How Well Are Recessions and Recoveries Forecast?

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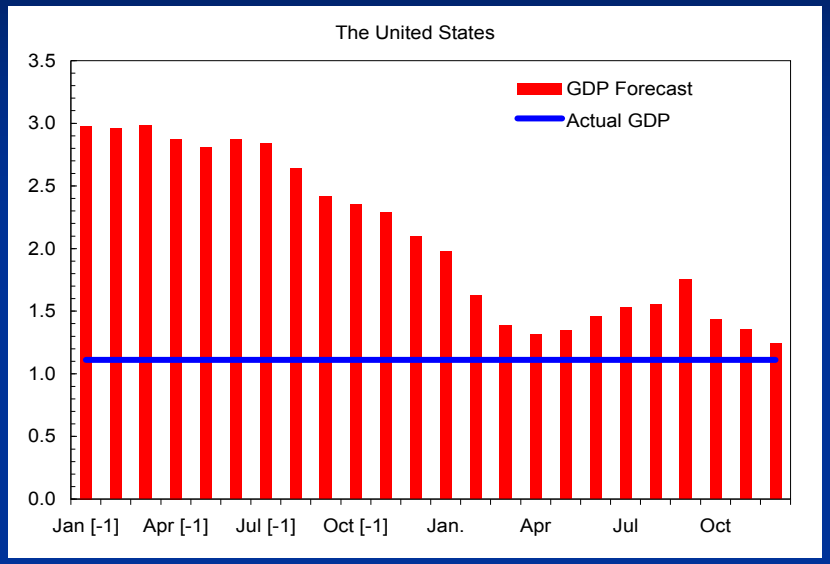
Outline

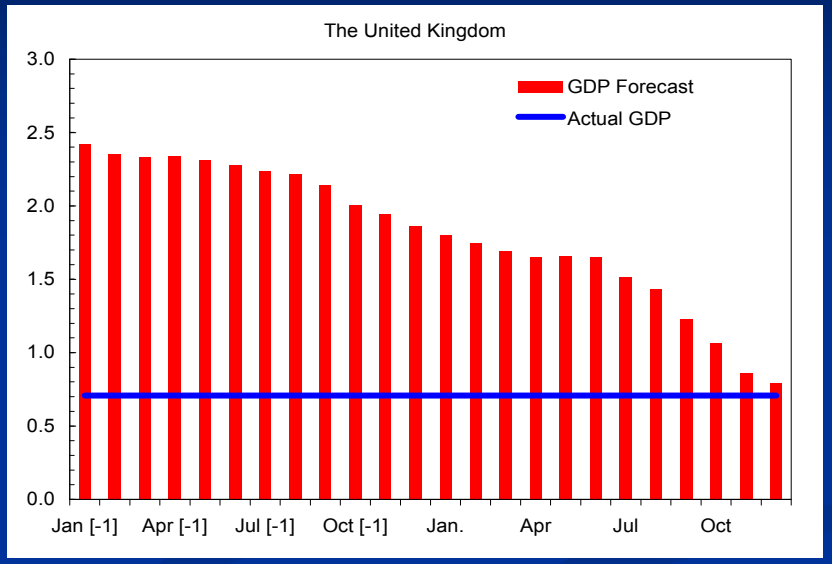
- Focus of the study
- Data
- Dispersion and forecast errors during turning points
- Testing efficiency of forecasts
- Conclusions

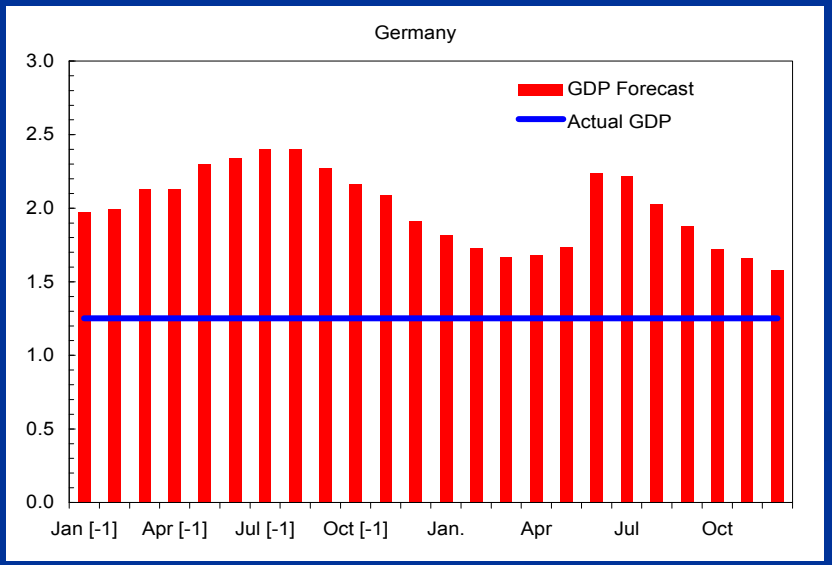
Forecasting turning points of business cycles is a daunting task

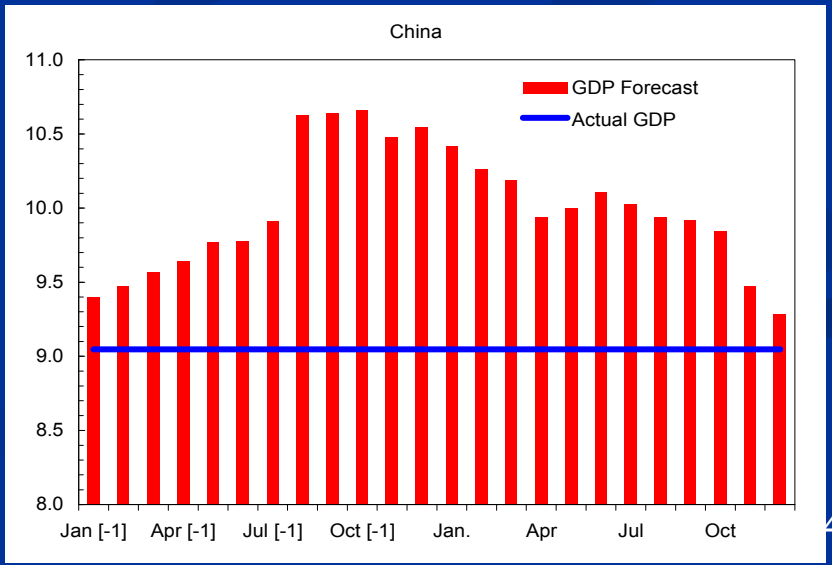
- Most recessions remain undetected until they are well underway
- Less is known about forecasting recoveries, esp. in emerging economies
- Forecast performance during crises also has not been explored
- Can dispersion of forecasts be a leading indicator of turning points?

Predicting growth in 2008









Literature on Consensus Forecasts

- "Predictive failure" for U.S. recessions
  - Zarnowitz (1986), Fintzen and Stekler (1999)
- Scarce literature on forecast performance for other countries
  - Similar predictive failure (Öller and Barot, 2000)
  - Inefficiency of forecasts (Loungani, 2001)
- Nascent literature on dispersion of consensus forecasts
  - For G7, dispersion increases during periods of uncertainty (Dovern, Fritzsche and Slacalek, 2009)

This study focuses on forecast performance in a broad range of countries during crises

- Describe performance of private sector forecasts for real GDP growth in a broad range of countries
- Examine track record for forecasting recoveries and how it varied depending on the shape of recovery
- Compare forecast errors for recoveries after banking, currency and debt crises
- Test efficiency and bias of forecasts during recession, recovery and crisis episodes
- Examine dynamics of forecast dispersion and role as a leading indicator

The dataset is a complex panel

- Monthly forecasts of output growth for the current and next year
- 24 forecast observations for each year
- *Consensus Economics*, Inc
- October 1989 to December 2008
- 22 advanced and 56 emerging and developing economies
- Monthly and bi-monthly frequency

Dating of recession episodes combines quarterly and annual data

- Quarterly data for all advanced and 22 emerging economies (Burns and Mitchell, 1946)
- Recession year if at least one quarter in recession
- Annual data for 24 emerging and developing economies
- 61 and 45 recession episodes in advanced and emerging/developing economies
- 40 and 38 recovery episodes (some recessions are not over yet)

