SUPPLEMENTARY MATERIAL FOR FORECASTING INFLATION IN A DATA-RICH ENVIRONMENT: THE BENEFITS OF MACHINE LEARNING METHODS

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JEL: C22, E31.
Keywords: Big data, inflation forecasting, LASSO, random forests, machine learning.
Acknowledgements: We are very grateful to the co-editor, Christian B. Hansen, the associate editor, and two anonymous referees for very helpful comments. We thank Federico Bandi, Anders B. Kock and Michael Wolf for helpful comments during the workshop "Trends in Econometrics: Machine Learning, Big Data, and Financial Econometrics," Rio de Janeiro, October 2017. The participants of the "Third International Workshop in Financial Econometrics," Arraial d'Ajuda, October 2017, the workshop "Big data, Machine Learning and the Macroeconomy," Oslo, October 2017, and the National Symposium on Probability and Statistics (SINAPE), São Pedro, September 2018, are also gratefully acknowledged. We also thank Alberto Cavallo for an insightful discussion during the workshop "Measuring and Analyzing the Economy using Big Data" at the Central Bank of Brazil, November 2017. We also thank the suggestions received during seminars at the Università Ca'Foscari, Venice, at the School of Applied Mathematics at FGV/RJ, and at the Department of Economics at Duke University. Special thanks also to Tim Bollerslev, Jia Li, Andrew Patton, Rogier Quaedvlieg, Peter R. Hansen, Mark Watson and Brian Weller for inspiring discussions and comments. Finally, we are grateful to Michael McCracken for his help with the real-time dataset. The views expressed in this paper do necessarily reflect the position of the Central Bank of Chile.
Abstract: In this online supplement we report additional material to support the results in the paper "Forecasting Inflation in a Data-Rich Environment: The Benefits of Machine Learning Methods". The supporting material consists of descriptive statistics and more detailed results.

Date: April 2019.

1. Introduction

In this online supplement we report additional material to support the results in the paper "Forecasting Inflation in a Data-Rich Environment: The Benefits of Machine Learning Methods". The supporting material consists of descriptive statistics, more detailed results for the CPI inflation as well as results concerning the PCE and the CPI core inflation measures.

The supplementary material is organized as follows. In Section 2 we briefly describe the FRED-MD data that we use in the paper. Section 3 we present descriptive statistics for CPI inflation, industrial production and economic uncertainty measures during the out-of-sample period considered in paper. Section 4 contains additional estimation results.

2. Variable Description

In this section, we present a description of the dataset used in this paper. Tables S.1–S.8 describe the data and the transformations that were applied to each variable. Each table considers one of the eight different classes in which the variables are grouped. The column "tcode" denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta\log(x_t)$; (6) $\Delta^2\log(x_t)$; and (7) $\Delta(x_t/x_{t-1}-1)$. The column "fred" gives mnemonics in FRED followed by a short description. The comparable series in global insight is given in the column "gsi".

3. Descriptive Statistics

Figure S.1 shows the time evolution of the consumer price index (CPI), the personal consumption expenditures (PCE) and the core CPI inflation measures from January 1960 to December 2015 (672 observations). Inflation is computed as $\pi_t = \log(\mathsf{P}_t) - \log(\mathsf{P}_{t-1})$, where P_t represents each one of the price measures considered in the paper. Shaded areas represent recession periods according to the NBER classification.

In Table S.9, we report the mean, standard deviation (Sd), median, maximum, minimum, first-order autocorrelation (AC1), and sum of the first 36 autocorrelations (AC36) for several macroeconomics variables. These variables include CPI monthly inflation (π_t), CPI twelve-month inflation ($\pi_{12,t}$), monthly growth of the industrial production ($\Delta\mathsf{IP}_t$) and twelve-month growth of industrial production ($\Delta_{12}\mathsf{IP}_t$). We also report these statistics for measures of macroeconomic ($\mathcal{U}_{\mathsf{macro}}$), financial ($\mathcal{U}_{\mathsf{fin}}$) and real ($\mathcal{U}_{\mathsf{real}}$) uncertainty computed as in Jurado et al. (2015), which are the conditional volatility of the unforecastable part of macroeconomic, financial and firm-level variables, respectively. In particular, the authors consider forecasting horizons of one, three and twelve months ahead.[1]

[1]These uncertainty measures are available at Sydney C. Ludvigson's webpage (https://www.sydneyludvigson.com/).

The monthly growth in industrial production is on average higher and less volatile during the first subsample. Finally, uncertainty measures are uniformly higher during 2001-2015, mainly due to the Great Recession.

4. Additional Results

4.1. **Summary Results.** Tables S.10 and S.11 report for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Table S.10 refers to the first subsample (1990–2000) and Table S.11 presents the results for the second subsample (2001–2015). Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only. Results are discussed in the main text.

4.2. **Factor Analysis.** Figure S.2 reports the eigenvalues associated with the principal components computed over the rolling windows. To improve readability, we only show the estimated eigenvalues every January. From the figure it is clear that there is a small number of dominating factors.

4.3. **Correlations.** Figure S.3 shows the correlation between the forecasts of every pair of models considered in the paper. The darkest the entries the highest the correlation (in absolute value). Degrees of blue indicate positive correlations while degrees of red indicate negative ones. As can be seen from the figure the correlations among forecasts are high and positive.

4.4. **Rolling RMSEs, MAEs, and MADs.** Figures S.4–S.18 display the rolling RMSEs, MAEs, and MADs over windows of 48 months, as discussed in the main text.

4.5. **Detailed Results.** Tables S.12 and S.13 show the root mean squared error (RMSE), and between parenthesis, the mean absolute errors (MAE) for all models relative to the random walk (RW). The error measures were calculated from 132 rolling windows covering the 1990–2000 period (Table S.12) and 180 rolling windows covering the 2001–2015 period (Table S.13) . Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss functions. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table report how many models were included in the MCS for square and absolute losses.

Table S.14 reports the coefficients and the standard deviation of the regression

$$\widehat{e}^2_{t+h,\mathrm{RF}} - \widehat{e}^2_{t+h,\text{other model}} = \alpha_0 \mathsf{I}_{t+h} + \alpha_1(1 - \mathsf{I}_{t+h}) + \text{error},$$

where I_t is an indicator function that equals one for expansion periods as labeled by the NBER and zero otherwise. The standard errors are heteroskedasticity-autocorrelation robust and are computed with a quadratic spectral kernel and bandwidth selected by Andrew's automatic method. $***$, $**$, and $*$ indicate, respectively, that the coefficients are statistically significant that the 1%, 5%, and 10% levels. Similarly, Table S.15 reports analogous statistics when the indicator function, I_t, equals one for periods when macroeconomic uncertainty is higher than the historical average.

4.6. **Variable Selection: Word Clouds.** This section presents the variable selection for several models as *word clouds*. In the present context, a word cloud is an image composed of the names of variables selected by a specific model across the estimation windows in which the size of each word indicates its frequency or importance. The names displayed in the clouds are as defined in the third column of Tables S.1–S.8. These names represent FRED mnemonics. The clouds also indicate the degree of sparsity of each model. For instance, the smaller the cloud is, the more sparse the model is.

Figures S.19 and S.20 display the word clouds for the linear model estimated with the adaLASSO method for the first and second subsamples, respectively. In each figure, panel (a) shows the cloud for one-month-ahead models ($h = 1$), panel (b) presents the results for the three-month horizon ($h = 3$), and panels (c) and (d) consider the cases for $h = 6$ and $h = 12$, respectively. A number of findings emerge from the word clouds. First, as expected, the adaLASSO method delivers very sparse methods, and this did not change much according to the subsample considered. Second, the models across different horizons, as shown in the main text, are quite different. For example, in the first subsample and for $h = 1$, the three variables that stand out from the cloud are CUSR0000SAOL5 (CPI: all items less medical care), WPSFD49207 (PPI: finished goods), and DSERRG3M086SBEA (PCE: Services). However, for $h = 12$, the most important variables are AMDMUOx (unfilled orders for durable goods) and HOUSTMW (Housing starts, Midwest). Finally, the pool of selected variables also changes from the first to the second sample, specially for $h = 1$. In this case, oil prices turn out to be one of the most relevant variables.

Figures S.21 and S.22 shows the word clouds for the RF model. From the pictures it is clear that the number of important variables are much higher. As in the adaLASSO case, the variable composition changes from the first to the second subsample.

4.7. **Additional Results: Personal Consumption Expenditure (PCE).** In this section, we report forecasting results for PCE. The main message is similar to the one described in the main text: RF models outperform traditional benchmarks as well as other linear ML methods.

In Tables S.16–S.18, we report for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six- and twelve-month horizon for the full out-of-sample period (1990–2015) as well as for the two subsamples considered, namely, 1990–2000 and 2001–2015. Columns (1), (2) and (3) report the RMSE, the MAE and the MAD, respectively. Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. All these statistics are relative to the benchmark. In columns (10), (11) and (12) we report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p-values of the superior predictive ability (SPA) test proposed by Hansen (2005), columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011), and column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The details of these tests are provided in the main text.

Tables S.19–S.21 show the RMSEs and, in parenthesis, the MAEs for all models relative to the RW. The error measures were calculated from 132 rolling windows covering the 1990-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% MCS using the squared error (absolute error) as the loss function. The MCSs were constructed based on the maximum t statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table report how many models were included in the MCS for square and absolute losses.

Again, the performance of the RF model is remarkable, and our conclusions in the main text are fairly robust once forecasting of the PCE rather than the CPI is considered.

4.8. **Additional Results: CPI-Core.** In this section, we report forecasting results for the core of the Consumer Price Index. The CPI-Core series exhibits a dynamics quite different from the other two inflation indexes reported before. More specifically there is a clear seasonal pattern in the series.

In Tables S.22–S.27, we report for each model a number of different summary statistics analogous to those in Tables S.16–S.21 for the PCE; see description above. For the core CPI, bagging seems to be the best method for shorter horizons. For longer horizons, RF still seems to be the best method. In addition, the benchmarks RW and UCSV are among the winner methods once accumulated inflation is considered.

TABLES AND FIGURES

Table S.1. Data Description: Output and Income

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 1: Output and income

	id	tcode	fred	description	gsi	gsi:description
1	1	5	RPI	Real Personal Income	M_14386177	PI
2	2	5	W875RX1	Real personal income ex transfer receipts	M_145256755	PI less transfers
3	6	5	INDPRO	IP Index	M_116460980	IP: total
4	7	5	IPFPNSS	IP: Final Products and Nonindustrial Supplies	M_116460981	IP: products
5	8	5	IPFINAL	IP: Final Products (Market Group)	M_116461268	IP: final prod
6	9	5	IPCONGD	IP: Consumer Goods	M_116460982	IP: cons gds
7	10	5	IPDCONGD	IP: Durable Consumer Goods	M_116460983	IP: cons dble
8	11	5	IPNCONGD	IP: Nondurable Consumer Goods	M_116460988	IP: cons nondble
9	12	5	IPBUSEQ	IP: Business Equipment	M_116460995	IP: bus eqpt
10	13	5	IPMAT	IP: Materials	M_116461002	IP: matls
11	14	5	IPDMAT	IP: Durable Materials	M_116461004	IP: dble matls
12	15	5	IPNMAT	IP: Nondurable Materials	M_116461008	IP: nondble matls
13	16	5	IPMANSICS	IP: Manufacturing (SIC)	M_116461013	IP: mfg
14	17	5	IPB51222s	IP: Residential Utilities	M_116461276	IP: res util
15	18	5	IPFUELS	IP: Fuels	M_116461275	IP: fuels
16	19	1	NAPMPI	ISM Manufacturing: Production Index	M_110157212	NAPM prodn
17	20	2	CUMFNS	Capacity Utilization: Manufacturing	M_116461602	Cap uti

Table S.2. Data Description: Labor Market

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 2: Labor market

	id	tcode	fred	description	gsi	gsi:description
1	21*	2	HWI	Help-Wanted Index for United States		Help wanted indx
2	22*	2	HWIURATIO	Ratio of Help Wanted/No. Unemployed	M_110156531	Help wanted/unemp
3	23	5	CLF16OV	Civilian Labor Force	M_110156467	Emp CPS total
4	24	5	CE16OV	Civilian Employment	M_110156498	Emp CPS nonag
5	25	2	UNRATE	Civilian Unemployment Rate	M_110156541	U: all
6	26	2	UEMPMEAN	Average Duration of Unemployment (Weeks)	M_110156528	U: mean duration
7	27	5	UEMPLT5	Civilians Unemployed - Less Than 5 Weeks	M_110156527	U ¡ 5 wks
8	28	5	UEMP5TO14	Civilians Unemployed for 5-14 Weeks	M_110156523	U 5-14 wks
9	29	5	UEMP15OV	Civilians Unemployed - 15 Weeks & Over	M_110156524	U 15+ wks
10	30	5	UEMP15T26	Civilians Unemployed for 15-26 Weeks	M_110156525	U 15-26 wks
11	31	5	UEMP27OV	Civilians Unemployed for 27 Weeks and Over	M_110156526	U 27+ wks
12	32*	5	CLAIMSx	Initial Claims	M_15186204	UI claims
13	33	5	PAYEMS	All Employees: Total nonfarm	M_123109146	Emp: total
14	34	5	USGOOD	All Employees: Goods-Producing Industries	M_123109172	Emp: gds prod
15	35	5	CES1021000001	All Employees: Mining and Logging: Mining	M_123109244	Emp: mining
16	36	5	USCONS	All Employees: Construction	M_123109331	Emp: const
17	37	5	MANEMP	All Employees: Manufacturing	M_123109542	Emp: mfg
18	38	5	DMANEMP	All Employees: Durable goods	M_123109573	Emp: dble gds
19	39	5	NDMANEMP	All Employees: Nondurable goods	M_123110741	Emp: nondbles
20	40	5	SRVPRD	All Employees: Service-Providing Industries	M_123109193	Emp: services
21	41	5	USTPU	All Employees: Trade, Transportation & Utilities	M_123111543	Emp: TTU
22	42	5	USWTRADE	All Employees: Wholesale Trade	M_123111563	Emp: wholesale
23	43	5	USTRADE	All Employees: Retail Trade	M_123111867	Emp: retail
24	44	5	USFIRE	All Employees: Financial Activities	M_123112777	Emp: FIRE
25	45	5	USGOVT	All Employees: Government	M_123114411	Emp: Govt
26	46	1	CES0600000007	Avg Weekly Hours : Goods-Producing	M_140687274	Avg hrs
27	47	2	AWOTMAN	Avg Weekly Overtime Hours : Manufacturing	M_123109554	Overtime: mfg
28	48	1	AWHMAN	Avg Weekly Hours : Manufacturing	M_14386098	Avg hrs: mfg
29	49	1	NAPMEI	ISM Manufacturing: Employment Index	M_110157206	NAPM empl
30	127	6	CES0600000008	Avg Hourly Earnings : Goods-Producing	M_123109182	AHE: goods
31	128	6	CES2000000008	Avg Hourly Earnings : Construction	M_123109341	AHE: const
32	129	6	CES3000000008	Avg Hourly Earnings : Manufacturing	M_123109552	AHE: mfg

