## FORECASTING STANDARDS CHECKLIST

An electronic version of this checklist is available on the Forecasting Principles Web site.

			Does formal procedure follow the star dard?						stan-
			NO!			YES!			
			N/A	-2	-1	0	1	2	?
P	ROBLI	EM							
1.	Setti	ng Objectives							
	1.1. 1.2.	Describe decisions that might be affected Agree on actions for different possible							_
	1.3.	forecasts  Make forecast independent of organizational politics							
	1.4.	Consider whether events or series are forecastable							
	1.5.	Gain decision makers' agreement on methods							
2.	Struc	cturing the Problem							
	2.1.	Identify possible outcomes prior to making forecasts							
	2.2.	Tailor the level of data aggregation to the decisions							
	2.3.	Decompose the problem into sub problems							
	<ul><li>2.4.</li><li>2.5.</li></ul>	Decompose time series by causal forces Structure problems to deal with important interactions							
	2.6.	Structure problems that involve causal chains							
	2.7.	Decompose time series by level and trend							
I R	NEO PA	MATION							
		tifying Information Sources							
Э.		· -							
	3.1.	Use theory to guide information search on explanatory variables							
	3.2.	Ensure that data match the forecasting situation							
	3.3.	Avoid biased data sources							
	3.4.	Use diverse sources of data							
	3.5.	Obtain information from similar (analogous) series or cases							

Does formal procedure follow the standard? NO! YES! -2 2 ? N/A -1 0 1 4. Collecting Data 4.1. Use unbiased and systematic procedures to collect data 4.2. Ensure that information is reliable 4.3. Ensure information is valid 4.4. Obtain all important data 4.5. Avoid collection of irrelevant data Obtain the most recent data 5. Preparing Data Clean the data 5.1. Use transformations as required by expectations 5.3. Adjust intermittent series 5.4. Adjust for unsystematic past events (outliers) Adjust for systematic events (e.g., seasonality) 5.6. Use multiplicative adjustments for seasonality for stable series with trends Damp seasonal factors for uncertainty Use graphical displays for data **METHODS** 6. Selecting Methods Develop list of all important criteria 6.2. Ask unbiased experts to rate potential methods 6.3. Use structured forecasting methods rather than unstructured 6.4. Use quantitative methods rather than qualitative methods Use causal rather than naïve methods Select simple methods unless evidence favors complex methods 6.7 Match forecasting method(s) to the situation 6.8. Compare track records of various methods Assess acceptability and understandability of methods to users 

6.10. Examine value of alternative forecasting

methods

			Does formal procedure follow the stan- dard?							
			NO!				YES!			
			N/A	-2	-1	0	1	2	?	
7.	Imple	ementing Methods: General								
	7.1.	Keep methods simple								
	7.2.	Provide a realistic representation of the								
	7.0	forecasting situation								
	7.3.	Be conservative in situations of uncertainty or instability								
	7.4.	Do not forecast cycles								
	7.5.	Adjust for expected events in future								
	7.6.	Pool similar types of data								
	7.7.	Ensure consistency with forecasts of related								
		series								
8.	Imple	ementing Methods: Judgment								
	8.1.	Pretest questions used to solicit judgmental forecasts								
	8.2.	Use questions that have been framed in alternative ways								
	8.3.	Ask experts to justify their forecasts								
	8.4.	Use numerical scales with several categories								
	8.5.	Obtain forecasts from heterogeneous experts								
	8.6.	Obtain intentions or expectations from representative samples								
	8.7.	Obtain forecasts from sufficient number of respondents								
	8.8.	Obtain multiple estimates of an event from each expert								
9.	Imple	ementing Method: Quantitative								
	9.1.	Tailor the forecasting model to the horizon								
	9.2.	Match model to underlying process								
	9.3.	Do not use fit to develop a model								
	9.4.	Weight the most relevant data more heavily								
	9.5.	Update models frequently								
10	. Imp	plementing Methods: Quantitative Models								
	witl	h Explanatory Variables								
	10.1.	Use theory and domain expertise to select casual variables								
		Use all important variables								
		Use theory and domain expertise to specify directions of relationships								
		Use theory and domain expertise to estimate/limit relationships								
	10.5.	Use different types of data to estimate a relationship								

