Indicateur économique ÉU
USRI

http://www.idp.zhaw.ch/usri

http://blog.zhaw.ch/idp/sefblog

Marc Wildi

Intentions

- Réaliser l'importance du problème d'estimation –de cycle, de tendance- en temps réel
  - D'en apprécier la magnitude et de le `quantifier'
  - Les formules semblent contre-indiquées
- Invités à poser des questions durant ma présentation!
- Atelier: comprendre l'origine du problème, développer des outils simples (Excel), présenter des critères d'optimisation abstraits

Pourquoi les ÉU?

- La raison hypocrite: le pays d' Obama
- La raison pragmatique: Referee "took the viewpoint of an applied economic researcher who ... is not very interested in the Swiss economy".
  - Shame on you!
- La raison économique: les États-Unis sont à l'origine de la crise `financière'.
  - Suffisamment importants pour influer sur le cours des chose

Problème

CIRET-conf. 2008

(Centre for International Research on Economic

Tendency Surveys)

Datation NBER
http://www.nber.org/cycles.html

- History
  - December 2007-
    - Peak announced in December 2008
  - March 2001-November 2001
    - Trough ann. in July 2003
  - July 1990-March 1991
  - July 1981-November 1982
  - January 1980-July 1980
  - November 1973-March 1975
  - December 1969-November 1970
  - April 1960-February 1961
- Les décisions se prennent en comité restreint, en `délibéré', on vote (il ne s'agit pas d'une `méthode')!
- Datation en `temps réel' est fortement retardée (~1 year)
  - Datation accélérée?
  - Prédiction?

Exemple

Marcelle Chauvet – CREFC and University of California Riverside

Probabilities of Recession up to February 2009
using data available as of May 2009

Smoothed Probabilities of Recession
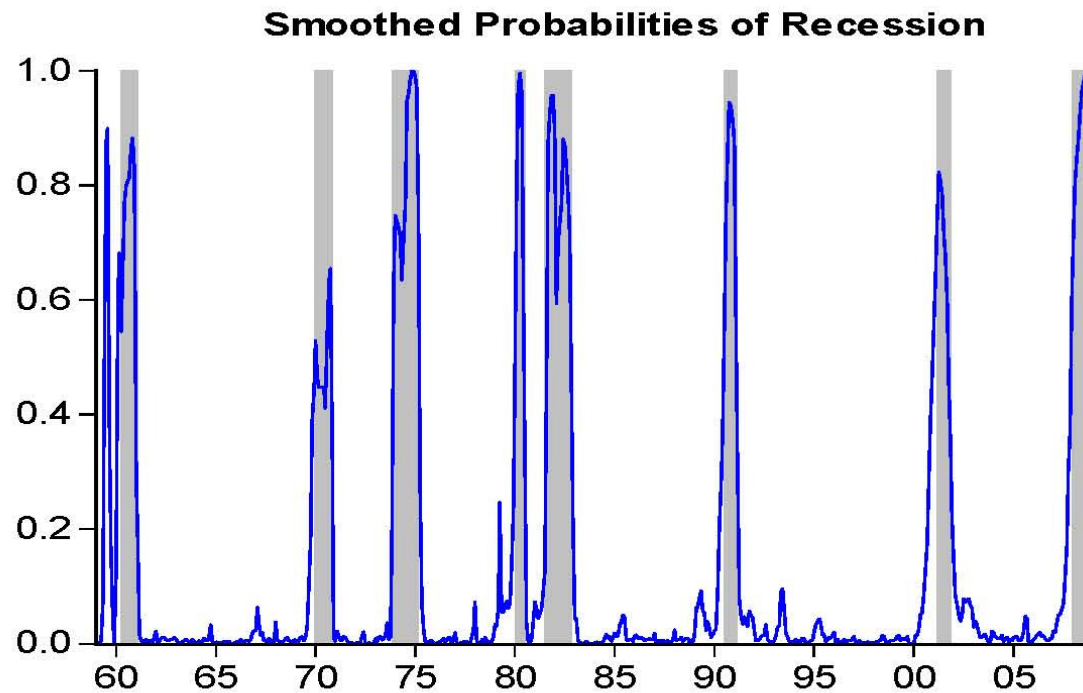
U.S. Business Cycle Indicator

http://blog.zhaw.ch/idp/sefblog

- Discute chaque mois (`en temps réel')
  - MS
    - Chauvet
    - Piger
  - ADS
  - CFNAI
  - Conference board (CEI/LEI)
  - OECD-CLI
  - USRI

USRI

Données/information

Priorité USRI: Accordance avec opinion exprimée par BCDC

- Lntc - total civilian employment
  - Publication lag : 1 month
- Lnip - industrial production
  - Lag : 1 month
- Lnm - manufacturing (fabrication) and trade sales
  - Lag: 2 months (series is delayed by one month in our filter design)
- Lnpa – empl. on non-agric. Payroll (effectifs)
  - Lag: 1 month
- Lnpi – pers. income (revenu) less trans. paym.
  - Lag : 1 month
- Transformation: log-returns

Problème(s) Real-Time

Révisions

Délais

Bruit

1. Datation selon J. Piger
Données Septembre 2008

http://www.uoregon.edu/~jpiger/us_recession_probs.htm

Month	Probability of Recession
February 2008	15.4%
March 2008	16.0%
April 2008	15.6%
May 2008	15.3%
June 2008	14.0%
July 2008	13.0%

- Retard de publication (2 mois)
- Lissage historique vs. filtre en temps réel

Historical U.S. Recession Probabilities
June 1967 – July 2008
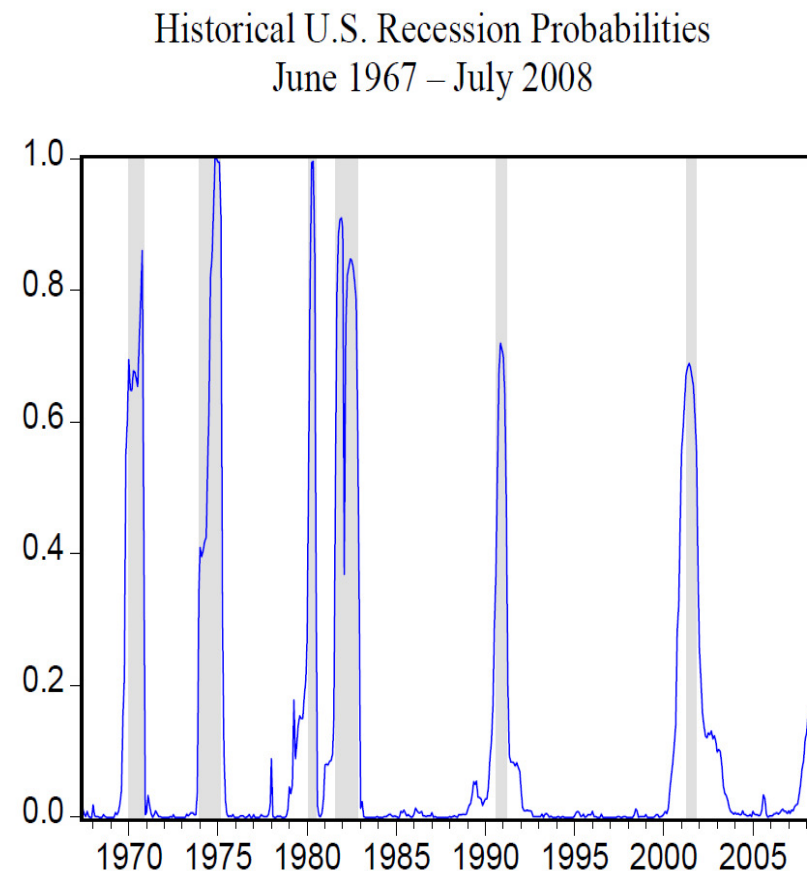
Révisions (Piger): Données
Sep. 2008, Nov. 2008, Feb.2009
http://www.uoregon.edu/~jpiger/us_recession_probs.htm

Month	Probability of Recession
February 2008	15.4%
March 2008	16.0%
April 2008	15.6% 42.7%
May 2008	15.3% 47.7%
June 2008	14.0% 54.9%
July 2008	13.0% 66.0% 92.8%
August 2008	96.2% 98.9%
September 2008	99.2% 99.4%
October	90.1%
November	98.5%
December	98.2%

Révisions (Chauvet)

http://faculty.ucr.edu/~chauvet/prob0409.pdf

|	Smoothed	Filtered
2007		
October	0.301	0.089
November	0.371	0.043
December	0.591	0.108
2008		
January	0.717	0.171
February	0.804	0.298
March	0.846	0.336
April	0.883	0.331
May	0.926	0.38
June	0.964	0.587
July	0.979	0.642
August	0.992	0.81
September	0.998	0.996
October	0.915	0.249
November	0.989	0.736
December	0.998	0.98
2009		
January	0.989	0.989

ADS-Index : révisions

Aruoba-Diebold-Scotti Business Conditions Index Extracted on Various Dates (9/5/2008-9/5/2009)
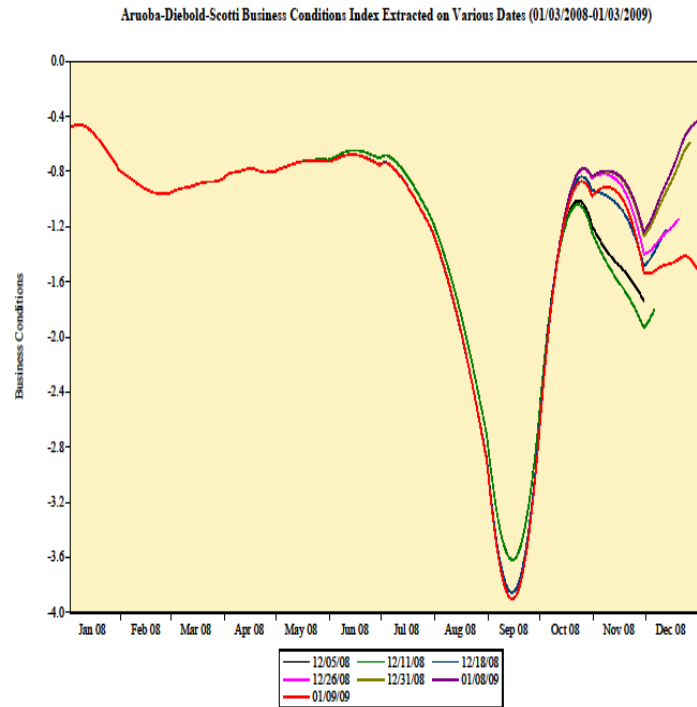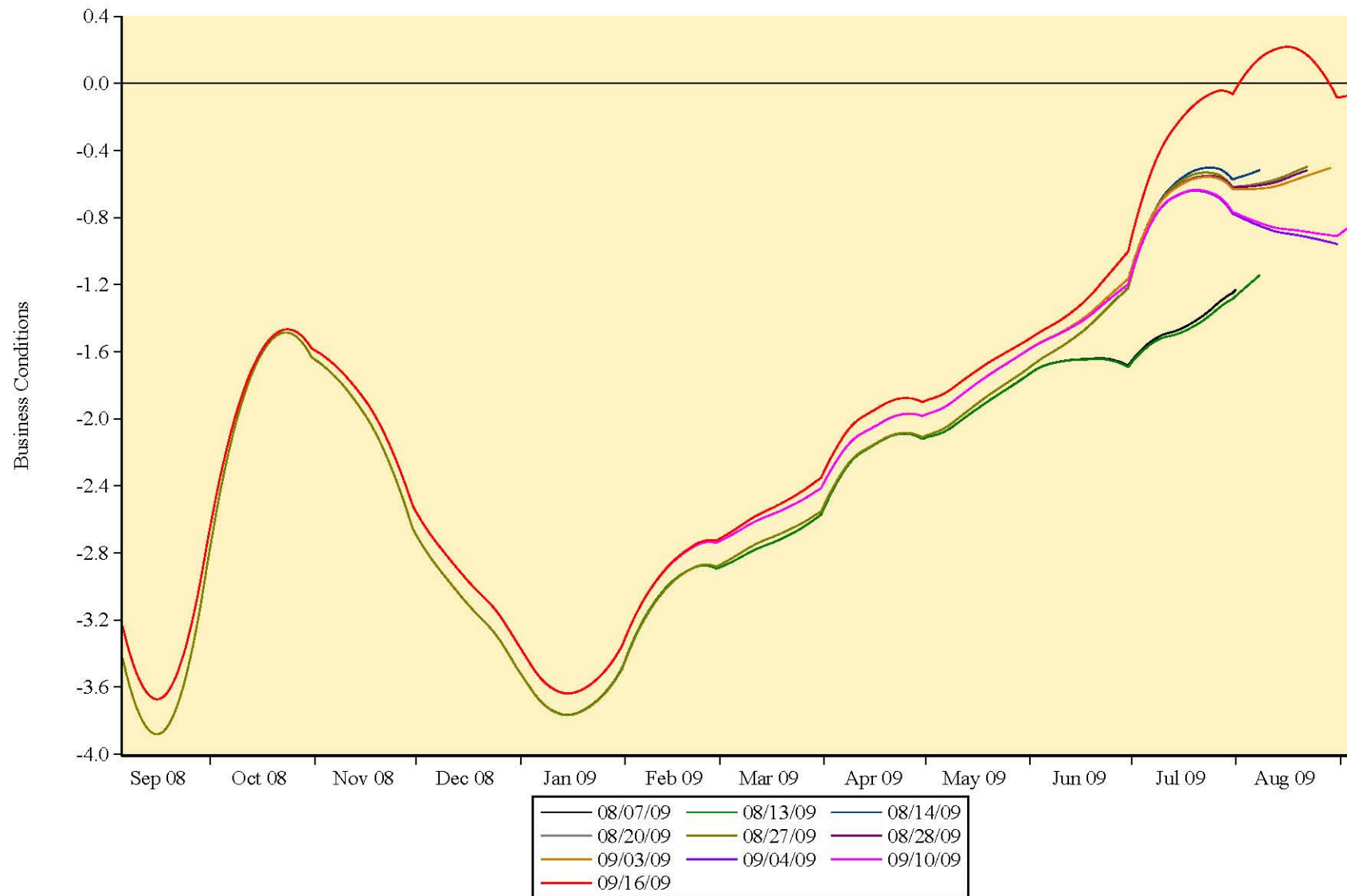
Note: We construct the most recent ADS Index using the latest data available as of September 16, 2009. This includes (1) initial jobless claims through the week ending September 5, 2009, (2) payroll employment through August 2009, (3) industrial production through August 2009, (4) real personal income through July 2009, (5) real manufacturing and trade sales through June 2009, and (6) real GDP through the second quarter of 2009. Yellow shading indicates the most recent recession, designated by the NBER to have started in December 2007 but not yet (as of the date of creation of the figure) designated by the NBER to have ended.

