

The Financial Bubble Experiment: Advanced Diagnostics and Forecasts of Bubble Terminations Volume III—Assets Document

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This is the third installment of the Financial Bubble Experiment. We identify 27 bubbles in 27 different global assets; for 25 of these assets, we present windows of dates of the most likely ending time of each bubble. This current document, which will be made public on 2 May 2011 is the one whose digital fingerprint is provided in the accompanying master document [1], made public on 11 November 2010.

I. INTRODUCTION

The Financial Bubble Experiment (FBE) aims at testing the following two hypotheses:

- **Hypothesis H1:** Financial (and other) bubbles can be diagnosed in real-time before they end.
- **Hypothesis H2:** The termination of financial (and other) bubbles can be bracketed using probabilistic forecasts, with a reliability better than chance.

In a medical context, H1 corresponds to the diagnostic of cancer and H2 to the forecast of remaining life expectancy. These are embedded hypotheses, in that H1 includes H2 and we test them here separately. The “end of a bubble” is interpreted in terms of dynamical systems as a “change of regime” or “turning point”. This qualitative terminology is supported by quantitative measures [3].

We began this experiment in November 2009 with the publication of diagnoses of three distinct bubbles in three distinct assets, followed in December 2009 with a fourth. We only published the digital fingerprints of electronic documents containing our forecasts in November and December 2009. On 3 May 2010 we revealed the four assets and published the original documents. In each of the four original documents, we presented a range of dates of the most likely end of the bubbles. In the follow-up report in May 2010, we presented quantitative analysis measuring the quality of our forecasts. The background theory and methodology, as well as these previous results—the original documents, the digital fingerprints and the follow-up analysis—are publicly available online at the URL given in [3]. We continued the FBE with 7 more assets, whose key was published in May 2010 and revealed in November 2010 [2].

This report is a continuation of the FBE in that we offer the digital fingerprint of an electronic document containing 27 assets that we find to be in bubbles at the time of writing. We published the original document itself on 11 November 2010. As in the second installment, we create only a single document containing the information on the 27 assets. We continue with testing separately H1 by itself and H1 in combination with H2.

We present a collection of 27 assets that our methods indicate support H1 (Sections II-III, Tables I-II). For 25 of these assets, we also provide forecast windows of the most likely ending of the bubbles, which would support H2 (Section III, Table II). Further, we categorize the assets by type: Index, Equity, Commodity and Foreign Exchange. Note that in our Equity category, we mean products that can be traded on an exchange. This is why, for instance, Ishares Singapore Index, with ticker symbol EWS appears under our Equity category and not under the Index category.

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2 H1 Assets (identified bubble)		
Category	Asset	Ticker
Index	MERVAL Buenos Aires	^MERV (Y)
Equity	AUTOZONE	AZO (Y)

TABLE I. 2 H1 assets of the Financial Bubble Experiment as of 11 November 2010. All listed assets are candidates for H1 (identified bubble phase). In the Ticker column, (B) stands for Bloomberg and (Y) for Yahoo Finance.

25 H1 and H2 Assets (identified bubble)				
Category	Asset	Ticker	t_c 20% - 80%	t_c 5% - 95%
Index	BSE SENSEX, Bombay	^BSESN (Y)	2010-11-03 - 2010-12-01	2010-10-27 - 2010-12-10
	Dow Jones-AIG Commodity Index	^DJC (Y)	2010-11-16 - 2010-12-04	2010-11-09 - 2010-12-10
	FTSE 100	^FTSE (Y)	2010-11-27 - 2010-12-26	2010-11-07 - 2011-01-03
	Hang Seng Index Hong Kong	^HSI (Y)	2010-11-09 - 2010-12-09	2010-11-07 - 2010-12-16
	Interactive Week Internet Index	^IIX (Y)	2010-11-12 - 2010-12-10	2010-11-04 - 2010-12-23
	NASDAQ Computer	^IXK (Y)	2010-11-13 - 2010-12-06	2010-11-07 - 2010-12-09
	Jakarta Composite	^JKSE (Y)	2010-11-06 - 2010-12-09	2010-10-23 - 2010-12-25
	KOSPI Composite Index, Seoul	^KS11 (Y)	2010-11-15 - 2010-12-26	2010-10-30 - 2011-01-07
	NASDAQ-100 (DRM)	^NDX (Y)	2010-11-05 - 2010-11-29	2010-11-03 - 2010-12-22
	Reuters/Jefferies CRB index	CRY INDEX (B)	2010-11-11 - 2010-11-22	2010-11-07 - 2010-11-26
	TSEC weighted index	^TWII (Y)	2010-12-01 - 2011-01-03	2010-11-13 - 2011-01-08
	Major Market Index	^XMI (Y)	2010-11-10 - 2010-11-25	2010-10-30 - 2010-12-04
Equity	Ishares Singapore Index	EWS (Y)	2010-11-14 - 2010-12-12	2010-11-06 - 2010-12-25
	Freeport McMoRan Copper & Gold	FCX (Y)	2010-11-15 - 2010-12-17	2010-11-09 - 2010-12-27
	F5 NETWORKS	FFIV (Y)	2010-12-27 - 2011-03-09	2010-12-02 - 2011-04-08
	INTUIT	INTU (Y)	2010-11-28 - 2011-01-15	2010-11-07 - 2011-02-11
	STARBUCKS	SBUX (Y)	2010-11-08 - 2010-11-18	2010-11-06 - 2010-11-25
	UNITED RENTALS INC	URI (Y)	2010-11-09 - 2010-12-13	2010-11-02 - 2011-01-08
Commodity	Copper future (USD)	HG1 COMB Comdty (B)	2010-11-09 - 2011-01-07	2010-10-31 - 2011-01-15
	Corn future (CHF)	C 1 COMB Comdty (B)	2010-11-18 - 2010-12-19	2010-11-08 - 2010-12-28
	Cotton future (USD)	CT1 COMB Comdty (B)	2010-11-12 - 2010-11-13	2010-11-08 - 2010-11-15
	Palladium future (USD)	PA1 COMB Comdty (B)	2010-11-12 - 2010-11-19	2010-11-10 - 2010-11-27
	Silver future (CHF)	SI1 COMB Comdty (B)	2010-11-13 - 2010-11-18	2010-11-08 - 2010-11-29
	Sugar future (CHF)	SB1 COMB Comdty (B)	2010-11-20 - 2010-12-09	2010-11-10 - 2010-12-17
Forex	AUDUSD	(B)	2010-11-12 - 2010-12-25	2010-10-30 - 2011-01-12

TABLE II. 25 H2 assets of the Financial Bubble Experiment as of 11 November 2010. All listed assets are candidates for H1 (identified bubble phase) and H2 (identification of end of bubble phase). Quantile windows of most likely dates of the end of the bubble phases are shown. In the Ticker column, (B) stands for Bloomberg and (Y) for Yahoo Finance.

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- [1] R. Woodard, D. Sornette, M. Fedorovsky. The financial bubble experiment: advanced diagnostics and forecasts of bubble terminations, Vol. III. (Specific URL <http://arxiv.org> unavailable at time of digital signature), November 2010.
- [2] D. Sornette, R. Woodard, M. Fedorovsky, S. Reimann, H. Woodard, and W. X. Zhou The Financial Crisis Observatory. The Financial Bubble Experiment: advanced diagnostics and forecasts of bubble terminations, Vol. II-Master document. URL <http://arxiv.org/abs/1005.5675>. 2010.
- [3] D. Sornette, R. Woodard, M. Fedorovsky, S. Reimann, H. Woodard, and W.-X. Zhou. The financial bubble experiment: advanced diagnostics and forecasts of bubble terminations. URL <http://arxiv.org/abs/0911.0454>, May 2010.

II. H1 ASSETS

We diagnose that the 2 assets in this Section (see Table I) are in a bubble phase (H1) but we do not make forecasts of likely dates of change of regime (H2). For each asset, we present a figure showing the time series of the observations and indicate the range over which our analysis was performed (the shaded area in each figure).

A. H1 Indexes

1. Merval Buenos Aires

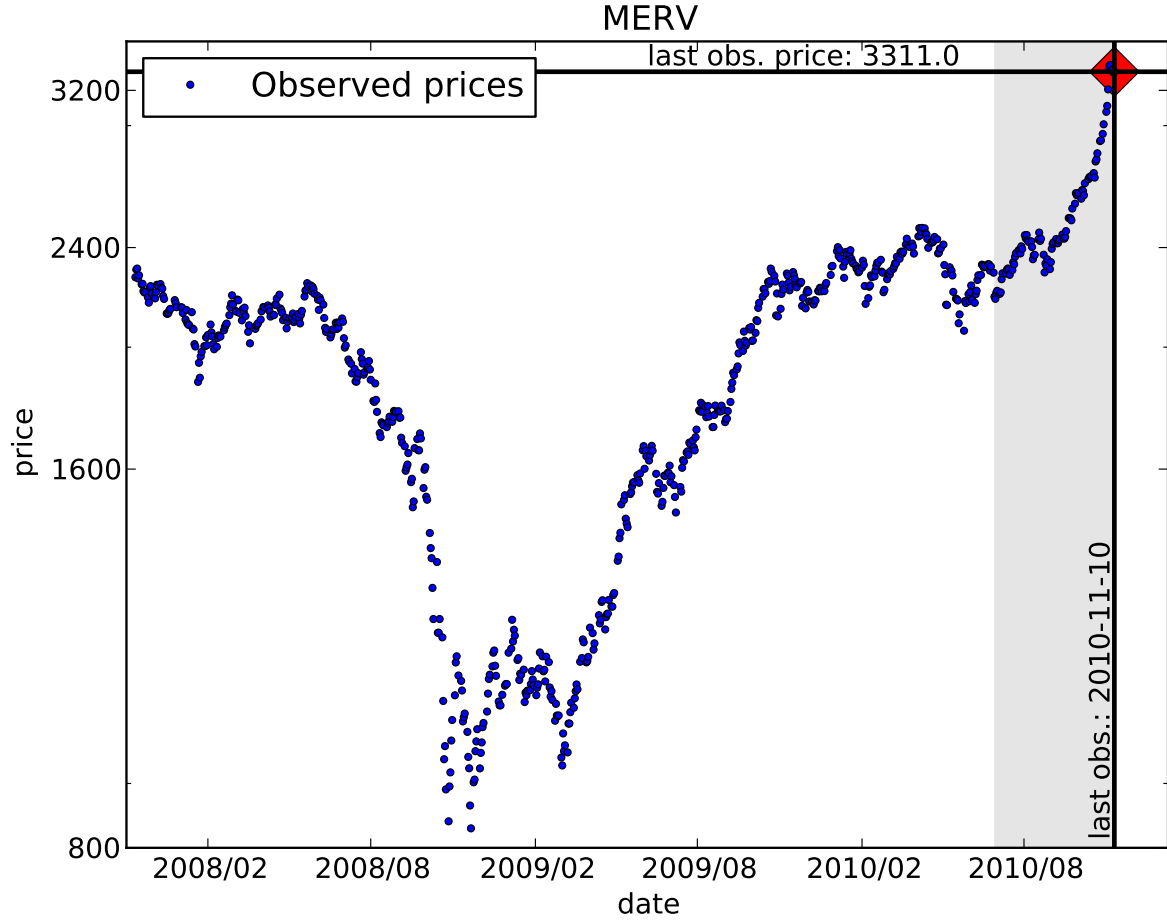


FIG. 1. Merval Buenos Aires: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

