

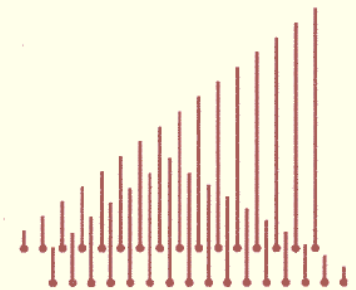
niesr

Discussion: Early Warning Systems Papers

E Philip Davis

NIESR and Brunel University

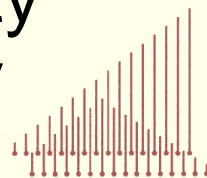
October 2012



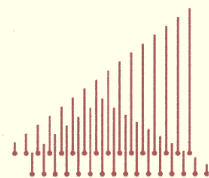
National Institute
of Economic and
Social Research

(1) Identifying sentiment effects

- Seeks to identify “irrational exuberance” as distinct from consensus forecasts of growth and equity risk premium
- Basic framework of Gordon’s growth model of share price determination
- Short estimation period - surely better to estimate such effects over several cycles (especially as ECM component). Why does analysis focus on even shorter 96-03 period given interest in valuation before subprime?
- To extend sample, VIX could be proxied by risk indicator such as GARCH conditional volatility and the components of the BW are generally available

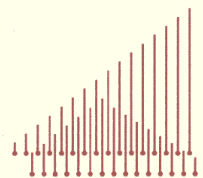


- How do results compare with tests of stock market bubbles? At least “irrational” ones?
- How interesting are individual share valuations – sectors more relevant for MP?
- How should authorities respond to a positive signal from the indicator? Is it really sufficient to “draw attention to arbitrage opportunities”?
- How could procedure be adapted to look at property prices, since much more relevant for macroprudential? What would be the main issues and difficulties?

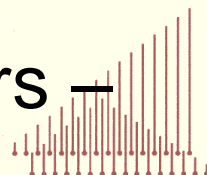


(2) Predicting bank distress

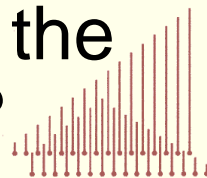
- EWS for distress at individual banks using bank and country data with allowance for Type I and II error preferences
- Tail dependence network calculations to assess contagion (dropped from latest version!)
- Unified EMU banking supervision is a further motivation for such a Euro wide bank distress EWS
- Types of event are quite different – why not graduate according to severity?
- What is treatment of generalised asset relief programmes?



- Is return on assets a measure of asset quality or asset mix? (Low ROA may show vulnerability to interbank market failure.)
- Quite short data period, presumably due to Bankscope? Or, limit to EMU period? “Imbalance of tranquil periods” problem reduced if go back to 1990
- What does a positive sign for size show about EU bank regulation? Would it be the same if restricted to severe distress?
- What about size relative to country banking sector (systemic importance)?
- Likely collinearity of bank and sector indicators — latter still useful for crisis prediction

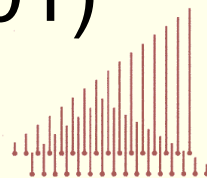


- Distinguish idiosyncratic failures and those part of systemic events (most in 2008-9?)
- Only country level and not global indicators – why not include the latter
- How about cross country lending as a risk indicator? And now bank holdings of government debt?
- Would be useful to assess determinants and nature of “false negatives”
- What happened to the contagion work – separate paper or politically sensitive? NB Subprime crisis was global. What is effect on the contagion model of excluding e.g. US banks?