Après cinq jours

Aruoba-Diebold-Scotti Business Conditions Index (9/30/2007-9/30/2009)
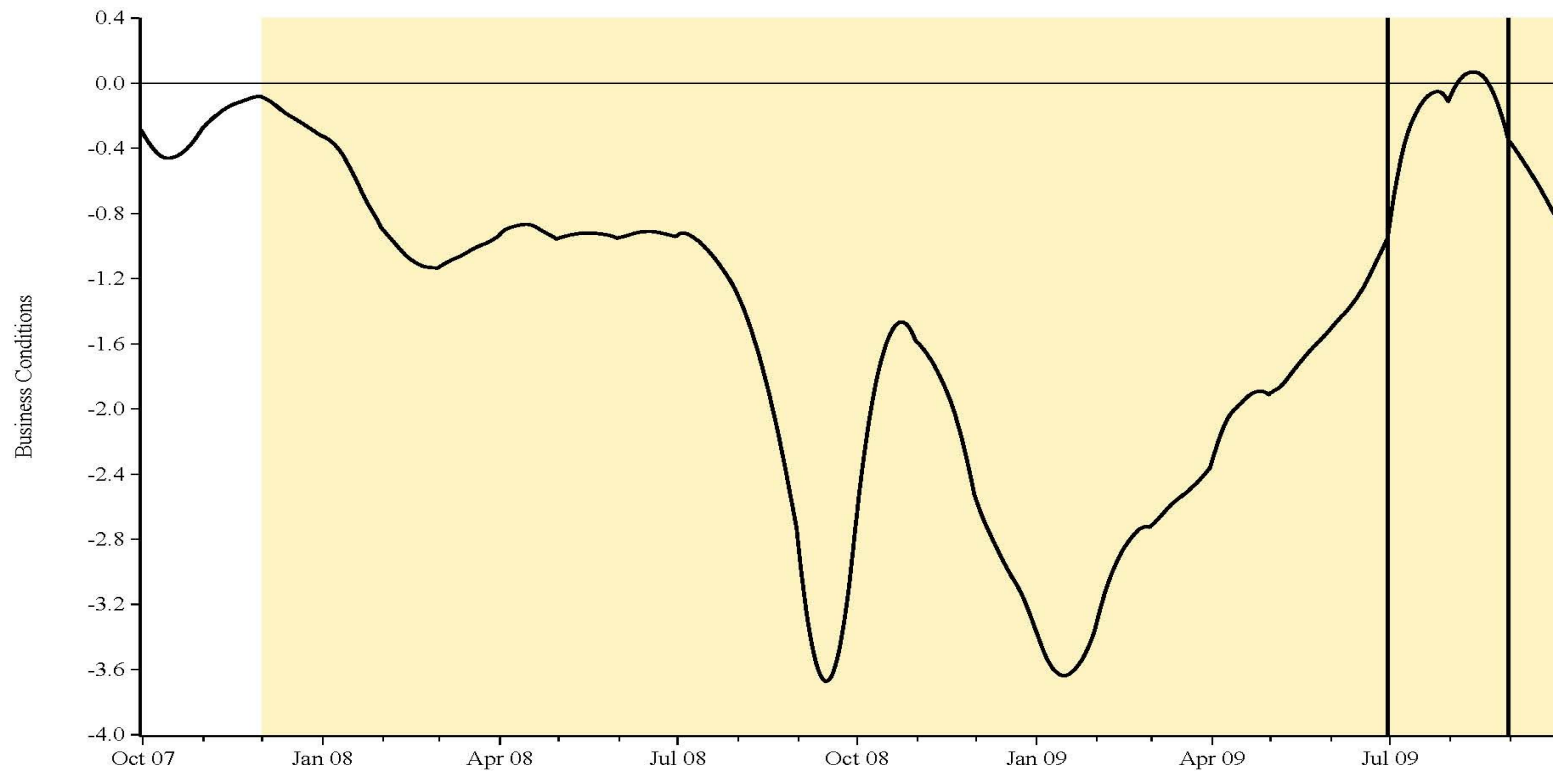
Note: We construct the ADS Index using the latest data available as of October 2, 2009. The bold vertical lines provide information as to which indicators are available for which dates. For dates to the left of the left line, the ADS index is based on observed data for all six underlying indicators. For dates between the left and right lines, the ADS index is based on at least two monthly indicators (typically employment and industrial production) and initial jobless claims. For dates to the right of the right line, the ADS index is based on initial jobless claims and possibly one monthly indicator.

Encore cinq jours

Aruoba-Diebold-Scotti Business Conditions Index (10/10/2007-10/10/2009)
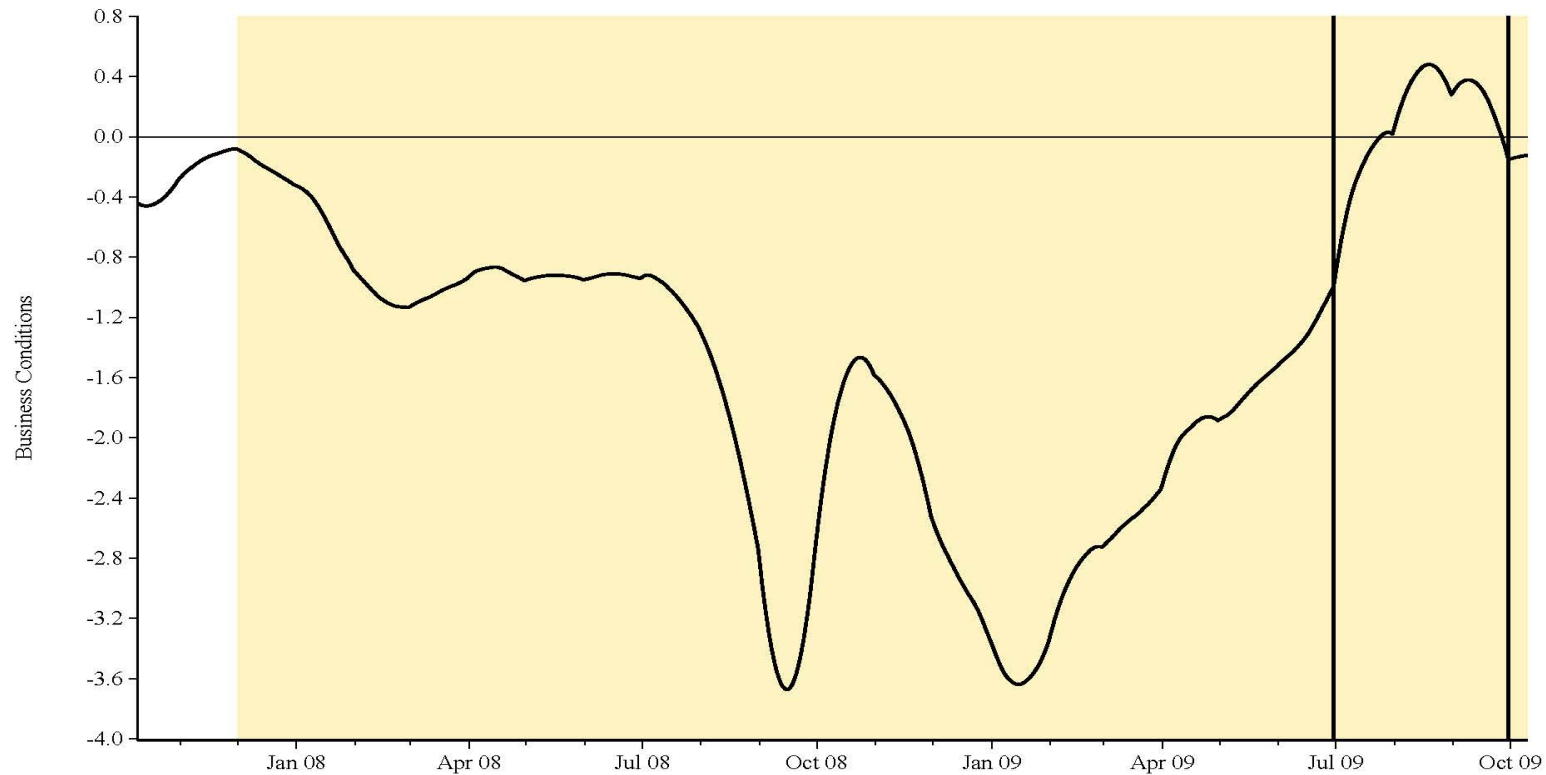
Note: We construct the ADS Index using the latest data available as of October 16, 2009. The bold vertical lines provide information as to which indicators are available for which dates. For dates to the left of the left line, the ADS index is based on observed data for all six underlying indicators. For dates between the left and right lines, the ADS index is based on at least two monthly indicators (typically employment and industrial production) and initial jobless claims. For dates to the right of the right line, the ADS index is based on initial jobless claims and possibly one monthly indicator.

Révisions

- Méthodes traditionnelles: WYSINWYG
  - L'intention est bonne…
- USRI: WYSIWYG
  - **Le seul indicateur publié qui ne soit jamais révisé!!!**
  - Filtres en temps réel
  - Données historiques (ALFRED)
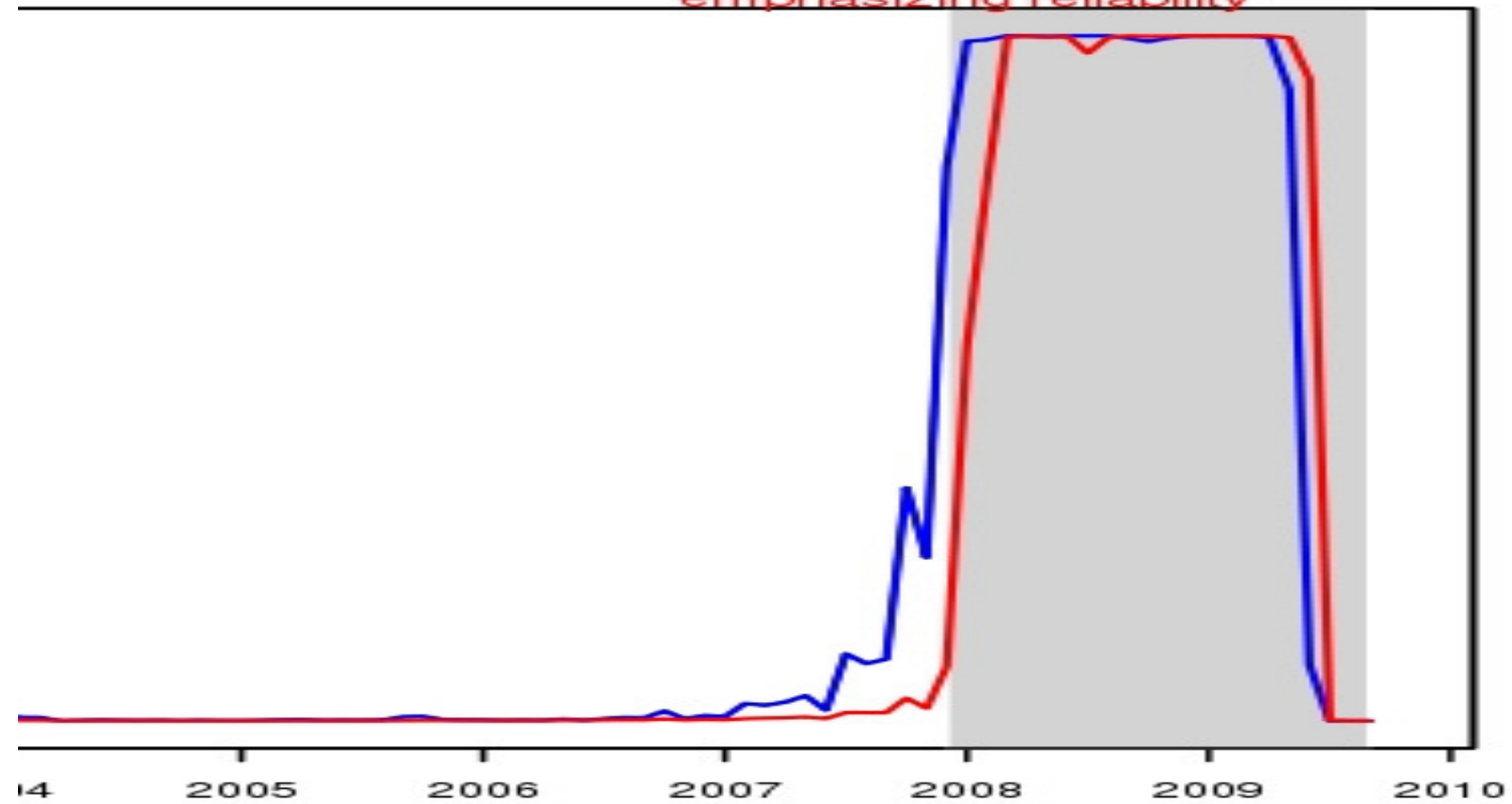 - Réplication en Excel (Atelier)
  - http://www.idp.zhaw.ch/usri