B. H1 Equities

1. AUTOZONE

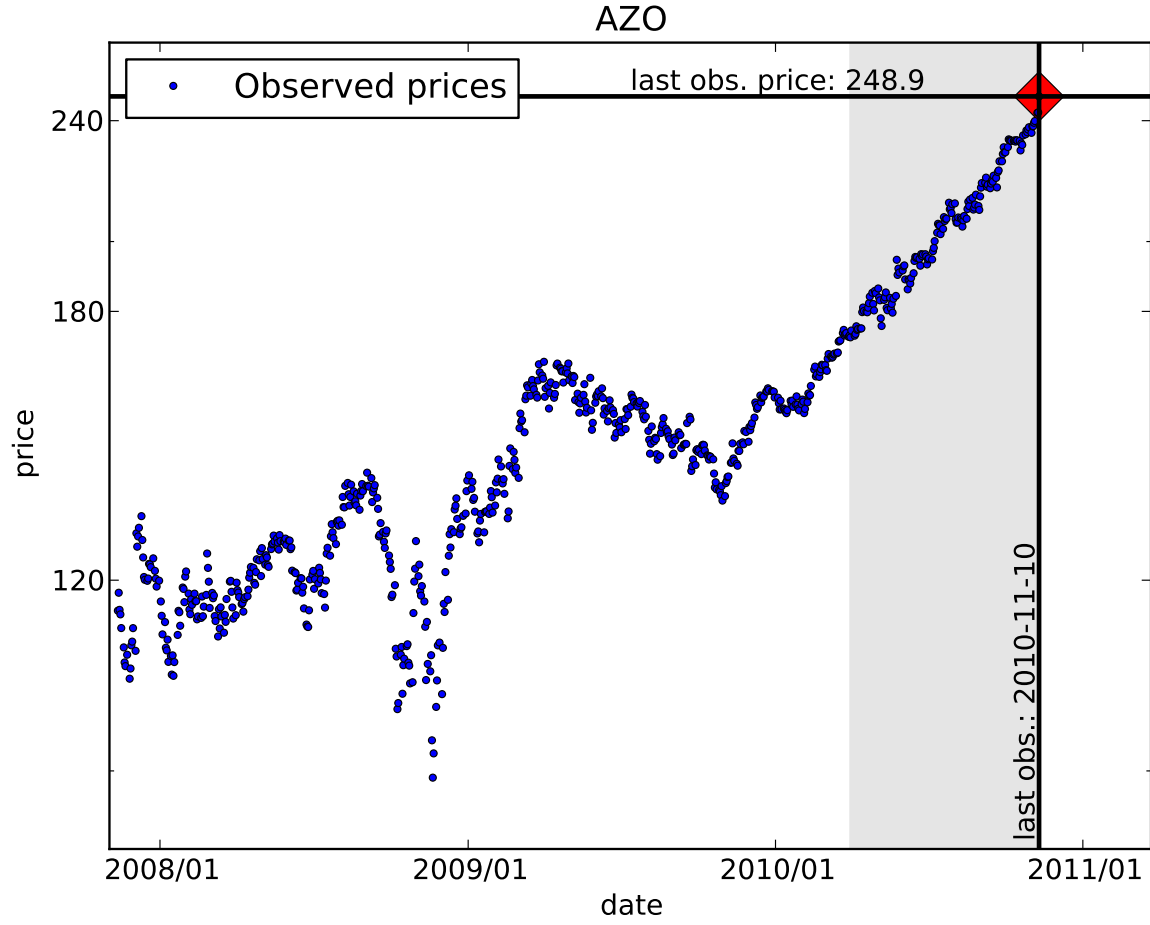


FIG. 2. AUTOZONE: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

III. H1 & H2 ASSETS

We hypothesize that the 25 assets in this Section (see Table II) are all in a bubble phase (H1) and are likely to end within the quantile ranges indicated in Table II (H2).

A. H1 & H2 Indexes

1. BSE SENSEX, Bombay

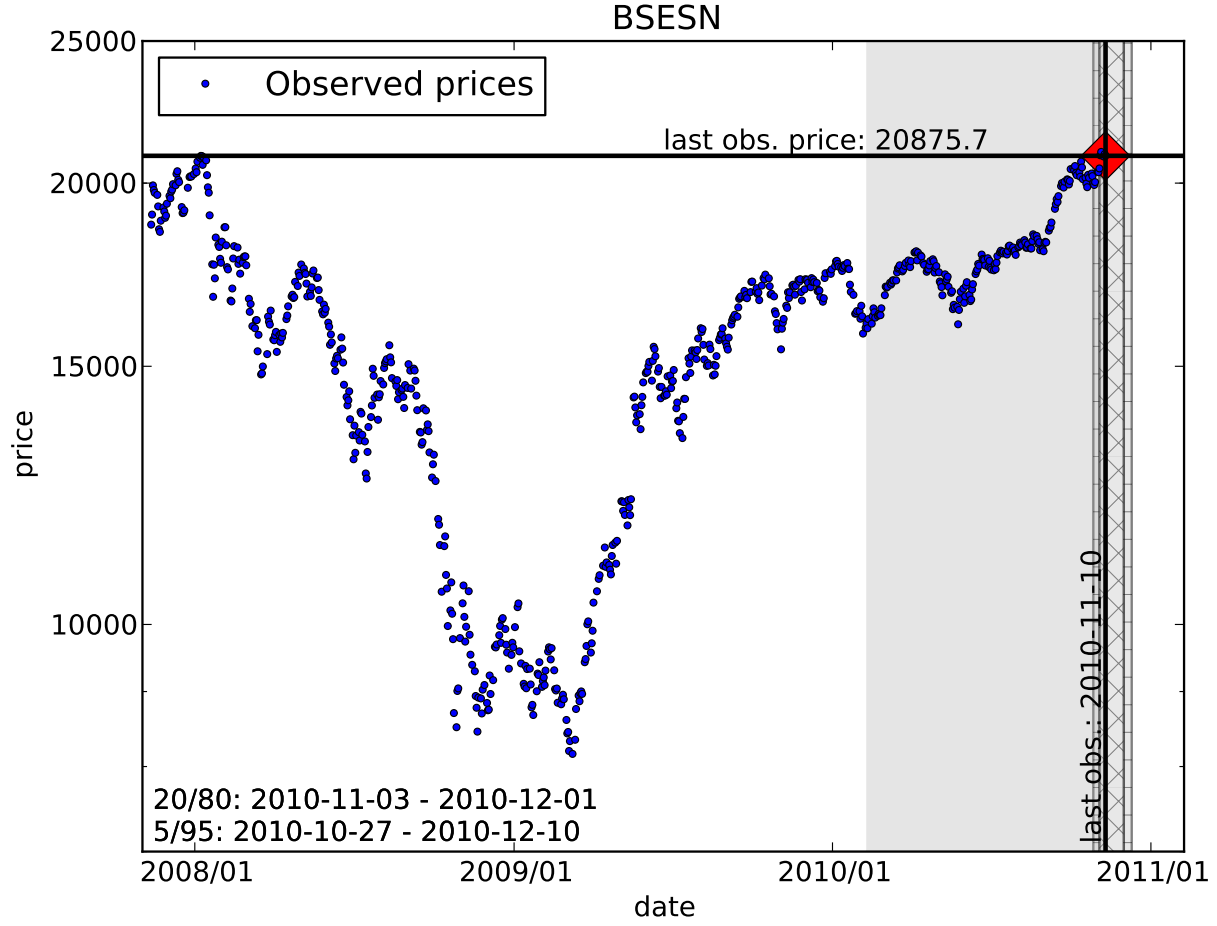


FIG. 3. BSE SENSEX, Bombay: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

2. Dow Jones-AIG Commodity Index

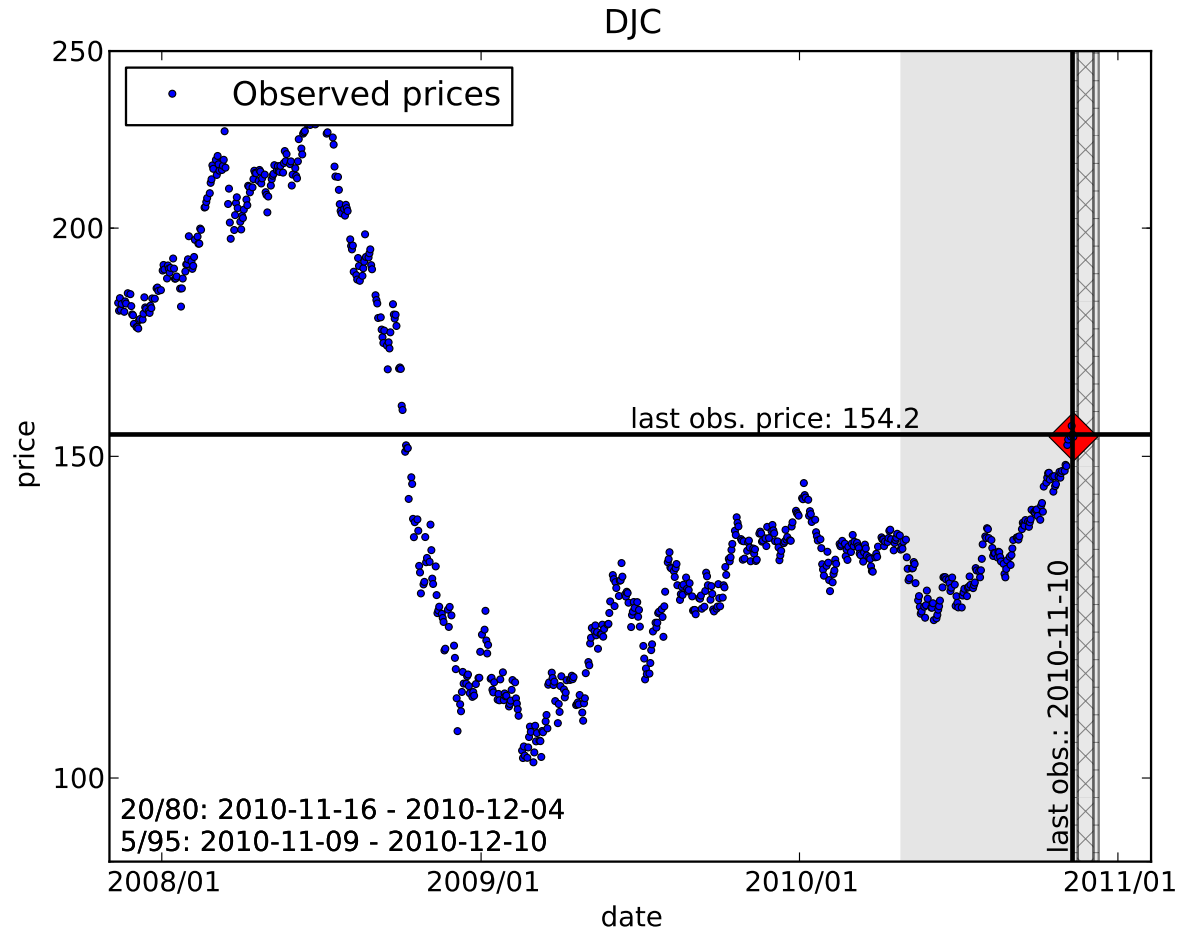


FIG. 4. Dow Jones-AIG Commodity Index: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