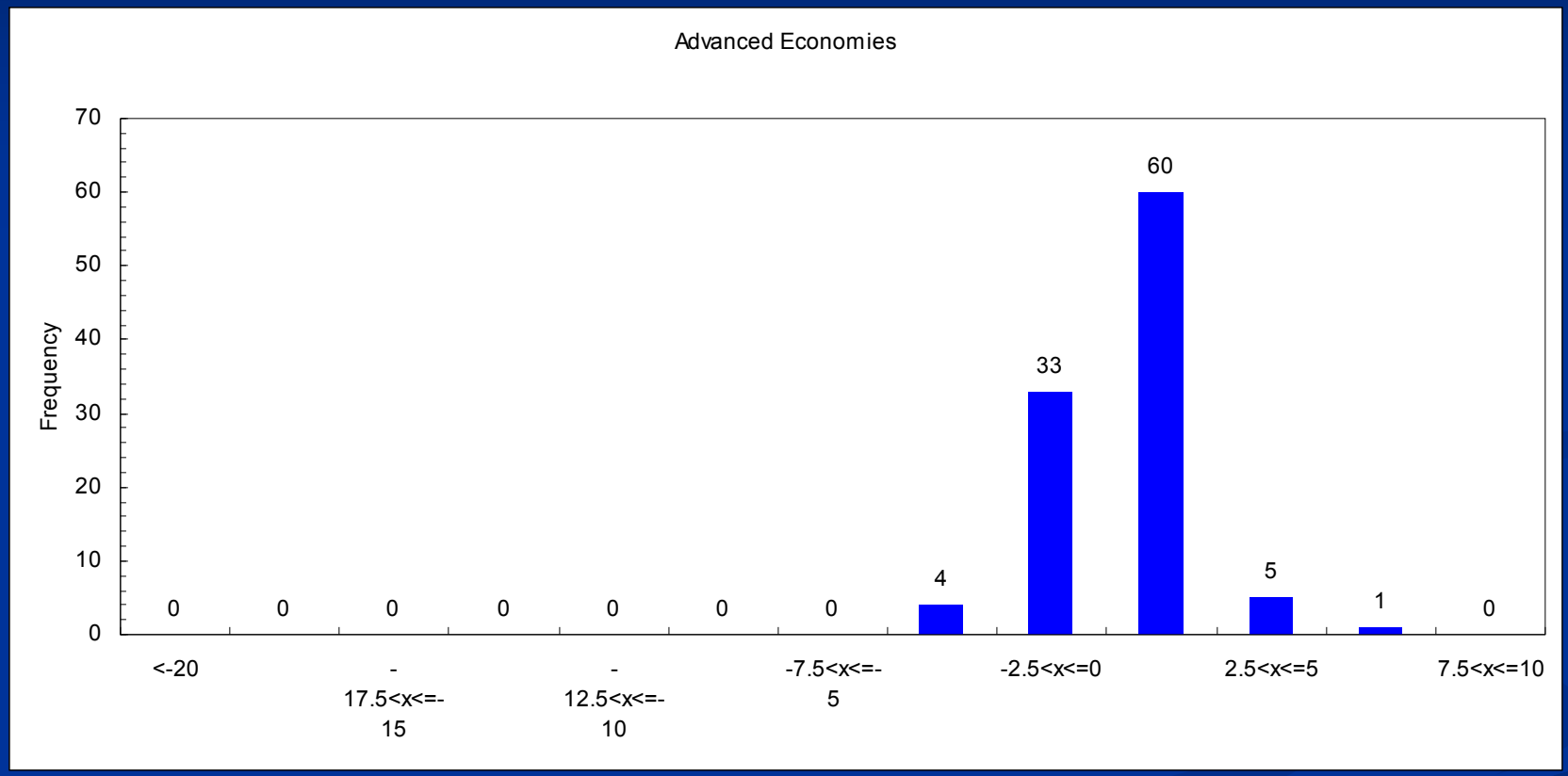
Recession Episodes in Advanced Economies

List of Countries and Recessions			
AUSTRALIA	1990-91, 2008	ITALY	1992-93, 1996, 2001, 2003-05, 2008
AUSTRIA	1992-93, 2001, 2008	JAPAN	1993, 1997-99, 2001, 2008
BELGIUM	1992-93, 2001-2003, 2008	NETHERLANDS	2008
CANADA	1990-91, 2008	NEW ZEALAND	1991, 1997-98, 2008
DENMARK	1992-93, 1997, 2006-08	NORWAY	2002-03, 2008
FINLAND	1990-93, 2001, 2008	PORTUGAL	1992-93, 2002, 2008
FRANCE	1992-93, 2002-03, 2008	SPAIN	1992-93, 2008
GERMANY	1992-93, 1995-96, 2002-04, 2008	SWEDEN	1990-93, 2008
GREECE	1993-95, 2008	SWITZERLAND	1990-93, 1996, 1998-99, 2001-03, 2008
IRELAND	2001, 2008	UNITED STATES	1990-91, 2001, 2008
ISRAEL	2001-02	UNITED KINGDOM	1990-91, 2008

Recession Episodes in Emerging and Developing Economies

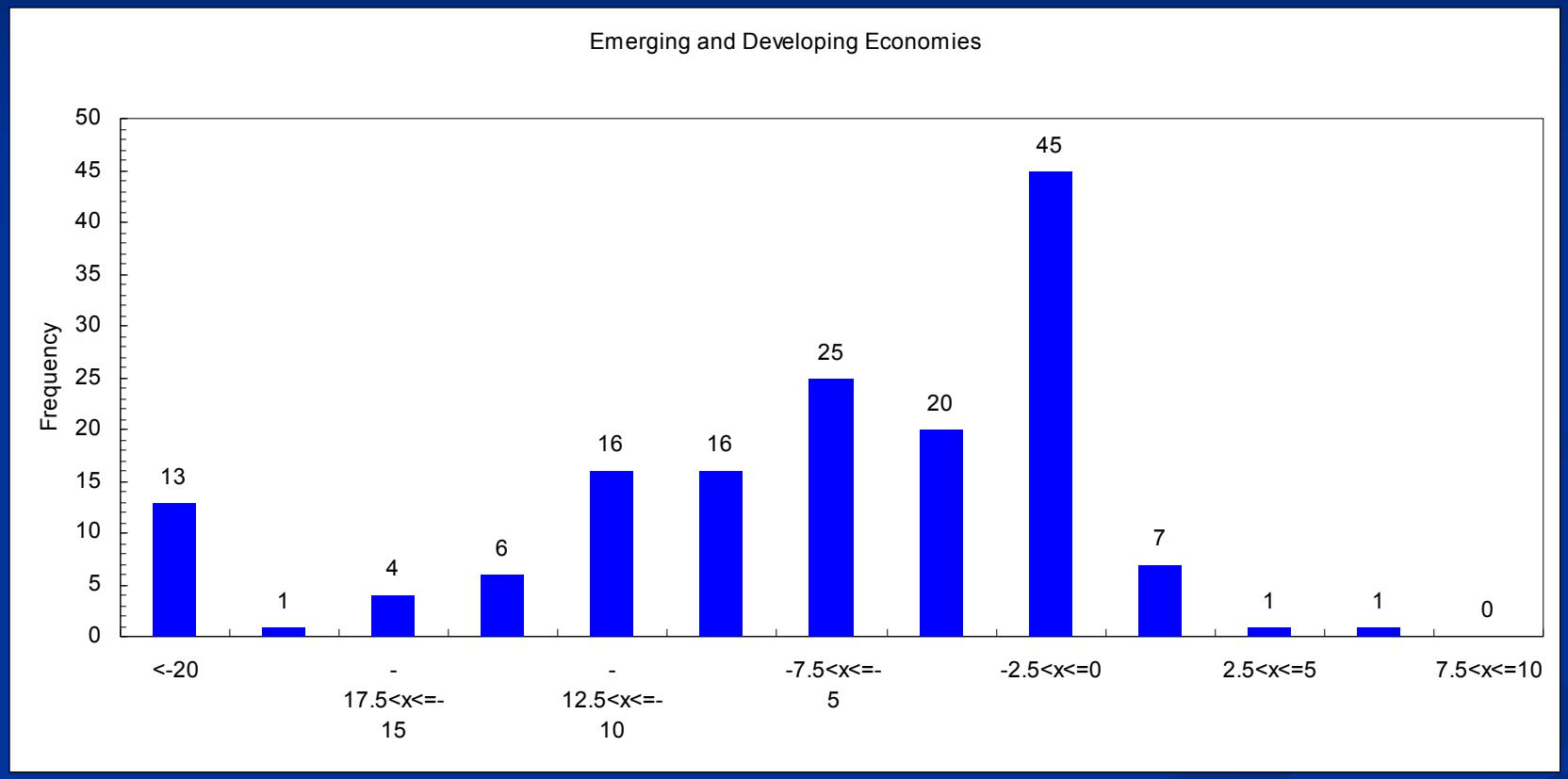
List of Countries and Recessions			
ARGENTINA	1995, 1999-2002	MEXICO	1995, 2001
BRAZIL	1990, 1992, 1998-1999	PARAGUAY	2000, 2002
BULGARIA	1996-97	PERU	2001
CHILE	1999	PHILIPPINES	1998
COLOMBIA	1999	POLAND	1990-91
COSTA RICA	1996	ROMANIA	1997-1998
CROATIA	1998-99	REPUBLIC OF KOREA	1998
CZECH REPUBLIC	1998-99	RUSSIA	1995-96, 1998
DOMINICAN REPUBLIC	2001, 2003	SAUDI ARABIA	1995, 1999
ECUADOR	1999	SINGAPORE	2001, 2008
ESTONIA	1999, 2008	SRI LANKA	2001, 2008
HONG KONG	1998	TAIWAN	2001, 2008
HUNGARY	1990-93	THAILAND	1997-98
INDONESIA	1998	TURKEY	1999, 2001
LATVIA	2008	UKRAINE	1995-99
LITHUANIA	1999	URUGUAY	1995, 1999-2002
MALAYSIA	1998	VENEZUELA	1993-94, 1996, 1998-99, 2002-03

Annual GDP growth during recession years in advanced economies tends to be positive



Output declines between 2½ percent and 5 percent: Finland after the banking crisis in 1991–93 and Japan in 1998.