Épisode:
`fin de récession 2009'
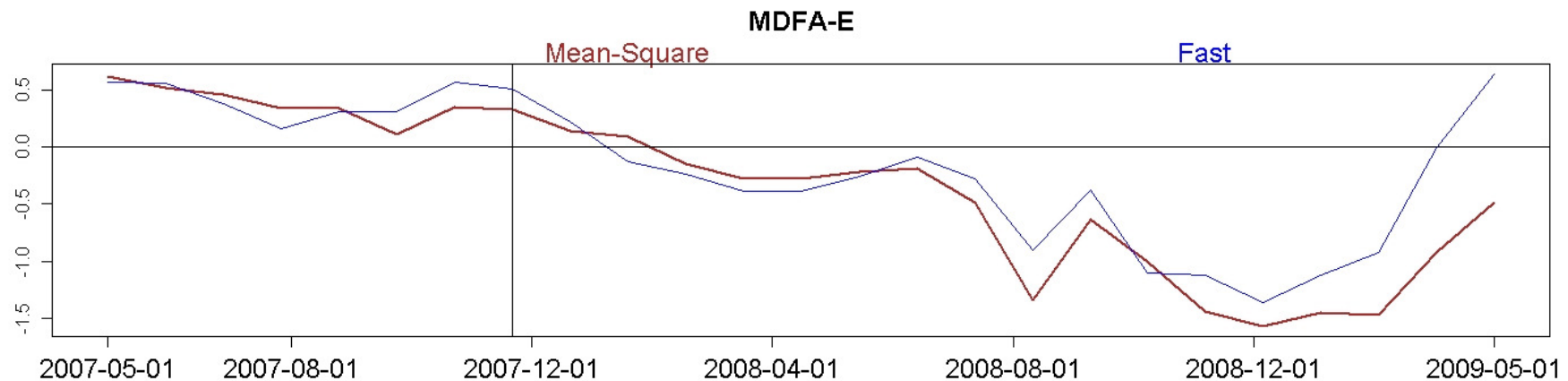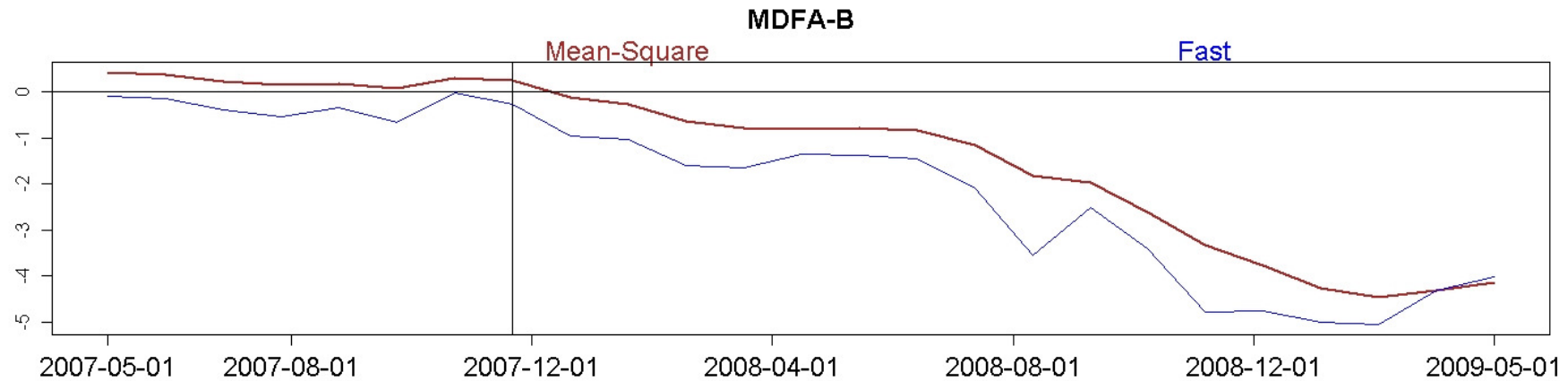
USRI
MS (Chauvet/Piger)
DFM (CFNAI)
SS (ADS)
Conference Board (CEI/LEI)
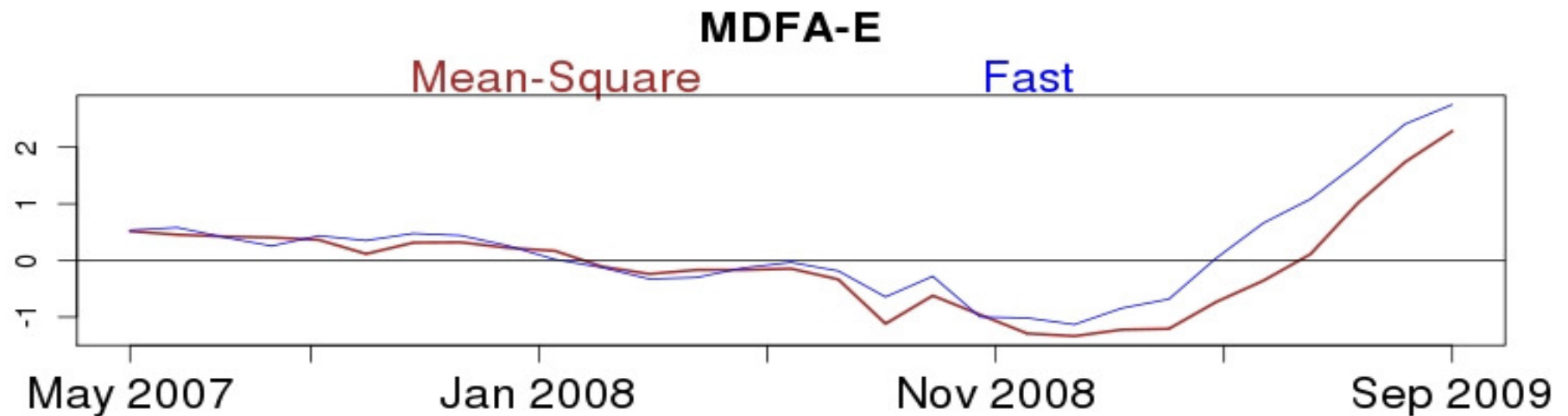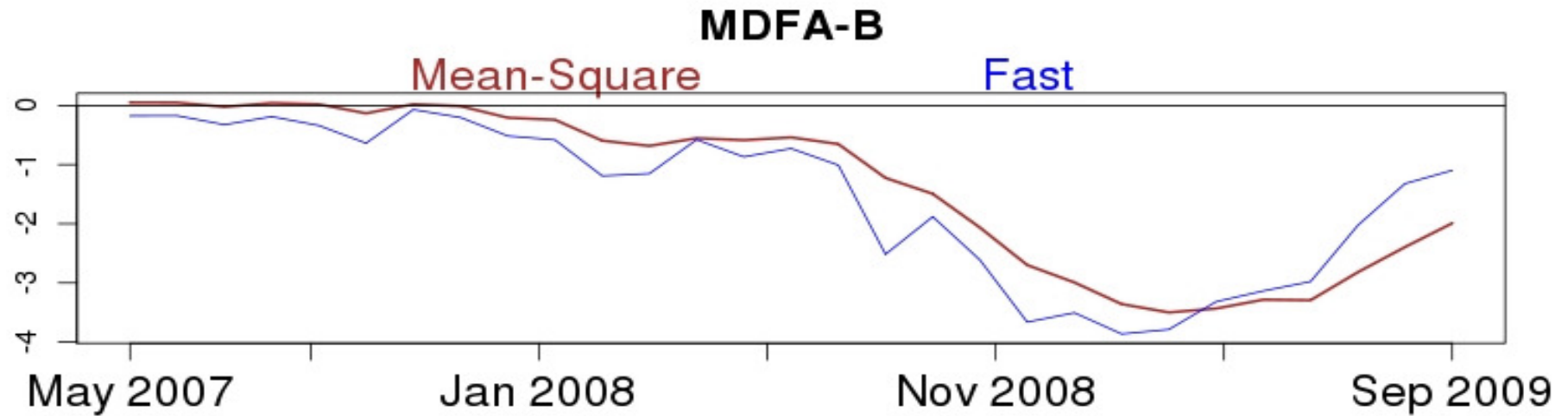HP (OCDE-CLI)

USRI (Octobre 2009)

USRI (18. Juin 2009)
Indicateurs: avancé et synchrone

USRI (Octobre 2009)

USRI (Octobre 2009)
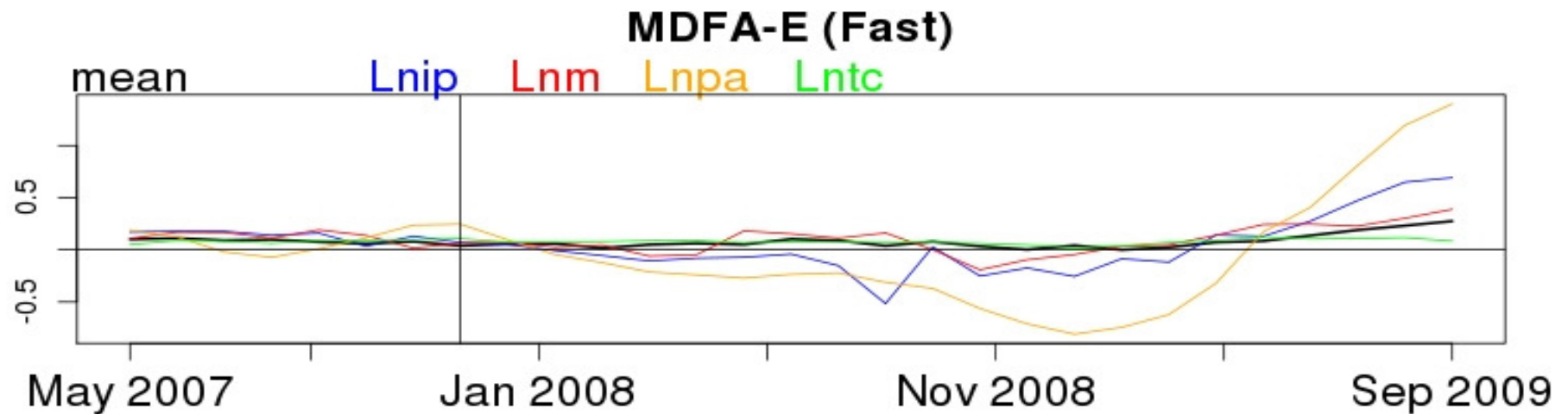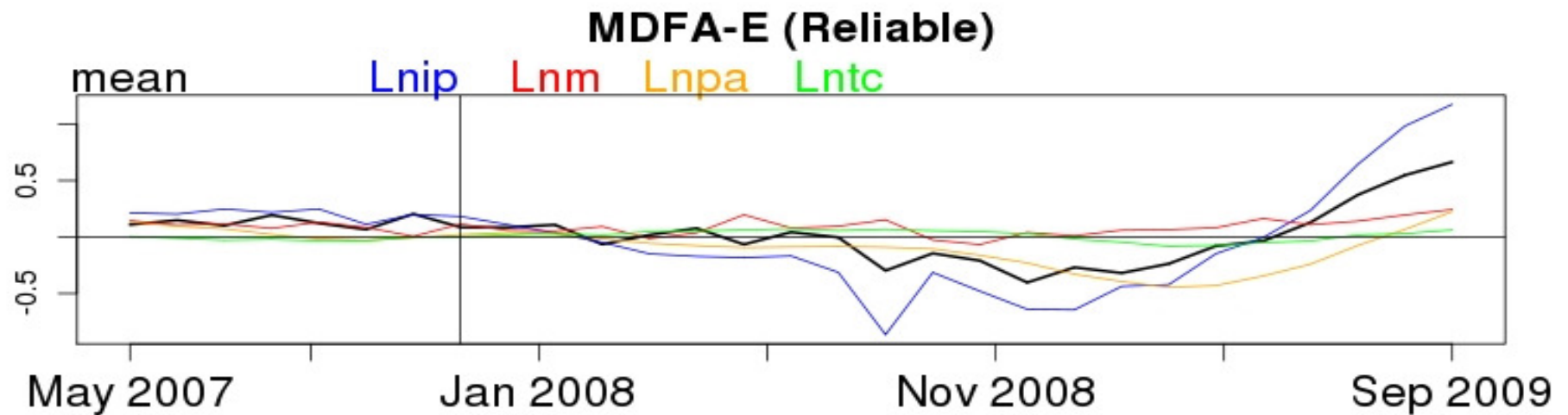
MS-Switching (Chauvet, Octobre 2009)

2007	30.8	-0.05
November	36.4	0.77
Decembe	**60.2**	**0.13**
2008	75.2	-0.12
February	86	-0.79
March	88.3	-0.5
April	90.1	-0.01
May	94.7	-0.35
June	97.3	-0.74
July	98.3	-0.46
August	99.4	-1
September	99.9	-4.39
October	95.5	-0.33
November	98.8	-0.85
December	99.9	-2.94
2009	100	-5.43
February	99.5	-2.16
March	98.8	-2.26
April	93	-0.74
May	76.9	-0.51
June	56.9	-0.28
July	**38.5**	**0.69**

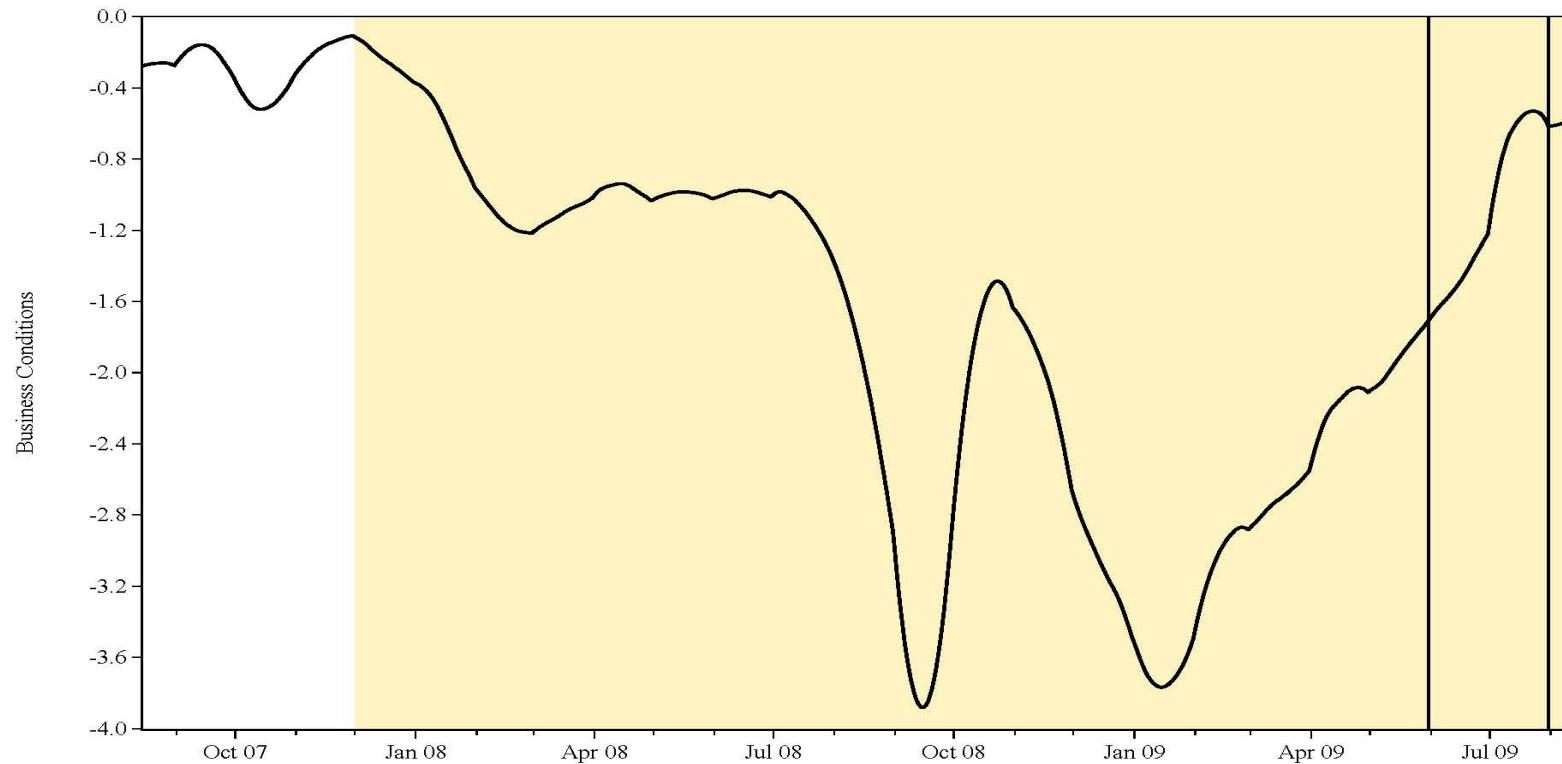- Les mêmes données que USRI
- La série `cycle' est retardée (5 mois)

MS-Switching (Piger, Octobre 2009)

| Month	Probability
February 2009	**98.20%**
March	**98.10%**
Apr 09	**97.00%**
May 2009	**95.40%**
June 2009	**86.50%**
July 2009	**53.30%**

ADS Septembre 2009

Aruoba-Diebold-Scotti Business Conditions Index (8/15/2007-8/15/2009)

Note: We construct the ADS Index using the latest data available as of August 20, 2009. The bold vertical lines provide information as to which indicators are available for which dates. For dates to the left of the left line, the ADS index is based on observed data for all six underlying indicators. For dates between the left and right lines, the ADS index is based on at least two monthly indicators (typically employment and industrial production) and initial jobless claims. For dates to the right of the right line, the ADS index is based on initial jobless claims and possibly one monthly indicator.