Table S.3. Data Description: Housing

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 3: Housing

	id	tcode	fred	description	gsi	gsi:description
1	50	4	HOUST	Housing Starts: Total New Privately Owned	M_110155536	Starts: nonfarm
2	51	4	HOUSTNE	Housing Starts, Northeast	M_110155538	Starts: NE
3	52	4	HOUSTMW	Housing Starts, Midwest	M_110155537	Starts: MW
4	53	4	HOUSTS	Housing Starts, South	M_110155543	Starts: South
5	54	4	HOUSTW	Housing Starts, West	M_110155544	Starts: West
6	55	4	PERMIT	New Private Housing Permits (SAAR)	M_110155532	BP: total
7	56	4	PERMITNE	New Private Housing Permits, Northeast (SAAR)	M_110155531	BP: NE
8	57	4	PERMITMW	New Private Housing Permits, Midwest (SAAR)	M_110155530	BP: MW
9	58	4	PERMITS	New Private Housing Permits, South (SAAR)	M_110155533	BP: South
10	59	4	PERMITW	New Private Housing Permits, West (SAAR)	M_110155534	BP: West

Table S.4. Data Description: Consumption, Orders and Inventories

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 4: Consumption, orders, and inventories

	id	tcode	fred	description	gsi	gsi:description
1	3	5	DPCERA3M086SBEA	Real personal consumption expenditures	M_123008274	Real Consumption
2	4*	5	CMRMTSPLx	Real Manu. and Trade Industries Sales	M_110156998	M&T sales
3	5*	5	RETAILx	Retail and Food Services Sales	M_130439509	Retail sales
4	60	1	NAPM	ISM : PMI Composite Index	M_110157208	PMI
5	61	1	NAPMNOI	ISM : New Orders Index	M_110157210	NAPM new ordrs
6	62	1	NAPMSDI	ISM : Supplier Deliveries Index	M_110157205	NAPM vendor del
7	63	1	NAPMII	ISM : Inventories Index	M_110157211	NAPM Invent
8	64	5	ACOGNO	New Orders for Consumer Goods	M_14385863	Orders: cons gds
9	65*	5	AMDMNOx	New Orders for Durable Goods	M_14386110	Orders: dble gds
10	66*	5	ANDENOx	New Orders for Nondefense Capital Goods	M_178554409	Orders: cap gds
11	67*	5	AMDMUOx	Unfilled Orders for Durable Goods	M_14385946	Unf orders: dble
12	68*	5	BUSINVx	Total Business Inventories	M_15192014	M&T invent
13	69*	2	ISRATIOx	Total Business: Inventories to Sales Ratio	M_15191529	M&T invent/sales
14	130*	2	UMCSENTx	Consumer Sentiment Index	hhsntn	Consumer expect

Table S.5. Data Description: Money and Credit

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 5: Money and credit

	id	tcode	fred	description	gsi	gsi:description
1	70	6	M1SL	M1 Money Stock	M_110154984	M1
2	71	6	M2SL	M2 Money Stock	M_110154985	M2
3	72	5	M2REAL	Real M2 Money Stock	M_110154985	M2 (real)
4	73	6	AMBSL	St. Louis Adjusted Monetary Base	M_110154995	MB
5	74	6	TOTRESNS	Total Reserves of Depository Institutions	M_110155011	Reserves tot
6	75	7	NONBORRES	Reserves Of Depository Institutions	M_110155009	Reserves nonbor
7	76	6	BUSLOANS	Commercial and Industrial Loans	BUSLOANS	C&I loan plus
8	77	6	REALLN	Real Estate Loans at All Commercial Banks	BUSLOANS	DC&I loans
9	78	6	NONREVSL	Total Nonrevolving Credit	M_110154564	Cons credit
10	79*	2	CONSPI	Nonrevolving consumer credit to Personal Income	M_110154569	Inst cred/PI
11	131	6	MZMSL	MZM Money Stock	N.A.	N.A.
12	132	6	DTCOLNVHFNM	Consumer Motor Vehicle Loans Outstanding	N.A.	N.A.
13	133	6	DTCTHFNM	Total Consumer Loans and Leases Outstanding	N.A.	N.A.
14	134	6	INVEST	Securities in Bank Credit at All Commercial Banks	N.A.	N.A.

Table S.6. Data Description: Interest and Exchange Rates

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 6: Interest and exchange rates

	id	tcode	fred	description	gsi	gsi:description
1	84	2	FEDFUNDS	Effective Federal Funds Rate	M_110155157	Fed Funds
2	85*	2	CP3Mx	3-Month AA Financial Commercial Paper Rate	CPF3M	Comm paper
3	86	2	TB3MS	3-Month Treasury Bill:	M_110155165	3 mo T-bill
4	87	2	TB6MS	6-Month Treasury Bill:	M_110155166	6 mo T-bill
5	88	2	GS1	1-Year Treasury Rate	M_110155168	1 yr T-bond
6	89	2	GS5	5-Year Treasury Rate	M_110155174	5 yr T-bond
7	90	2	GS10	10-Year Treasury Rate	M_110155169	10 yr T-bond
8	91	2	AAA	Moody's Seasoned Aaa Corporate Bond Yield		Aaa bond
9	92	2	BAA	Moody's Seasoned Baa Corporate Bond Yield		Baa bond
10	93*	1	COMPAPFFx	3-Month Commercial Paper Minus FEDFUNDS		CP-FF spread
11	94	1	TB3SMFFM	3-Month Treasury C Minus FEDFUNDS		3 mo-FF spread
12	95	1	TB6SMFFM	6-Month Treasury C Minus FEDFUNDS		6 mo-FF spread
13	96	1	T1YFFM	1-Year Treasury C Minus FEDFUNDS		1 yr-FF spread
14	97	1	T5YFFM	5-Year Treasury C Minus FEDFUNDS		5 yr-FF spread
15	98	1	T10YFFM	10-Year Treasury C Minus FEDFUNDS		10 yr-FF spread
16	99	1	AAAFFM	Moody's Aaa Corporate Bond Minus FEDFUNDS		Aaa-FF spread
17	100	1	BAAFFM	Moody's Baa Corporate Bond Minus FEDFUNDS		Baa-FF spread
18	101	5	TWEXMMTH	Trade Weighted U.S. Dollar Index: Major Currencies		Ex rate: avg
19	102	* 5	EXSZUSx	Switzerland / U.S. Foreign Exchange Rate	M_110154768	Ex rate: Switz
20	103	* 5	EXJPUSx	Japan / U.S. Foreign Exchange Rate	M_110154755	Ex rate: Japan
21	104	* 5	EXUSUKx	U.S. / U.K. Foreign Exchange Rate	M_110154772	Ex rate: UK
22	105	* 5	EXCAUSx	Canada / U.S. Foreign Exchange Rate	M_110154744	Ex rate: Canada

Table S.7. Data Description: Prices

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 7: Prices

	id	tcode	fred	description	gsi	gsi:description
1	106	5	WPSFD49207	PPI: Finished Goods	M110157517	PPI: fin gds
2	107	5	WPSFD49502	PPI: Finished Consumer Goods	M110157508	PPI: cons gds
3	108	5	WPSID61	PPI: Intermediate Materials	M_110157527	PPI: int matls
4	109	5	WPSID62	PPI: Crude Materials	M_110157500	PPI: crude matls
5	110*	5	OILPRICEx	Crude Oil, spliced WTI and Cushing	M_110157273	Spot market price
6	111	5	PPICMM	PPI: Metals and metal products	M_110157335	PPI: nonferrous
7	112	1	NAPMPRI	ISM Manufacturing: Prices Index	M_110157204	NAPM com price
8	113	5	CPIAUCSL	CPI : All Items	M_110157323	CPI-U: all
9	114	5	CPIAPPSL	CPI : Apparel	M_110157299	CPI-U: apparel
10	115	5	CPITRNSL	CPI : Transportation	M_110157302	CPI-U: transp
11	116	5	CPIMEDSL	CPI : Medical Care	M_110157304	CPI-U: medical
12	117	5	CUSR0000SAC	CPI : Commodities	M_110157314	CPI-U: comm.
13	118	5	CUUR0000SAD	CPI : Durables	M_110157315	CPI-U: dbles
14	119	5	CUSR0000SAS	CPI : Services	M_110157325	CPI-U: services
15	120	5	CPIULFSL	CPI : All Items Less Food	M_110157328	CPI-U: ex food
16	121	5	CUUR0000SA0L2	CPI : All items less shelter	M_110157329	CPI-U: ex shelter
17	122	5	CUSR0000SA0L5	CPI : All items less medical care	M_110157330	CPI-U: ex med
18	123	5	PCEPI	Personal Cons. Expend.: Chain Index	gmdc	PCE defl
19	124	5	DDURRG3M086SBEA	Personal Cons. Exp: Durable goods	gmdcd	PCE defl: dlbes
20	125	5	DNDGRG3M086SBEA	Personal Cons. Exp: Nondurable goods	gmdcn	PCE defl: nondble
21	126	5	DSERRG3M086SBEA	Personal Cons. Exp: Services	gmdcs	PCE defl: service

Table S.8. Data Description: Stock Market

The column tcode denotes the following data transformation for a series x: (1) no transformation; (2) Δx_t; (3) $\Delta^2 x_t$; (4) $\log(x_t)$; (5) $\Delta \log(x_t)$; (6) $\Delta^2 \log(x_t)$; (7) $\Delta(x_t/x_{t-1} - 1)$. The FRED column gives mnemonics in FRED followed by a short description. The comparable series in Global Insight is given in the column GS.

Group 8: Stock Market

	id	tcode	fred	description	gsi	gsi:description
1	80*	5	S&P 500	S&P's Common Stock Price Index: Composite	M_110155044	S&P 500
2	81*	5	S&P: indust	S&P's Common Stock Price Index: Industrials	M_110155047	S&P: indust
3	82*	2	S&P div yield	S&P's Composite Common Stock: Dividend Yield		S&P div yield
4	83*	5	S&P PE ratio	S&P's Composite Common Stock: Price-Earnings Ratio		S&P PE ratio
5	135*	1	VXOCLSx	VXO		

Figure S.1. Inflation rate (CPI, PCE and CPI-core) from 1960 to 2015.

The figure shows the time evolution of the consumer price index (CPI), the personal consumption expenditures (PCE) and the core CPI inflation measures from January 1960 to December 2015 (672 observations). Inflation is computed as $\pi_t = \log(\mathsf{p}_t) - \log(\mathsf{p}_{t-1})$, where p_t represents each one of the price measures considered in this paper. Shaded areas represent recession periods.

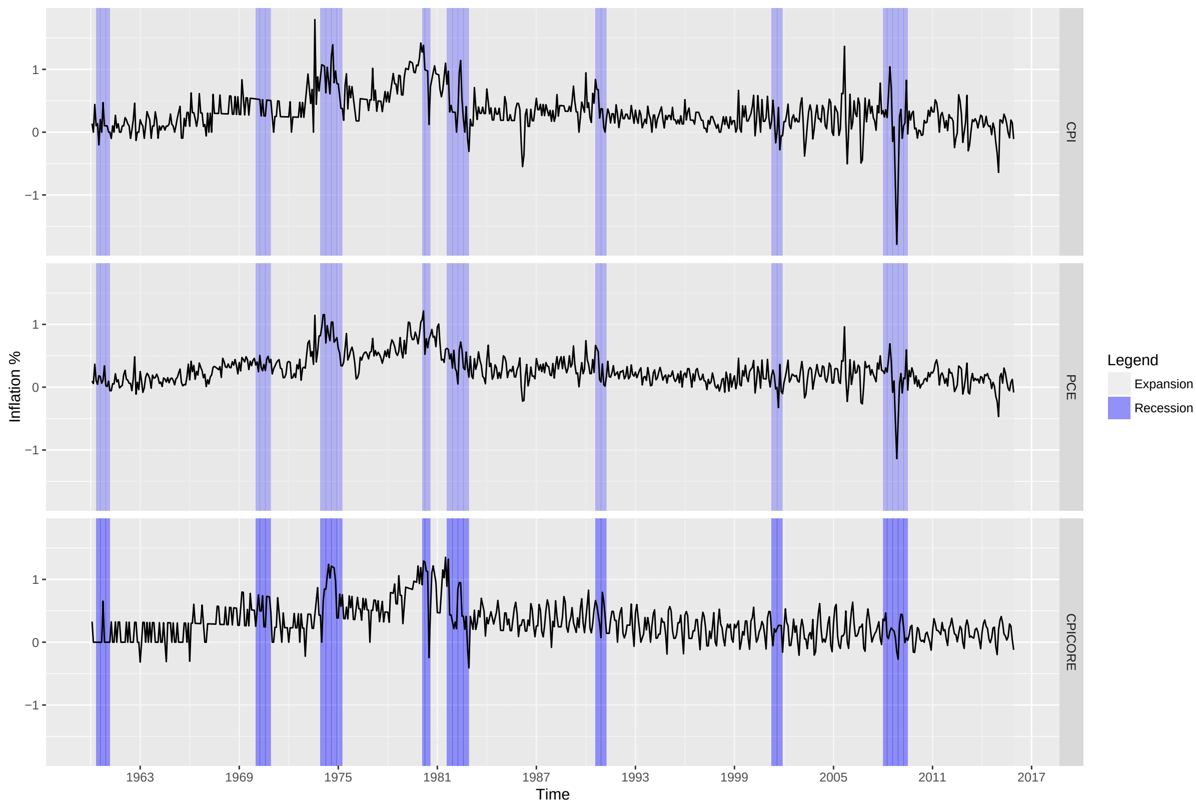


TABLE S.9. Descriptive Statistics

The table reports the mean, standard deviation (Sd), median, maximum, minimum, first-order autocorrelation (AC1), and sum of the first 36 autocorrelations (AC36) for several macroeconomics variables, namely: CPI monthly inflation (π_t), CPI twelve-month inflation ($\pi_{12,t}$), monthly growth of industrial production ($\Delta \mathsf{IP}_t$), twelve-month growth of industrial production ($\Delta_{12}\mathsf{IP}_t$), and measures of macroeconomic ($\mathcal{U}_{\mathsf{macro}}$), financial ($\mathcal{U}_{\mathsf{fin}}$) and real uncertainty ($\mathcal{U}_{\mathsf{real}}$) for one, three and twelve months.

