.46	45
Drop Oil	.25* (.10)	-2.13** (.77)	-.007 (.026)	.023 (.053)	.52 (1.83)	-3.36* (1.28)	.44	68
Drop Financial Centers	.22* (.09)	-2.09** (.70)	-.031 (.035)	-.001 (.051)	.77 (.99)	-2.95* (1.40)	.41	65
Drop Poor, Oil, and Financial Centers	.30 (.15)	-1.30 (.91)	-.039 (.038)	.020 (.077)	1.49 (1.32)	-3.41 (2.42)	.37	41

# Sobering Results

- Poor fit consistently
- Despite pre-filtering, many insignificant regressors
  - Stock market run-up (RS)
  - Trade linkage with US (RS)
- Some Weak “Successes”
  - Credit Growth significant at 5% for 1/7 measures
  - Current Account, income for 2/7

## More ...

- One Real Success (GLR)
  - Credit Market Regulation: significant 6/7
- 2008-09 Real GDP growth
  - Three pre-crisis vulnerabilities significant
  - Use that crisis intensity measure to maximize odds of successful EWS
- Even sticking with growth though
  - Results sensitive to exact sample of countries

# Housing Prices, Short-Term External Debt

Current Account %GDP, 2006	Credit Market Regulation, 2006	Growth in Bank Credit %GDP, 2000-06	Trade with US %Trade, 2006	Growth in Market Capitalization 2003-06	Log Real GDP per capita, 2006	ST External Debt %GDP, 2006	Real Housing Price Growth, 2000-06	R <sup>2</sup>	Obs
.22** (.08)	-2.01** (.70)	-.012 (.025)	-.002 (.046)	.85 (.99)	- 3.19** (.1.21)			.41	75
.12 (.22)	-2.08* (.94)	-.027 (.066)	-.033 (.071)	.86 (1.12)	-2.47 (2.94)	-.34* (.14)		.49	38
.17 (.13)	-1.72 (1.28)	.015 (.025)	.050 (1.86)	-.50 (1.86)	-4.35 (2.51)		-.042 (.025)	.43	43