ADS Octobre 2009

Aruoba-Diebold-Scotti Business Conditions Index (10/17/2007-10/17/2009)
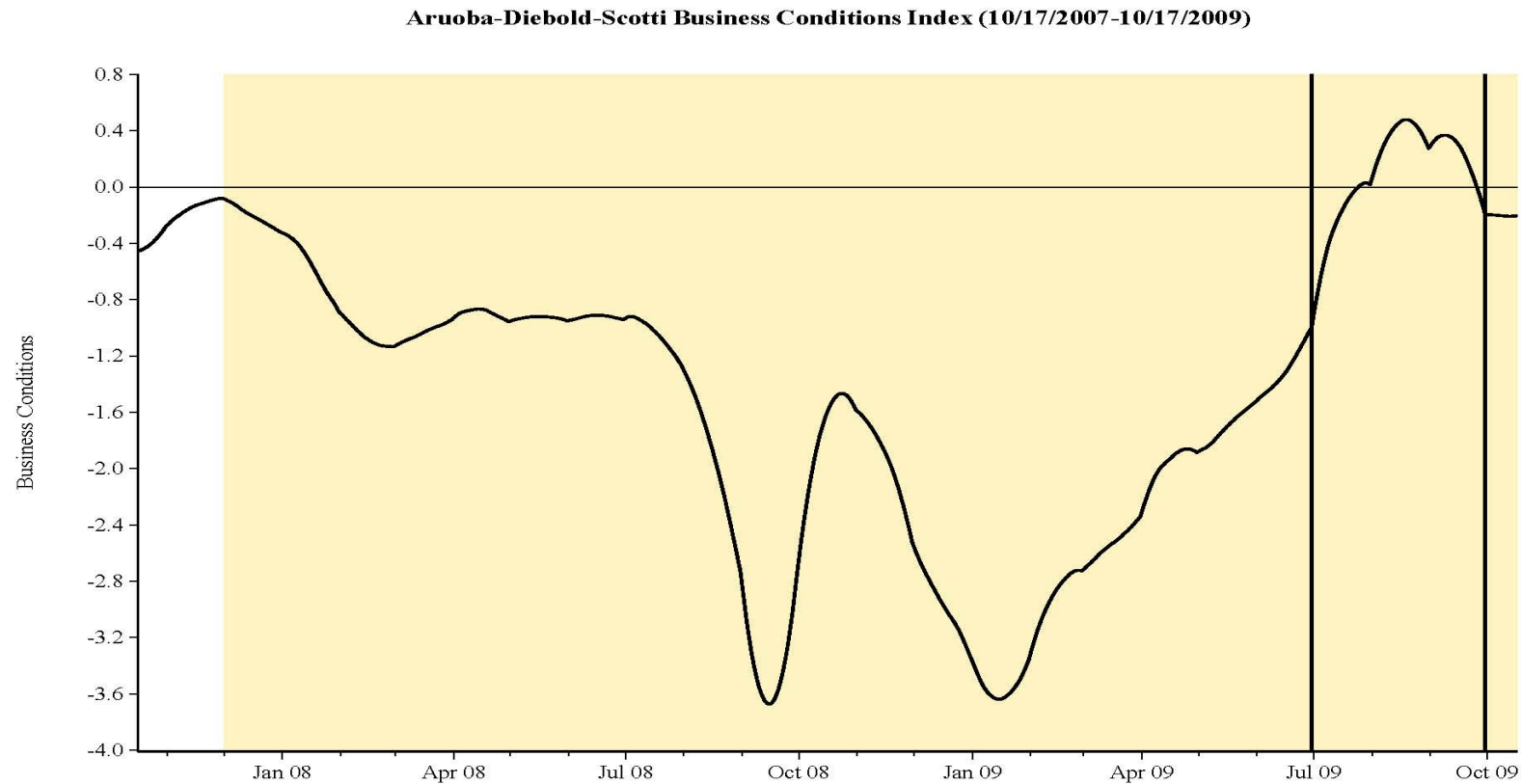
Note: We construct the ADS Index using the latest data available as of October 22, 2009. The bold vertical lines provide information as to which indicators are available for which dates. For dates to the left of the left line, the ADS index is based on observed data for all six underlying indicators. For dates between the left and right lines, the ADS index is based on at least two monthly indicators (typically employment and industrial production) and initial jobless claims. For dates to the right of the right line, the ADS index is based on initial jobless claims and possibly one monthly indicator.

contribution to the index for the second consecutive month.

**The next CFNAI will be released:
October 26, 2009
8:30 am Eastern Time
7:30 am Central Time**

The three-month moving average, CFNAI-MA3, improved for the seventh consecutive month. At −1.09 in August (up from −1.61 in the previous month), the CFNAI-MA3 suggests that growth in national economic activity was below its historical trend. With regard to inflation, the amount of economic slack reflected in the CFNAI-MA3 indicates low inflationary pressure from economic activity over the coming year. Please see the accompanying *Chicago Fed Letter* at www.chicagofed.org/publications/fedletter/cflnovember2009_268.pdf for further analysis of the CFNAI-MA3.

The production-related indicators made a smaller positive contribution of +0.29 to the index in August compared with +0.45 in July. Industrial production increased 0.8 percent in August,

Chicago Fed National Activity Index, Three-Month Moving Average (CFNAI-MA3)
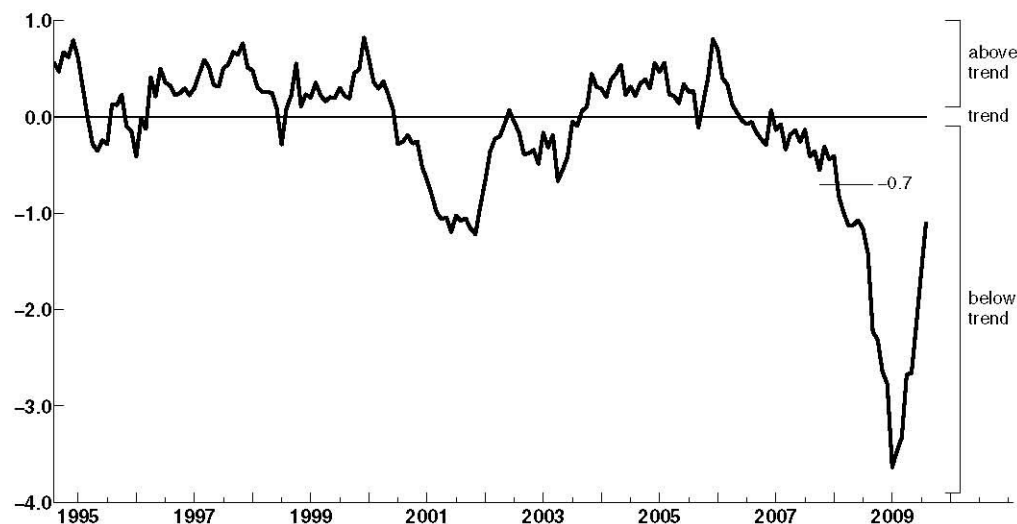
CFNAI and CFNAI-MA3 for the latest six months and year-ago month

	Aug '09	Jul '09	Jun '09	May '09	Apr '09	Mar '09	Aug '08
CFNAI							
Current	−0.90	−0.56	−1.82	−2.45	−2.17	−3.36	−2.01
Previous	N/A	−0.74	−1.82	−2.50	−2.23	−3.40	−2.01
CFNAI-MA3							
Current	−1.09	−1.61	−2.15	−2.66	−2.67	−3.33	−1.42
Previous	N/A	−1.69	−2.18	−2.71	−2.70	−3.33	−1.42

Current and Previous values reflect index values as of the September 28, 2009, release and August 24, 2009, release, respectively. N/A indicates not applicable.

September, following a 0.4 percent gain in August, and a 1.0 percent rise in July.

"With the sixth consecutive increase, the LEI's six-month growth rate has improved to its highest pace since 1983," says Ataman Ozyildirim, Economist at The Conference Board. "Except for average workweek and building permits, all the leading indicators contributed positively to the index this month. At the same time, the contraction in the coincident economic index has halted in recent months, but the continued downtrend in employment is keeping this index of current economic conditions from rising faster."

Says Ken Goldstein, Economist at The Conference Board: "The LEI has risen for six consecutive months and the coincident economic index has increased in two of the last three months. These numbers strongly suggest that a recovery is developing. However, the intensity of that recovery will depend on how much, and how soon, demand picks up."

The Conference Board Coincident Economic Index™ (CEI) for the U.S. was unchanged in September, following a 0.1 percent increase in both August and July. **The Conference Board Lagging Economic Index™** (LAG) declined 0.3 percent in September, following a 0.2 percent decline in August, and a 0.6 percent decline in July.

The Conference Board Leading Economic Index™ for the U.S. Improves; Sixth Consecutive Increase
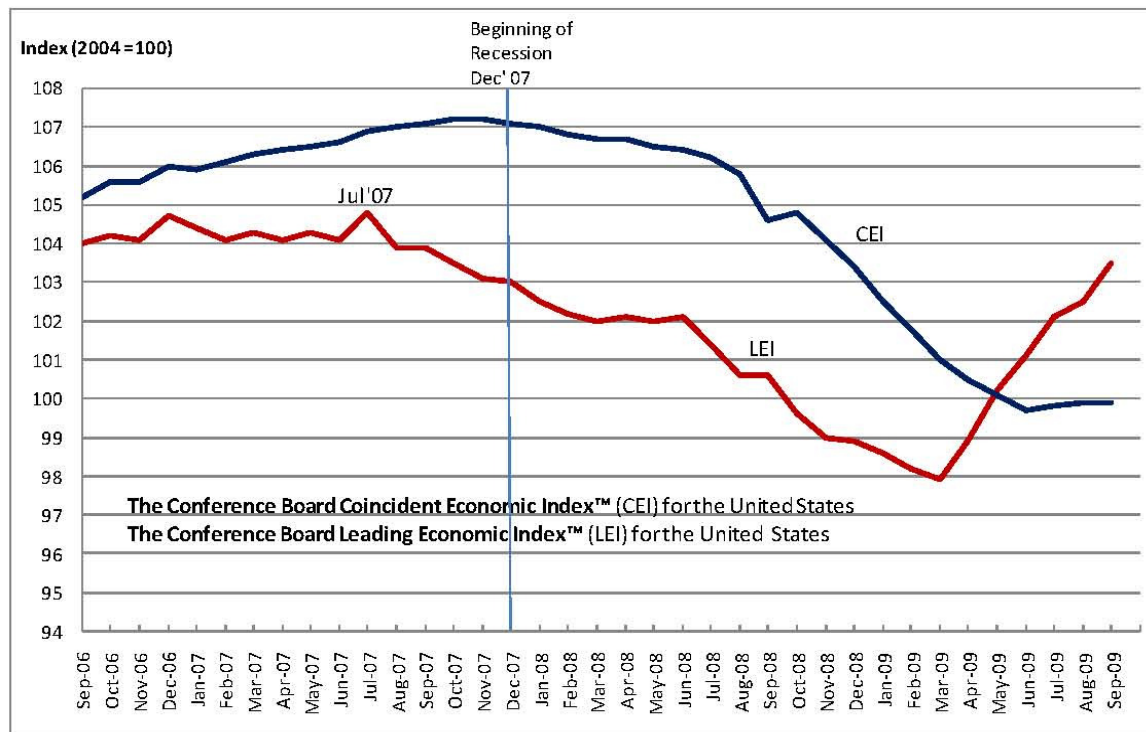
Détection en temps réel

- LEI-Conference board
  - Turning-point apparaît en avril
  - Délai de publication: TP apparaît en mai09 (Mars09 diff.)
- USRI `rapide'
  - TP niveau apparaît en avril09 (TP diff. en Déc09)
    - **Avantage Différences!**
  - Délai de publication: TP apparaît en mai09 (en diff.: Jan09)
    - Effet Obama
  - USRI: séries standard **(pas d'indicateurs avancés, mais des statistiques avancées…)**
- MS
  - Chauvet: TP apparaît en Octobre
  - Piger: TP pas confirmé
  - **Mêmes données que USRI!**
- CFNAI: TP pas confirmé
- ADS: peu fiable en fin de série