Statistic	π_t	$\pi_{12,t}$	$\Delta \mathsf{IP}_t$	$\Delta_{12}\mathsf{IP}_t$	$\mathcal{U}_{\mathsf{fin}}(1)$	$\mathcal{U}_{\mathsf{fin}}(3)$	$\mathcal{U}_{\mathsf{fin}}(12)$	$\mathcal{U}_{\mathsf{macro}}(1)$	$\mathcal{U}_{\mathsf{macro}}(3)$	$\mathcal{U}_{\mathsf{macro}}(12)$	$\mathcal{U}_{\mathsf{real}}(1)$	$\mathcal{U}_{\mathsf{real}}(3)$	$\mathcal{U}_{\mathsf{real}}(12)$
Full Sample: 1990–2015													
Mean	0.203	2.395	0.154	1.929	0.891	0.934	0.979	0.640	0.779	0.905	0.613	0.724	0.862
Sd	0.268	1.199	0.642	4.181	0.186	0.149	0.055	0.081	0.083	0.047	0.046	0.041	0.022
Median	0.201	2.569	0.187	2.661	0.827	0.882	0.964	0.623	0.763	0.897	0.601	0.715	0.858
Max	1.367	6.067	2.026	8.298	1.549	1.432	1.137	1.022	1.174	1.121	0.826	0.935	0.971
Min	-1.786	-1.978	-4.398	-16.721	0.641	0.729	0.903	0.551	0.686	0.847	0.539	0.661	0.826
AC1	0.415	0.926	0.245	0.973	0.987	0.988	0.992	0.987	0.989	0.992	0.969	0.979	0.985
AC36	0.812	5.079	1.727	6.980	14.358	14.743	15.879	15.460	15.535	14.906	11.495	11.640	11.960
First Sample: 1990–2000													
Mean	0.245	2.789	0.302	3.898	0.897	0.941	0.985	0.609	0.748	0.891	0.597	0.711	0.857
Sd	0.168	0.815	0.515	2.432	0.184	0.150	0.058	0.052	0.055	0.031	0.029	0.026	0.016
Median	0.214	2.782	0.335	4.163	0.869	0.922	0.979	0.587	0.723	0.879	0.594	0.707	0.859
Max	0.946	6.067	2.026	8.298	1.277	1.232	1.081	0.777	0.902	0.955	0.673	0.771	0.889
Min	-0.058	1.367	-1.173	-3.552	0.659	0.745	0.909	0.551	0.686	0.853	0.539	0.661	0.826
AC1	0.229	0.893	0.075	0.939	0.983	0.985	0.990	0.981	0.987	0.991	0.926	0.956	0.976
AC36	1.678	5.482	1.311	9.489	21.454	21.680	22.257	15.273	16.836	16.476	6.560	8.632	10.321
Second Sample: 2001–2015													
Mean	0.172	2.130	0.045	0.605	0.886	0.928	0.975	0.663	0.802	0.915	0.624	0.734	0.866
Sd	0.320	1.337	0.703	4.577	0.188	0.149	0.053	0.090	0.092	0.053	0.053	0.047	0.024
Median	0.181	2.074	0.120	2.066	0.812	0.869	0.952	0.643	0.779	0.900	0.608	0.720	0.858
Max	1.367	5.352	1.545	8.148	1.549	1.432	1.137	1.022	1.174	1.121	0.826	0.935	0.971
Min	-1.786	-1.978	-4.398	-16.721	0.641	0.729	0.903	0.554	0.691	0.847	0.555	0.681	0.840
AC1	0.441	0.928	0.264	0.972	0.977	0.978	0.981	0.986	0.988	0.991	0.974	0.981	0.985
AC36	0.339	4.195	0.237	1.933	8.074	8.195	8.573	11.493	11.287	11.995	9.321	9.460	10.816

TABLE S.10. Forecasting Results: Summary statistics for the out-of-sample period from 1990–2000

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	ave.	ave.	ave.	max.	max.	max.	min.	min.	min.	# min.	# min.	# min.	ave. p.v.	ave. p.v.	ave. p.v.	ave. p.v.	p.v.
Model	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	sq	abs	Tmax sq	Tmax abs	m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	0.10	0.14	0.43	0.49	0.00
AR	0.90	0.96	0.76	1.25	1.36	1.26	0.78	0.80	0.59	0	0	2	0.21	0.09	0.66	0.48	0.01
UCSV	0.89	0.90	0.86	1.01	1.01	0.96	0.84	0.84	0.71	1	1	0	0.30	0.40	0.70	0.77	0.04
LASSO	0.91	0.98	0.77	1.26	1.43	1.10	0.78	0.83	0.60	0	0	0	0.03	0.03	0.59	0.50	0.00
adaLASSO	0.86	0.89	0.80	1.07	1.18	1.09	0.75	0.73	0.67	1	1	1	0.48	0.55	0.86	0.88	0.78
ElNet	0.91	1.00	0.76	1.28	1.48	1.04	0.79	0.83	0.57	0	0	1	0.06	0.05	0.51	0.38	0.01
adaElnet	0.86	0.90	0.79	1.09	1.18	1.13	0.74	0.73	0.63	0	2	0	0.45	0.52	0.83	0.87	0.79
RR	0.85	0.90	0.84	1.04	1.20	1.16	0.76	0.78	0.71	2	0	0	0.52	0.48	0.81	0.78	0.79
BVAR	0.97	1.05	0.84	1.42	1.53	1.28	0.77	0.77	0.65	0	1	1	0.12	0.11	0.54	0.41	0.18
Bagging	0.93	0.97	0.97	1.10	1.27	1.43	0.79	0.82	0.74	0	0	0	0.13	0.20	0.53	0.64	0.01
CSR	0.88	0.94	0.85	1.16	1.33	1.31	0.76	0.76	0.68	2	0	0	0.26	0.20	0.67	0.55	0.79
JMA	1.07	1.12	1.16	1.21	1.47	1.82	0.93	0.98	0.94	0	0	0	0.03	0.03	0.21	0.18	0.00
Factor	1.01	1.11	0.98	1.52	1.72	1.66	0.84	0.88	0.72	0	0	0	0.01	0.01	0.25	0.16	0.00
T. Factor	1.06	1.18	0.95	1.66	1.94	1.70	0.86	0.93	0.73	0	0	0	0.00	0.00	0.14	0.07	0.00
B. Factor	1.06	1.19	1.28	1.72	2.05	2.48	0.81	0.89	0.89	0	0	0	0.03	0.02	0.43	0.34	0.00
RF	0.81	0.85	0.67	0.99	1.15	0.88	0.72	0.75	0.56	6	7	7	0.98	0.91	0.98	0.91	1
Mean	0.84	0.89	0.81	1.06	1.22	1.25	0.76	0.76	0.67	0	0	0	0.66	0.59	0.88	0.83	0.48
T.Mean	0.85	0.90	0.78	1.08	1.21	1.12	0.75	0.77	0.65	1	0	0	0.53	0.44	0.87	0.84	0.78
Median	0.85	0.90	0.78	1.08	1.22	1.13	0.75	0.77	0.65	0	0	0	0.43	0.43	0.85	0.82	0.79
RF/OLS	0.84	0.90	0.87	1.06	1.23	1.15	0.74	0.76	0.67	0	1	0	0.61	0.49	0.88	0.84	0.48
adaLASSO/RF	0.83	0.87	0.72	1.00	1.17	0.88	0.72	0.73	0.54	2	2	3	0.71	0.63	0.89	0.87	0.79

Table S.11. Forecasting Results: Summary statistics for the out-of-sample period from 2001–2015

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Model	ave. RMSE	ave. MAE	ave. MAD	max. RMSE	max. MAE	max. MAD	min. RMSE	min. MAE	min. MAD	# min. RMSE	# min. MAE	# min. MAD	ave. p.v. sq	ave. p.v. abs	ave. p.v. Tmax sq	ave. p.v. Tmax abs	p.v. m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	0.02	0.00	0.15	0.04	0.00
AR	0.84	0.82	0.80	1.21	1.17	0.94	0.73	0.70	0.62	0	0	0	0.06	0.02	0.48	0.21	0.00
UCSV	0.81	0.80	0.81	0.98	0.93	0.96	0.76	0.73	0.71	0	0	0	0.10	0.06	0.59	0.37	0.00
LASSO	0.76	0.73	0.67	0.91	0.89	0.88	0.70	0.65	0.52	0	0	2	0.28	0.54	0.87	0.79	0.99
adaLASSO	0.77	0.75	0.71	0.93	0.90	0.88	0.70	0.67	0.56	0	0	1	0.17	0.25	0.78	0.66	0.18
ElNet	0.76	0.73	0.66	0.91	0.89	0.86	0.70	0.64	0.50	0	0	4	0.33	0.58	0.87	0.79	0.99
adaElnet	0.77	0.74	0.70	0.93	0.90	0.87	0.70	0.67	0.56	0	0	0	0.22	0.30	0.83	0.70	0.13
RR	0.75	0.73	0.69	0.86	0.85	0.88	0.69	0.67	0.53	0	0	1	0.53	0.61	0.85	0.77	0.21
BVAR	0.77	0.74	0.69	0.99	0.92	0.87	0.72	0.67	0.56	0	0	0	0.28	0.42	0.85	0.79	0.77
Bagging	0.77	0.78	0.79	0.82	0.84	0.90	0.71	0.71	0.66	0	0	0	0.33	0.11	0.78	0.37	0.19
CSR	0.81	0.78	0.72	1.12	1.05	0.85	0.74	0.69	0.56	0	0	1	0.15	0.11	0.61	0.47	0.00
JMA	0.82	0.84	0.86	1.00	0.99	1.13	0.72	0.77	0.69	0	0	0	0.14	0.03	0.50	0.19	0.00
Factor	0.81	0.79	0.75	1.10	1.02	0.88	0.74	0.69	0.57	0	0	1	0.11	0.07	0.55	0.42	0.00
T. Factor	0.80	0.77	0.75	1.05	0.96	0.90	0.74	0.69	0.60	0	0	0	0.15	0.13	0.59	0.48	0.01
B. Factor	0.79	0.80	0.78	1.03	1.09	0.96	0.72	0.69	0.62	0	0	0	0.13	0.08	0.80	0.58	0.00
RF	0.72	0.70	0.70	0.86	0.81	0.94	0.68	0.63	0.50	11	10	3	0.93	0.92	0.96	0.97	1
Mean	0.76	0.73	0.70	0.93	0.90	0.85	0.69	0.65	0.53	0	1	0	0.39	0.45	0.85	0.76	0.99
T.Mean	0.76	0.73	0.68	0.92	0.89	0.83	0.70	0.64	0.52	0	0	0	0.40	0.65	0.87	0.80	0.98
Median	0.76	0.73	0.69	0.92	0.89	0.83	0.70	0.65	0.53	0	0	1	0.37	0.58	0.86	0.79	0.99
RF/OLS	0.75	0.74	0.69	0.92	0.89	0.83	0.70	0.67	0.54	1	1	1	0.51	0.56	0.89	0.78	0.99
adaLASSO/RF	0.74	0.71	0.69	0.87	0.81	0.89	0.69	0.65	0.54	3	3	0	0.58	0.62	0.91	0.86	0.99

Figure S.2. Eigenvalues of the matrix of contemporaneous regressor.