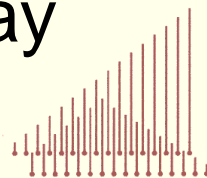


Banking, debt and currency crises

- Unique dataset of crises from 1970 and application of advanced analyses thereof
- What is the gain from quarterly data?
- Why not distinguish systemic and non systemic crises?
- Rather than choosing ordering, why not use generalised impulse responses?
- Measure of output loss based on year on year growth probably inferior to integral of output loss (Hoggarth and Sapporta 2001)



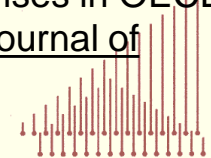
- BMA results link well to Minsky-Kindleberger story of banking problems, starting with investment optimism before shifting to macro booms
- Use of signal extraction inferior to logit in a number of ways (Davis and Karim 2008), was logit considered and why rejected?
- Consider country disaggregation for crisis determination (following Davis and Karim 2011), such as small versus large, bank versus market, or by income level – how important for example are CEE transition period crises
- Other comments illustrated by papers with Ray Barrell, Dilly Karim, Iana Liadze:



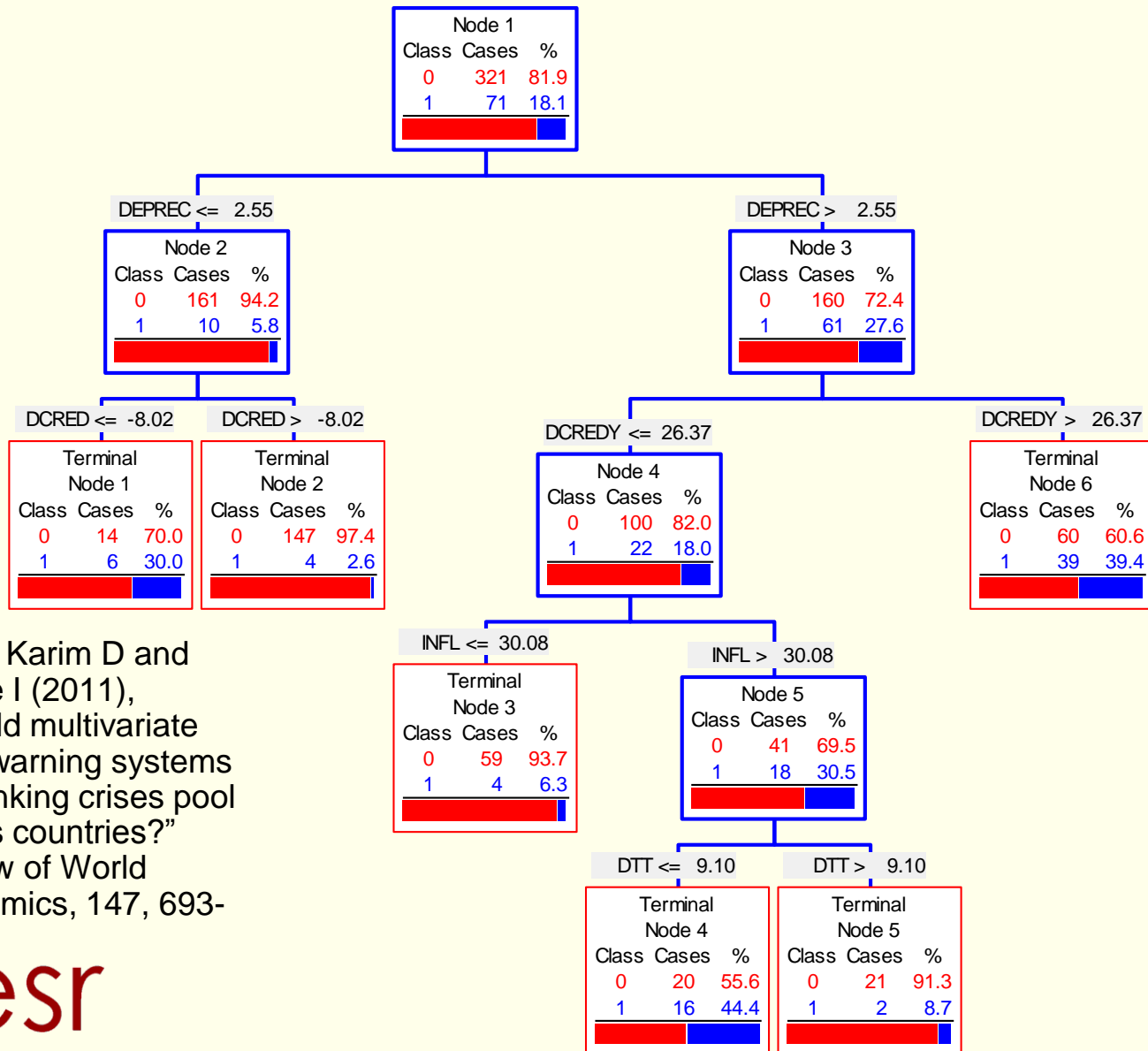
Omission of banking macro variables

Regression Number	1	2	3	4	5	6	7	8
GDP growth(-2)	0.234 (0.176)	0.25 (0.131)	0.229 (0.117)	0.234 (0.115)	0.234 (0.113)	0.273* (0.063)	0.256* (0.08)	0.28** (0.05)
2003 Dummy*OBS Income/Total Income(-2)	0.039** (0.02)	0.04** (0.017)	-0.33*** (0.00)	-0.516*** (0.001)	-0.316*** (0.00)	0.041*** (0.00)	0.039*** (0.00)	0.038*** (0.00)