USRI

1.Transformations

2. Co-mouvements

3. Filtres en temps réel (Révisions, rapidité détection)

4. Modèles MS (univariés)

5. Déclencheur

1. Transformation

Règle de récession
Passbande 2-10 années

Log−returns IP, NM, PA and TC

Lnip   Lnm   Lnpa   Lntc

Symmetric Bandpass Filter: 2−10 years

Lnip   Lnm   Lnpa   Lntc
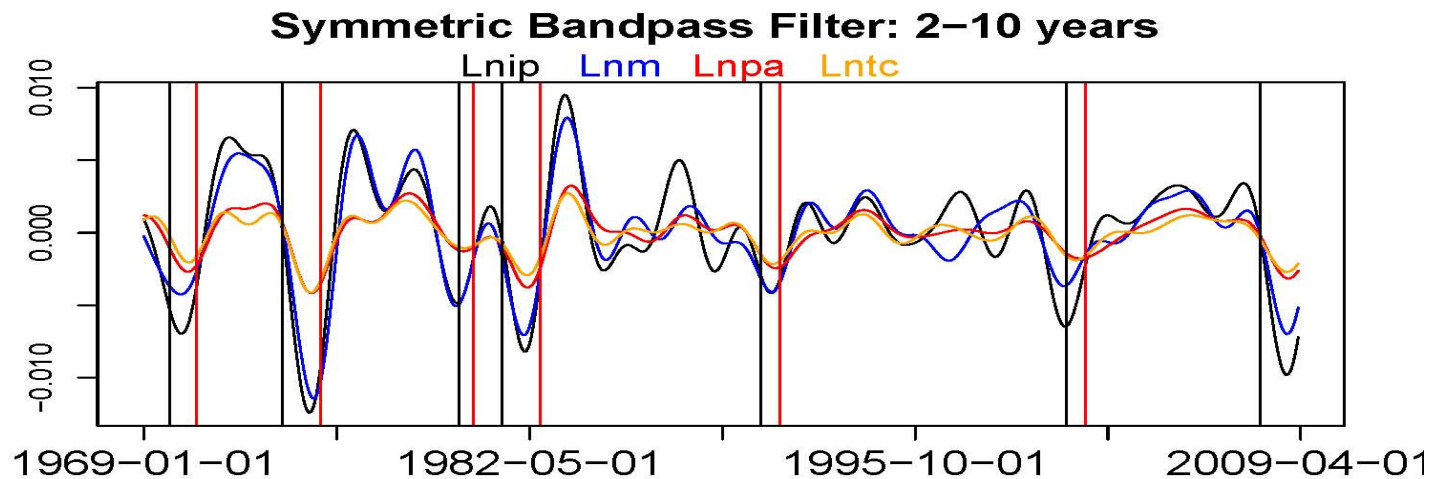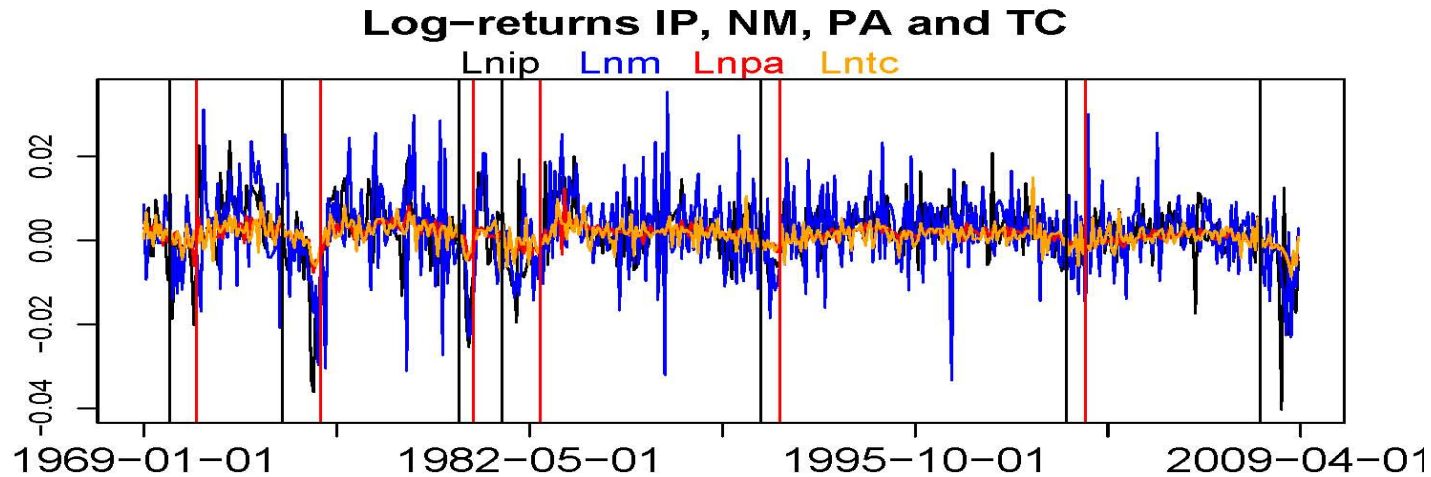
Règle:
Passbande 2-10 années
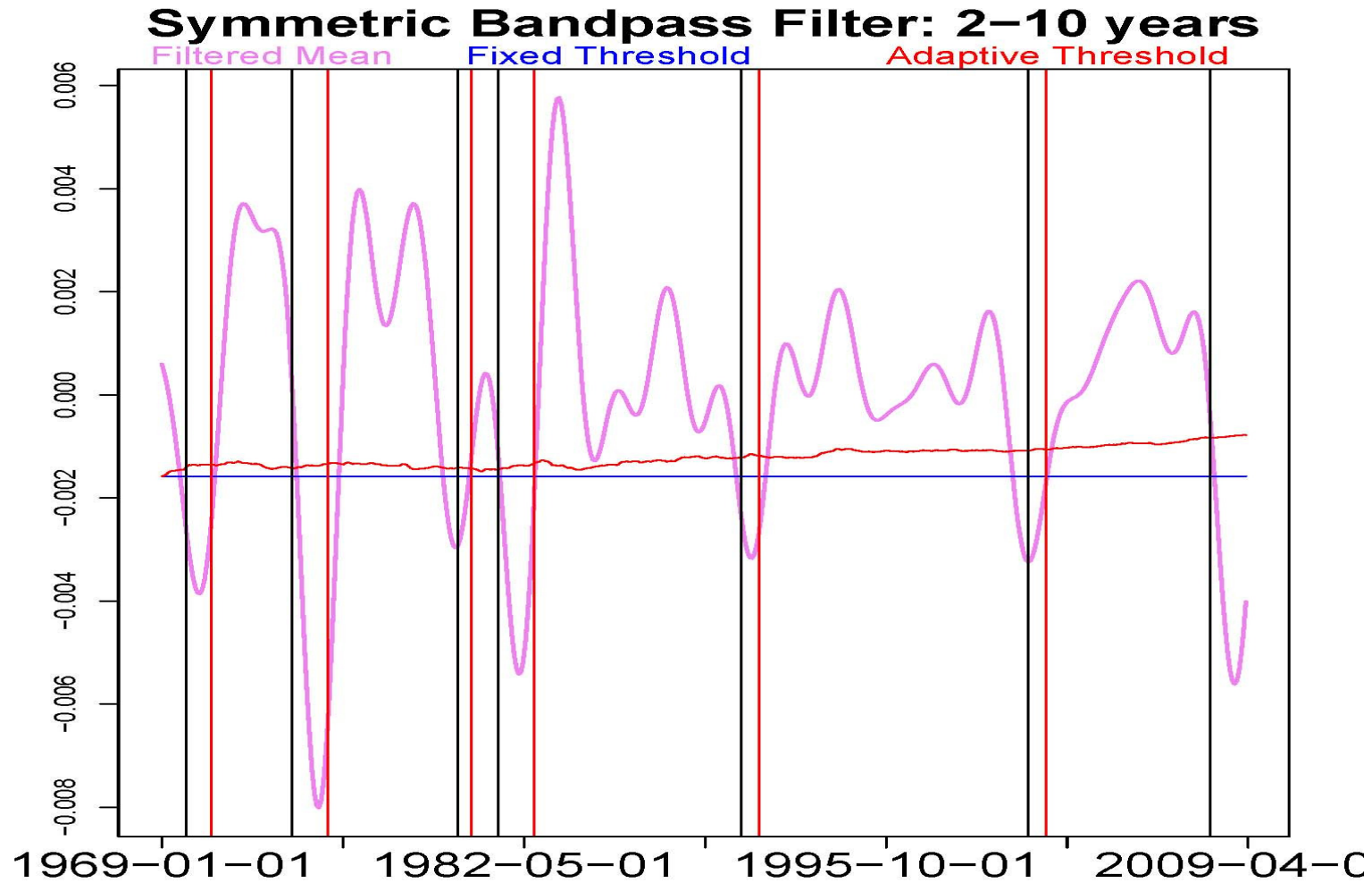
Croissance adaptive

Normal Growth Rate
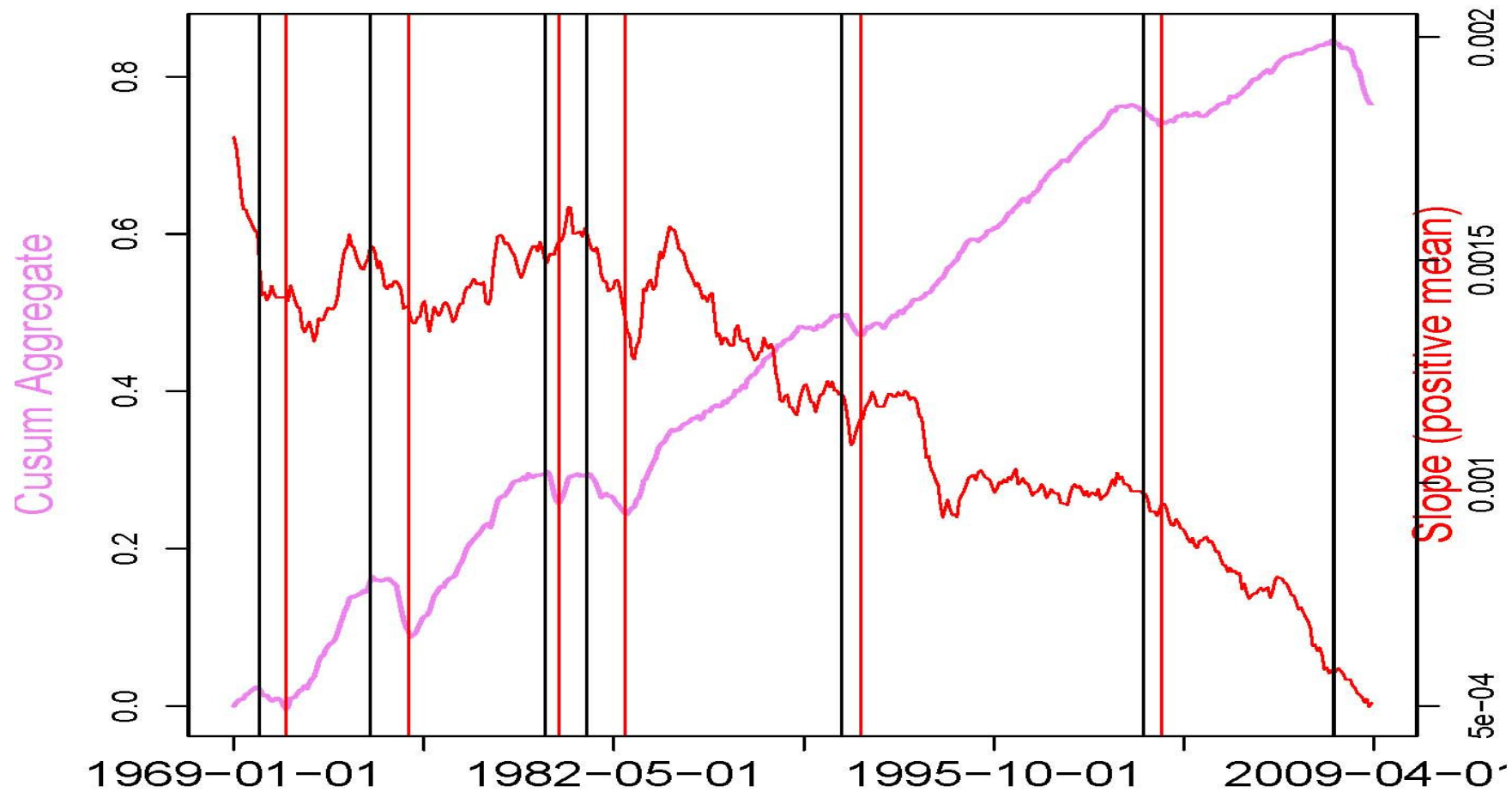
Fixer non-stationarité

- Niveau des log-returns est changeant
  - La transformation $Z_t = Y_t + G_t^+$ fixe ce problème
  - Une récession est déclarée dès que $Z_t < 0$

- Variance du cycle est mouvante
  - La transformation $I_t = \dfrac{Y_t}{G_t^+} + 1$ fixe ce problème
  - Une récession est déclarée dès que $I_t < 0$

Indicateur prototypique
Règle fixe

Prototypical Indicator Recession
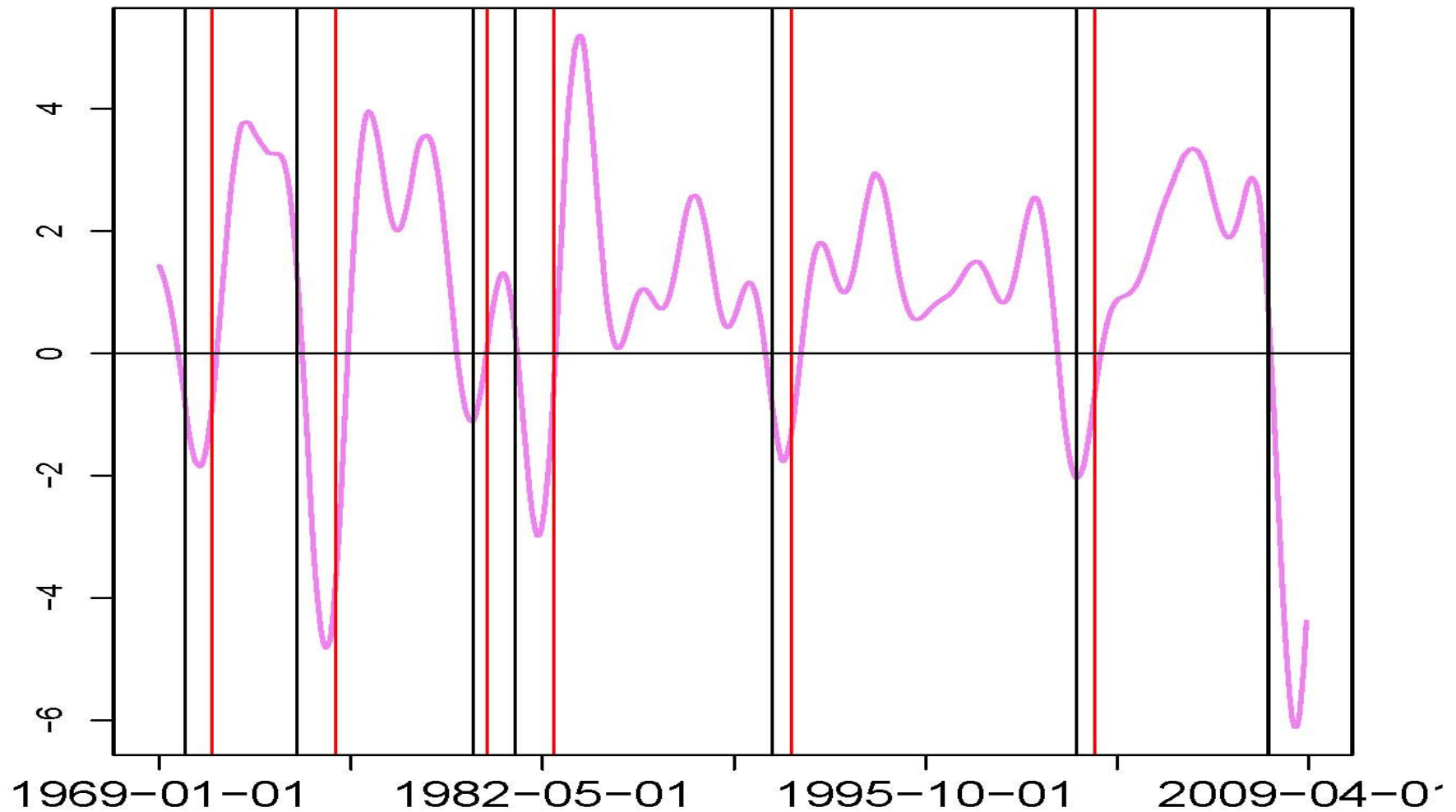
2. Co-Mouvements