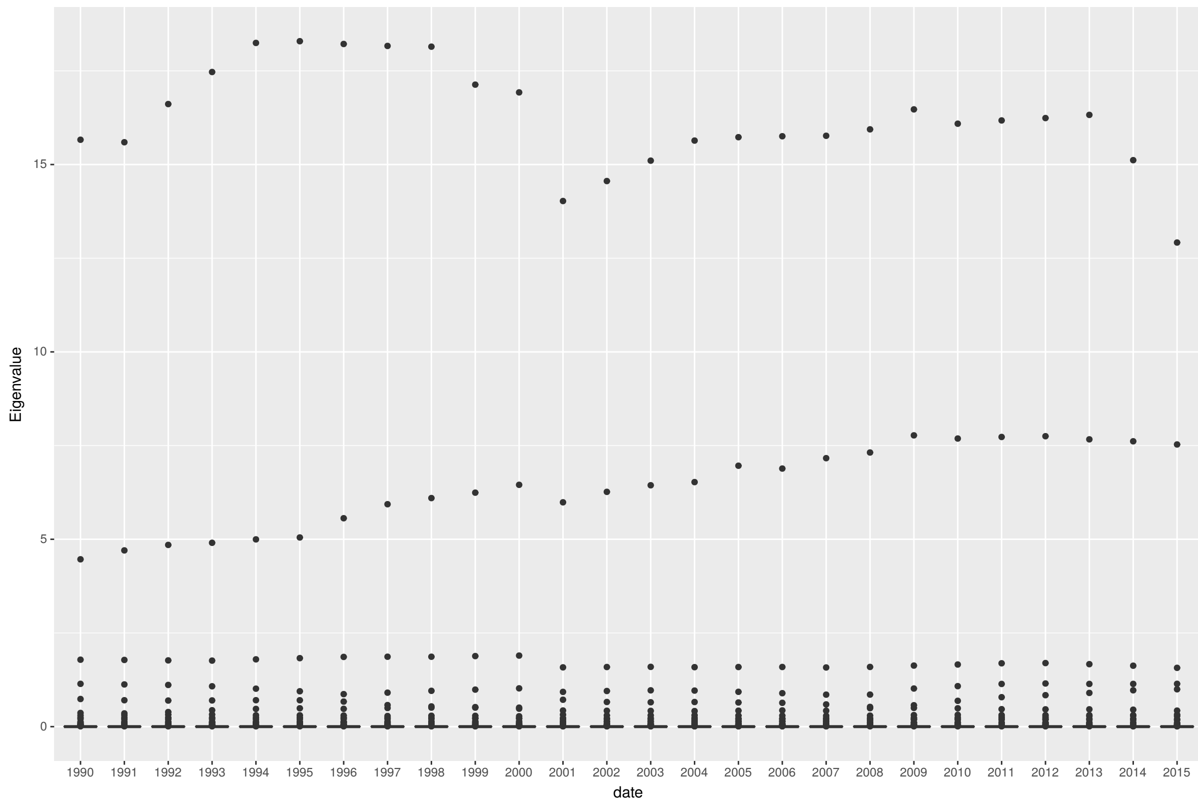


Figure S.3. Correlation of the Forecasts for the CPI from 1990 to 2015

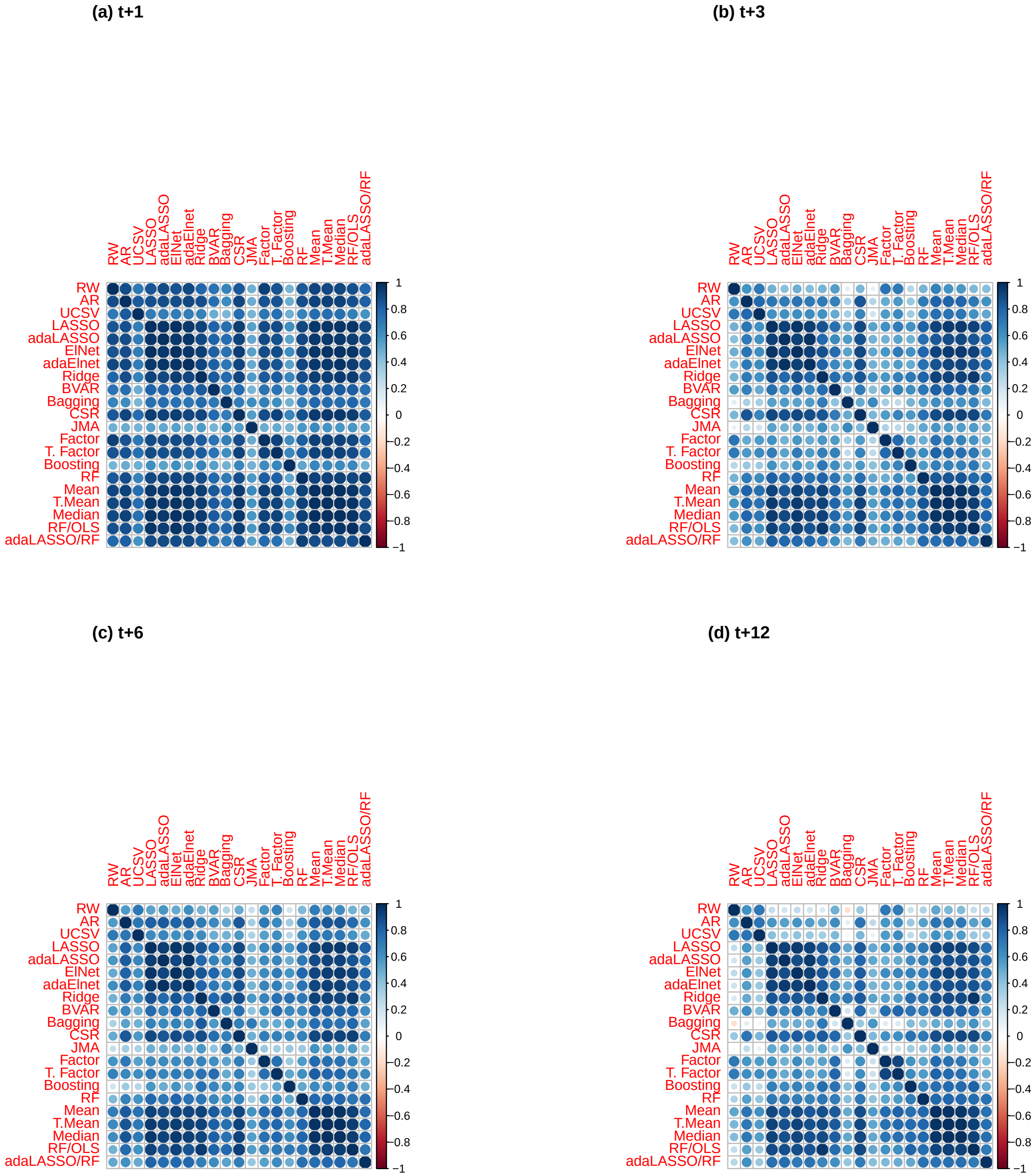
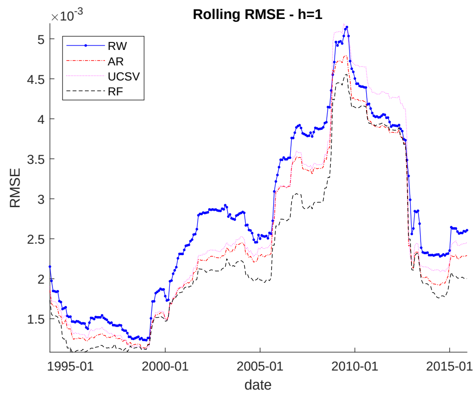
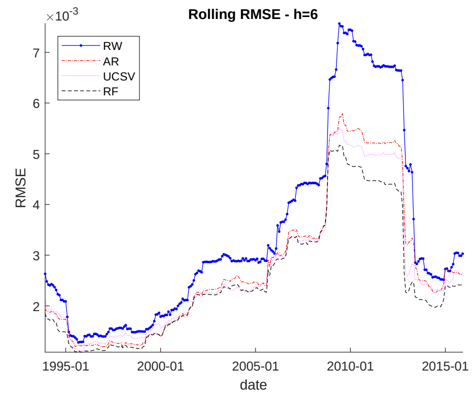


Figure S.4. Rolling RMSE.

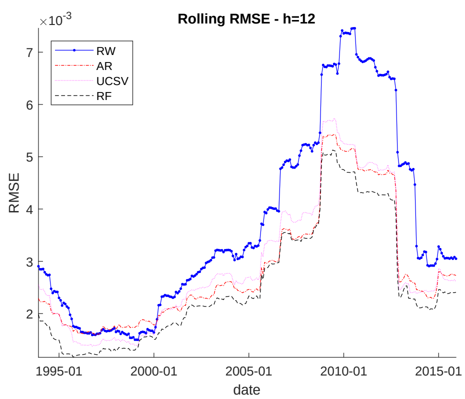
The figure displays the root mean squared errors (RMSE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



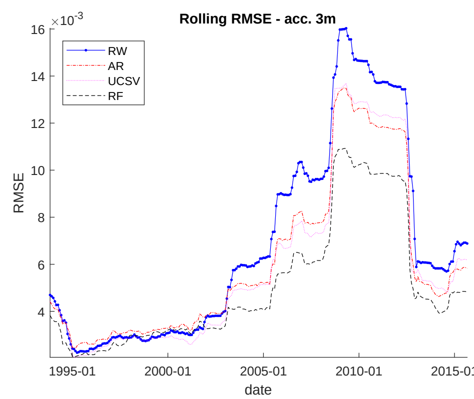
(a)



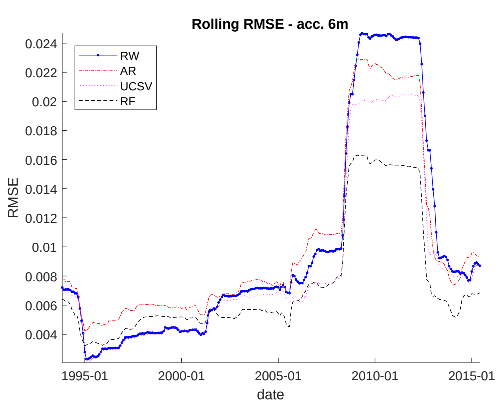
(b)



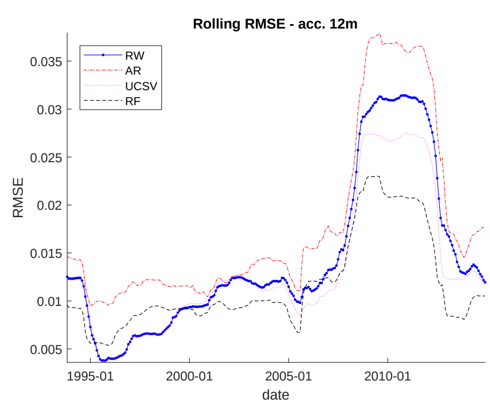
(c)



(d)



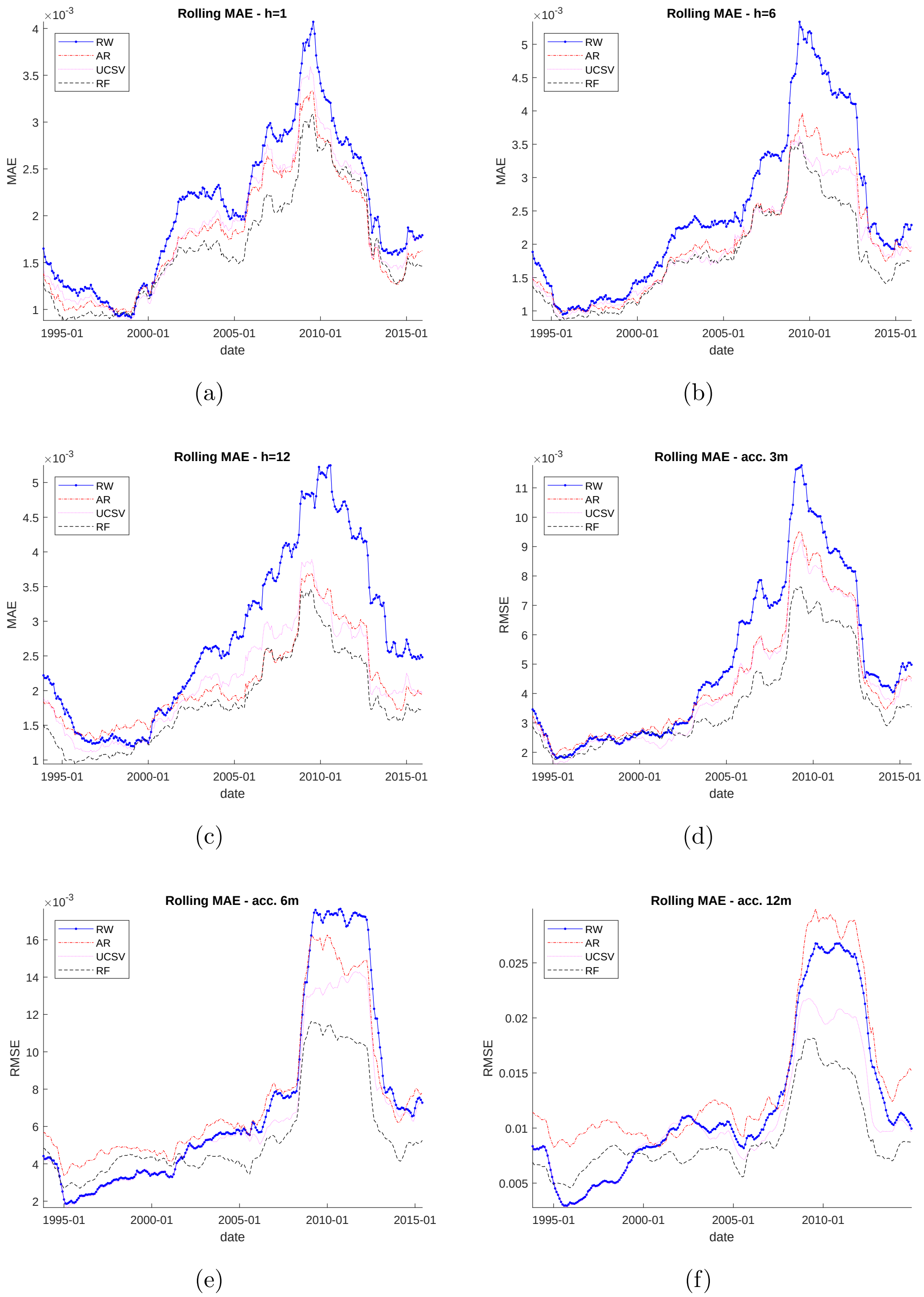
(e)



(f)

FIGURE S.5. Rolling MAE.

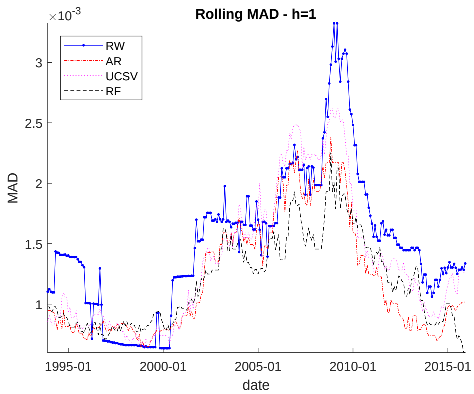
The figure displays the mean absolute errors (MAE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



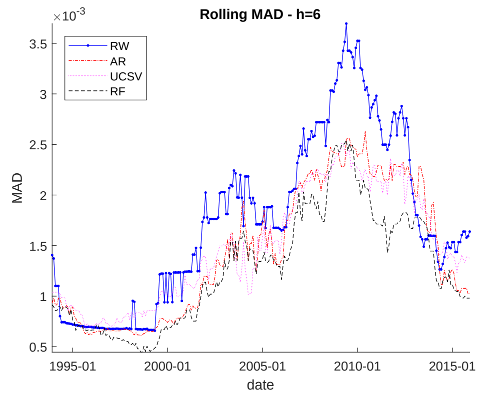
(a) (b) (c) (d) (e) (f)

Figure S.6. Rolling MAD.

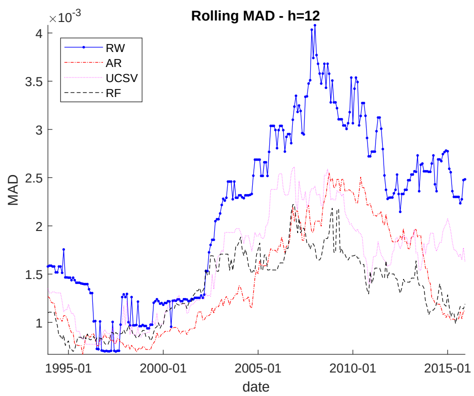
The figure displays the mean absolute deviation from the median (MAD) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



(b)



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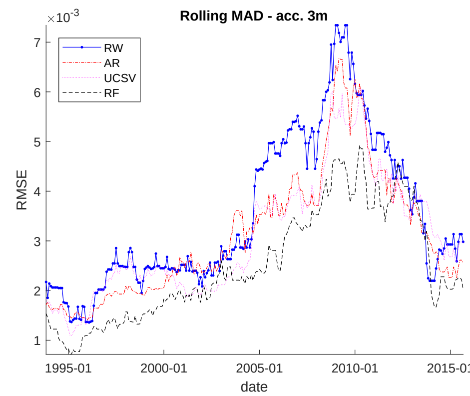

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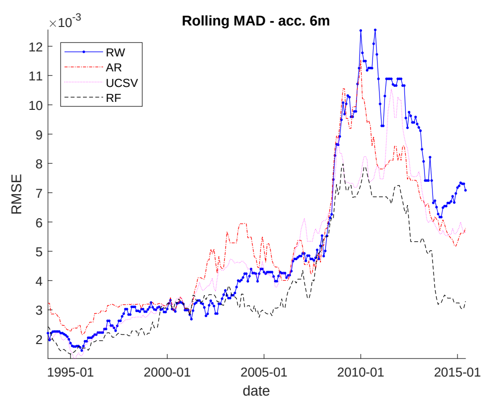

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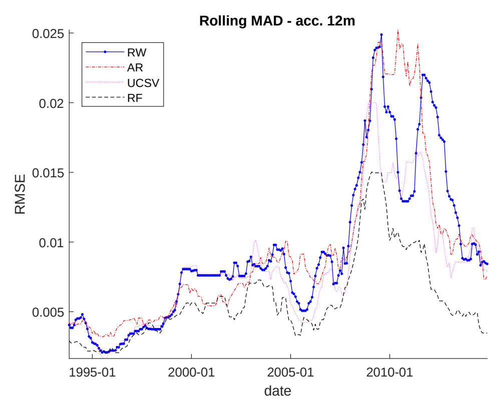
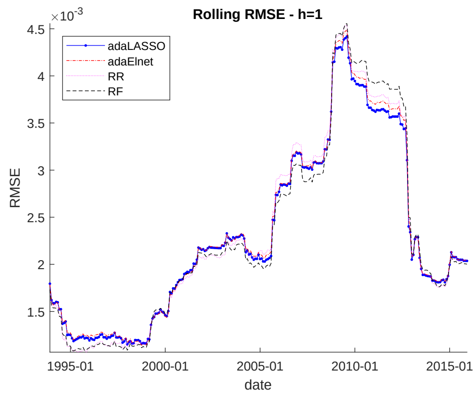


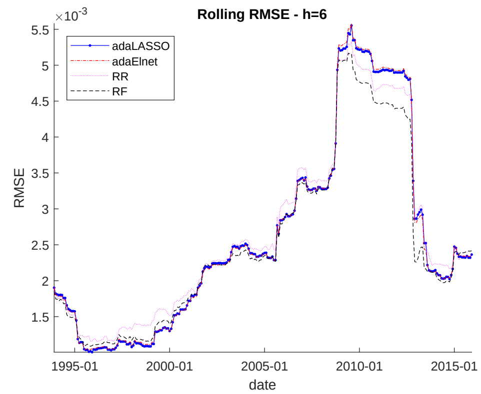
(f)

FIGURE S.7. Rolling RMSE: RF versus adaLASSO, adaElnet, and RR.