In emerging and developing economies output growth in recessions is mostly negative

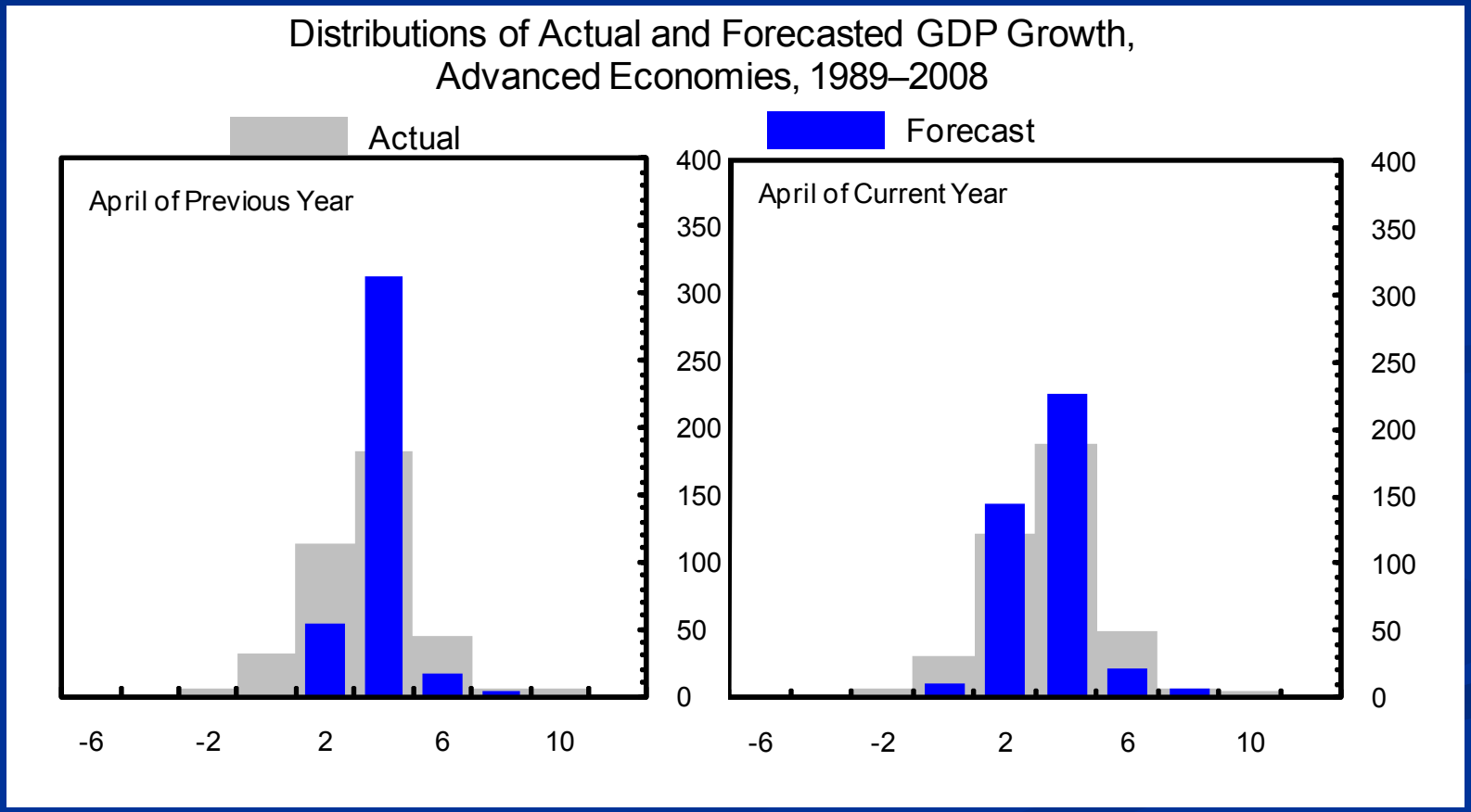


Output declines exceeding 20 percent: former Soviet Union in the early 1990s and Albania in 1997.

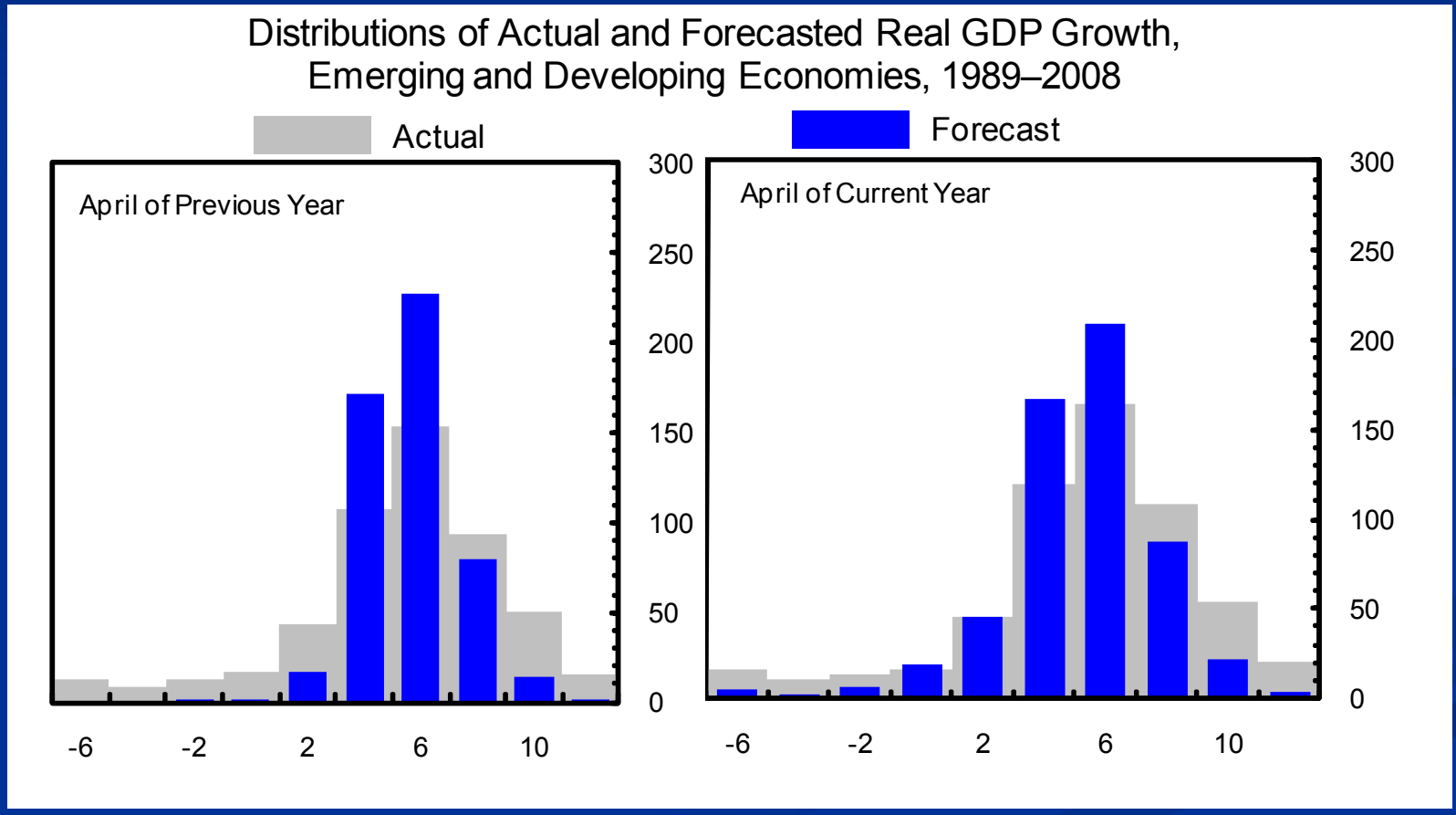
The dating of crisis episodes follows Laeven and Valencia (2008)

- Systemic banking crises
- Currency crises
- Debt crises
- 5 banking and 3 currency crises in advanced economies
- 26 banking, 26 currency and 6 debt crises in emerging and developing economies