3. FTSE 100

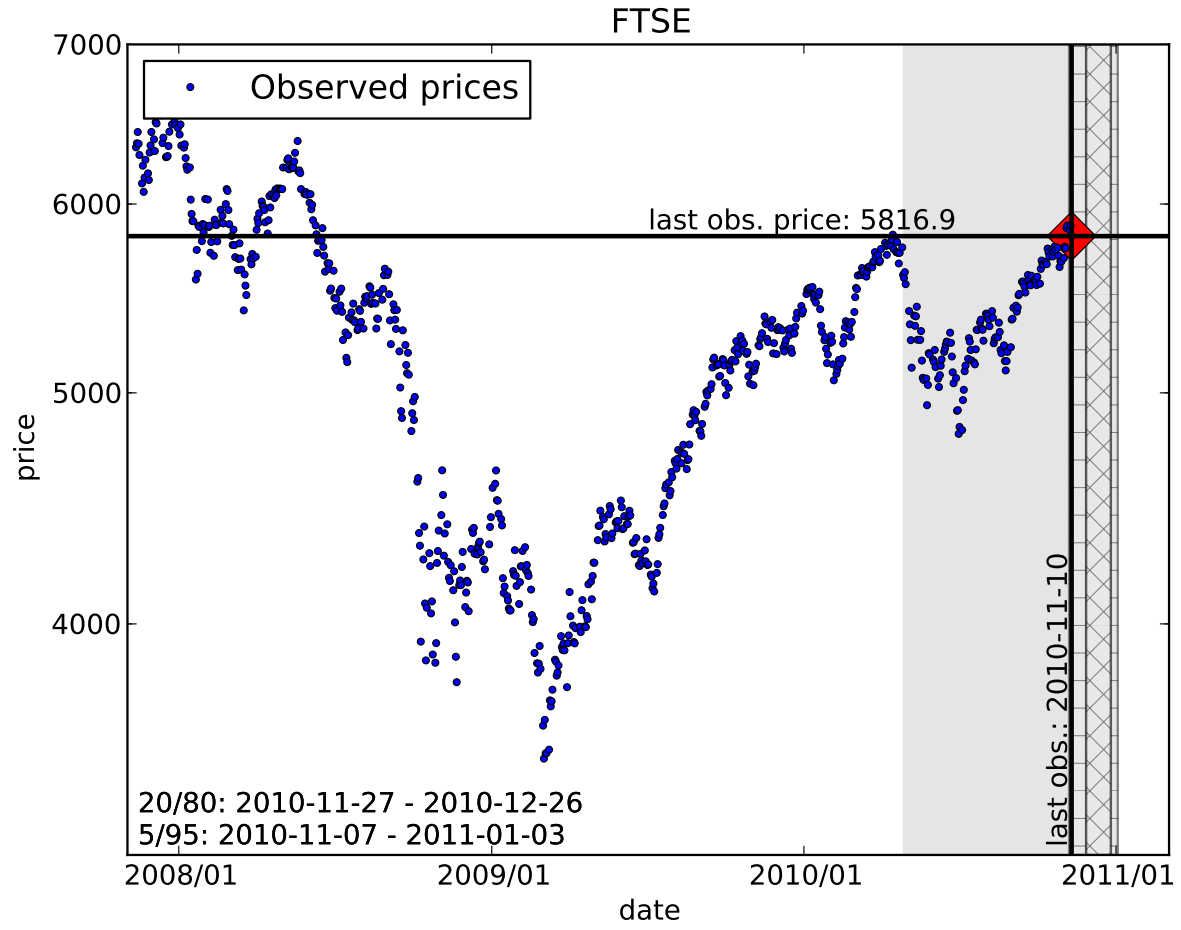


FIG. 5. FTSE 100: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

4. Hang Seng Index Hong Kong

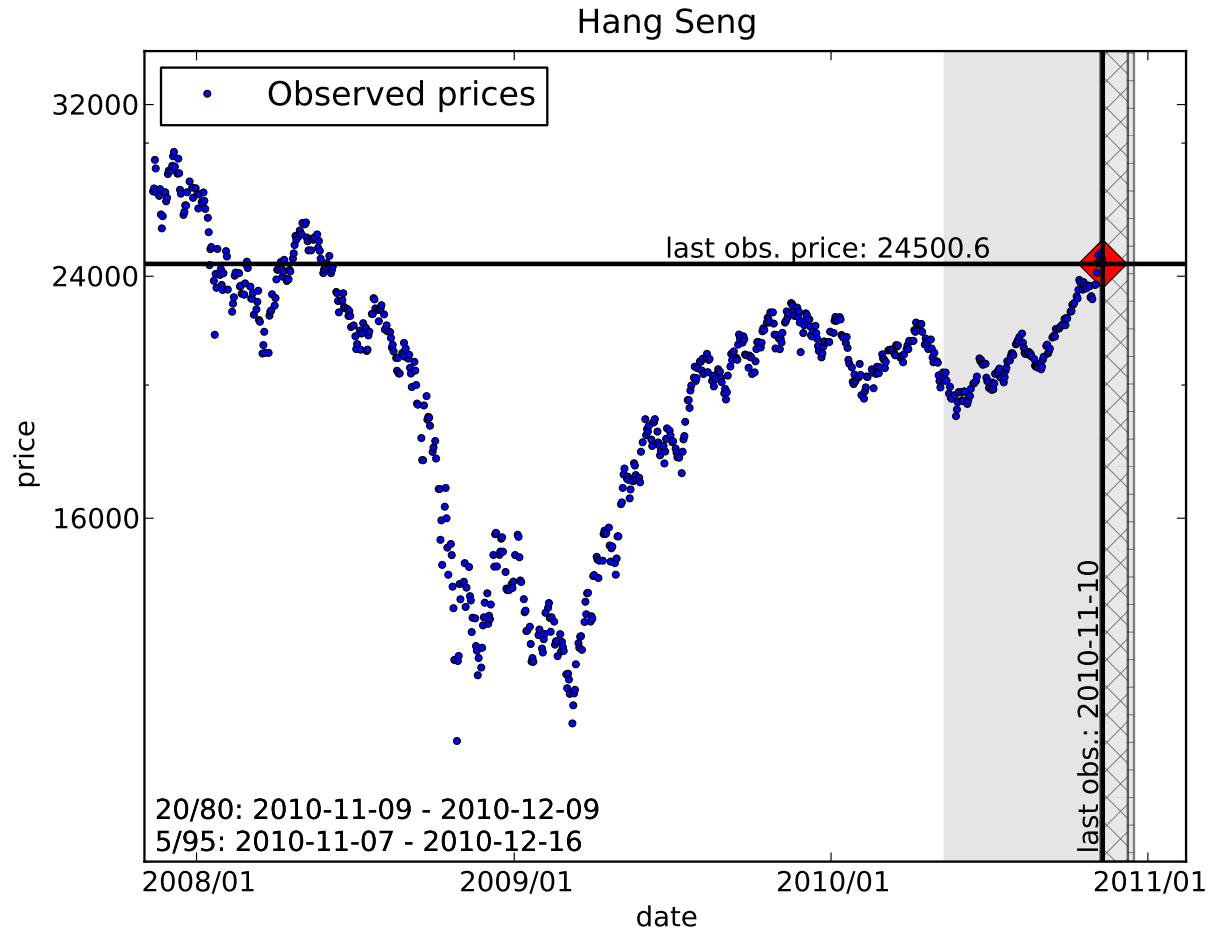


FIG. 6. Hang Seng Index Hong Kong: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

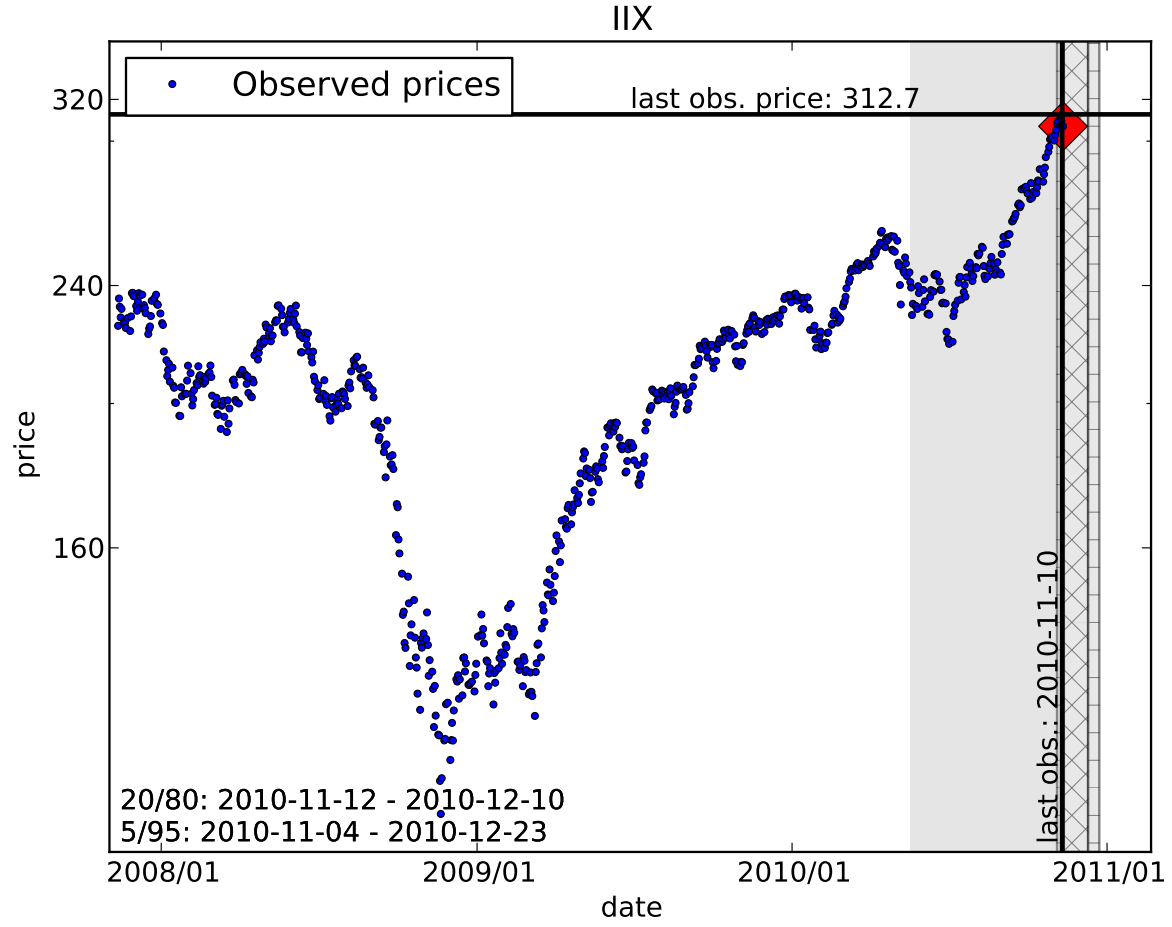
5. *Interactive Week Internet Index*

FIG. 7. Interactive Week Internet Index: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