The figure displays the root mean squared errors (RMSE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



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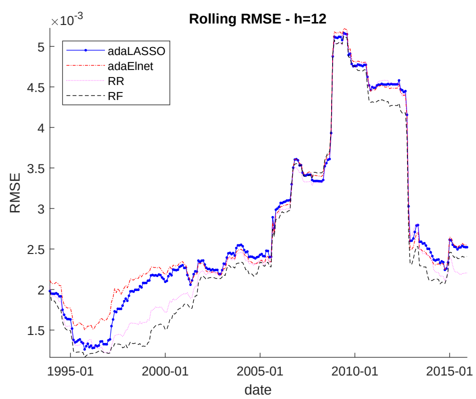

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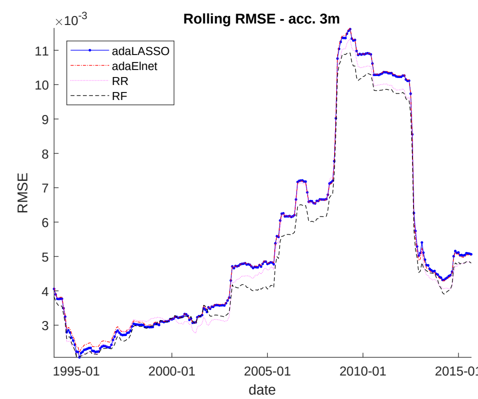

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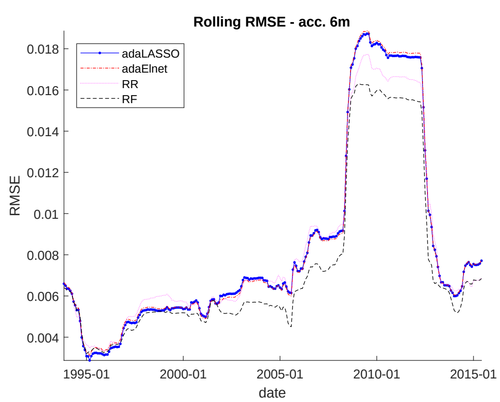
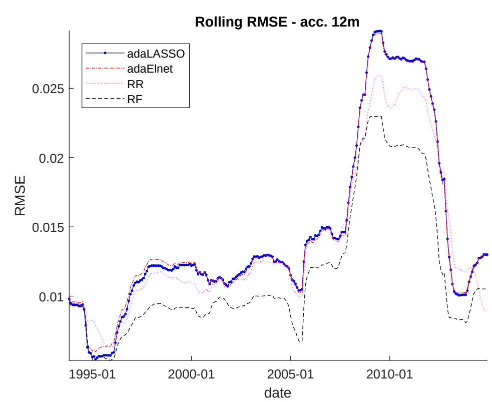


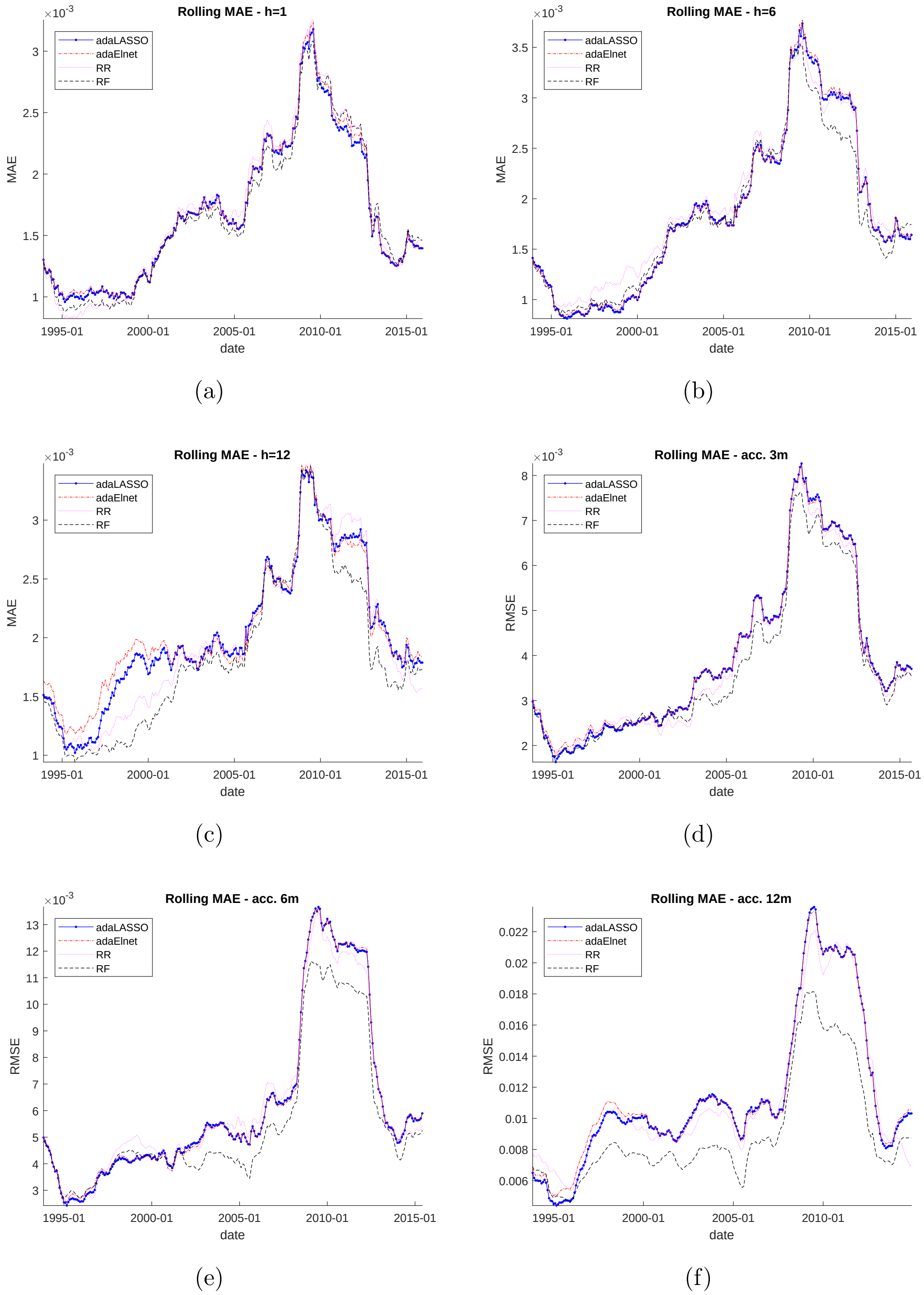
(e)



(f)

Figure S.8. Rolling MAE: RF versus adaLASSO, adaElnet, and RR.

The figure displays the mean absolute errors (MAE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a) (b)

(c) (d)

(e) (f)

Figure S.9. Rolling MAD: RF versus adaLASSO, adaElnet, and RR.

The figure displays the mean absolute deviation from the median (MAD) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.

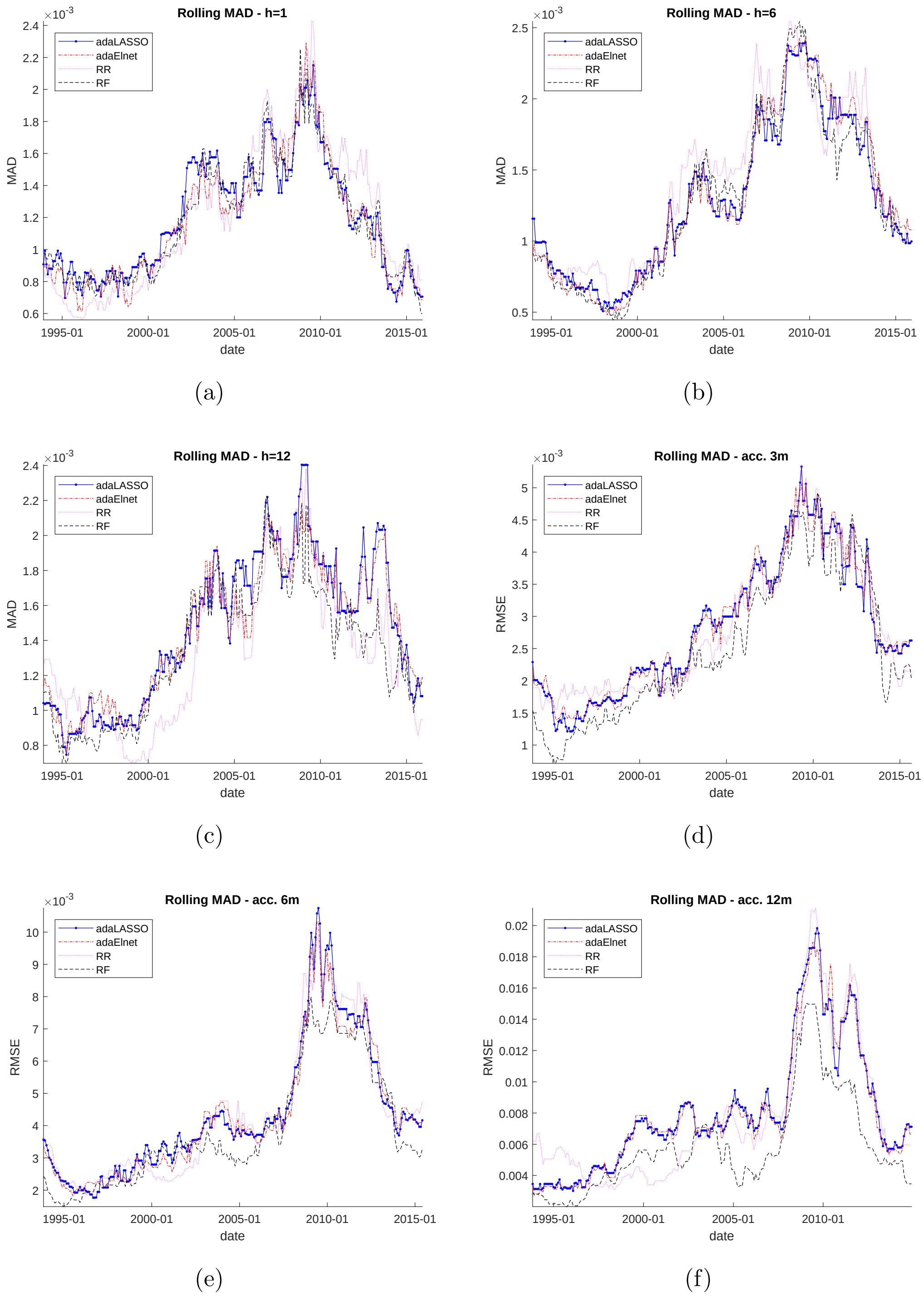
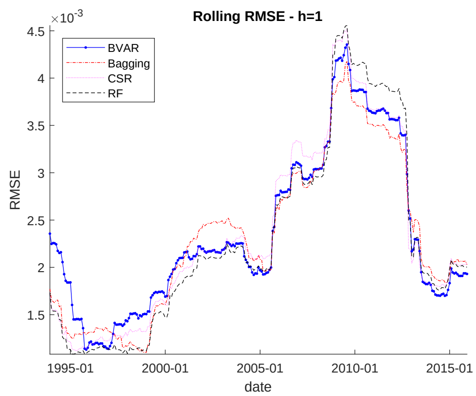
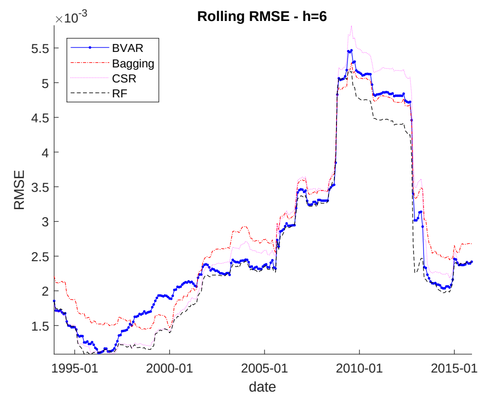


Figure S.10. Rolling RMSE: RF versus BVAR, Bagging, and CSR.

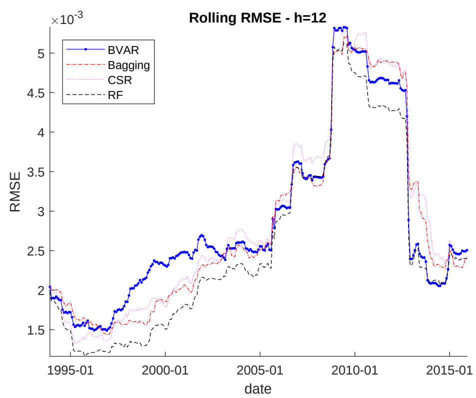
The figure displays the root mean squared errors (RMSE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



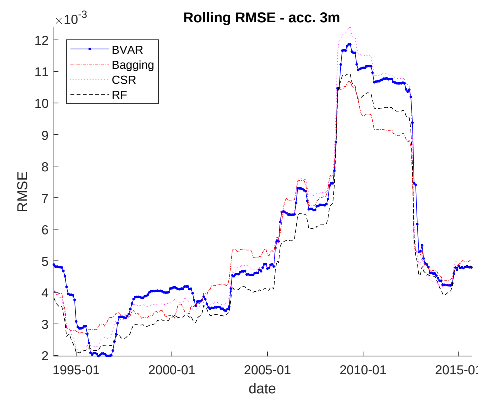
(a)



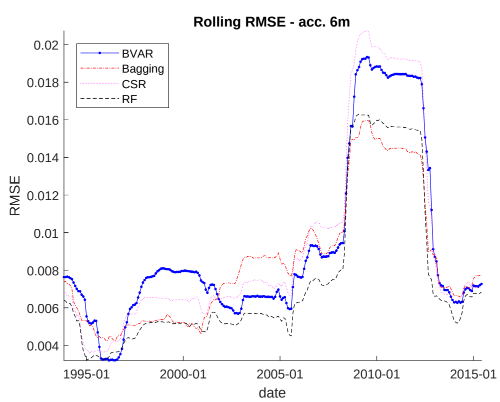
(b)



(c)



(d)



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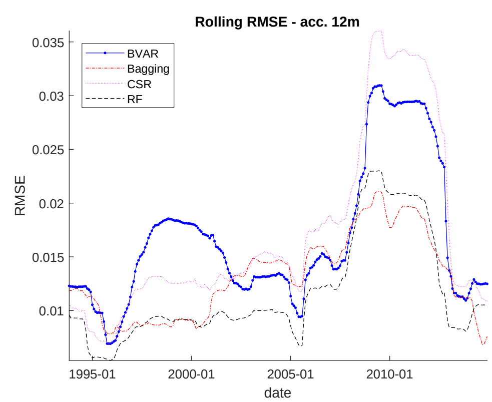


(f)

Figure S.11. Rolling MAE: RF versus BVAR, Bagging, and CSR.