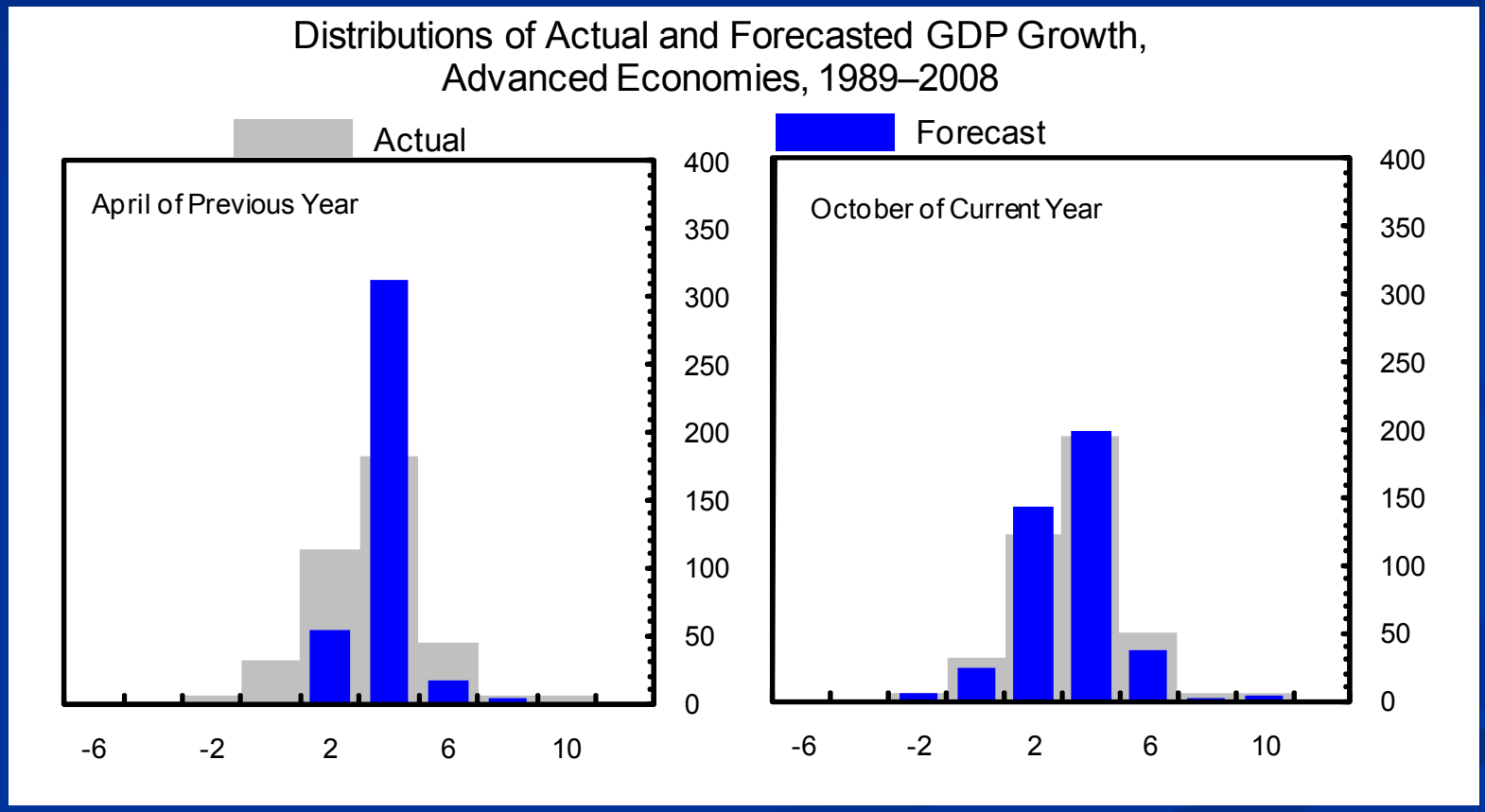
Recessions in advanced economies are not predicted until they are well underway



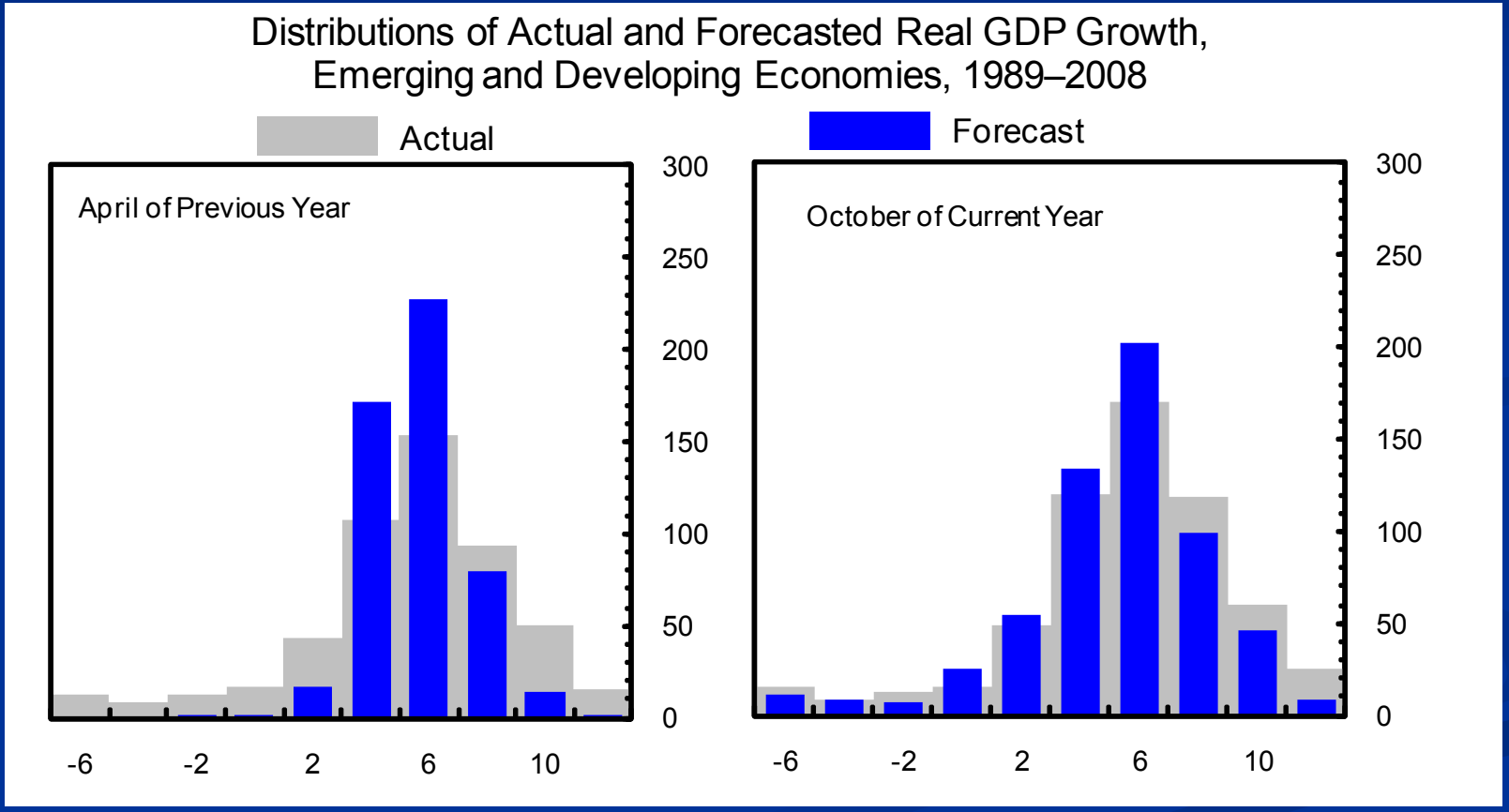
The same holds for emerging and developing economies