Narrow Liquidity(-2)	-0.111** (0.013)	-0.112** (0.012)	-0.112** (0.012)	-0.115*** (0.009)	-0.123*** (0.003)	-0.114*** (0.004)	-0.115*** (0.004)	-0.14*** (0.00)
Current Balance (% GDP) (-2)	-0.329*** (0.00)	-0.334*** (0.00)	0.039** (0.016)	0.034*** (0.006)	0.036*** (0.003)	-0.302*** (0.00)	-0.315*** (0.00)	-0.293*** (0.00)
Leverage(-2)	-0.526*** (0.001)	-0.525*** (0.001)	-0.524*** (0.001)	-0.329*** (0.00)	-0.514*** (0.001)	-0.438*** (0.00)	-0.471*** (0.00)	-0.457*** (0.00)
Budget Balance(-2)	0.101 (0.223)	0.104 (0.202)	0.098 (0.211)	0.087 (0.244)	0.084 (0.256)	0.083 (0.262)	0.091 (0.212)	
M2/Rreserves(-2)	0.00 (0.273)	0.00 (0.279)	0.00 (0.291)	0.00 (0.296)	0.00 (0.295)	0.00 (0.297)		
OBS Income/Total Income(-2)	0.0154 (0.505)	0.015 (0.518)	0.015 (0.525)	0.02 (0.323)	0.017 (0.383)			
Inflation(-2)	-0.102 (0.496)	-0.102 (0.49)	-0.102 (0.49)	-0.042 (0.581)				
Real Interest Rate(-2)	0.048 (0.698)	0.056 (0.642)	0.058 (0.63)					
Real House Price Growth (-2)	-0.016 (0.729)	-0.011 (0.796)						
Real Credit Growth(-2)	0.018 (0.762)							

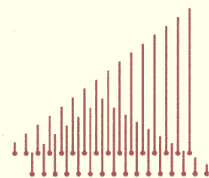
Barrell, R., Davis, P., Karim, D., Liadze, I., (2012), "Off-balance sheet exposures and banking crises in OECD countries", forthcoming, Journal of Financial Stability



Possible use of Binary Recursive Tree



Davis E P, Karim D and Liadze I (2011), "Should multivariate early warning systems for banking crises pool across countries?" Review of World Economics, 147, 693-716



Cross country contagion effects

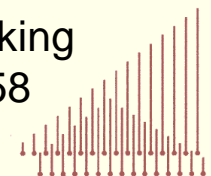
Table 4: Induced changes in crisis probabilities in other countries in 2006