Non-Linéarité

B-Indicateur: 2-10 années
Rapide départ-R, lent fin-R

Prototypical Indicator Recession
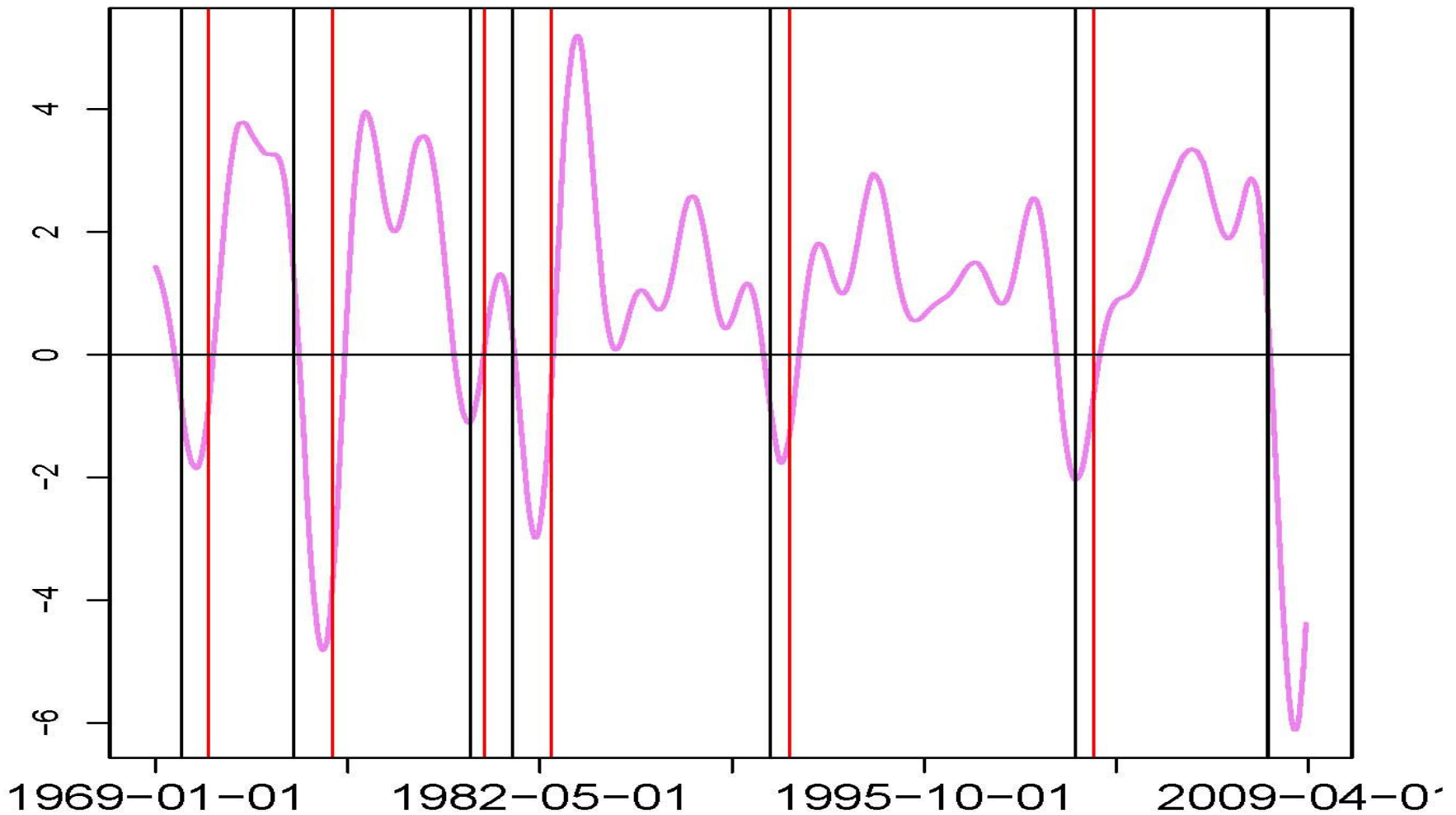
E-Indicateur: 1.5-3.5 années
Rapide fin-R, fausses alarmes

Prototypical Indicator Expansion
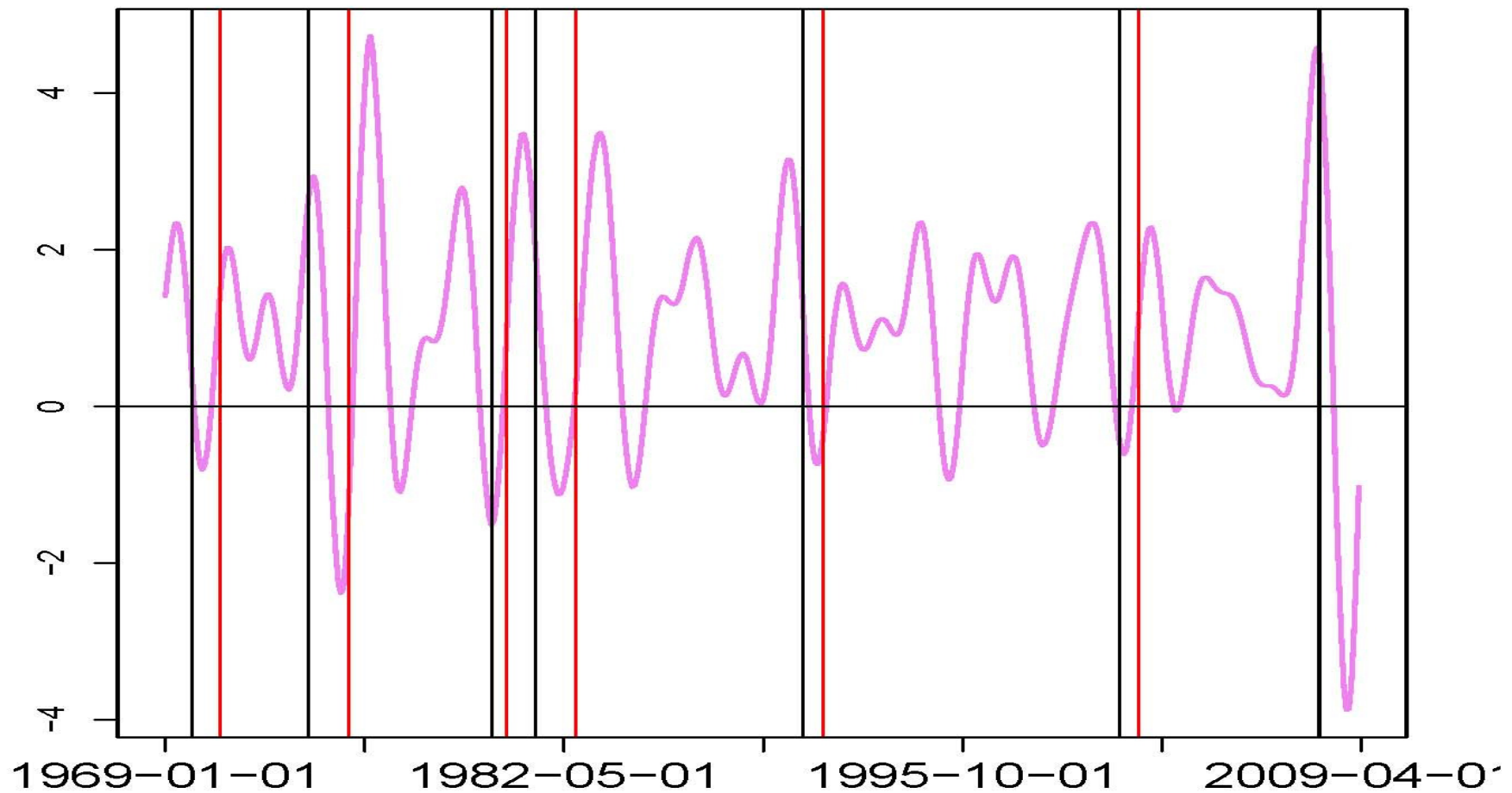
3. Filtres en temps réel

`Personnalisation' (customization)

Atelier

MDFA

- Personnalisation `moindres carrés´
  - Minimiser révisions
  - USRI `fiable'
- Personnalisation `détection avancée':
  - TP apparaissent plus tôt
  - USRI `avancé'

USRI (Octobre 2009)

• `Personnalisations': moindres carrés et détection avancée
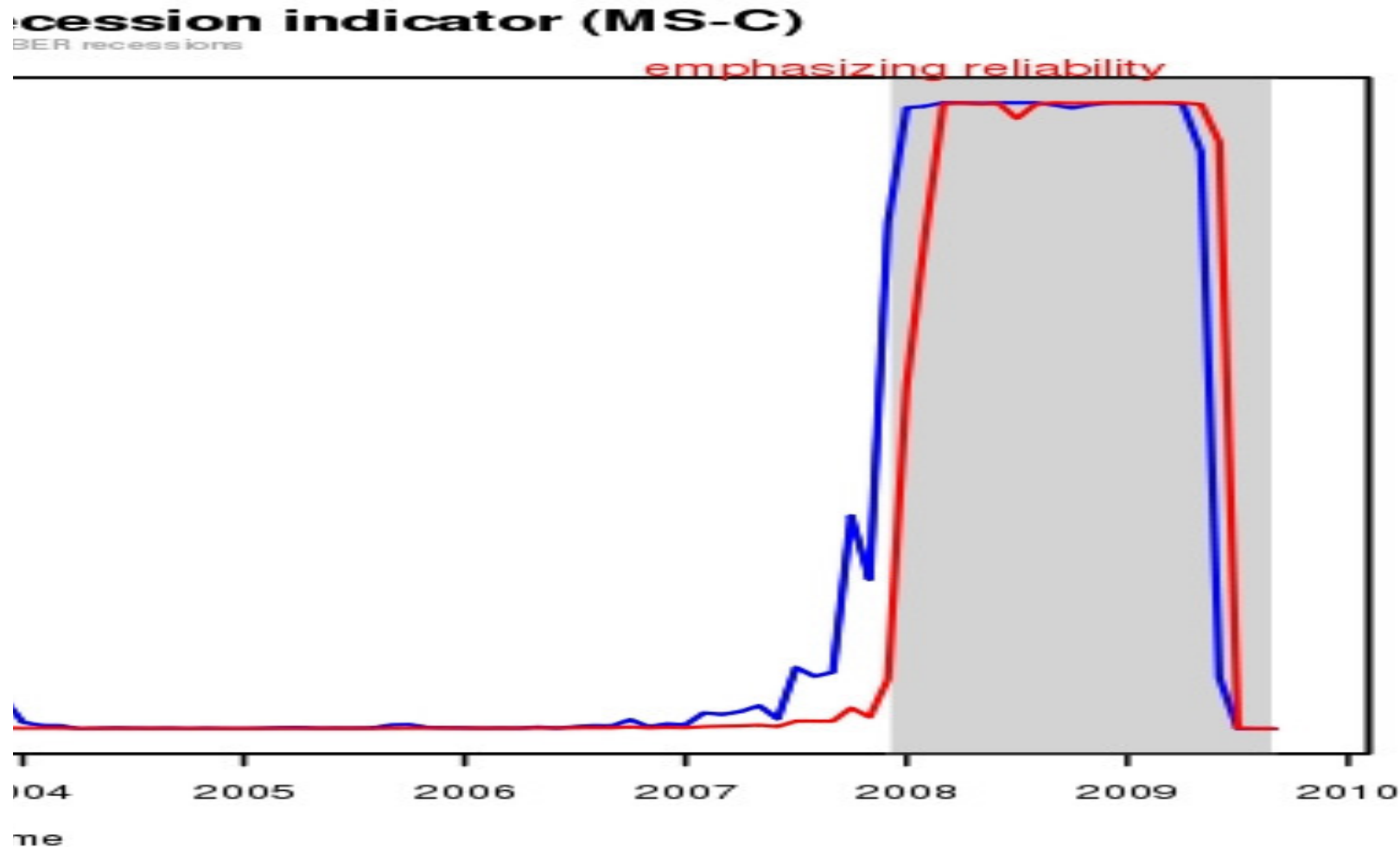
MDFA-B, MDFA-E:
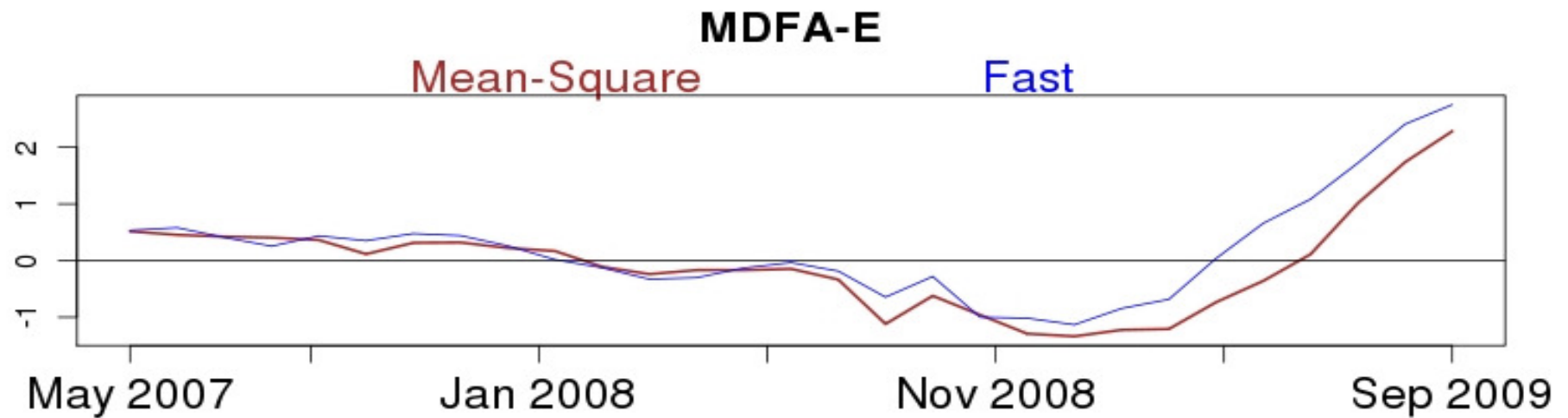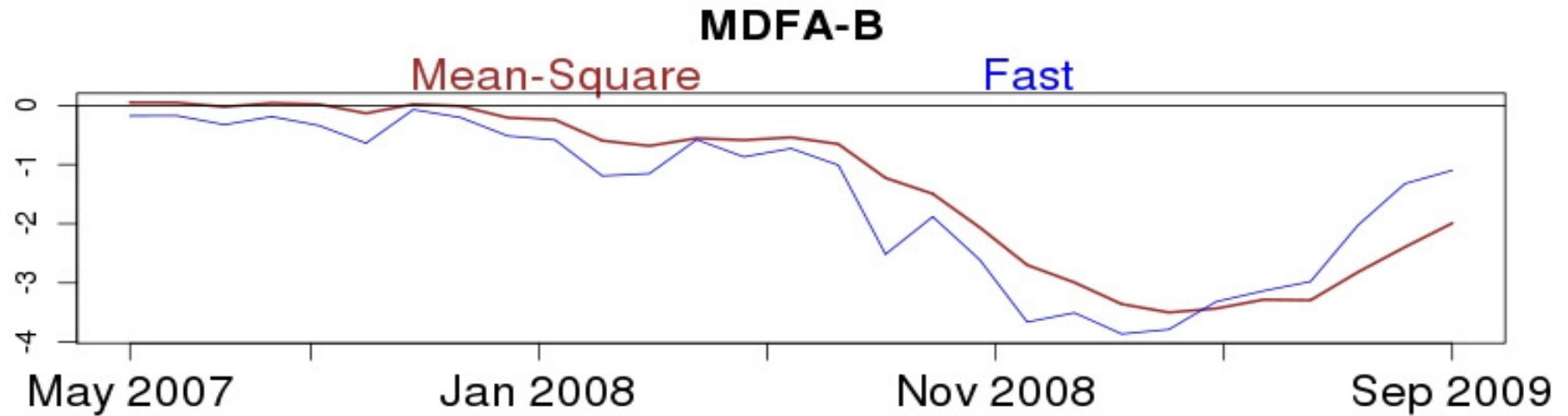
4. Modèles MS