Distributions of forecasts and actual values converge over time…



…but not perfectly for emerging and developing economies



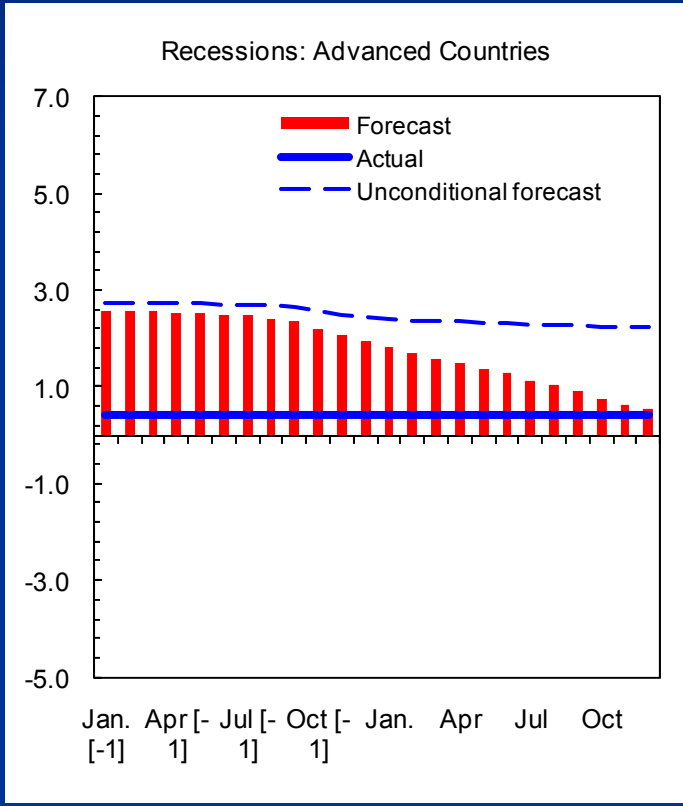
Definition of Forecast Errors

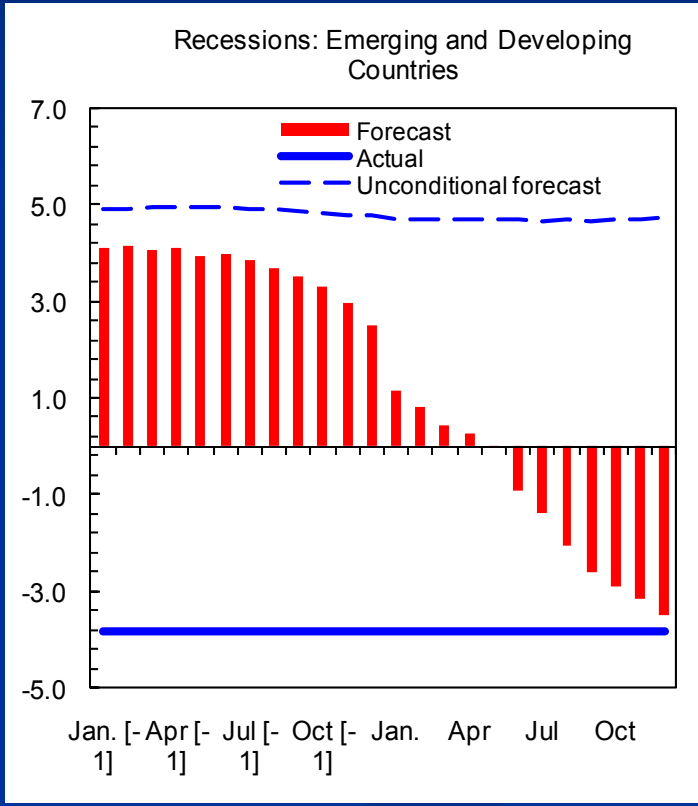
$$e_t = A_t - F_t,$$

where *At* is a vector of growth outcomes (the "actuals")

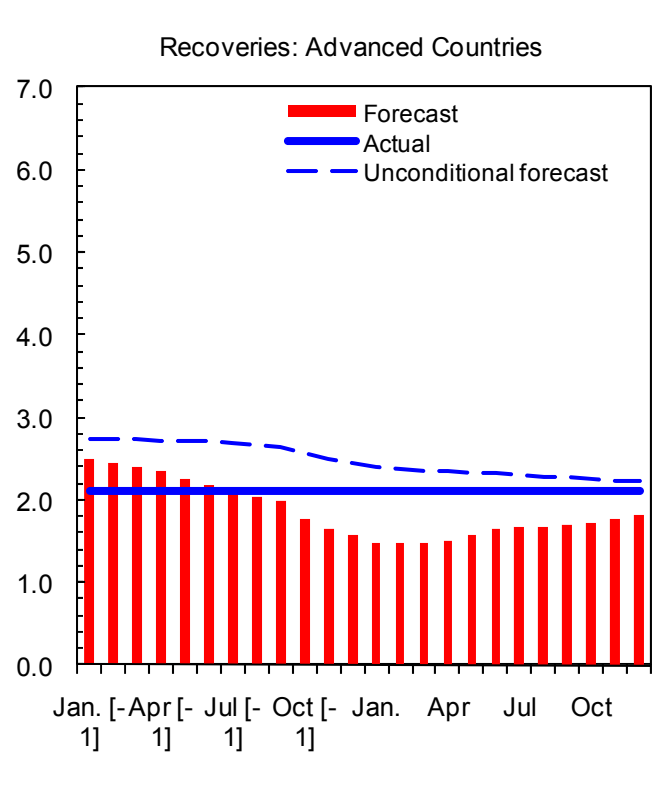
Ft is the corresponding vector of forecasts

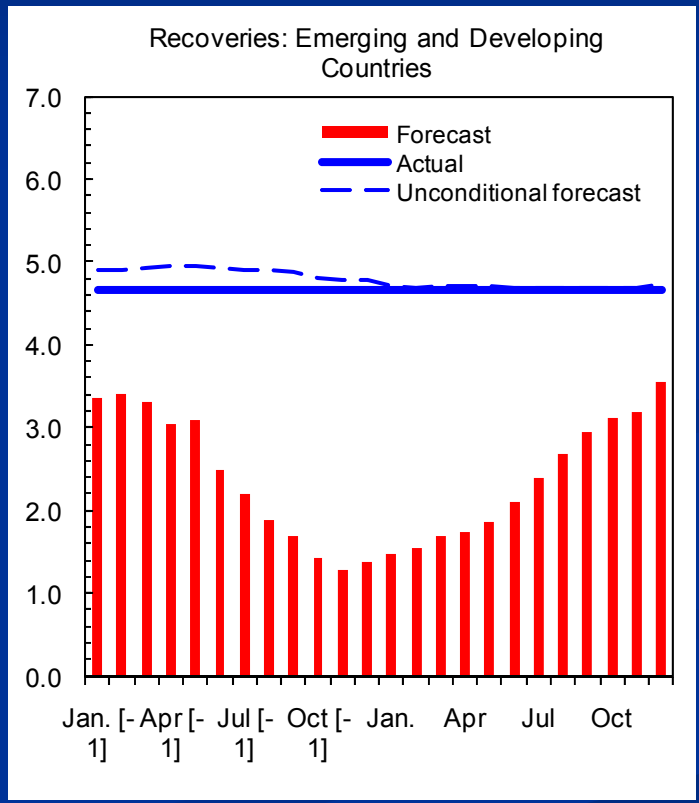
Recessions are difficult to anticipate in all economies