- Only short-term external debt helps

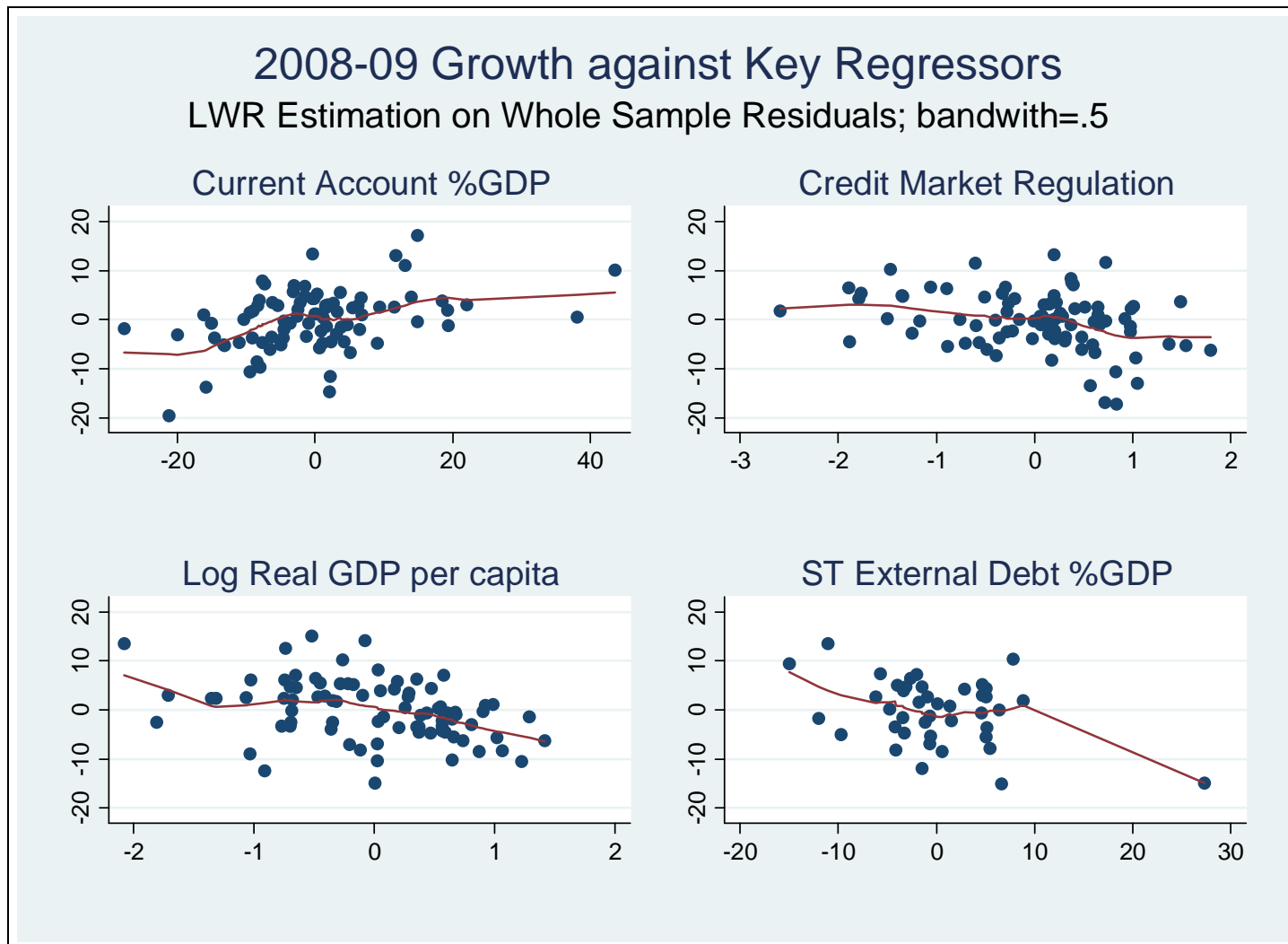
# Narrowing the Focus Further

Sample Period:	Current Account %GDP, 2006	Credit Market Regulation, 2006	Log Real GDP per capita, 2006	ST External Debt %GDP, 2006	R <sup>2</sup>	Obs
All	.21** (.06)	-2.16** (.67)	-2.98** (.83)		.38	84
All (no advanced economies or FCs)	.05 (.15)	-2.38* (.93)	-1.53 (2.31)	-.36* (.13)	.44	42
Only High Income	.21** (.07)	-.51 (1.30)	-4.93 (3.09)		.30	40
Drop Advanced Economies	.26** (.08)	-2.73** (.79)	-3.15 (1.71)		.39	52
Drop Oil	.22** (.07)	-2.39** (.68)	-2.92** (.87)		.42	76
Drop Oil	.08 (.16)	-2.59* (.97)	-1.16 (2.35)	-.37** (.14)	.48	38
Drop Financial Centers	.22** (.07)	-2.41** (.69)	-2.85** (.92)		.38	72
Drop Poor, Oil, and Financial Centers	.27* (.12)	-1.86 (.95)	-3.32 (1.80)		.29	4
Drop Poor, Oil, and Financial Centers	-.01 (.21)	-1.52 (1.47)	-1.73 (10.)	-.43* (.19)	.53	18

# Even Restricting to Positive Results

- Only short-term external debt consistently statistically significant
  - Current Account positive; real GDP per capita, and credit regulation have consistently negative signs
- Fit still poor
- Weighting by population has little effect
- Non-linearities (thresholds?) delivers little

# Non-Parametric (LWR) Estimation



# Other Global Recessions: 1991-92

	Current Account %GDP, 1990	Credit Market Regulation, 1990	Log Real GDP per capita, 1990	R <sup>2</sup>	Obs
All	.29** (.08)	.59* (.29)	-1.15* (.46)	.20	103
Only High Income	.30 (.16)	.26 (.58)	-2.53 (2.67)	.16	31
Drop Advanced Economies	.24* (.09)	.83* (.33)	-.43 (.68)	.25	76
Drop Oil	.33** (.12)	.62 (.32)	-1.26* (.49)	.21	92
Drop Financial Centers	.29** (.09)	.59 (.30)	-1.15* (.48)	.20	95
Drop Poor, Oil, and Financial Centers	.57** (.19)	.85* (.32)	-3.69** (.84)	.42	42



## 2001-02 Recession

	Current Account %GDP, 2000	Credit Market Regulation, 2000	Log Real GDP per capita, 2000	R <sup>2</sup>	Obs
All	-.03 (.04)	-.36 (.26)	-.42 (.31)	.09	112
Only High Income	.05* (.02)	.55* (.22)	-3.77** (.82)	.44	39
Drop Advanced Economies	-.05 (.06)	-.49 (.33)	-.33 (.57)	.07	80
Drop Oil	-.06 (.07)	-.35 (.29)	-.43 (.32)	.10	101
Drop Financial Centers	-.05 (.05)	-.41 (.28)	-.45 (.33)	.10	102
Drop Poor, Oil, and Financial Centers	-.06 (.05)	.71* (.34)	-.90* (.36)	.10	49

# Results Quite Sensitive to Time

- Most Successful variables do not have stable (let alone significant) coefficients
- Credit Market Regulation: “best” result for Great Recession (negative, often significant)
  - Positive, often significant earlier

# Conclusion

- RS: difficult to link 2008 recession to macroeconomic or financial indicators across countries
  - Updating data through Spring 2010 changes little

# Focus: Causes that “work” for others

- Positive Findings sensitive to:
  - Measures of Crisis Intensity
  - Sample of Countries
  - Time

# Message

- Natural to generalize from salient facts, but often inappropriate
  - Credit growth high pre-2008 in Australia, Canada, South Africa – but small crises
  - Housing Prices fell pre-2008 in Japan, Germany, Portugal – but big crises
- Still seems difficult to construct EWS