Commodité graphique

Espérances conditionnelles + bruit

$$\hat{Y}_t = \begin{cases} \mu_1 + \varepsilon_{t1} \ , \ S_t = 1 \\ \mu_2 + \varepsilon_{t2} \ , \ S_t = 2 \end{cases} \qquad \begin{matrix} \text{Récession:} \mu_1 < 0 \\ \text{Expansion:} \mu_2 > 0 \end{matrix}$$

$$P = \begin{pmatrix} p_{11} & p_{12} \\ p_{21} & p_{22} \end{pmatrix} = P(S_{t+1} = i \mid S_t = j)$$

$$P(S_t = i \mid \hat{Y}_{t+k}, \dots, \hat{Y}_1)$$

$k = 0 :$ Filtering,

$\hat{Y}_t$: univariate MDFA-B, MDFA-E-outputs

MS-B et MS-E (Filtres fiables)
Real-time vs. Final Vintage
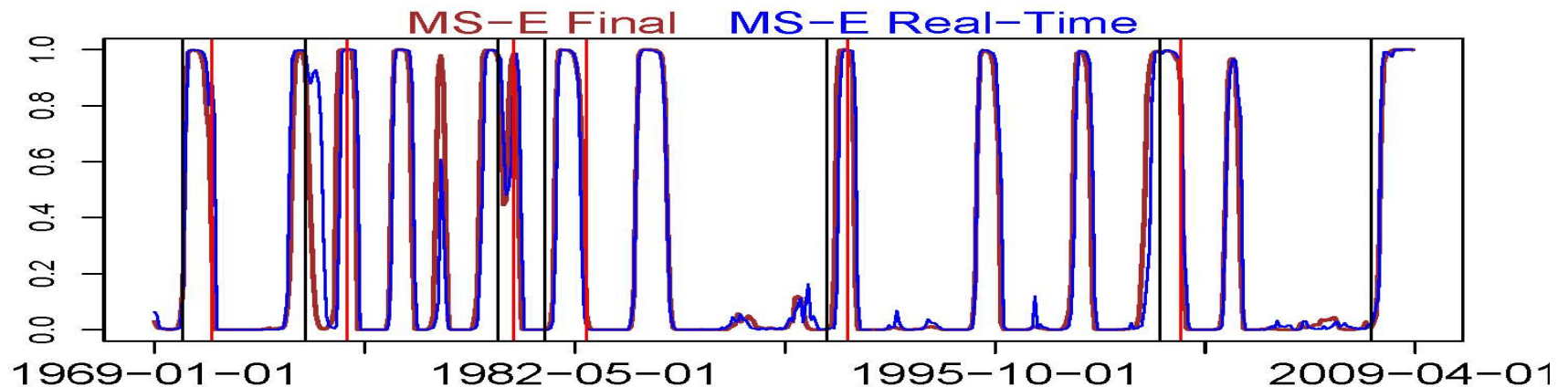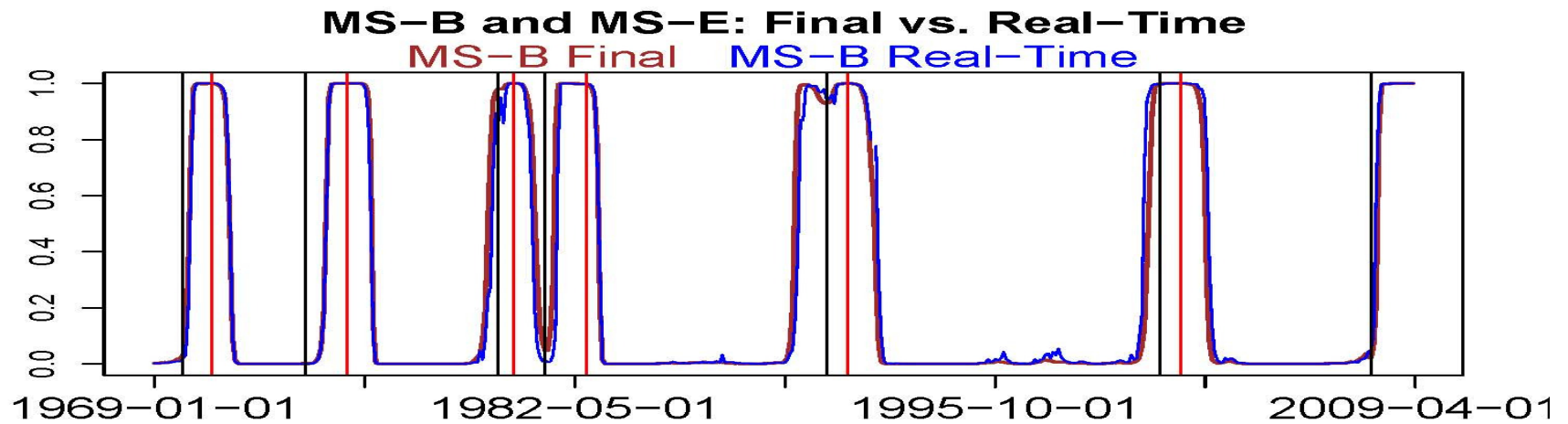
5. Déclencheur
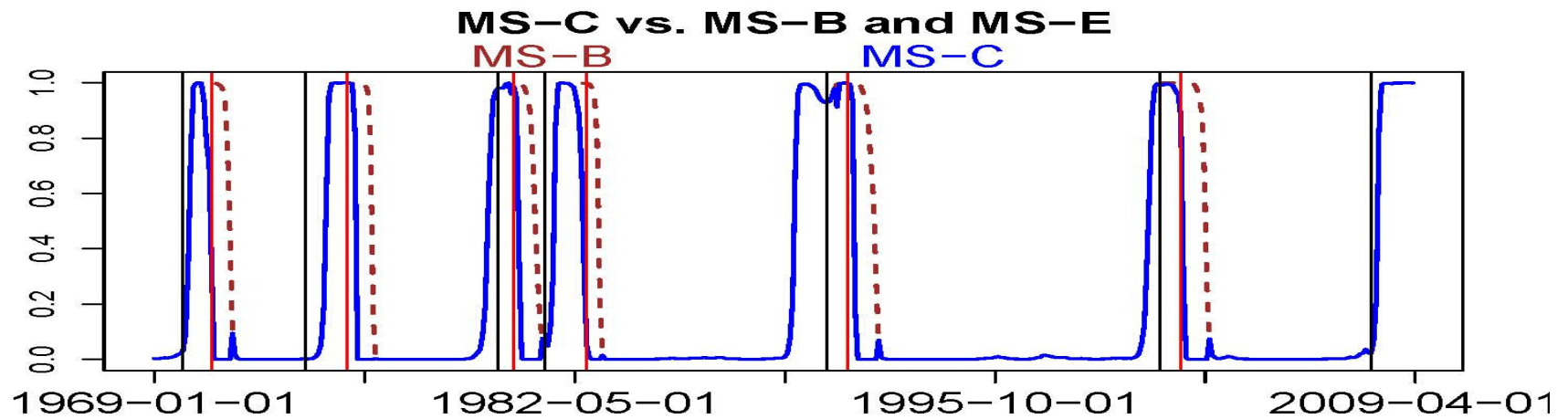
Index simple

Index simple: Déclencheur

$$s \in \,]0,1[$$

$$B_s = \{t \mid MS - B_t > s\}$$

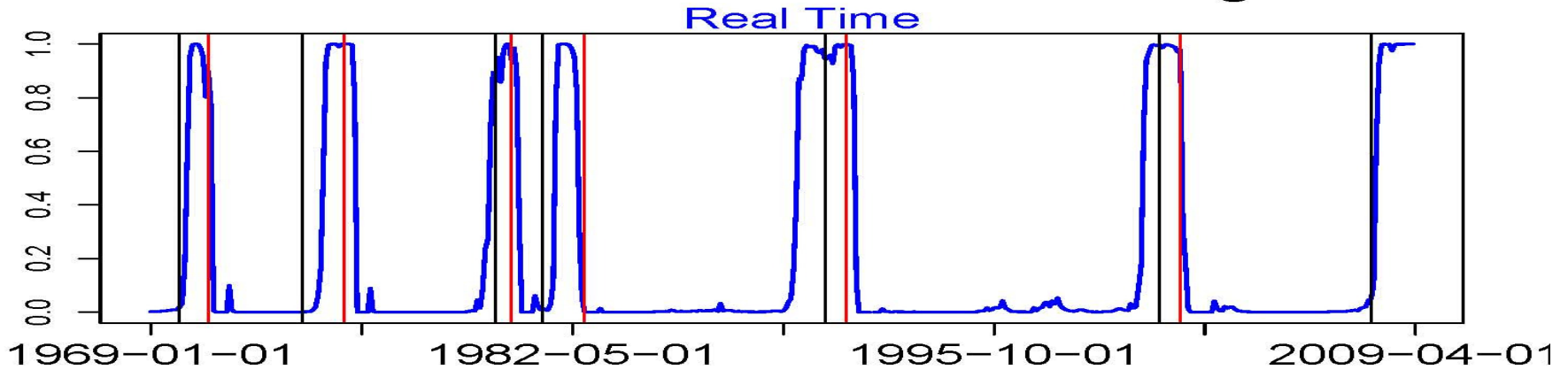$$B_s = B_{1s} \bigcup B_{2s} \bigcup ... \bigcup B_{Ks}$$

$$MS - C_{ts} = \begin{cases} MS - E_t \text{ , if } \begin{cases} \text{there exists a } j_0 \text{ such that } t \in B_{j_0} \text{ and} \\ \text{there exists a } t' < t \in B_{j_0} \text{ with } MS - E_{t'} > s \end{cases} \\ MS - B_t \text{ , otherwise} \end{cases}$$
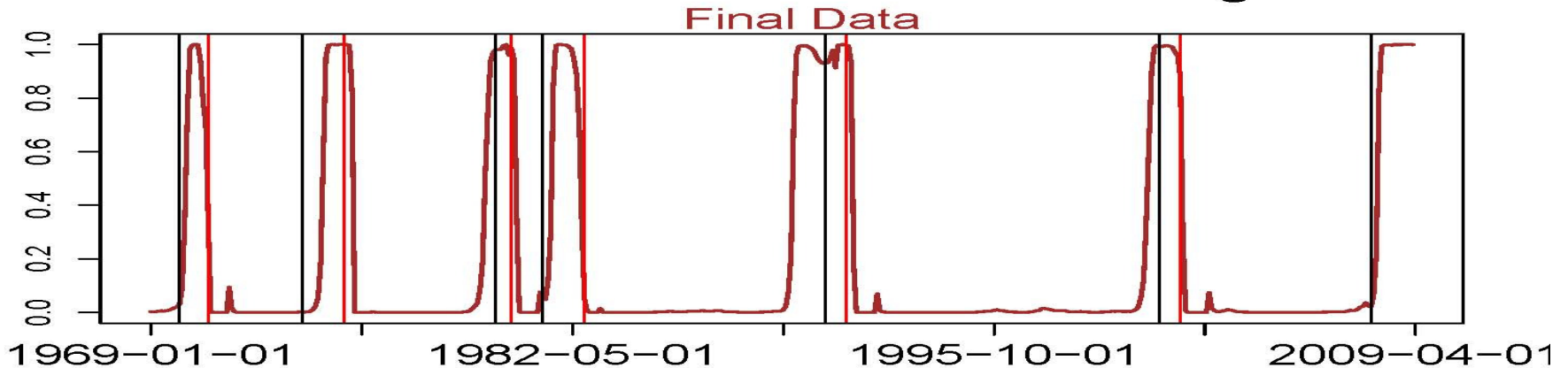
MS-C$_t$ vs. MS-B$_t$ et MS-E$_t$
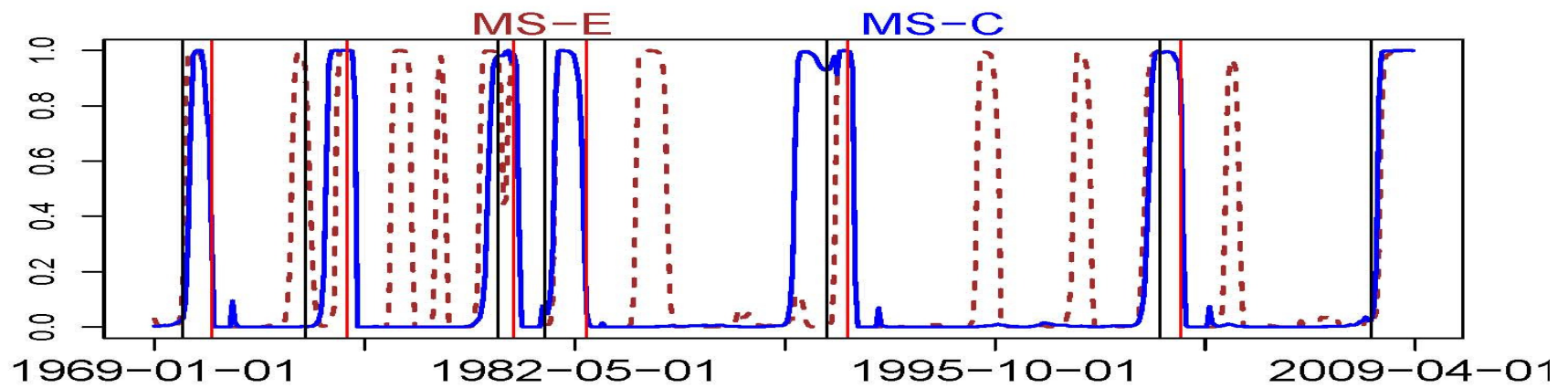
USRI `fiable`:
Real-Time vs. Final Vintage