The figure displays the mean absolute errors (MAE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.

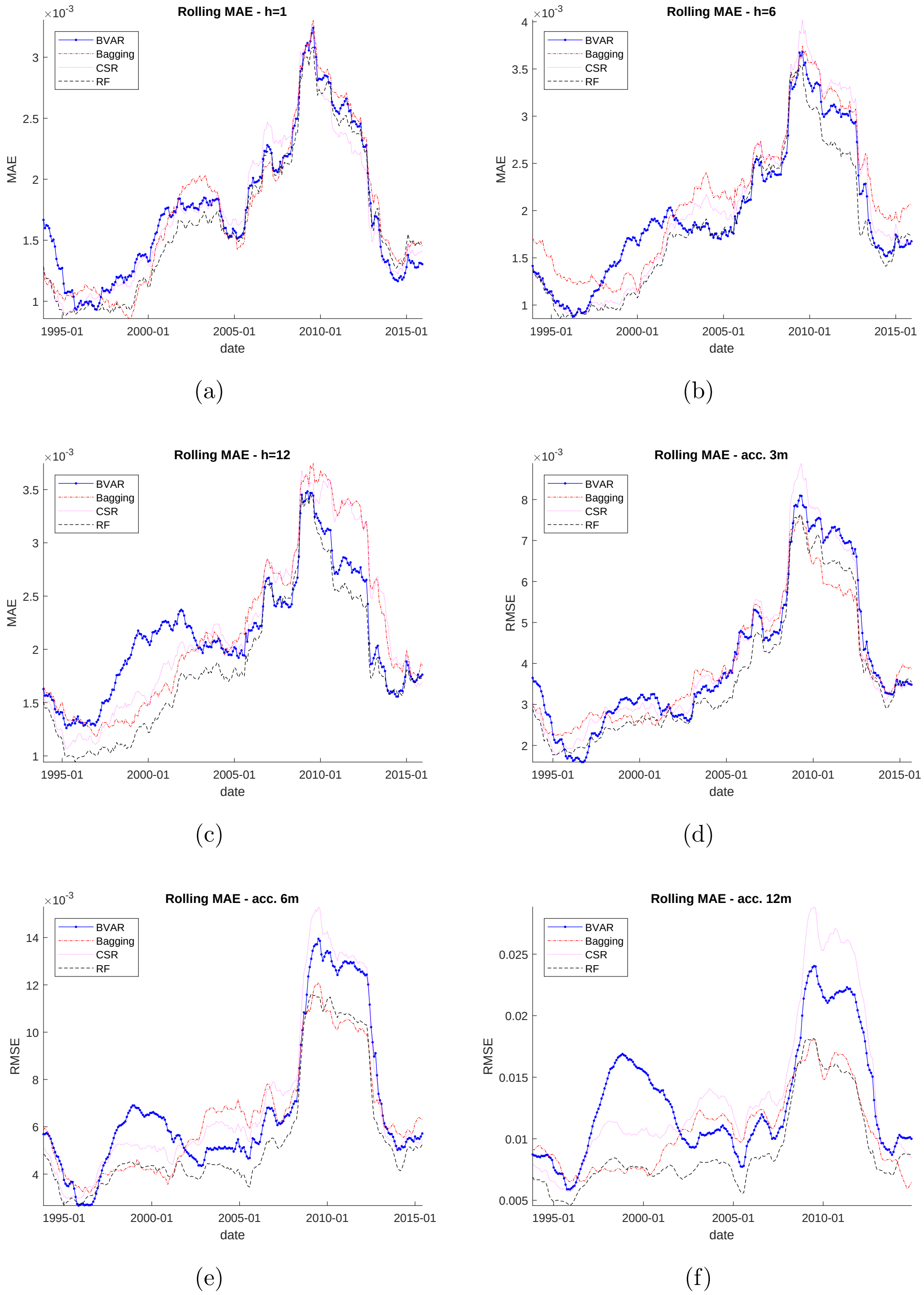


Figure S.12. Rolling MAD: RF versus BVAR, Bagging, and CSR.

The figure displays the mean absolute deviation from the median (MAD) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.

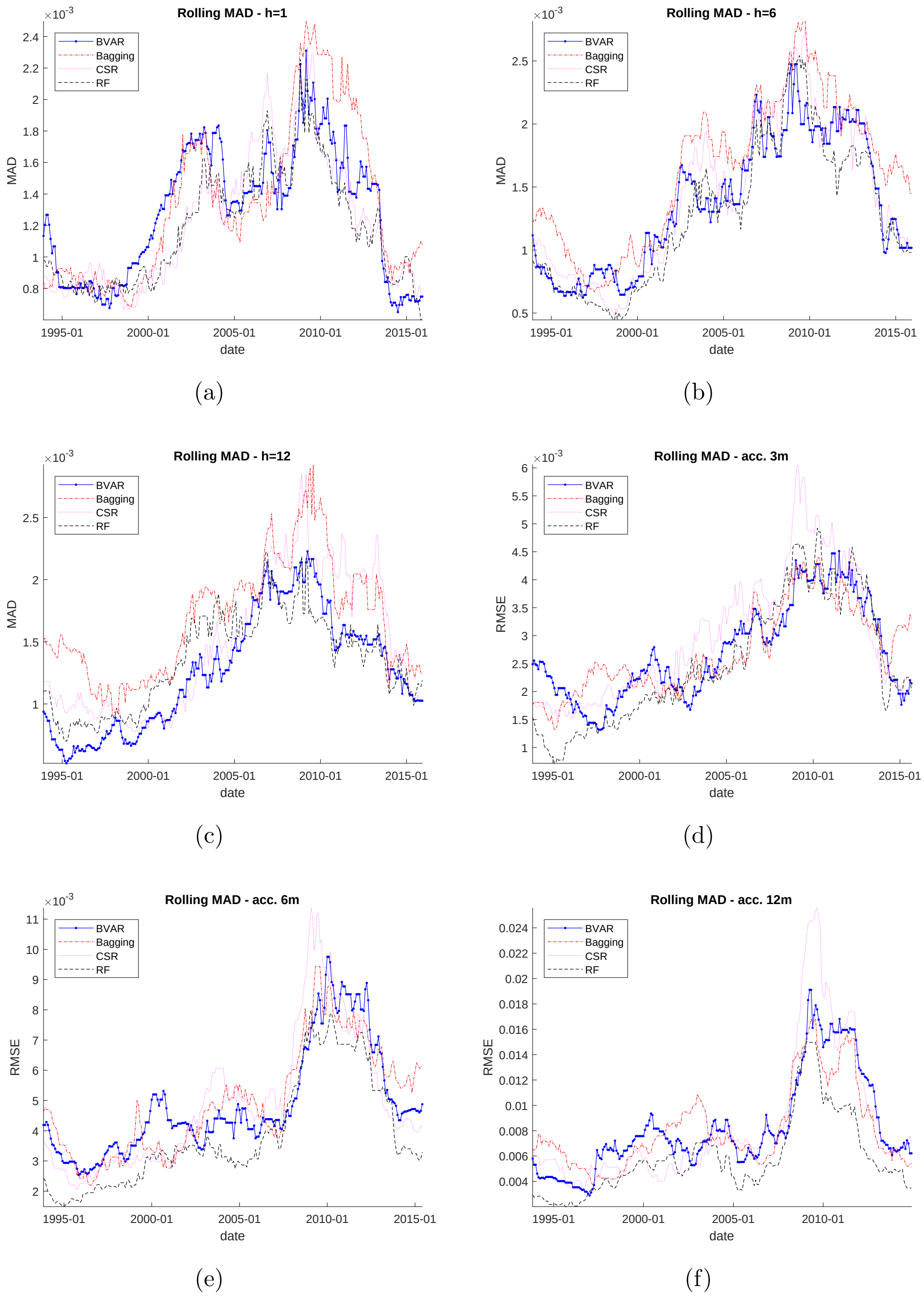
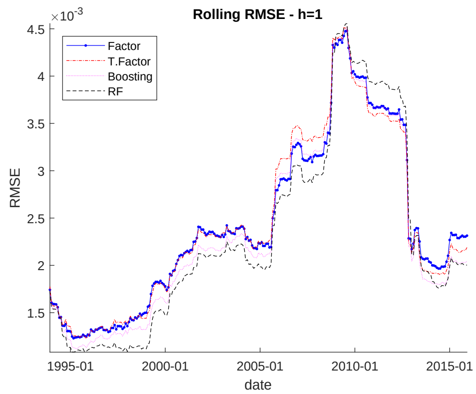
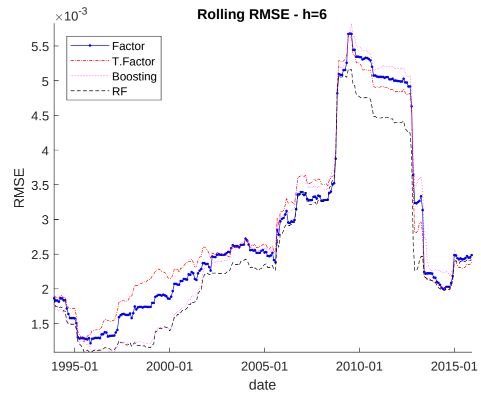


FIGURE S.13. Rolling RMSE: RF versus Factor, T. Factor, and Boosting.

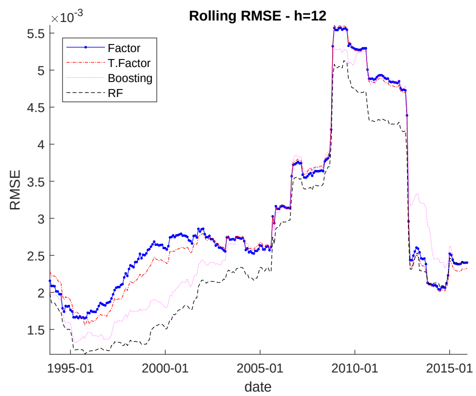
The figure displays the root mean squared errors (RMSE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



(b)



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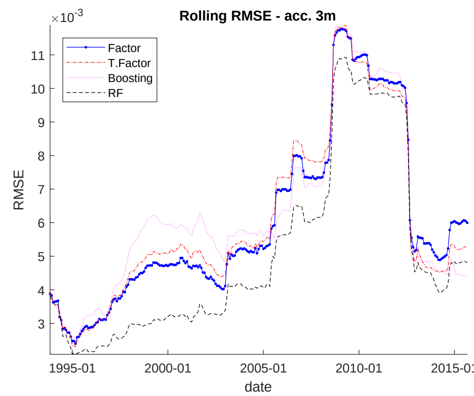

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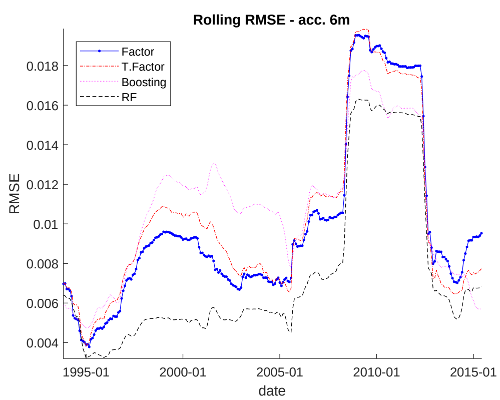

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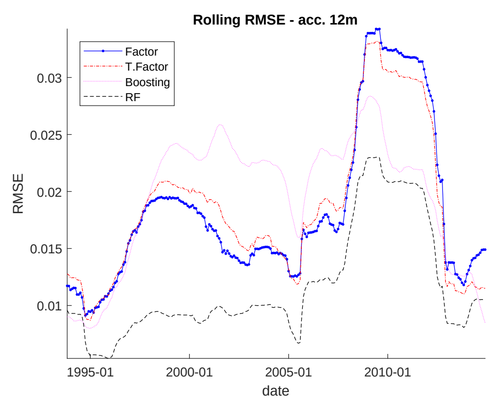
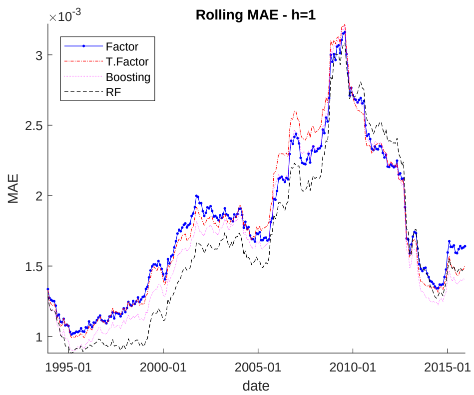


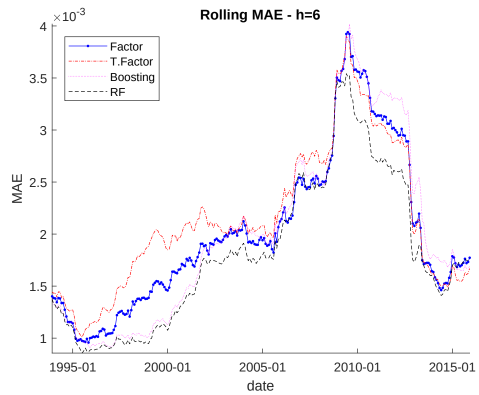
(f)

Figure S.14. Rolling MAE: RF versus Factor, T. Factor, and Boosting.