## Does formal procedure follow the standard?

			NO!				YES!	
		N/A	-2	-1	0	1	2	?
10.6.	Forecast for at least two alternative environments							
10.7.	Forecast for alternative interventions							
	Apply the same principles to the forecasts of the explanatory variables							
10.9.	Shrink the forecasts of change if there is uncertainty for predictions of the explanatory variables							
11. Inte	grating Judgmental and Quantitative							
Met	thods							
11.1.	Use structured procedures to do the integration							
11.2.	Use structured judgment as inputs to models							
11.3.	Use prespecified domain knowledge as input in selecting, weighting, and modifying quantitative methods							
11.4.	Limit subjective adjustments of quantitative	ш	Ц					
11	forecasts							
11.5.	Use judgmental bootstrapping instead of expert forecasts							
12. Con	nbining Forecasts							
12.1.	Combine forecasts from approaches that differ							
12.2.	Use many approaches (or forecasters), preferably at least five							
12.3.	Use formal procedures to combine forecasts							
12.4.	Start with equal weights							
12.5.	Use trimmed means							
12.6.	Use evidence on each method's accuracy to vary the weights on the component forecasts.							
12.7.	Use domain knowledge to vary the weights on the component forecasts							
12.8.	Combine when there is uncertainty about which method is best							
	Combine when uncertainty exists about the situation							
12.10	. Combine when it is important to avoid large errors							

		Does formal procedure follow the star dard?						stan-	
		NO!					YES!		
		N/A	-2	-1	0	1	2	?	
EVALUA <sup>-</sup>	ΓΙΟΝ								
3. Eval	uating Methods								
13.1.	Compare reasonable methods								
13.2.	Use objective tests of assumptions								
	Design test situation to match the forecasting problem								
13.4.	Describe conditions associated with the forecasting problem								
13.5.	Tailor the analysis to the decision								
13.6.	Describe potential forecaster biases								
13.7.	Assess reliability and validity of the data								
13.8.	Provide easy access to the data								
13.9.	Provide full disclosure of methods								
13.10.	Test assumptions for validity								
13.11.	Test client's understanding of the methods								
13.12.	Use direct replications of the evaluations to identify mistakes								
13.13.	Use replications of the forecast evaluations to assess reliability								
13.14.	Use extensions of evaluations for generalizability								
13.15.	Conduct extensions of evaluations in realistic situations								
13.16.	Compare forecasts generated by different methods								
13.17.	Examine all important criteria								
13.18.	Specify criteria prior to analyzing the data								
13.19.	Assess face validity								
13.20.	Use error measures that adjust for scale								
13.21.	Ensure error measures are valid								
13.22.	Use error measures that are not sensitive to degree of difficulty in forecasting								
13.23.	Avoid biased error measure								
13.24.	Avoid error measures with high sensitivity to outliers								
13.25.	Use multiple measures of accuracy								

13.26. Use out-of-sample (ex ante) error measures

13.27. Use ex post accuracy test to evaluate effects

13.28. Do not use adjusted R-square to compare

models

Does formal procedure follow the stan-

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			NO!				YES!	
		N/A	-2	-1	0	1	2	?
13.29.	Use statistical significance only to compare the accuracy of <i>reasonable</i> methods							
13.30.	Do not use root-mean-square errors to make comparisons							
13.31.	Base comparisons on large sample							
13.32.	Conduct explicit cost-benefit analyses							
14. Asses	ssing Uncertainty							
14.1.	Estimate prediction intervals (PI)							
14.2.	Use objective procedures							
14.3.	Develop PI using realistic representation of the situation							
14.4.	Use transformations when needed to estimate symmetric PIs							
14.5.	Ensure consistency over forecast horizon							
14.6.	List reasons why forecast might be wrong							
14.7.	Consider likelihood of alternative outcomes in assessing PIs							
14.8.	Obtain good feedback on accuracy and reasons for errors							
14.9.	Combine PIs from alternative methods							
14.10.	Use safety factors for PIs							
14.11.	Conduct experiments							
14.12.	Do not assess uncertainty in a traditional group meeting							
14.13.	Incorporate the uncertainty for predictions of the explanatory variables							
14.14.	Ask for a judgmental likelihood that a forecast will fall within a pre-defined minimum-maximum interval				_		_	
	minimum-maximum intervai	ш		ш		ш		ш
USING F	ORECASTS							
15. Prese	enting Forecasts							
15.1.	Provide clear summary of forecasts and data							
15.2.	Provide clear explanation of methods							
15.3.	Describe assumptions							
15.4.	Present prediction intervals							
15.5.	Present forecasts as scenarios							
16. Lear	ning							
16.1.	Consider use of adaptive models							
16.2.	Seek feedback about forecasts							
16.3.	Use a formal review process for forecasting methods							
16.4.	Use a formal review process for use of forecasts							