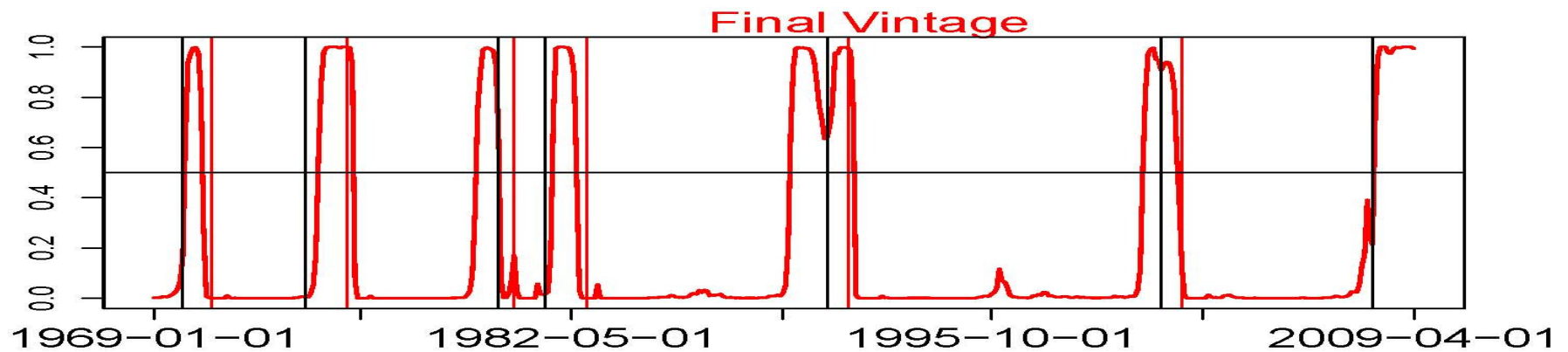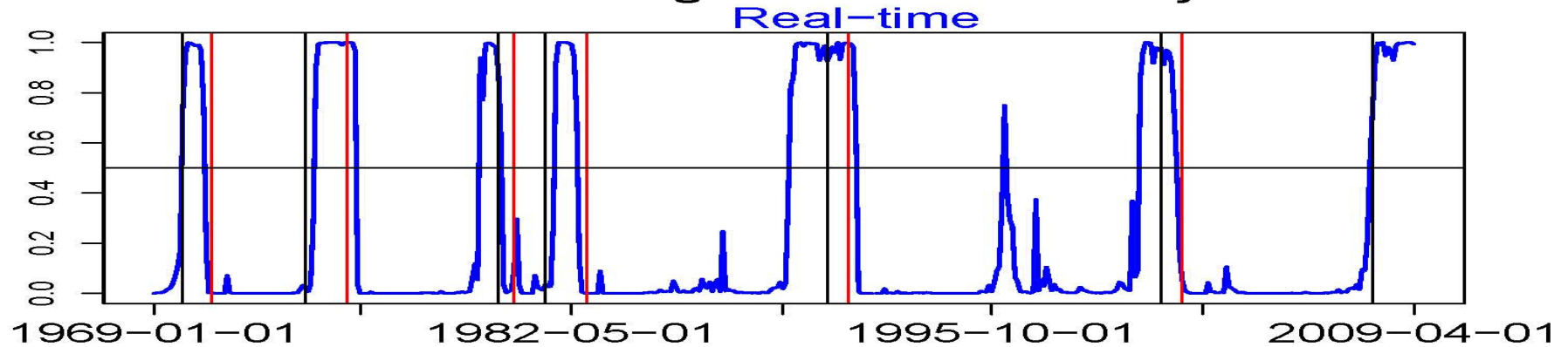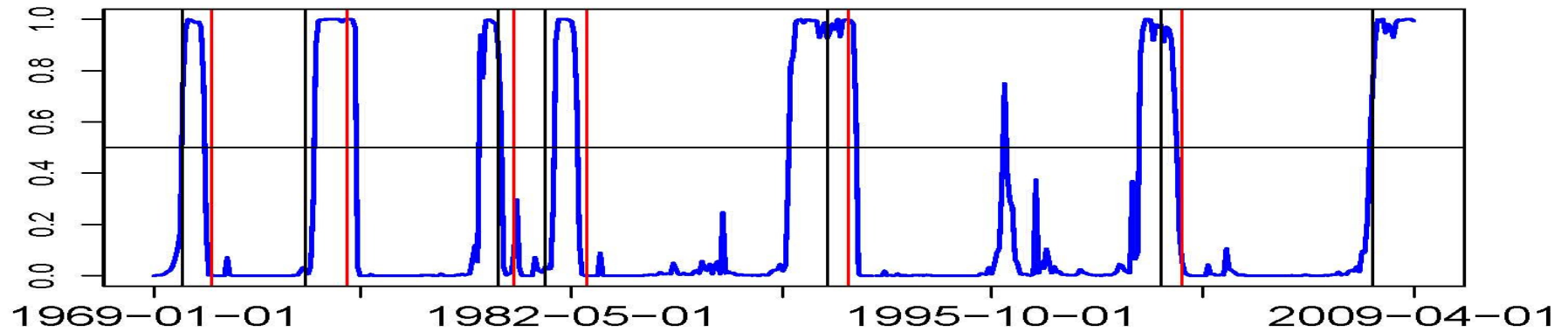

MS–C: Real–Time vs. Final Data Vintage — Real Time / Final Data

USRI `avancé':
Real-Time vs. Final Vintage
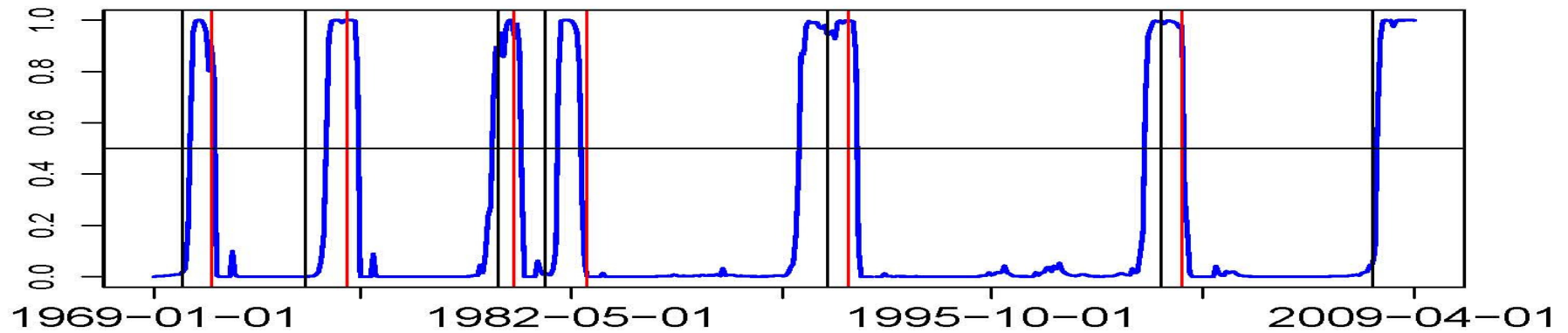

Real−time vs. final vintage:MS−C obtained by Fast MDFA

Avancé vs. fiable (Real-Time)

Avancé vs. fiable

| cession épisode	Begin of Recessions		Begin of Expansions	
	Fast Filter	Reliable Filter	Fast Filter	Reliable Filter
2008	-1	1	?	?
2001	-15	-7	-1	0
1990	-16	-12	2	3
1982	5	4	-4	-2
1980	-10	-3	-5	2
1974	-1	7	3	4
1970	-5	2	-2	1
Mean lead/lag	-6	-1.1	-1.2	1.3
False alarms	One	None	None	None

- Il est possible de faire des prévisions!
- En temps réel s'entend…

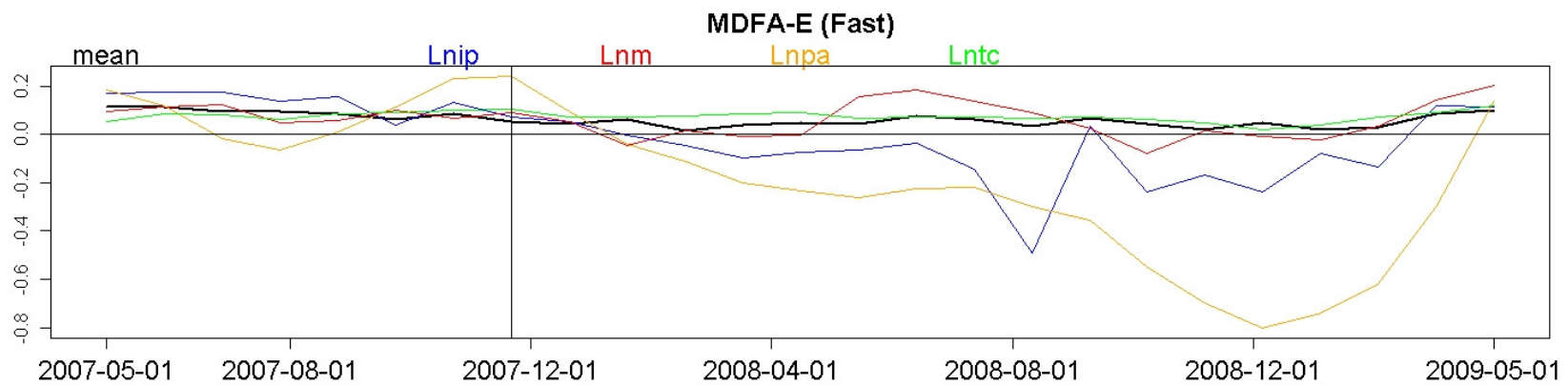# Information additionnelle transmise par MDFA

Cause/origine des alarmes

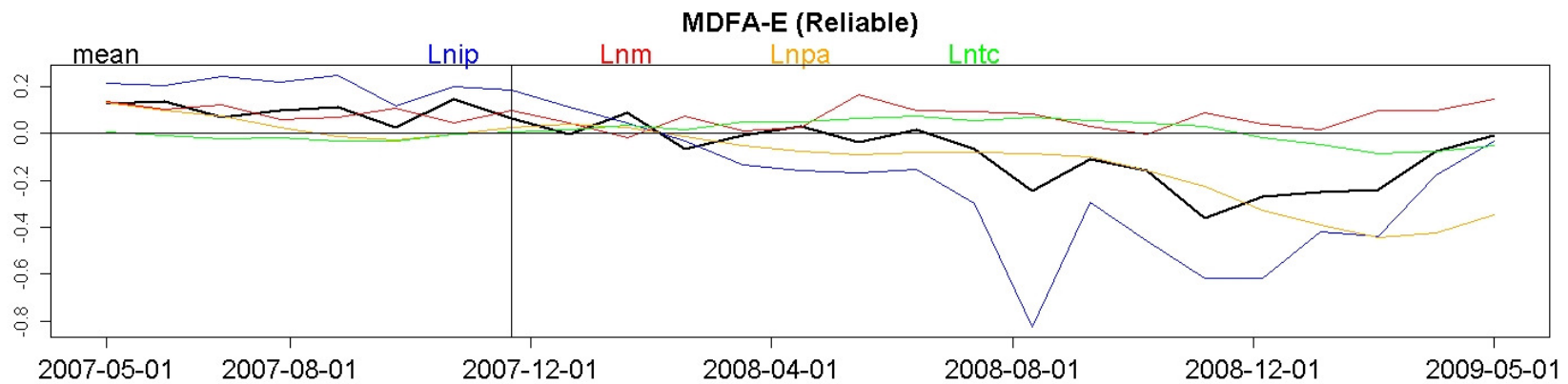# MDFA-B,-E 22.06.2009
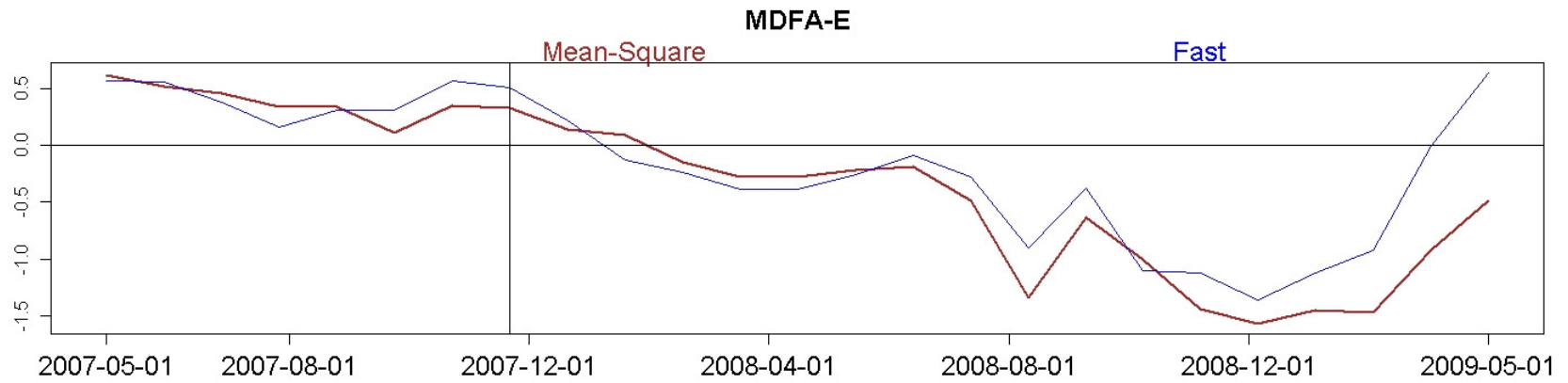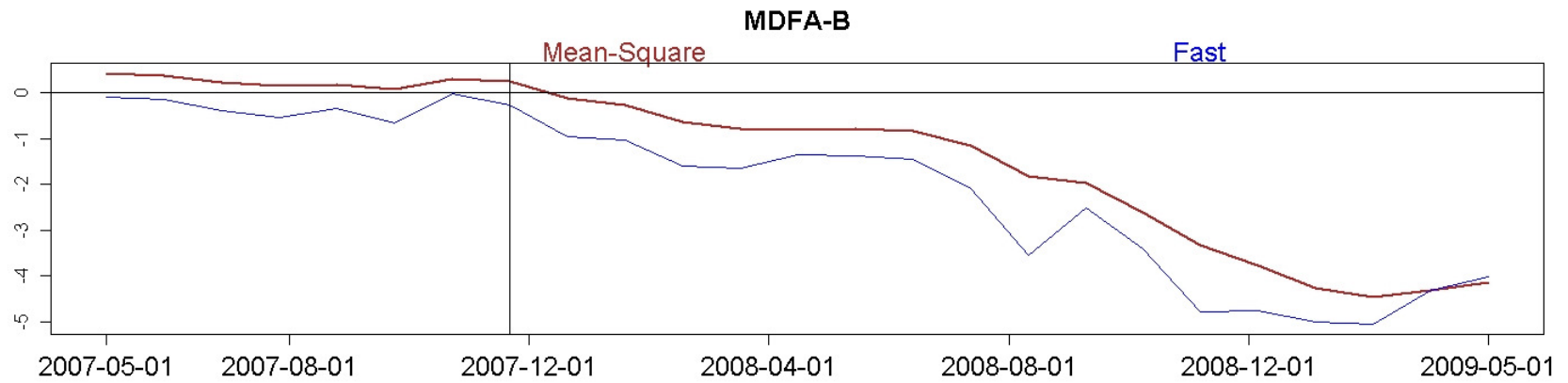
Séries individuelles
22.06.2009

Résumé

Spécificitiés Méthodologiques

- Dimensions
  - Intention/but de l'analyse
    - Deux designs: avancé et fiable
  - Structure du problème: asymétrie
    - récession/expansion

- Impact:
  - Pondération transversale
  - Pondération longitudinale

Web-Links

- NBER: http://www.nber.org/cycles.html
- Chauvet/Hamilton: http://faculty.ucr.edu/~chauvet/prob0509.pdf
- Piger: http://www.uoregon.edu/~jpiger/
- Stock and Watson (CFNAI): http://www.chicagofed.org/economic_research_and_data/cfnai.cfm
- Aruoba, Diebold, Scotti
  - http://www.philadelphiafed.org/research-and-data/real-time-center/business-conditions-index/
- Wildi:
  - USRI: http://www.idp.zhaw.ch/usri
  - Blog: http://blog.zhaw.ch/idp/sefblog

The End