Columns are for countries with a crisis and rows are for countries affected by spillover

Country j	Country i												
	US	UK	SP	SD	NW	NL	JP	IT	GE	FR	FN	DK	CN
BG	5.42	0.40	0.23	0.06	0.04	0.11	0.91	0.33	0.54	0.38	0.03	0.03	0.22
CN	9.25	0.71	0.42	0.10	0.07	0.19	1.61	0.59	0.95	0.68	0.05	0.06	0.00
DK	18.39	1.57	0.92	0.22	0.16	0.43	3.52	1.31	2.11	1.51	0.12	0.00	0.88
FN	3.53	0.26	0.15	0.04	0.03	0.07	0.58	0.21	0.34	0.25	0.00	0.02	0.14
FR	8.35	0.63	0.37	0.09	0.06	0.17	1.44	0.53	0.85	0.00	0.05	0.05	0.35
GE	4.98	0.37	0.21	0.05	0.04	0.10	0.83	0.30	0.00	0.35	0.03	0.03	0.20
IT	1.80	0.13	0.07	0.02	0.01	0.03	0.29	0.00	0.17	0.12	0.01	0.01	0.07
JP	0.13	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.01
NL	26.86	2.61	1.54	0.37	0.27	0.00	5.75	2.18	3.48	2.51	0.20	0.22	1.47
NW	15.54	1.28	0.75	0.18	0.00	0.35	2.88	1.07	1.72	1.23	0.10	0.11	0.72
SD	12.04	0.95	0.56	0.00	0.10	0.26	2.15	0.79	1.28	0.92	0.07	0.08	0.53
SP	3.59	0.26	0.00	0.04	0.03	0.07	0.59	0.22	0.35	0.25	0.02	0.02	0.14
UK	13.19	0.00	0.62	0.15	0.11	0.29	2.38	0.88	1.42	1.02	0.08	0.09	0.59
US	0.00	0.14	0.08	0.02	0.01	0.04	0.31	0.11	0.19	0.13	0.01	0.01	0.08
Ave	8.79	0.67	0.42	0.09	0.07	0.15	1.66	0.61	0.96	0.67	0.05	0.05	0.39

Note US: United States, UK: United Kingdom; SP: Spain, SD: Sweden, NW: Norway; NL: Netherlands, JP: Japan, IT: Italy, GE: Germany, FR: France, FN: Finland, DK: Denmark, CN: Canada, BG: Belgium

- Barrell R, Davis E P, Karim D and Liadze I, (2011), "How Idiosyncratic are Banking Crises in OECD Countries?," National Institute Economic Review, 216, R53-R58



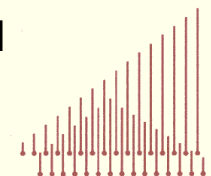
Shorten dataset showing ability predict subprime

Table 3: Out of sample rolling probabilities

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
BG	0.005	0.003	0.003	0.003	0.006	0.003	0.003	0.008	0.014	0.027
CN	0.032	0.052	0.051	0.026	0.011	0.012	0.014	0.019	0.013	0.015
DK	0.015	0.038	0.055	0.034	0.032	0.015	0.021	0.012	0.016	0.007
FN	0.004	0.005	0.008	0.004	0.000	0.000	0.000	0.001	0.000	0.001
FR	0.025	0.016	0.010	0.011	0.029	0.018	0.019	0.033	0.066	0.137
GE	0.026	0.025	0.026	0.041	0.054	0.024	0.010	0.012	0.003	0.003
IT	0.001	0.002	0.002	0.007	0.013	0.013	0.016	0.025	0.018	0.030
JP	0.071	0.023	0.007	0.007	0.005	0.005	0.002	0.001	0.000	0.000
NL	0.020	0.016	0.042	0.036	0.122	0.096	0.047	0.011	0.005	0.005
NW	0.011	0.005	0.034	0.010	0.000	0.000	0.001	0.001	0.000	0.000
SD	0.019	0.014	0.028	0.036	0.025	0.032	0.006	0.001	0.002	0.002
SP	0.005	0.005	0.008	0.024	0.036	0.034	0.033	0.062	0.217	0.493
UK	0.049	0.057	0.079	0.157	0.176	0.152	0.077	0.134	0.199	0.197
US	0.025	0.029	0.038	0.062	0.064	0.046	0.070	0.039	0.045	0.052
Prob threshold	0.057	0.054	0.050	0.048	0.045	0.043	0.041	0.039	0.037	0.036