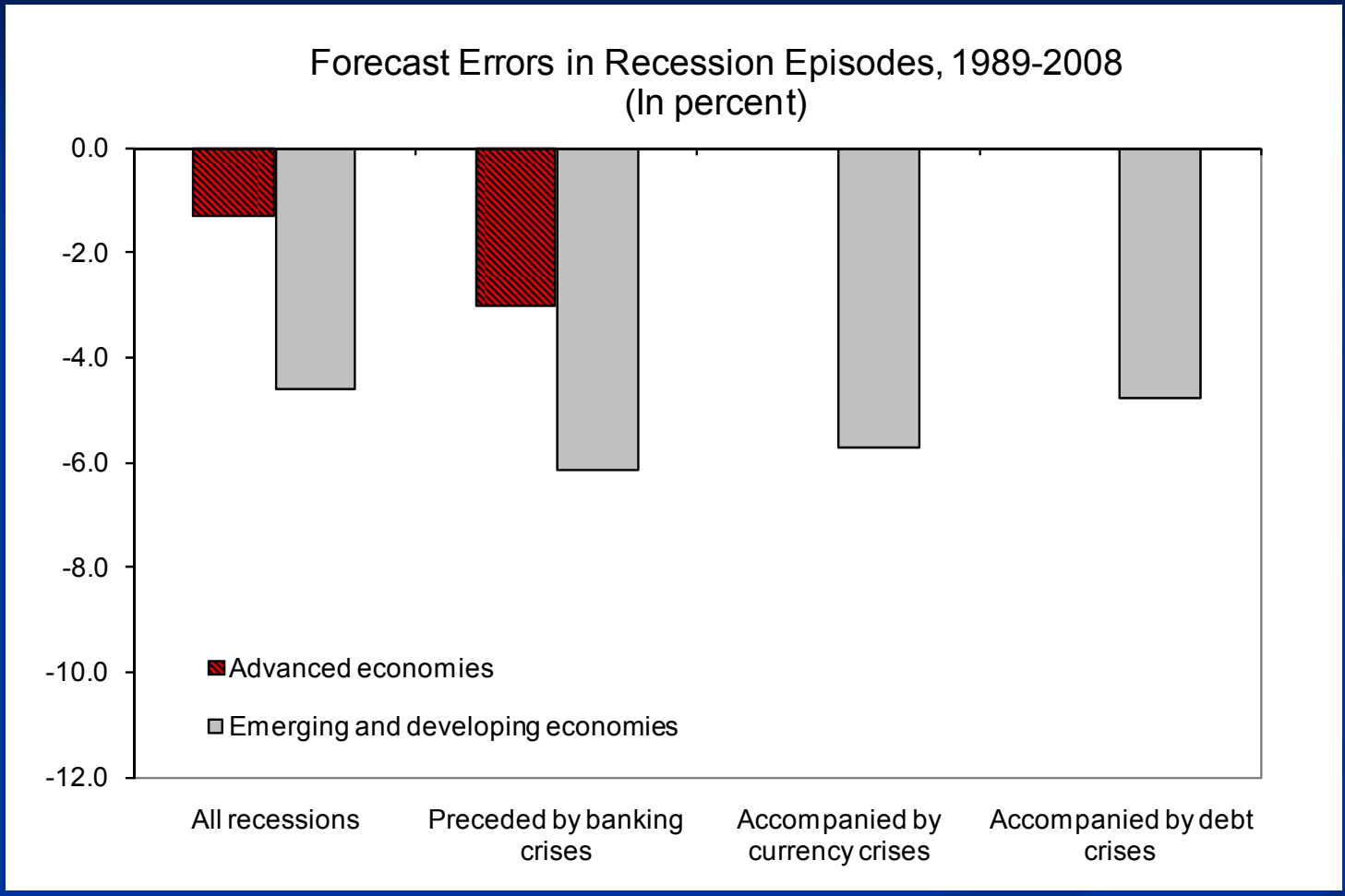


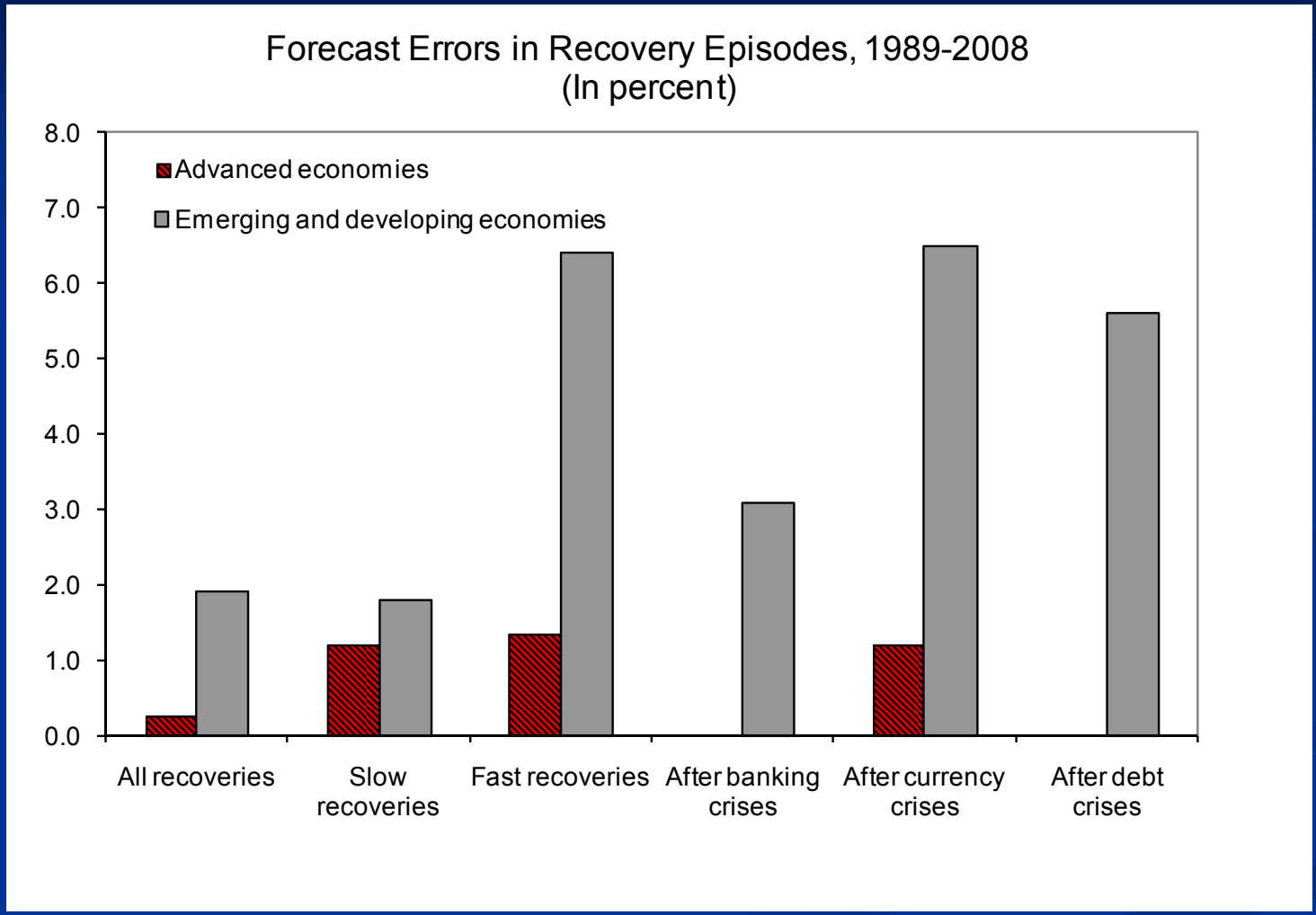


The record for anticipating recoveries is also imperfect

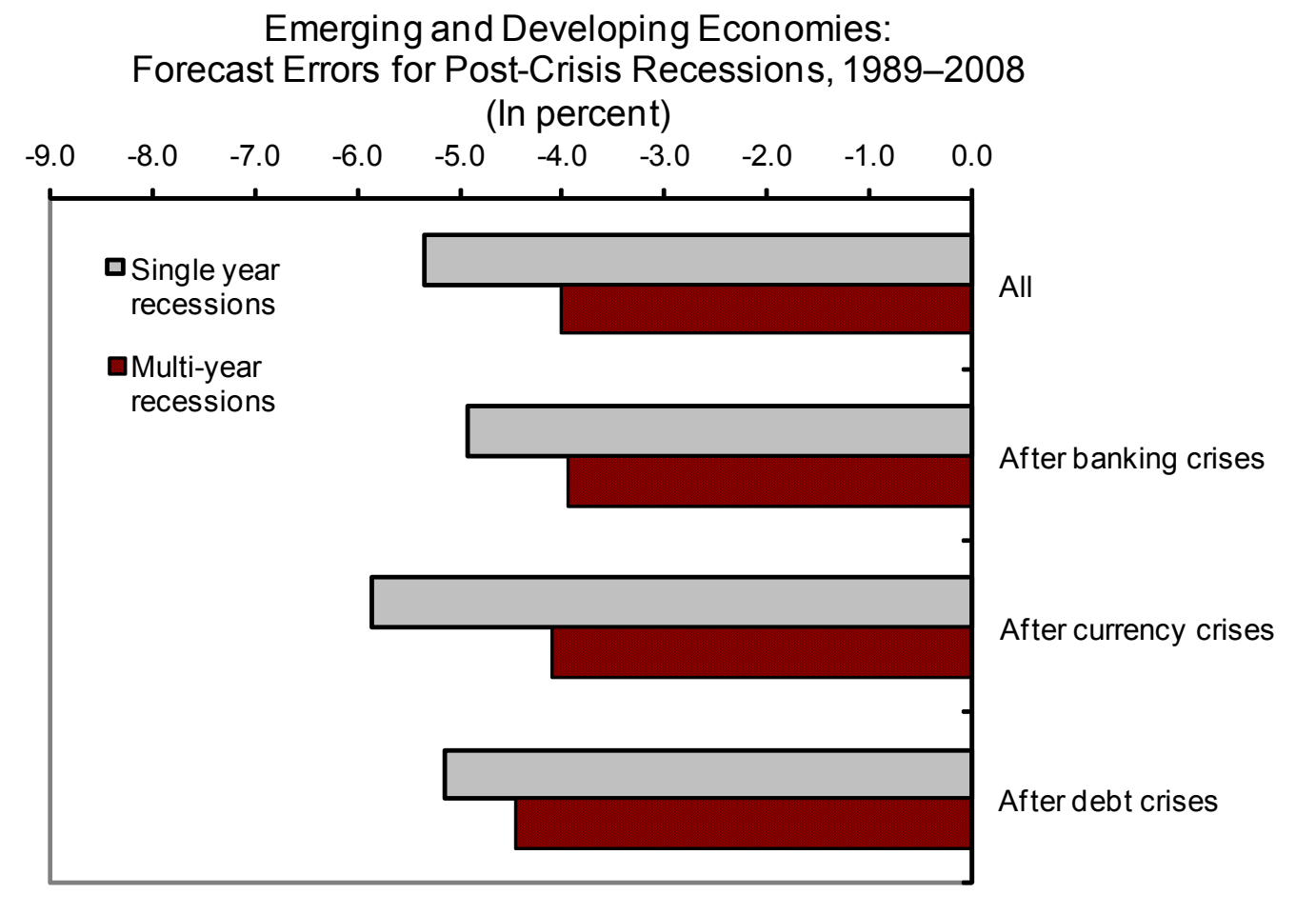




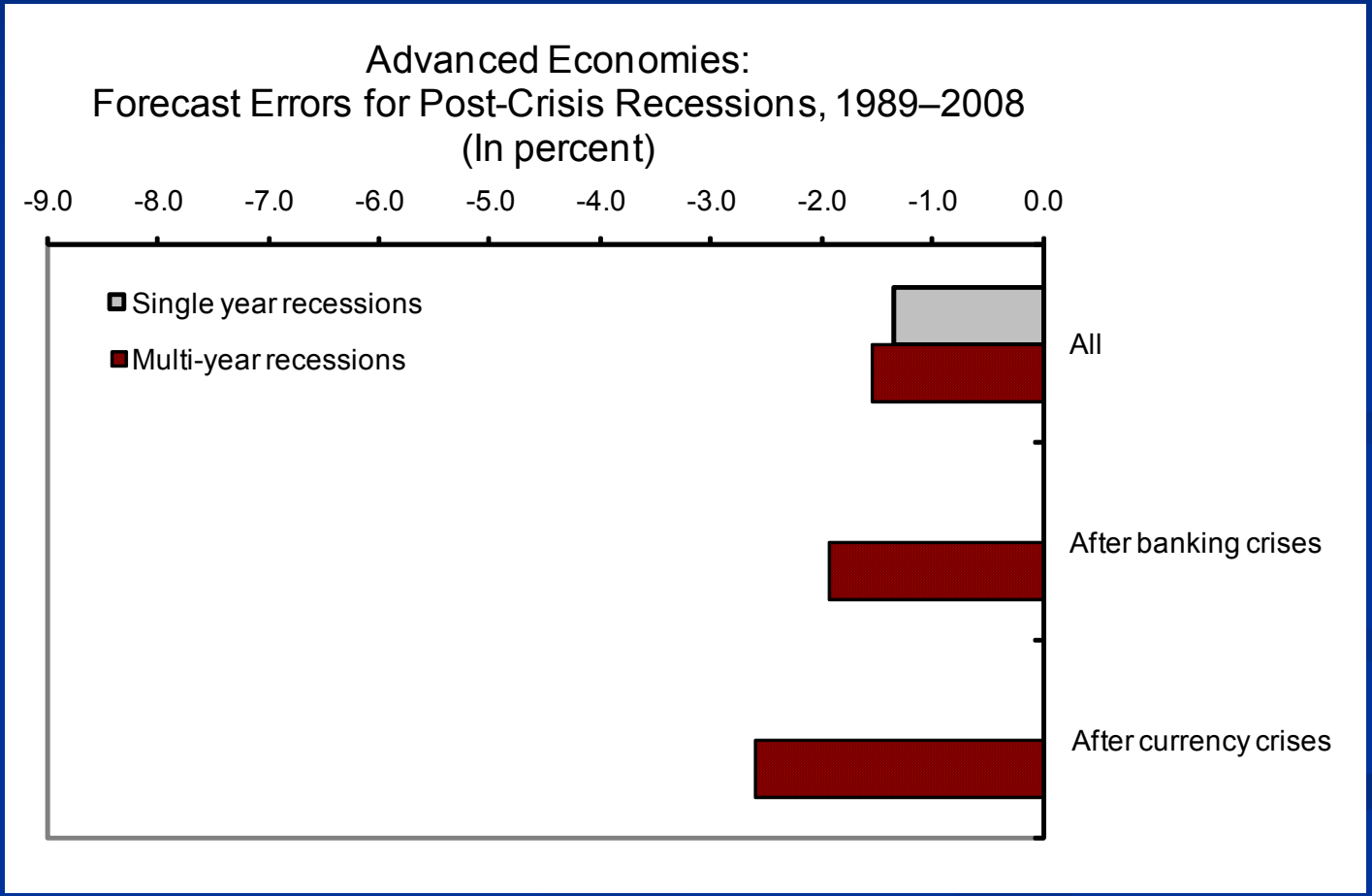

Forecast Errors in Recession Episodes, 1989-2008
(In percent)
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
-12.0
Advanced economies
Emerging and developing economies
All recessions
Preceded by banking crises
Accompanied by currency crises
Accompanied by debt crises


Forecast Errors in Recovery Episodes, 1989-2008
(In percent)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Advanced economies
Emerging and developing economies
All recoveries
Slow recoveries
Fast recoveries
After banking crises
After currency crises
After debt crises

Short recessions are harder to predict than multi-year recessions in emerging economies



One-year and multi-year recessions are almost equally hard to predict in advanced economies



Tests of Forecast Efficiency and Bias

- "If I can look at your most recent forecasts and accurately say: "Your next forecast will be 2 percent lower than today's, then you can surely improve your forecast." (Nordhaus, 1997)
- Successive forecasts of the same event should be uncorrelated
- Regress subsequent revisions on earlier revisions

Strong Efficiency

$$r_{i,t,h} = f_{i,t,h} - f_{i,t,h+1}$$

$$E[r_{i,t,h} \mid \Phi_{i,t,h+1}] = 0$$

Weak Efficiency

$$E\left[r_{i,t,h} \mid r_{i,t,h+1}, r_{i,t,h+2}, \ldots, r_{i,t,h+H} \right] = 0$$

$$r_{i,t,h} = \beta_1 r_{i,t,h+k} + u_{i,t,h}$$

Test of Bias

$$A_t = a_0 + a_1 F_t + u_t,$$

Forecasts are efficient if the intercept *a0* is zero,

the slope *a1* is 1, and the errors are random.

Forecast inefficiency for adjacent forecasts in all episodes