The figure displays the mean absolute errors (MAE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



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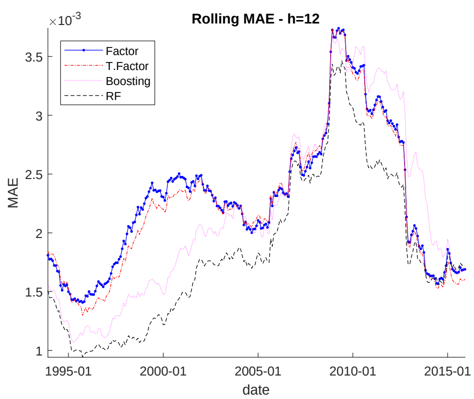

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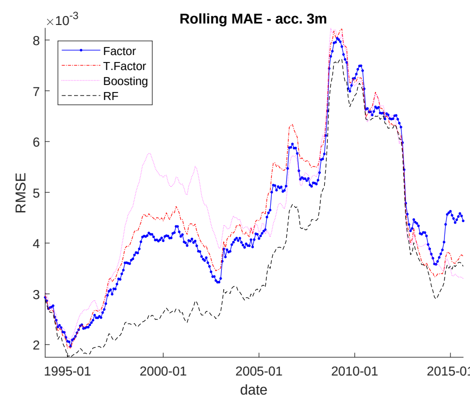
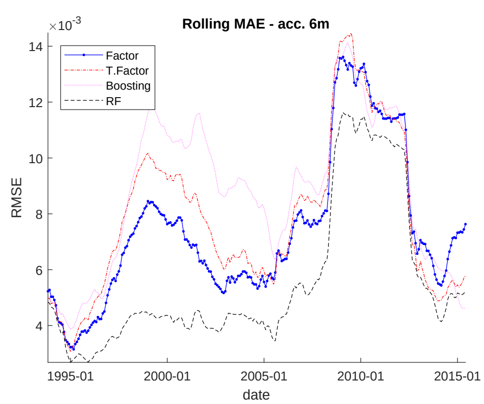


(d)



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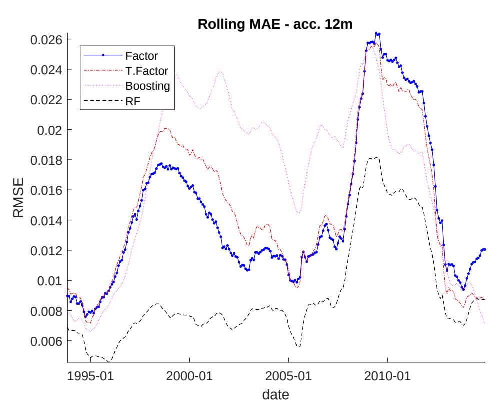
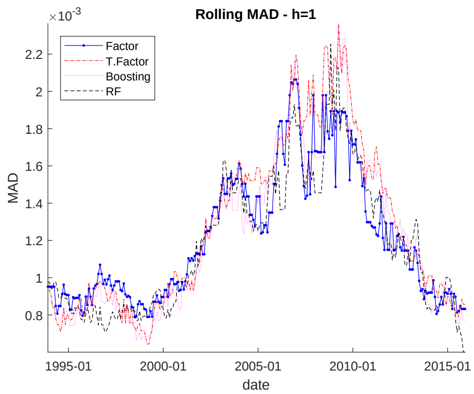


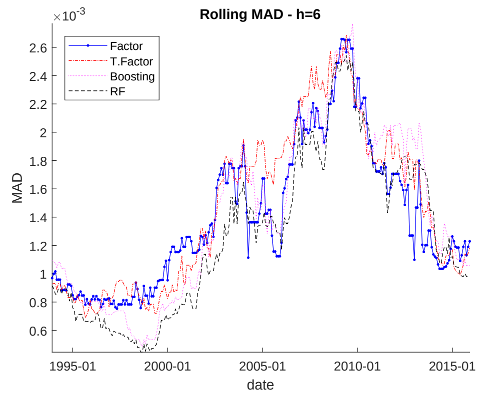
(f)

FIGURE S.15. Rolling MAD: RF versus Factor, T. Factor, and Boosting.

The figure displays the mean absolute deviation from the median (MAD) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



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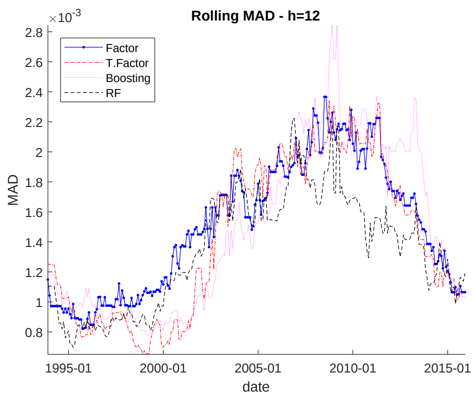
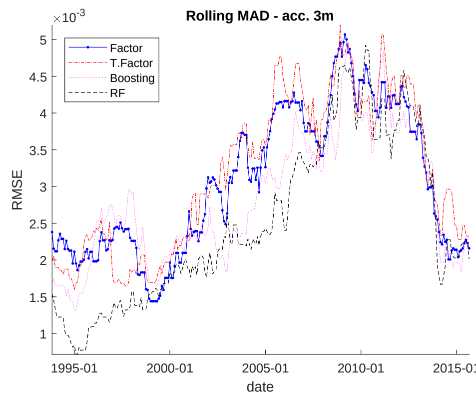


(c)



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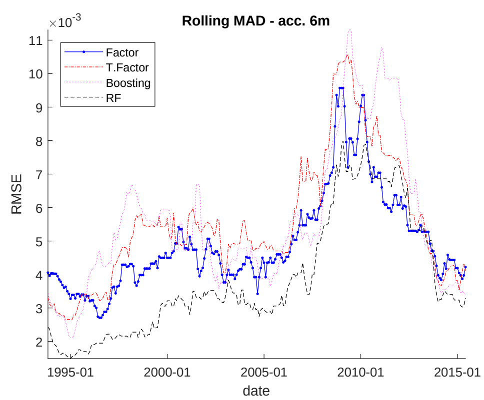
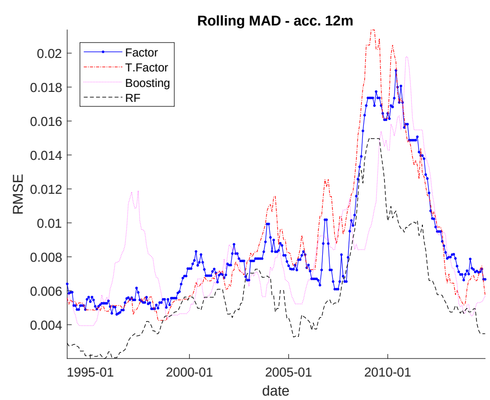


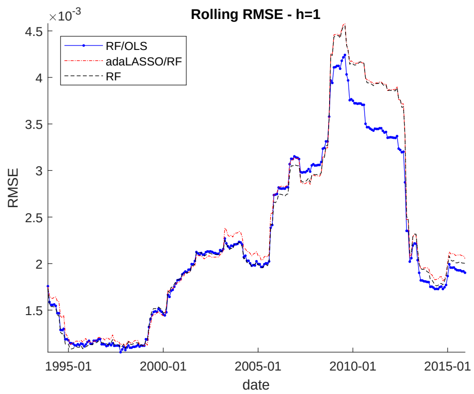
(e)



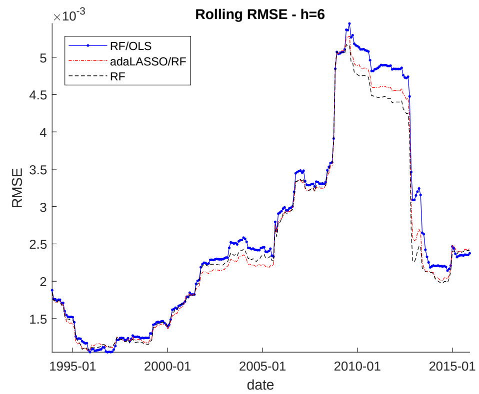
(f)

Figure S.16. Rolling RMSE: RF versus RF/OLS and adaLASSO/RF.

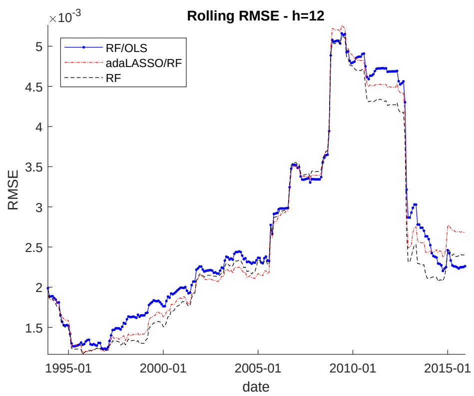
The figure displays the root mean squared errors (RMSE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



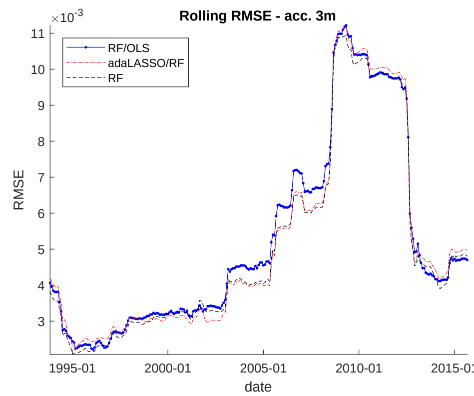
(a)



(b)



(c)



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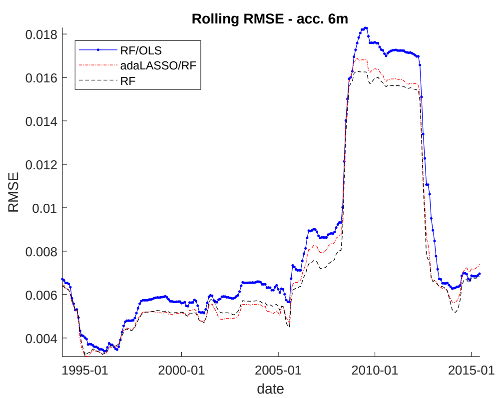

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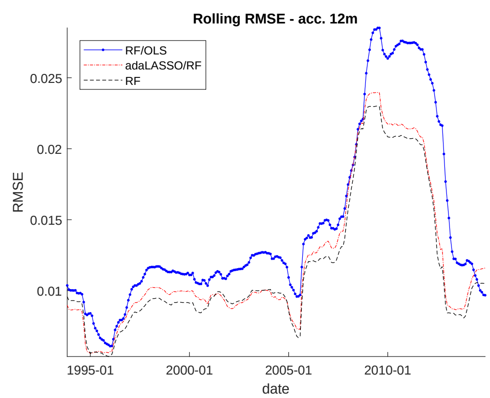
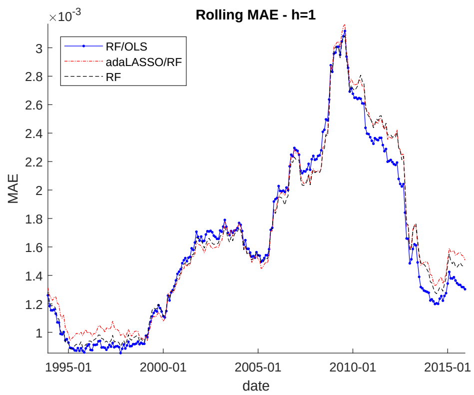


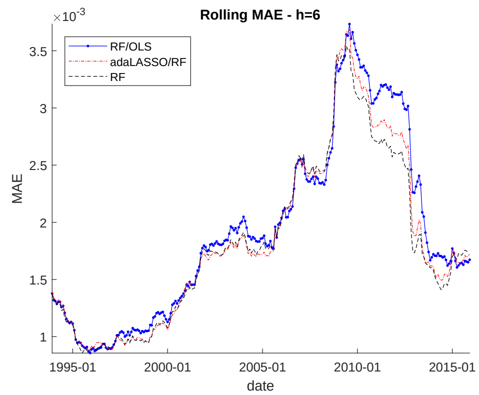
(f)

Figure S.17. Rolling MAE: RF versus RF/OLS and adaLASSO/RF.

The figure displays the mean absolute errors (MAE) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



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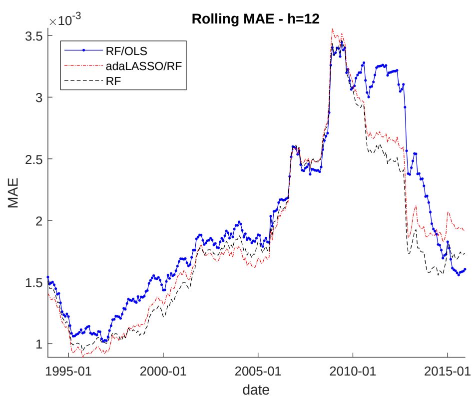

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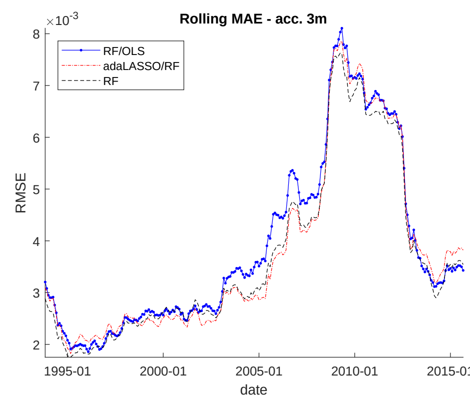

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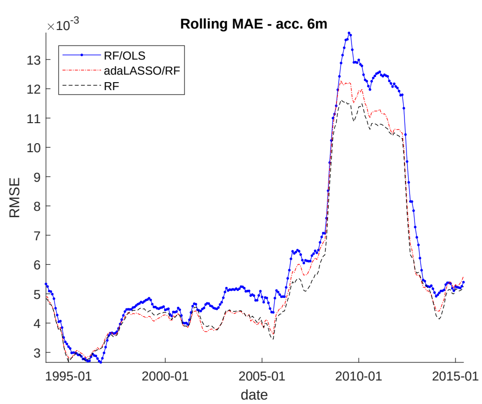

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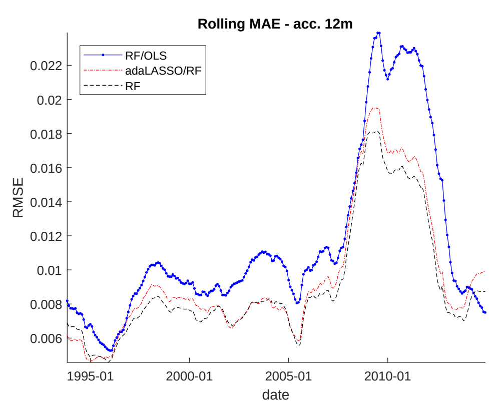
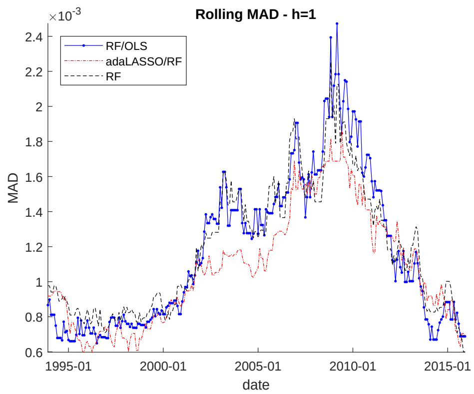


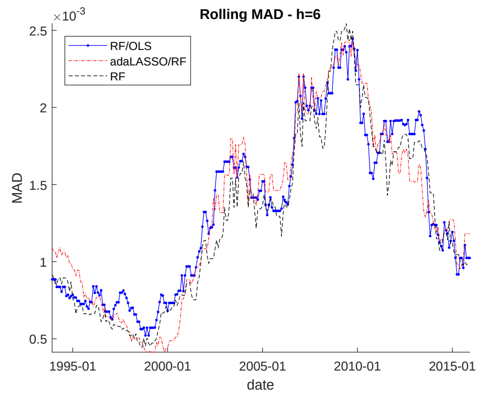
(f)

Figure S.18. Rolling MAD: RF versus RF/OLS and adaLASSO/RF.