6. NASDAQ Computer

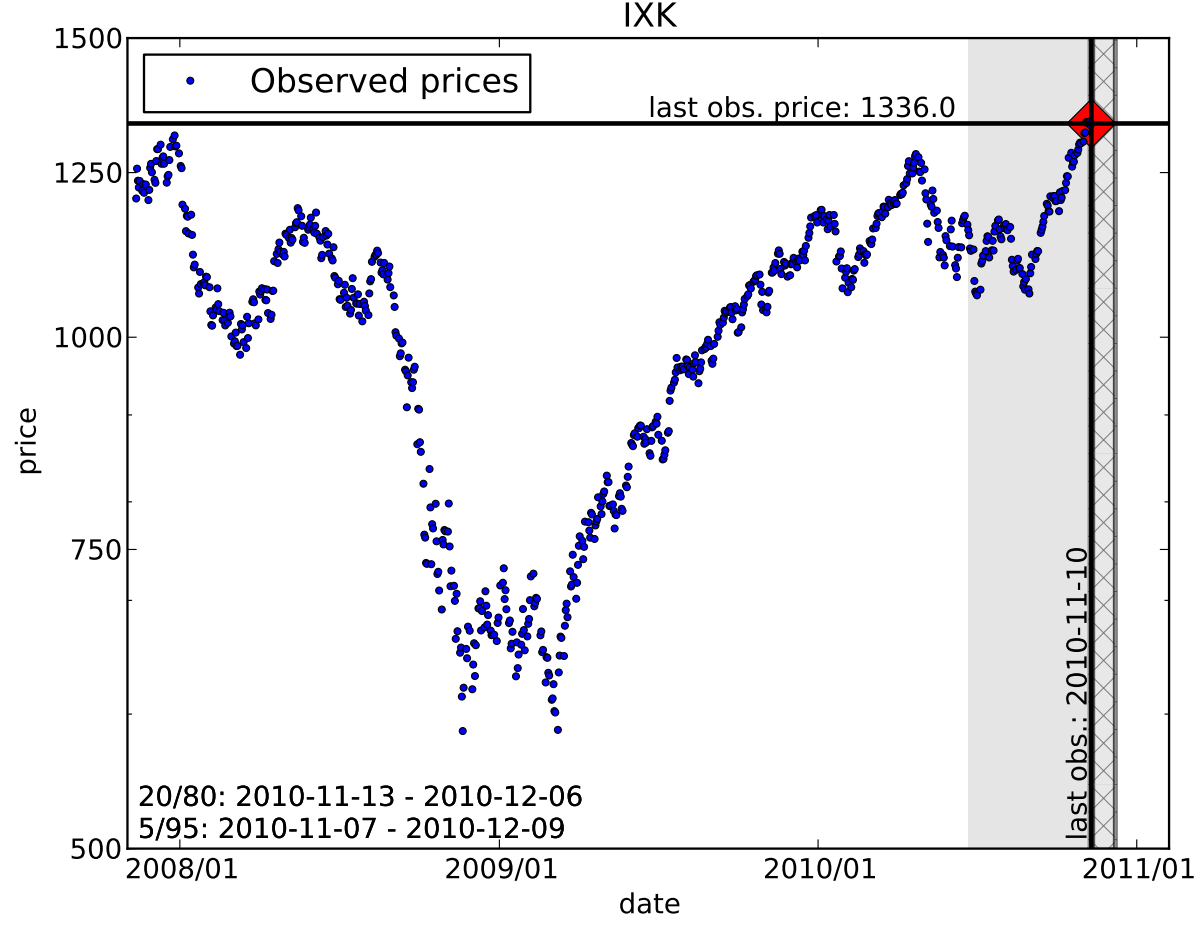


FIG. 8. NASDAQ Computer: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

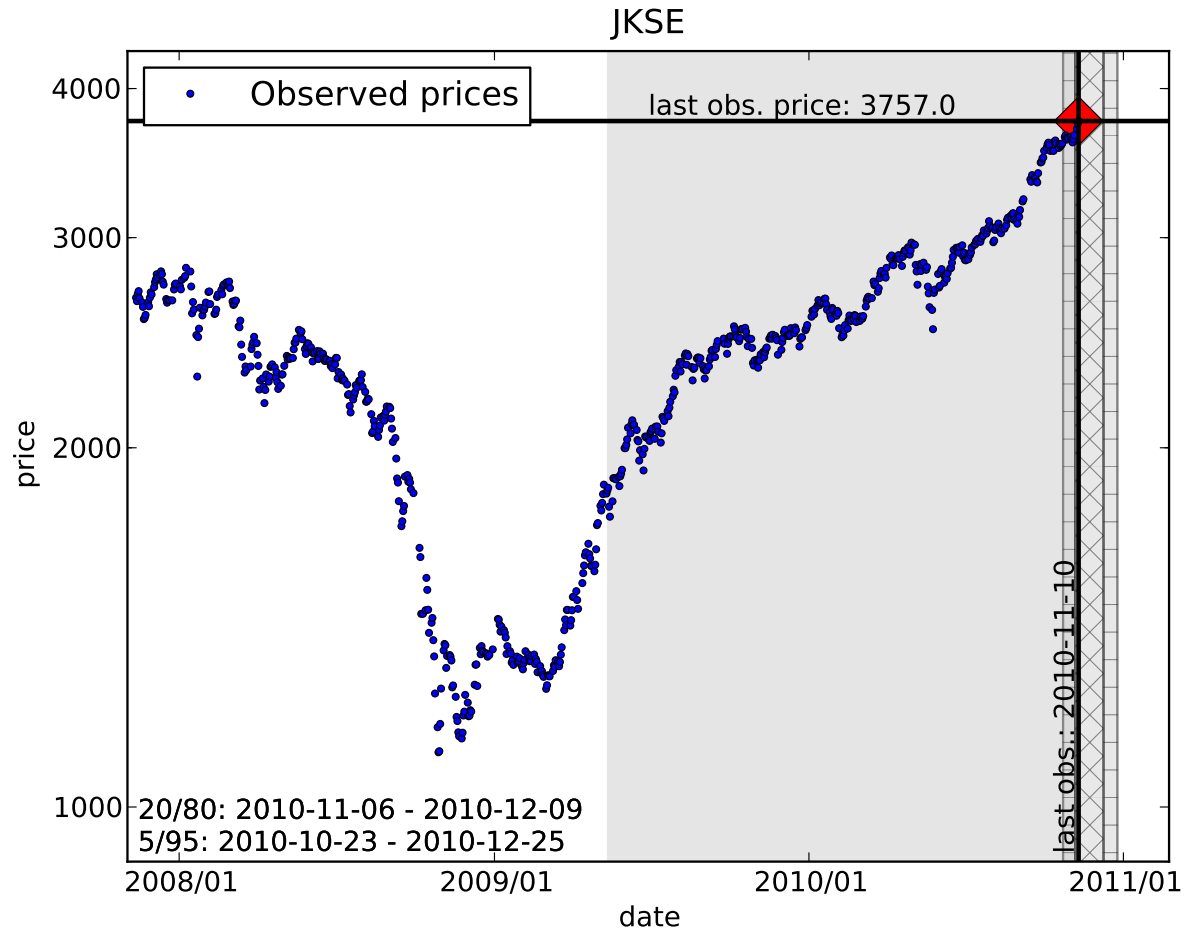
7. *Jakarta Composite*

FIG. 9. Jakarta Composite: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

8. KOSPI Composite Index, Seoul

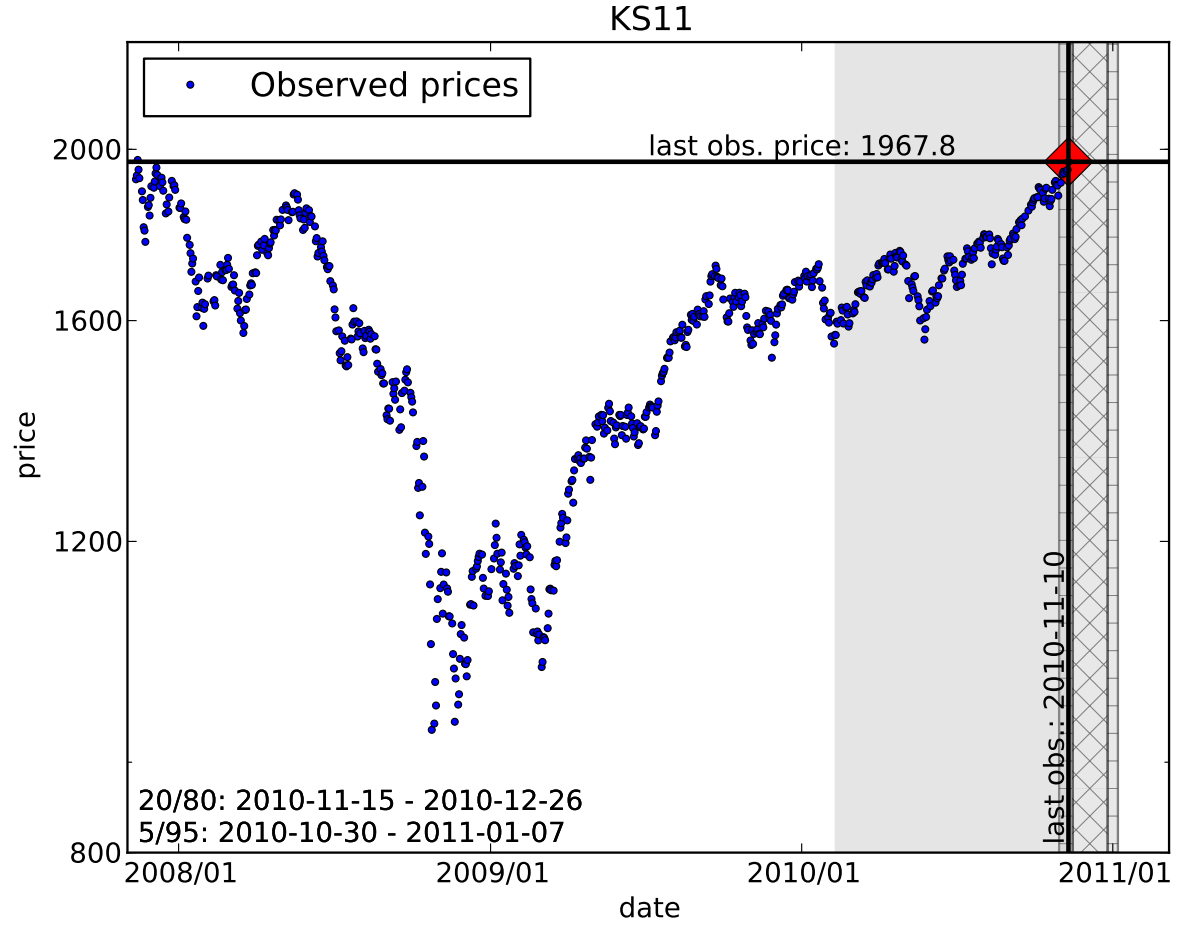


FIG. 10. KOSPI Composite Index, Seoul: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

9. NASDAQ-100 (DRM)

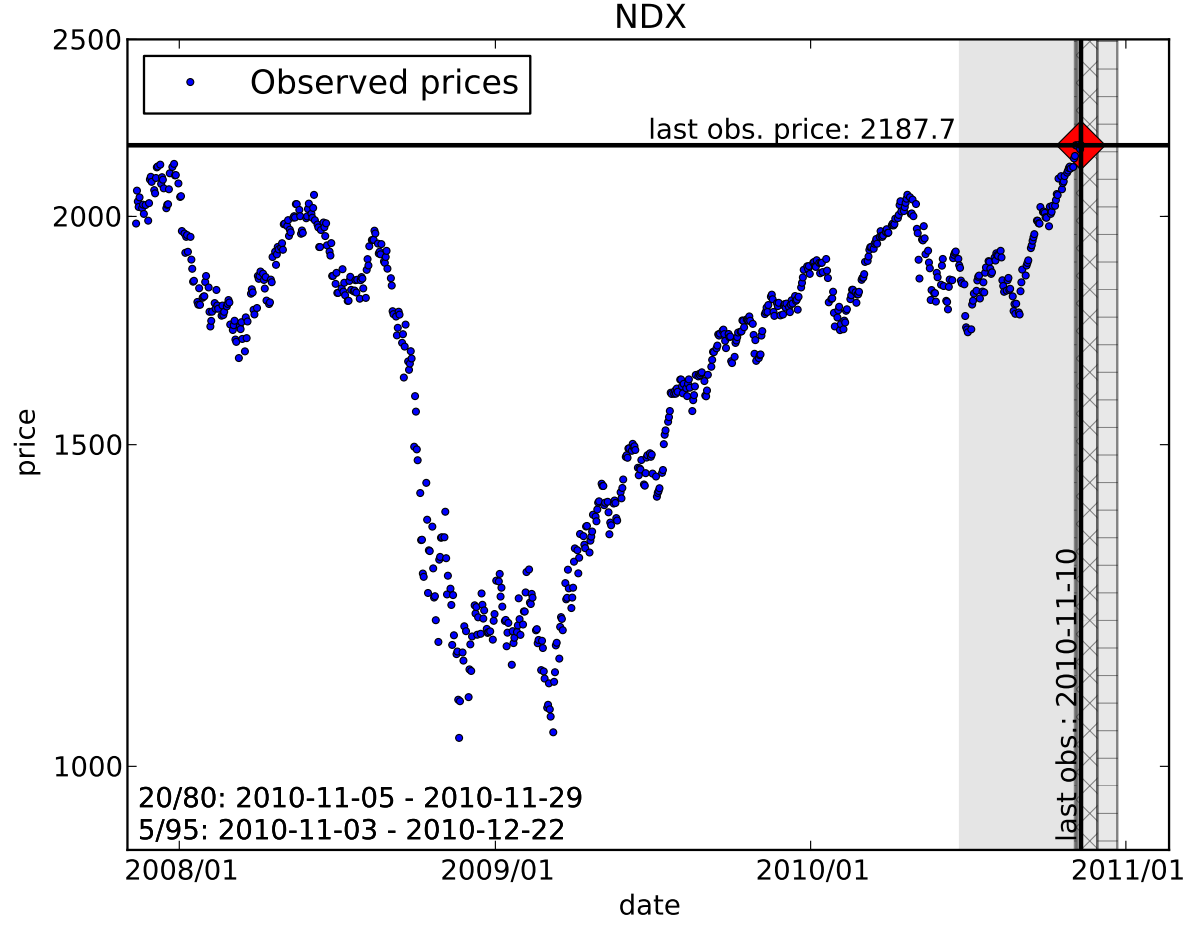


FIG. 11. NASDAQ-100 (DRM): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

10. Reuters/Jefferies CRB index

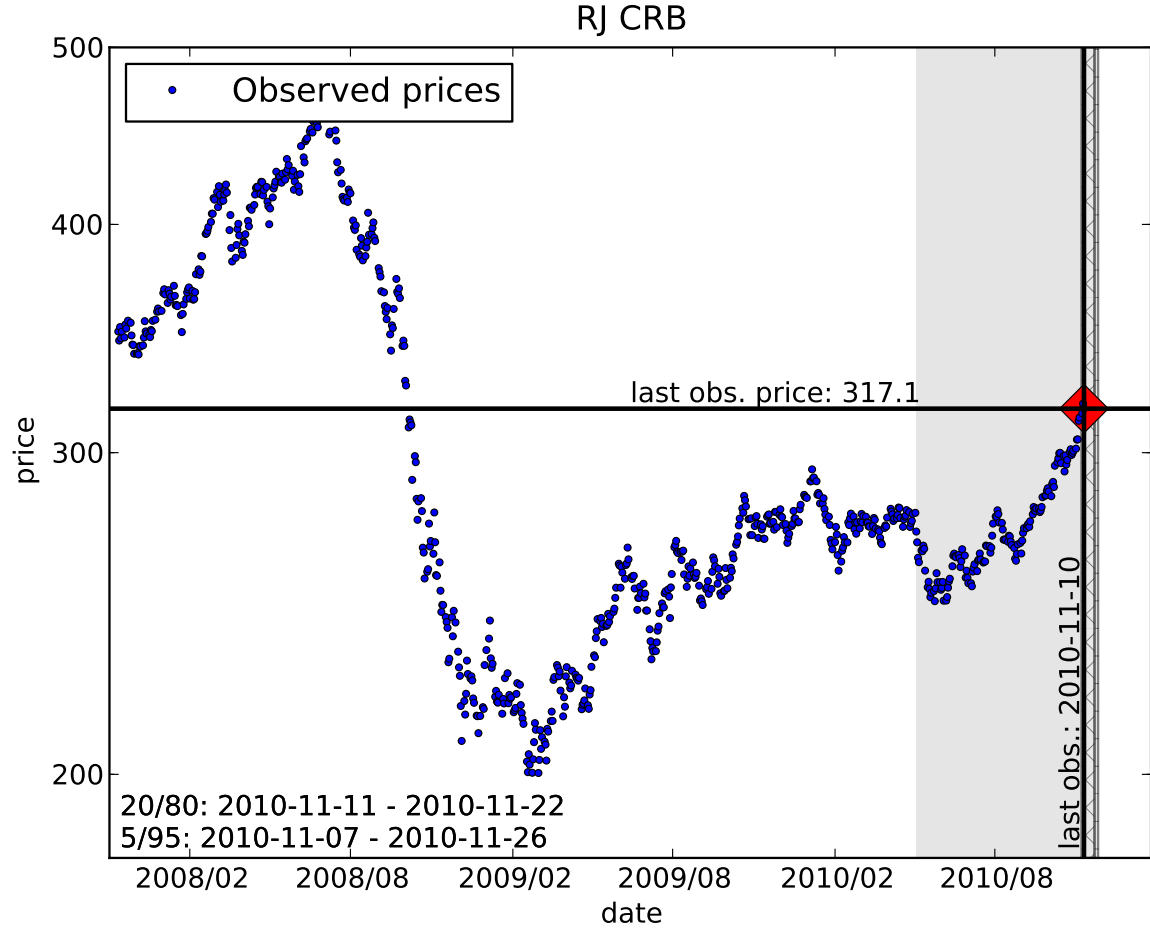


FIG. 12. Reuters/Jefferies CRB index: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