Test of Efficiency						
	Advanced			Emerging and developing		
	Coeff.	St. Error		Coeff.	St. Error	
Middle revision	0.37	0.07	***	0.60	0.07	***
Middle revision during recoveries	0.10	0.19		0.13	0.18	
Middle revision during recessions	0.09	0.13		-0.93	0.12	***
Middle revision during banking crises	0.89	0.52	*	-0.27	0.16	*
Middle revision during currency crises	2.06	0.09	***	0.71	0.24	***
Middle revision during debt crises	—	—		0.94	0.45	**
Initial revision	-0.02	0.08		-0.03	0.10	
Initial revision during recoveries	-0.01	0.17		-0.13	0.16	
Initial revision during recessions	-0.42	0.19	**	0.06	0.19	
Initial revision during banking crises	-0.75	0.53		0.06	0.44	
Initial revision during currency crises	-2.11	0.18	***	-0.66	0.43	
Initial revision during debt crises	—	—		-0.54	0.32	*
Number of observations		387			475	
R-squared		0.38			0.52	
P-values for Wald tests						
Middle revision during recoveries		0.01	***		0.00	***
Middle revision during recessions		0.00	***		0.00	***
Middle revision during banking crises		0.02	**		0.05	**
Middle revision during currency crises		0.00	***		0.00	***
Middle revision during debt crises		0.00	***		0.00	***
Initial revision during recoveries		0.87			0.19	
Initial revision during recessions		0.01	***		0.86	
Initial revision during banking crises		0.14			0.96	
Initial revision during currency crises		0.00	***		0.12	
Initial revision during debt crises		0.84			0.09	*
Source: Authors' estimate						
Note: The dependent variable is the final revisions. Asterisks *** (**, *) indicate statistical significance at the 1, 5, 10 percent level. Regressions include dummy variables for						

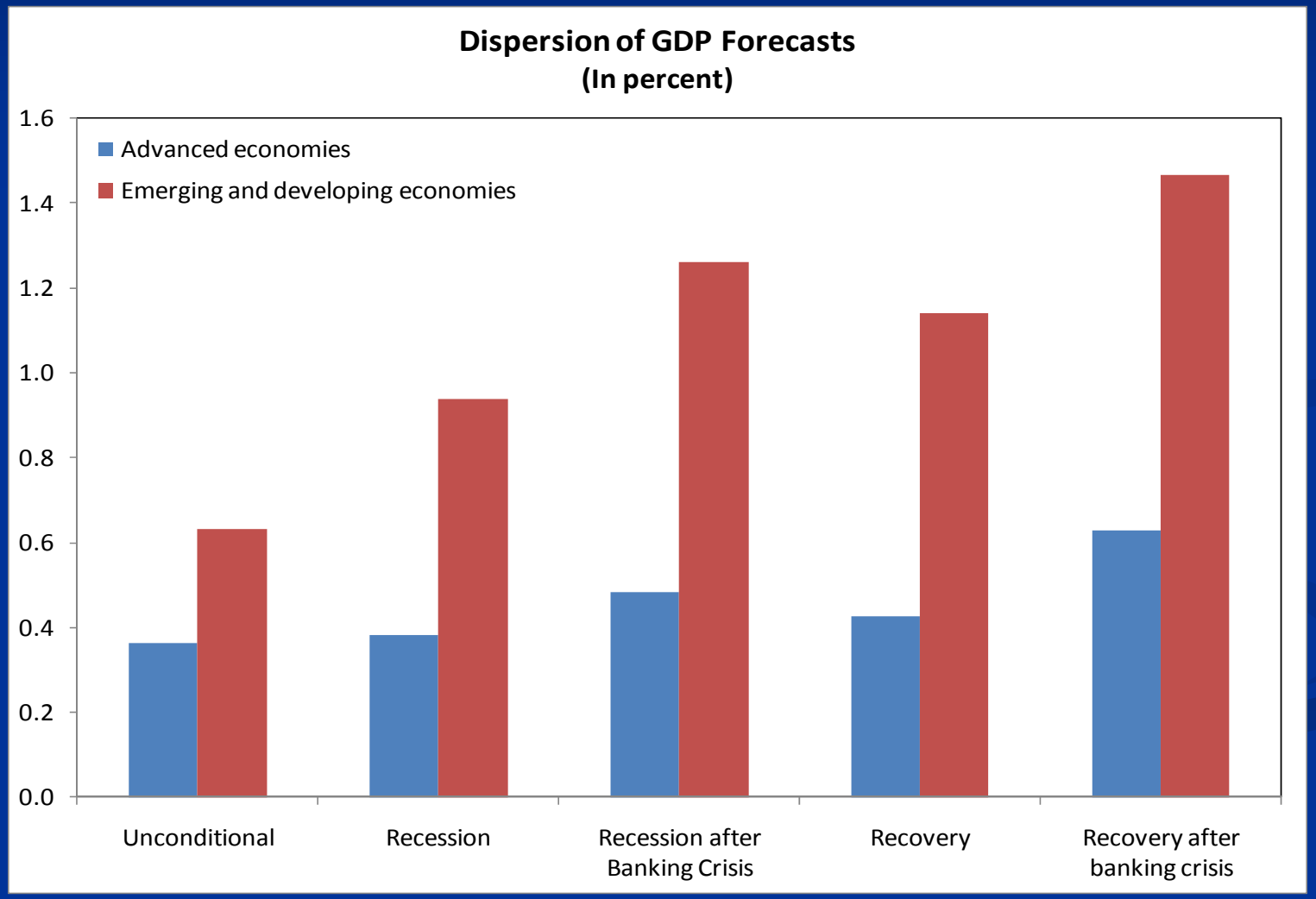
Confirmation of broad-based forecast inefficiency