Note: figures in bold exceed the cut-off threshold.

- Barrell, R., Davis, E., Liadze, I., Karim, D., (2010), "Calibrating Macroprudential Policy", NIESR Discussion Paper no. 354,

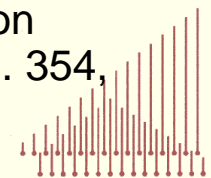


Use results to calibrate regulation

Table 5: Country Specific Regulatory Adjustments versus International Benchmarks

Column	1	2	3	4
	Additions to country specific levels of liquidity and leverage to reduce all prob. to 0.01 or below*		Under or overshoot	
			(column 1 - 3.7)	(column 2 - 4.59)
Top Panel	lev+nliq	lev alone	lev and nliq	lev
Belgium	2.11	2.56	-1.59	-2.03
Canada	3.31	4.15	-0.39	-0.44
Denmark	3.35	4.15	-0.35	-0.44
Finland	0.00	0.00	-3.70	-4.59
France	5.08	6.25	1.38	1.66
Germany	3.12	3.79	-0.58	-0.80
Italy	1.74	2.14	-1.96	-2.45
Japan	3.96	5.19	0.26	0.60
Neths	4.72	5.80	1.02	1.21
Norway	2.34	2.87	-1.36	-1.72
Sweden	2.38	2.90	-1.32	-1.69
Spain	9.32	11.48	5.62	6.89
UK	6.08	7.63	2.38	3.04
US	4.35	5.34	0.65	0.75
Mean (International Benchmark)	3.70	4.59		
SD	2.24	2.77		

- Barrell, R., Davis, E., Liadze, I., Karim, D., (2010), "Calibrating Macroprudential Policy", NIESR Discussion Paper no. 354,



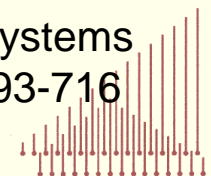
Further explore heterogeneity

Table A.1: Including leveraged coefficients for the Asian variables in the combined sample

Variable	Coefficient	z-Statistic
$\delta^*DCRED_1 (-1)$	-0.0370	-2.303387
$GDPPC_1 (-1)$	-0.000246	-7.226066
$\delta^*RIR_1 (-1)$	0.141	4.161717
$\delta^*DEPREC_1 (-1)$	0.0460	3.264150
$DGDP_1 (-1)$	-0.149	-6.110179
AIC	0.991	
Wald statistic	23.7 (0.0000)	
Observations	515	

Note: In Table 2 the coefficients and regressors can be represented as the vector βX whereas in this table the estimations can be expressed as $\beta X_1 + \delta \beta^* X_1$ where $\delta=0$ for Latin America and $\delta=1$ for Asia.

- Davis E P, Karim D and Liadze I (2011), "Should multivariate early warning systems for banking crises pool across countries?" Review of World Economics, 147, 693-716



Broader points on EWS

- How can EWS especially for crises per se cope with the fact that markets generating systemic risk differ but “patterns” are similar?
- How should EWS be brought systematically into MP analysis? Do policymakers really mind having false alarms (“cry wolf”?)
- What should be their interaction with MP policy? With what instruments should they be associated?
- Wider difficulty with credit as indicator – distinguishing a healthy cycle initiated by positive news about the future from a credit driven asset bubble.