11. TSEC weighted index

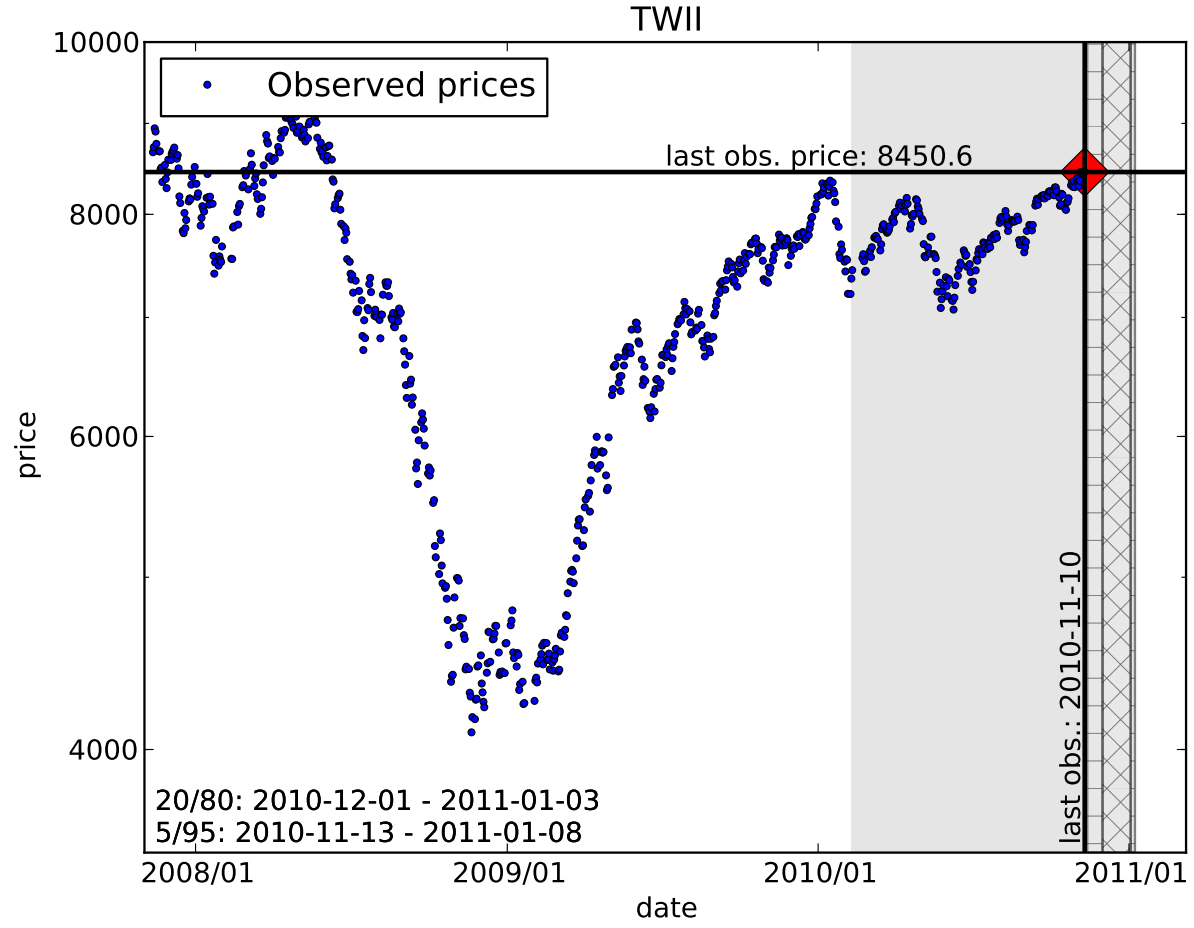


FIG. 13. TSEC weighted index: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

12. Major Market Index

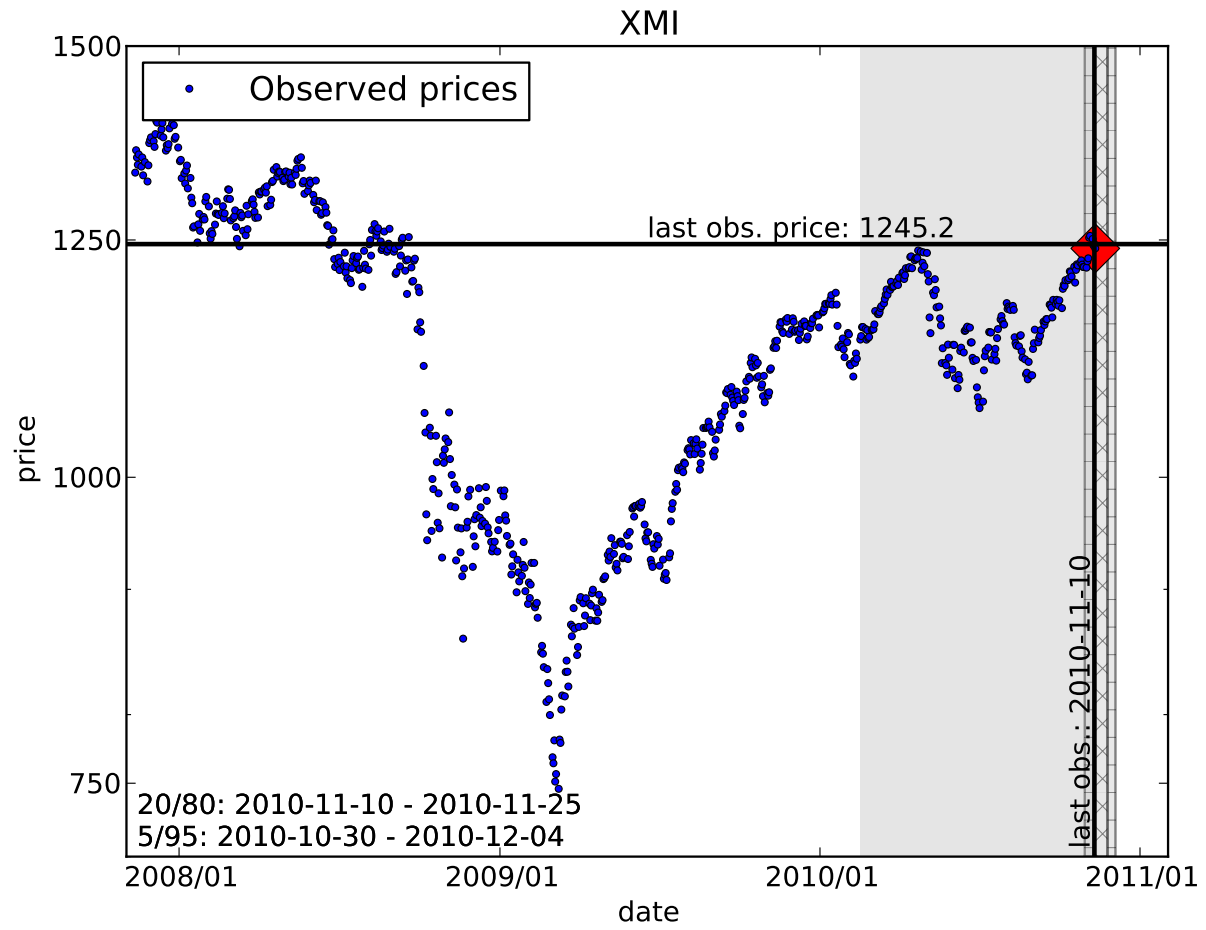


FIG. 14. Major Market Index: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

B. H1 & H2 Equities

1. Ishares Singapore Index

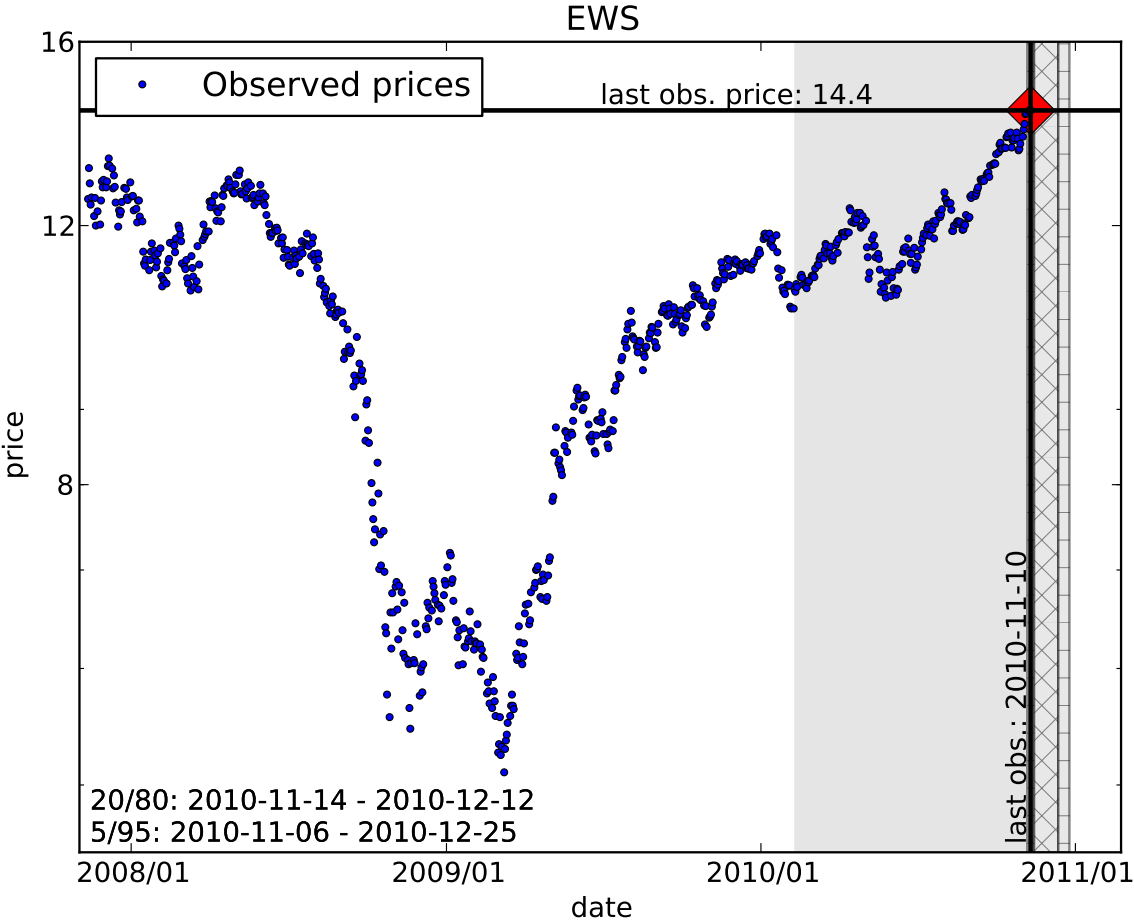


FIG. 15. Ishares Singapore Index: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

2. Freeport McMoRan Copper & Gold

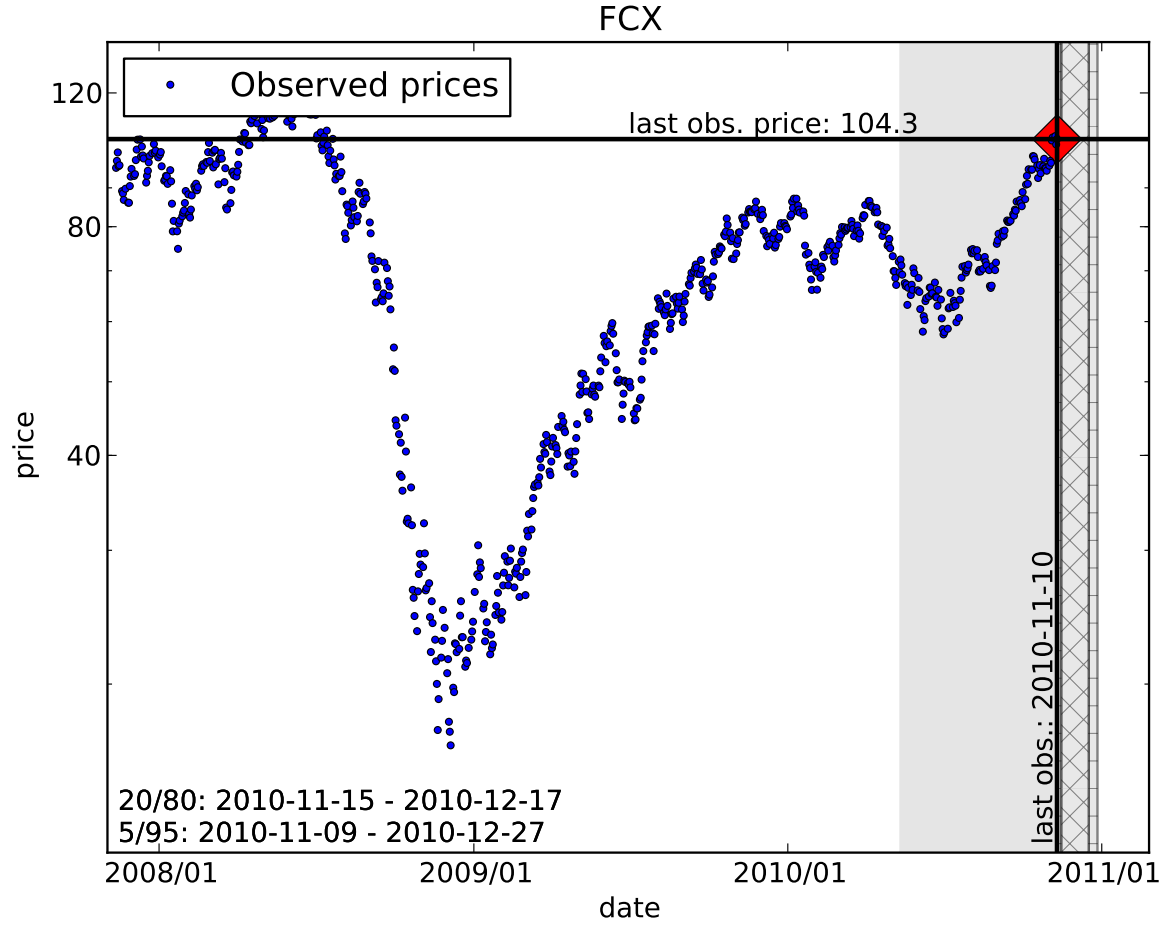


FIG. 16. Freeport McMoRan Copper & Gold: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