Test of Bias						
	Advanced			Emerging and developing		
	Coeff.	St. Error		Coeff.	St. Error	
Constant	0.34	0.08	***	1.56	0.41	***
Dummy for recovery	0.07	0.09		0.87	0.16	***
Dummy for recession	-0.52	0.06	***	-4.61	0.13	***
Dummy for banking crisis	0.38	0.15	**	-0.52	0.16	***
Dummy for currency crisis	-1.10	0.08	***	-1.05	0.20	***
Dummy for debt crisis	—	—		0.58	0.27	**
Forecast	0.96	0.02	***	0.84	0.01	***
Forecast during recovery	-0.22	0.05	***	-0.04	0.06	
Forecast during recession	-0.36	0.03	***	-0.39	0.03	***
Forecast during banking crisis	-0.31	0.09	***	-0.07	0.03	***
Forecast during currency crisis	-0.69	0.04	***	-0.12	0.04	***
Forecast during debt crisis	—	—		0.05	0.06	
Number of observations		9656			13562	
R-squared		0.71			0.70	
P-values for Wald tests						
Forecast		0.00	***		0.00	***
Forecast during recovery		0.00	***		0.00	***
Forecast during recession		0.00	***		0.00	***
Forecast during banking crisis		0.00	***		0.00	***
Forecast during currency crisis		0.00	***		0.00	***
Forecast during debt crisis		0.00	***		0.00	***

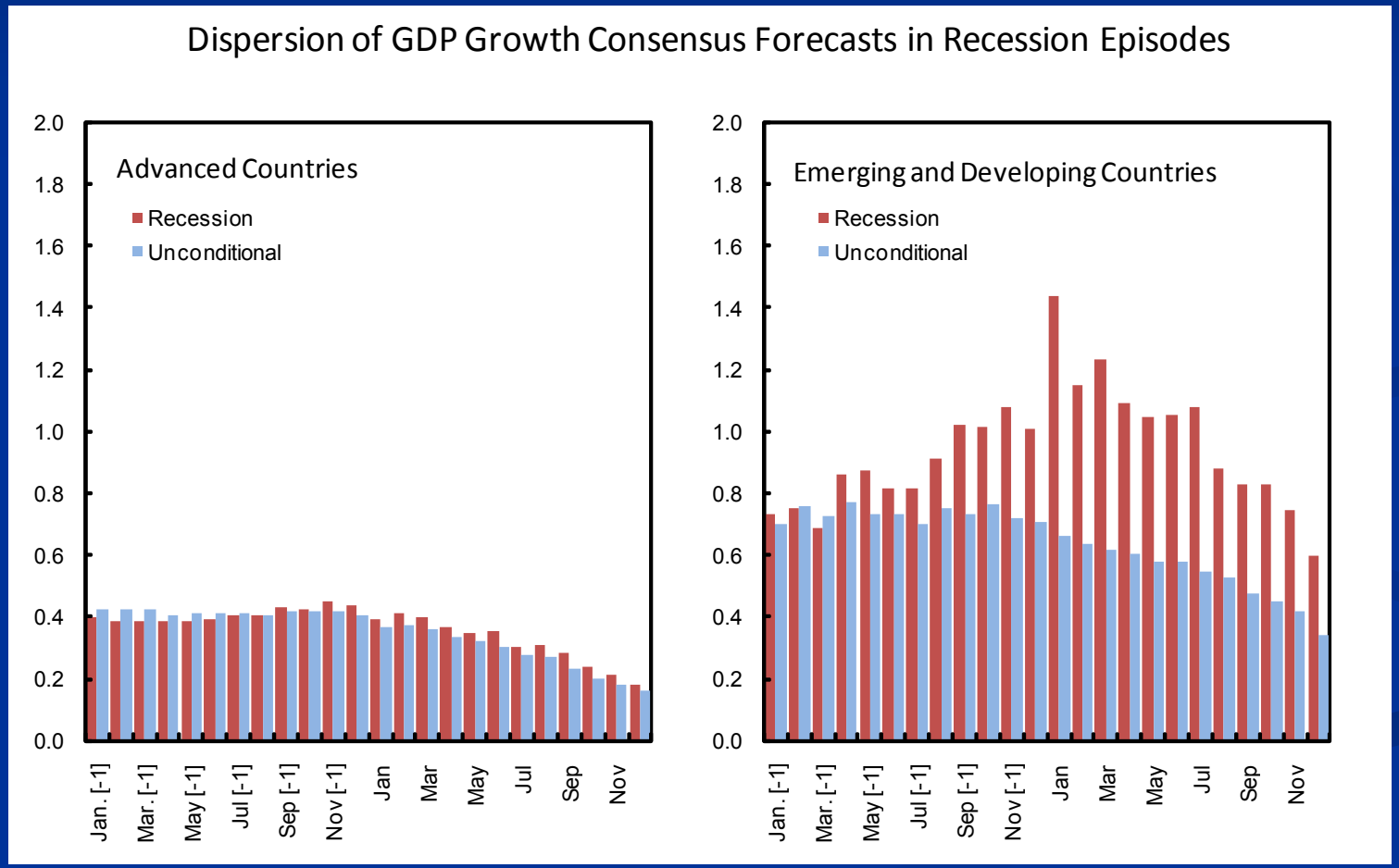
Source: Authors' estimate

Note: The dependent variable is the actual forecasts. Asterisks *** (**, *) indicate statistical significance at the 1, 5, 10 percent level. The joint Wald test focuses on the hypothesis that the coefficient on the respective consensus forecast is equal to 1 and the respective constant is equal to 0.

Dispersion of forecasts rises in recessions and recoveries, especially after crises



Dispersion of consensus forecasts increases in the run-up to and during recessions, especially for emerging economies



Dispersion rises during recessions and recoveries, esp. in crises, but is not a good predictor of recessions

Dispersion of GDP Consensus Forecasts, 1989-2008						
	Advanced Economies			Emerging and Developing Economies		
	Coef.	Std. Err.		Coef.	Std. Err.	
1 year before recession	-0.01	0.03		0.06	0.11	
11 months before recession	0.02	0.03		0.07	0.09	
10 months before recession	0.03	0.03		0.14	0.11	
9 months before recession	0.01	0.03		0.04	0.09	
8 month before recession	0.00	0.03		0.13	0.11	
7 month before recession	0.00	0.03		0.07	0.09	
6 month before recession	-0.01	0.03		0.15	0.11	
5 month before recession	0.00	0.03		0.11	0.09	
4 month before recession	-0.01	0.03		0.10	0.11	
3 month before recession	-0.06	0.03	*	0.08	0.09	
2 month before recession	-0.05	0.03	*	0.11	0.11	
1 month before recession	-0.04	0.03		0.02	0.09	
Recession	0.02	0.01	***	0.35	0.02	***
Recession after banking crisis	0.12	0.03	***	0.41	0.04	***
Recovery	0.05	0.01	***	0.48	0.02	***
Recovery after banking crisis	0.25	0.03	***	0.48	0.04	***
Horizon	0.01	0.00	***	0.02	0.00	***
Constant	0.20	0.01	***	0.30	0.01	***
R-squared	0.21			0.28		
Number of observations	5,346			5,549		
Source: Authors' estimates						
Notes: The dependent variable is dispersion (standard deviation) of consensus forecasts. The dummy variable "Recovery after banking crisis" takes a value of 1 if recovery occurred 2 years after banking crisis in emerging and developing economies and 3 years after crisis in advanced economies. Asterisks (***, **, *) indicate signficance at the 1 percent, 5 percent, and 10 percent level.						

Higher dispersion is associated with larger forecast errors

Dispersion of Growth Consensus Forecasts, 1989-2008						
	Advanced Economies			Emerging and Developing Economies		
	Coef.	Std. Err.		Coef.	Std. Err.	
Absolute forecast errors	0.04	0.00	***	0.052	0.00	***
Constant	0.31	0.00	***	0.508	0.01	***
R-squared	0.05			0.10		
Number of observations	5,514			6,293		
Source: Authors' estimates						

Conclusions

- Forecasts errors for recessions tend to exceed those for recoveries
- In advanced economies, forecasts of recessions and recoveries seem independent of their duration and pace
- However, in emerging and developing economies, short recessions and fast recoveries are harder to predict
- Forecasts during crisis episodes are highly uncertain, especially for banking crises
- It is important to report measures of forecast accuracy (fan charts, dispersion across forecasters)
- Improvements in leading indicators for emerging and developing economies would be useful