3. F5 NETWORKS

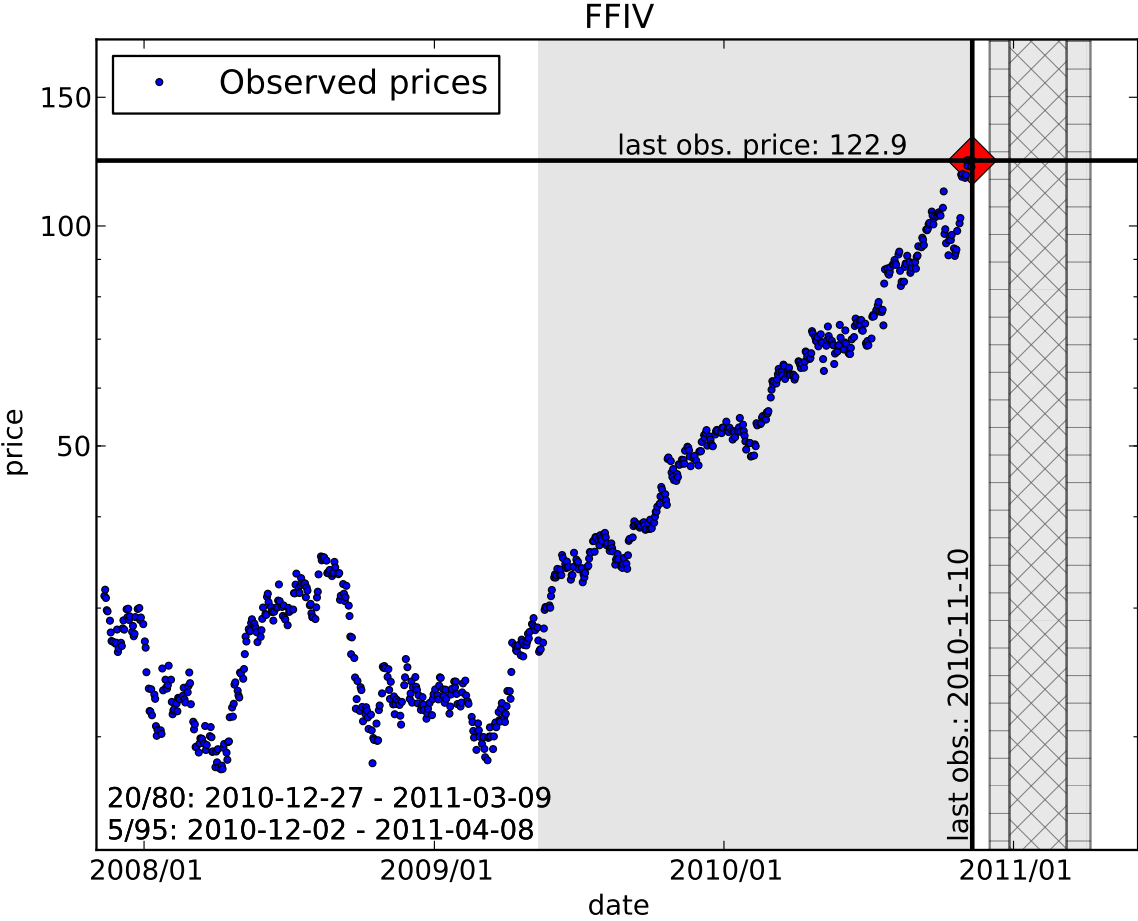


FIG. 17. F5 NETWORKS: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

4. INTUIT

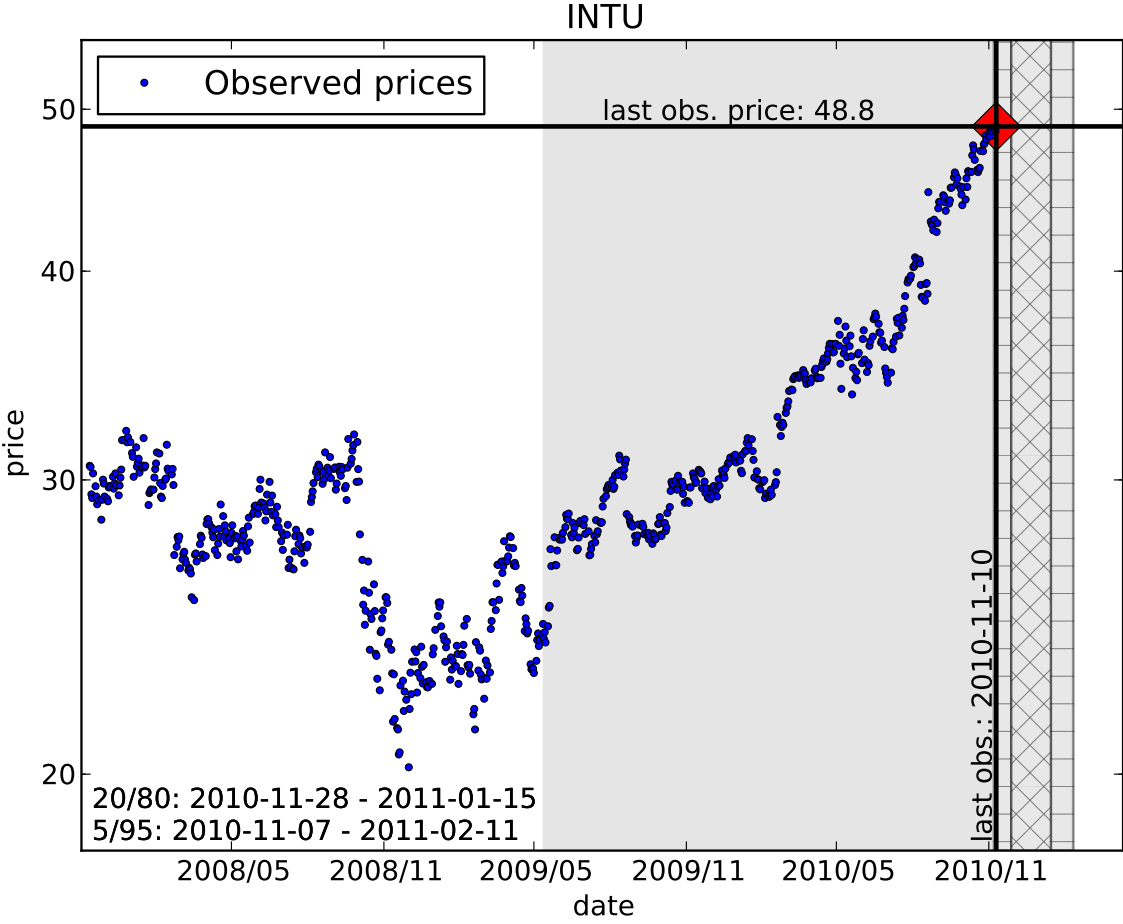


FIG. 18. INTUIT: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

5. STARBUCKS

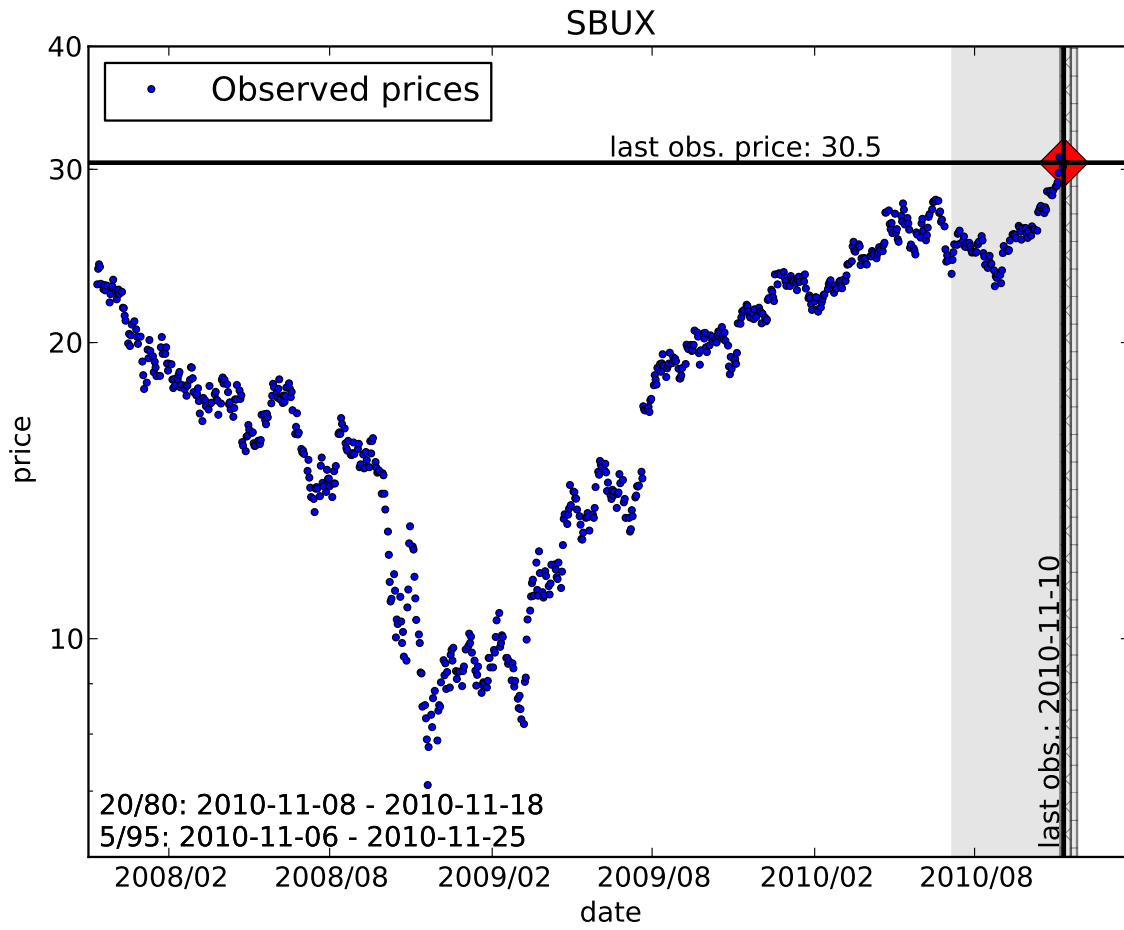


FIG. 19. STARBUCKS: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

6. UNITED RENTALS INC

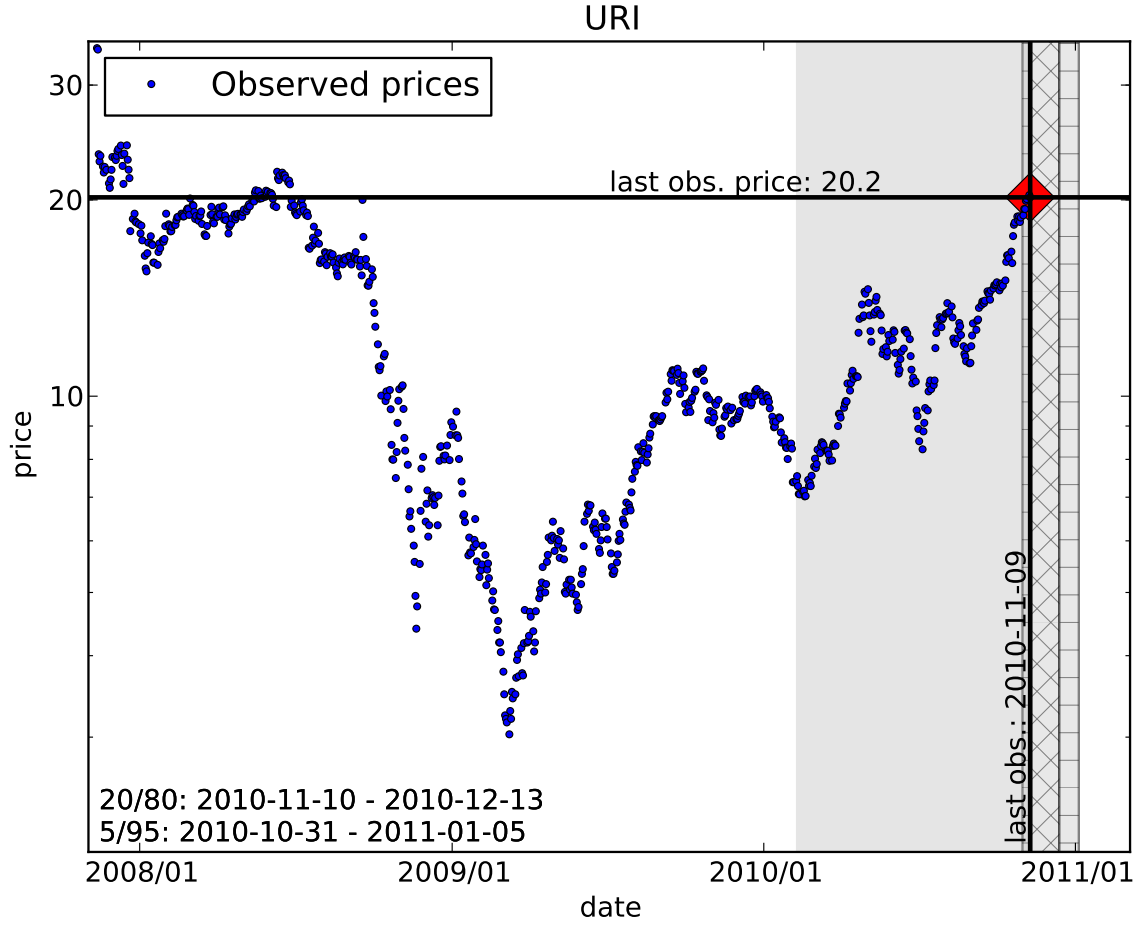


FIG. 20. UNITED RENTALS INC: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

C. H1 & H2 Commodities

1. Copper future (USD)

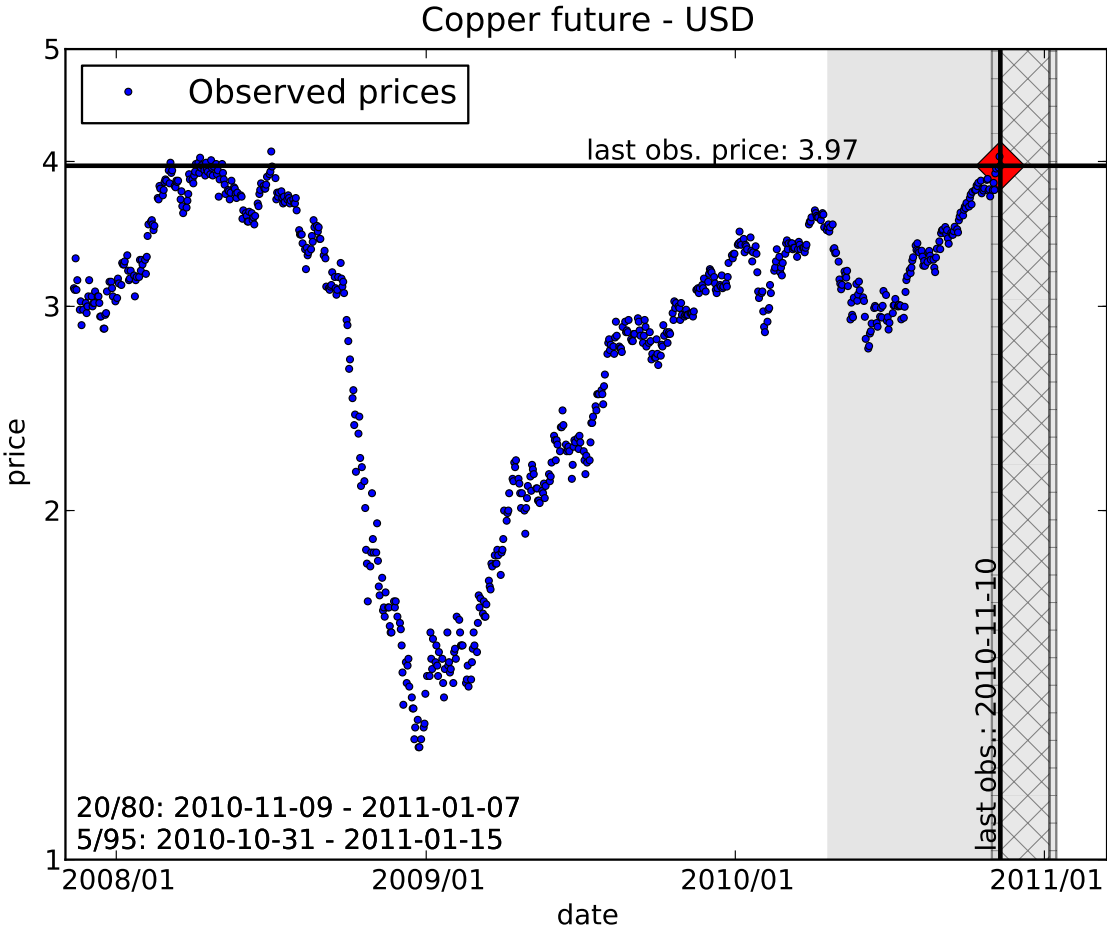


FIG. 21. Copper future (USD): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

2. Corn future (CHF)

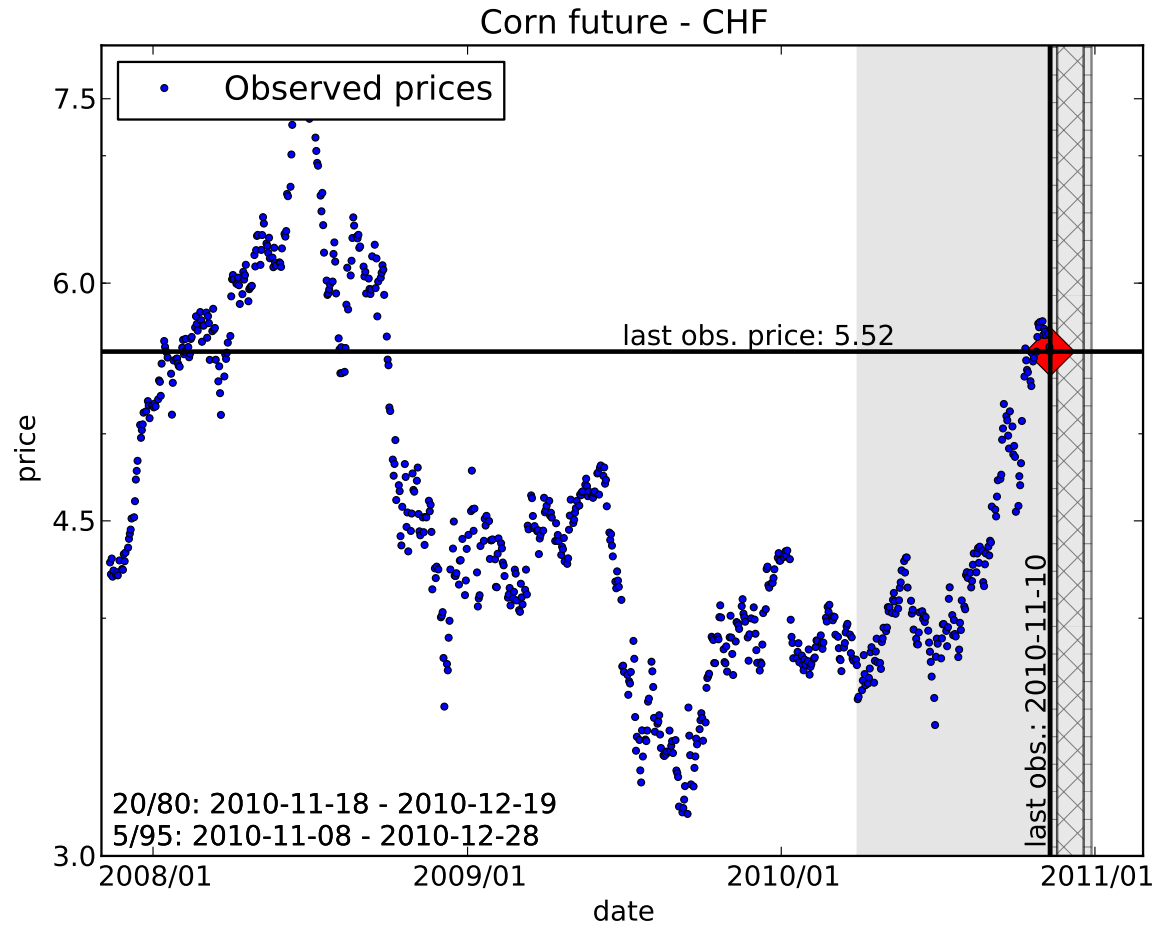


FIG. 22. Corn future (CHF): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

3. Cotton future (USD)

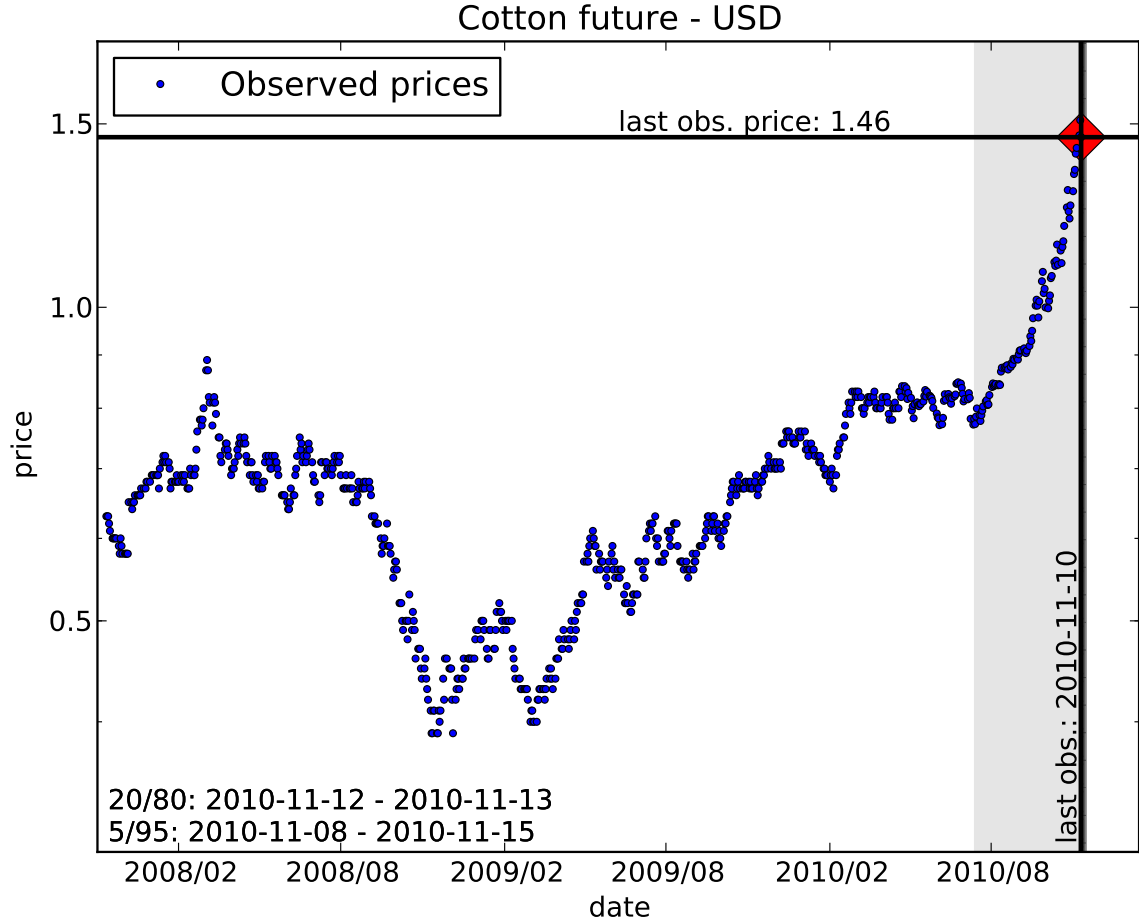


FIG. 23. Cotton future (USD): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

4. Palladium future (USD)

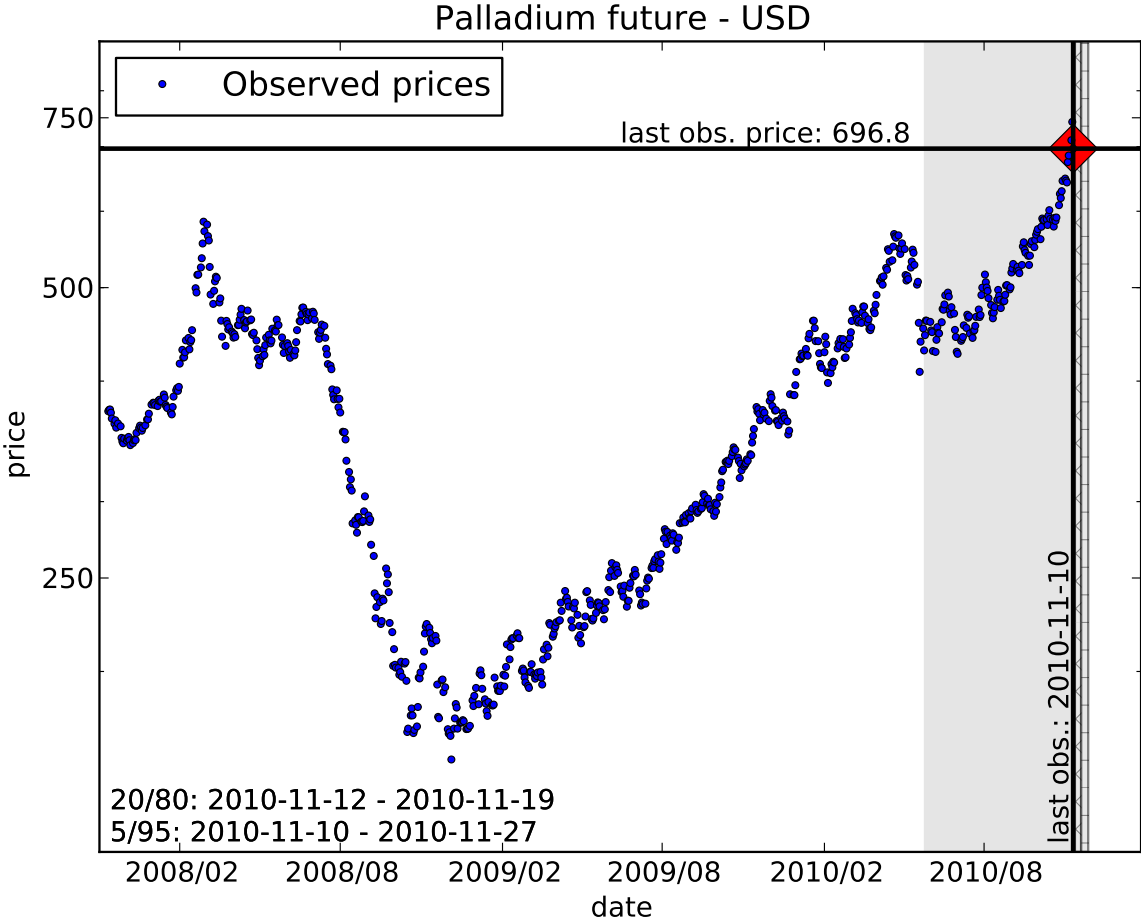


FIG. 24. Palladium future (USD): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

5. Silver future (CHF)

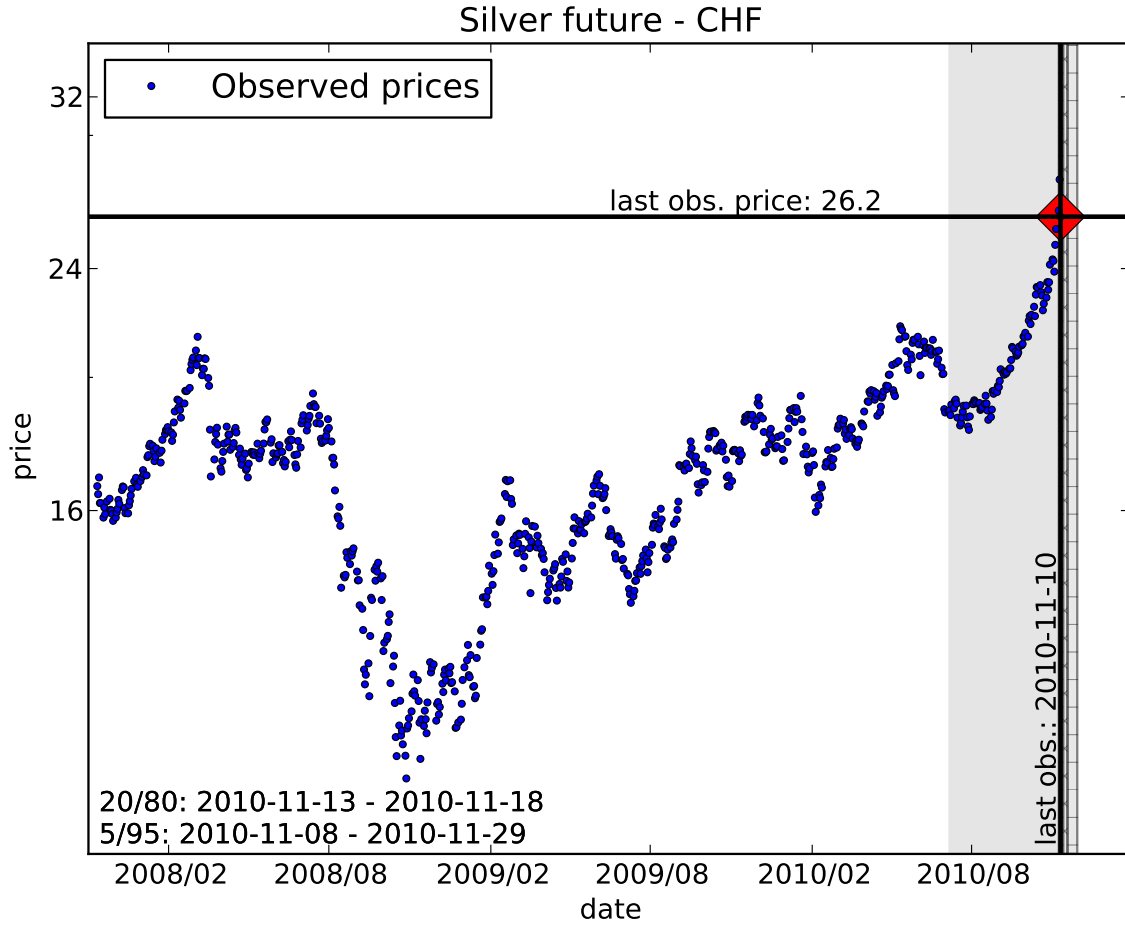


FIG. 25. Silver future (CHF): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

6. Sugar future (CHF)

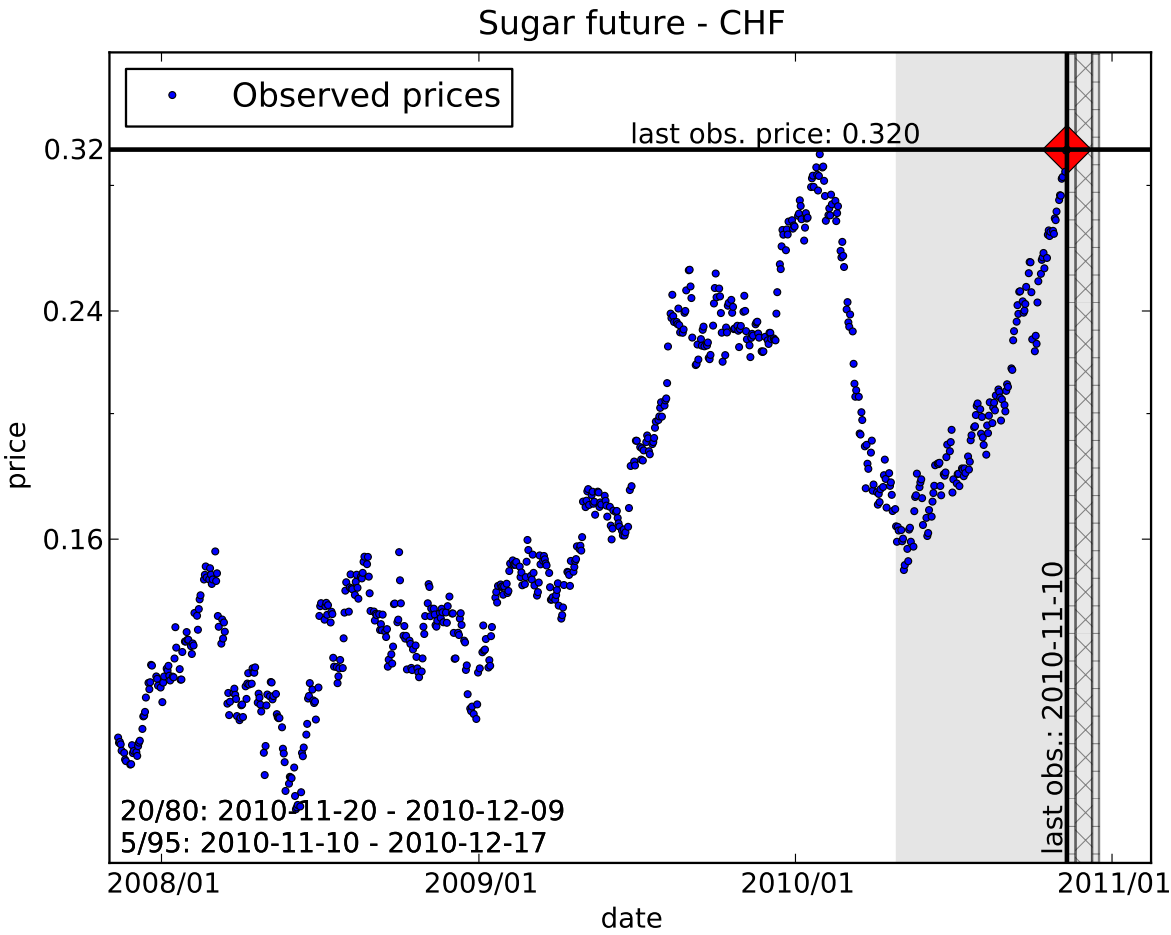


FIG. 26. Sugar future (CHF): Time series of observations (filled circles) and range over which our analysis was performed (shaded region).

D. H1 & H2 Foreign Exchange

1. AUDUSD

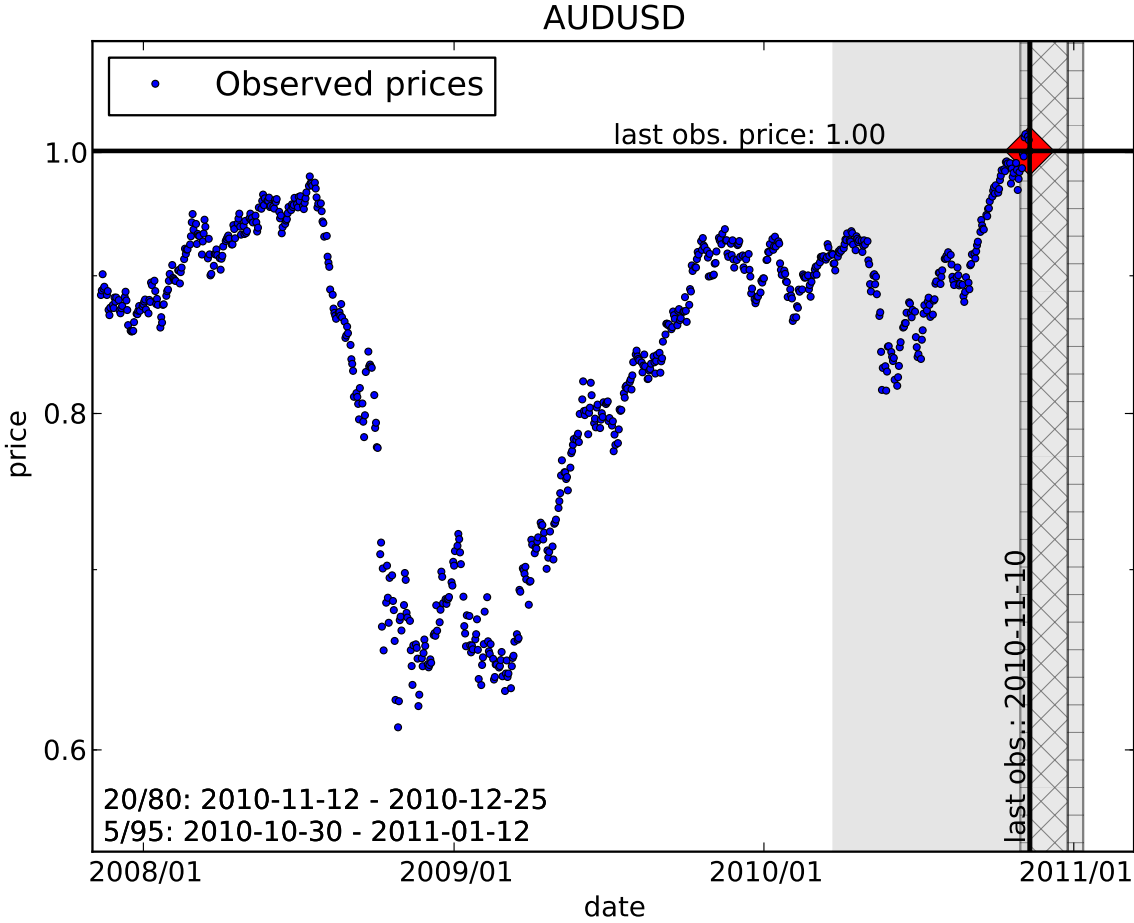


FIG. 27. AUDUSD: Time series of observations (filled circles) and range over which our analysis was performed (shaded region).