The figure displays the mean absolute deviation from the median (MAD) computed over rolling windows of 48 observations. Panel (a)–(c) display, respectively, the results for one-, six-, and twelve-month-ahead forecasts and panels (d)–(f) display, respectively, the results for the accumulated three, six, and twelve month forecasts.



(a)



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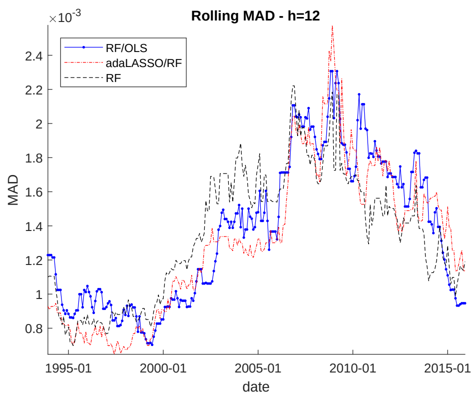

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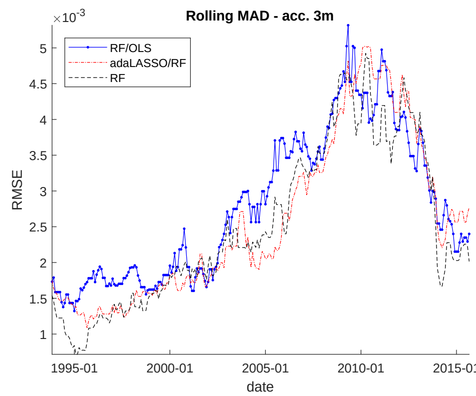
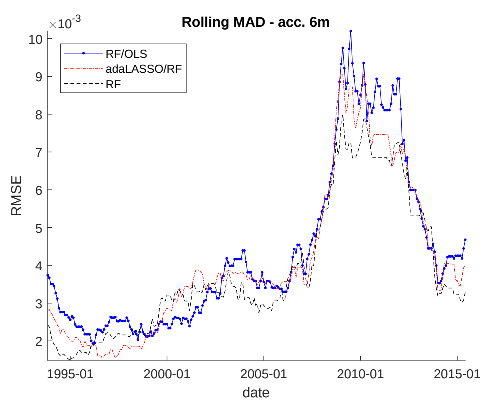


(d)



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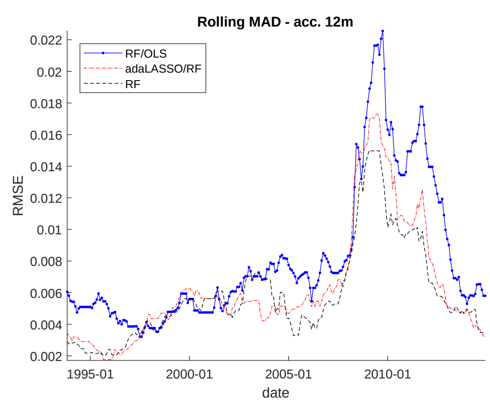


(f)

Table S.12. Forecasting Errors for the CPI from 1990 to 2000

The table shows the root mean squared error (RMSE), and between parenthesis, the mean absolute errors (MAE) for all models relative to the random walk (RW). The error measures were calculated from 132 rolling windows covering the 1990-2000 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss functions. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table report how many models were included in the MCS for square and absolute losses.

Consumer Price Index 1990–2000																
	Forecasting Horizon															
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(7)
AR	0.84	0.82	0.88	0.82	0.78	0.79	0.79	0.80	0.87	0.89	0.95	0.85	1.00	1.19	1.24	10
	(0.88)	(0.83)	(0.92)	(0.83)	(0.81)	(0.84)	(0.84)	(0.80)	(0.94)	(0.98)	(1.04)	(0.94)	(1.01)	(1.34)	(1.38)	(6)
UCSV	0.86	0.84	0.87	0.87	0.85	0.85	0.86	0.85	0.86	0.89	0.94	0.88	0.94	**0.98**	1.00	10
	(0.88)	(0.85)	(0.88)	(0.87)	(0.86)	(0.86)	(0.87)	(0.84)	(0.88)	(0.91)	(0.96)	(0.89)	(0.91)	**(1.00)**	(1.02)	(13)
LASSO	0.83	0.82	0.88	0.83	0.79	0.78	0.80	0.81	0.88	0.92	0.97	0.85	0.98	1.17	1.24	10
	(0.88)	(0.84)	(0.92)	(0.84)	(0.83)	(0.84)	(0.88)	(0.83)	(0.96)	(1.02)	(1.08)	(0.96)	(0.99)	(1.39)	(1.41)	(7)
adaLASSO	0.81	0.82	0.87	0.83	0.75	**0.75**	0.77	0.77	0.85	0.87	0.92	0.82	0.92	1.04	1.03	15
	(0.84)	(0.82)	(0.86)	(0.80)	(0.73)	**(0.77)**	(0.81)	(0.77)	(0.90)	(0.92)	(1.00)	(0.89)	(0.92)	(1.17)	(1.08)	(15)
ElNet	0.81	0.81	0.88	0.83	0.80	0.79	0.82	0.81	0.92	0.92	1.00	0.89	0.96	1.16	1.26	8
	(0.86)	(0.84)	(0.92)	(0.86)	(0.86)	(0.85)	(0.92)	(0.83)	(1.02)	(1.02)	(1.14)	(1.02)	(0.97)	(1.38)	(1.47)	(5)
adaElnet	0.81	0.82	0.86	0.80	0.74	0.75	0.77	0.78	0.87	0.87	0.92	0.87	0.93	1.04	1.06	14
	(0.85)	(0.83)	**(0.86)**	(0.77)	**(0.73)**	(0.78)	(0.81)	(0.78)	(0.92)	(0.93)	(1.00)	(0.95)	(0.94)	(1.17)	(1.13)	(15)
RR	**0.79**	**0.77**	0.86	0.80	0.76	0.80	0.80	0.80	0.86	0.85	0.88	0.76	0.90	1.04	0.99	14
	(0.83)	(0.78)	(0.90)	(0.81)	(0.78)	(0.84)	(0.85)	(0.79)	(0.90)	(0.92)	(0.96)	(0.82)	(0.92)	(1.20)	(1.15)	(14)
BVAR	0.97	0.80	0.92	0.83	0.77	0.84	0.87	0.90	1.00	0.98	1.02	0.88	1.10	1.29	1.43	7
	(1.00)	**(0.77)**	(0.96)	(0.88)	(0.84)	(0.93)	(0.98)	(0.95)	(1.12)	(1.10)	(1.16)	(1.01)	(1.04)	(1.47)	(1.56)	(3)
Bagging	0.85	0.86	1.02	0.92	0.90	0.91	0.90	0.86	0.91	0.91	0.93	0.79	0.99	1.11	1.02	10
	(0.86)	(0.87)	(1.04)	(0.95)	(0.93)	(0.95)	(0.92)	(0.82)	(0.94)	(0.95)	(0.99)	(0.87)	(0.98)	(1.28)	(1.15)	(11)
CSR	0.83	0.85	0.89	0.81	0.77	0.76	**0.76**	**0.76**	0.85	0.88	0.91	0.81	1.00	1.15	1.11	10
	(0.89)	(0.89)	(0.92)	(0.82)	(0.79)	(0.81)	(0.82)	(0.76)	(0.91)	(0.95)	(0.97)	(0.89)	(1.00)	(1.32)	(1.25)	(8)
JMA	0.94	1.01	1.17	0.99	1.03	1.01	1.06	1.03	1.21	1.13	1.13	0.93	1.10	1.21	1.00	1
	(1.00)	(1.02)	(1.19)	(1.01)	(1.07)	(1.05)	(1.06)	(1.01)	(1.29)	(1.19)	(1.20)	(0.98)	(1.14)	(1.45)	(1.08)	(2)
Factor	0.87	0.85	0.98	0.90	0.89	0.86	0.84	0.90	1.02	0.97	1.04	0.98	1.13	1.42	1.51	1
	(0.96)	(0.92)	(1.05)	(0.97)	(0.92)	(0.90)	(0.88)	(0.91)	(1.14)	(1.09)	(1.15)	(1.14)	(1.20)	(1.67)	(1.72)	(1)
T. Factor	0.87	0.91	1.01	0.98	0.92	0.94	0.86	0.91	1.04	1.02	1.02	0.95	1.19	1.57	1.62	0
	(0.93)	(0.98)	(1.13)	(1.07)	(1.02)	(1.05)	(0.94)	(0.93)	(1.16)	(1.18)	(1.15)	(1.10)	(1.27)	(1.90)	(1.91)	(0)
B. Factor	0.96	0.90	1.05	0.91	0.88	0.95	0.95	0.97	1.02	0.96	0.97	0.81	1.26	1.62	1.66	5
	(1.09)	(0.98)	(1.16)	(0.98)	(0.97)	(1.06)	(1.06)	(1.03)	(1.12)	(1.06)	(1.07)	(0.89)	(1.36)	(2.01)	(1.92)	(3)
RF	0.79	0.78	0.85	**0.77**	0.73	0.76	0.76	0.77	0.82	**0.82**	**0.85**	**0.72**	**0.88**	0.98	**0.87**	15
	(0.82)	(0.78)	(0.88)	(0.77)	(0.76)	(0.79)	**(0.78)**	**(0.75)**	**(0.86)**	**(0.86)**	**(0.89)**	(0.76)	**(0.90)**	(1.15)	**(0.94)**	(14)
Mean	0.80	0.79	0.85	0.79	0.76	0.77	0.77	0.77	0.84	0.84	0.87	0.78	0.91	1.05	1.02	15
	(0.83)	(0.81)	(0.87)	(0.80)	(0.79)	(0.81)	(0.81)	(0.76)	(0.90)	(0.91)	(0.94)	(0.85)	(0.92)	(1.21)	(1.11)	(14)
T.Mean	0.80	0.80	**0.85**	0.79	0.75	0.76	0.77	0.77	0.85	0.84	0.89	0.79	0.92	1.06	1.04	15
	(0.84)	(0.82)	(0.87)	(0.79)	(0.77)	(0.80)	(0.81)	(0.78)	(0.91)	(0.91)	(0.97)	(0.87)	(0.93)	(1.20)	(1.15)	(14)
Median	0.80	0.80	0.85	0.79	0.75	0.76	0.77	0.77	0.85	0.85	0.89	0.79	0.93	1.06	1.05	15
	(0.84)	(0.83)	(0.88)	(0.79)	(0.78)	(0.80)	(0.82)	(0.77)	(0.91)	(0.91)	(0.97)	(0.87)	(0.93)	(1.21)	(1.16)	(14)
RF/OLS	0.80	0.80	0.86	0.78	0.74	0.77	0.77	0.78	0.85	0.85	0.88	0.76	0.93	1.06	1.01	15
	(0.82)	(0.82)	(0.89)	(0.79)	(0.76)	(0.81)	(0.82)	(0.78)	(0.90)	(0.92)	(0.96)	(0.83)	(0.95)	(1.22)	(1.14)	(14)
adaLASSO/RF	0.79	0.81	0.91	0.77	**0.72**	0.77	0.77	0.77	**0.82**	0.89	0.90	0.72	0.93	1.00	0.89	14
	(0.84)	(0.81)	(0.94)	**(0.77)**	(0.73)	(0.81)	(0.81)	(0.77)	(0.86)	(0.94)	(0.99)	**(0.76)**	(0.93)	(1.16)	(0.95)	(14)
RMSE count	12	18	14	16	11	14	10	15	14	18	16	11	15	12	13	
MAE count	(12)	(15)	(9)	(10)	(3)	(15)	(14)	(15)	(15)	(16)	(14)	(16)	(15)	(12)	(13)	

TABLE S.13. Forecasting Errors for the CPI from 2001 to 2015

The table shows the root mean squared error (RMSE), and between parenthesis, the mean absolute errors (MAE) for all models relative to the random walk (RW). The error measures were calculated from 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss functions. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table report how many models were included in the MCS for square and absolute losses.

Consumer Price Index 2001–2015															
	Forecasting Horizon														
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(0)
AR	0.92	0.81	0.78	0.80	0.79	0.79	0.78	0.76	0.77	0.81	0.82	0.73	0.85	0.95	1.21	8
	(0.87)	(0.78)	(0.74)	(0.79)	(0.80)	(0.80)	(0.75)	(0.75)	(0.76)	(0.80)	(0.79)	(0.70)	(0.85)	(0.96)	(1.17)	(0)
UCSV	0.98	0.81	0.79	0.80	0.77	0.77	0.77	0.76	0.76	0.79	0.81	0.76	0.86	0.85	0.89	10
	(0.93)	(0.81)	(0.76)	(0.77)	(0.78)	(0.77)	(0.77)	(0.77)	(0.75)	(0.76)	(0.81)	(0.73)	(0.84)	(0.87)	(0.85)	(5)
LASSO	0.84	0.74	0.71	0.75	0.74	0.74	0.75	0.72	0.74	0.78	0.79	0.70	0.72	0.75	0.91	15
	(0.79)	(0.71)	(0.67)	(0.75)	(0.74)	(0.72)	(0.69)	(0.67)	(0.69)	(0.73)	(0.75)	(0.65)	(0.72)	(0.75)	(0.89)	(14)
adaLASSO	0.84	0.75	0.72	0.76	0.75	0.75	0.76	0.74	0.75	0.79	0.81	0.70	0.74	0.77	0.93	15
	(0.80)	(0.72)	(0.68)	(0.76)	(0.76)	(0.73)	(0.71)	(0.69)	(0.71)	(0.75)	(0.78)	(0.67)	(0.75)	(0.78)	(0.90)	(12)
ElNet	0.84	0.74	0.71	0.74	0.73	0.74	0.74	0.73	0.73	0.79	0.79	0.70	0.72	0.75	0.91	15
	(0.80)	(0.70)	(0.67)	(0.74)	(0.74)	(0.72)	(0.69)	(0.67)	(0.69)	(0.73)	(0.74)	(0.64)	(0.73)	(0.75)	(0.89)	(14)
adaElnet	0.85	0.74	0.72	0.76	0.75	0.75	0.75	0.74	0.74	0.79	0.80	0.70	0.74	0.78	0.93	14
	(0.81)	(0.71)	(0.68)	(0.76)	(0.76)	(0.73)	(0.70)	(0.68)	(0.70)	(0.74)	(0.76)	(0.67)	(0.75)	(0.78)	(0.90)	(12)
RR	0.86	0.72	0.70	0.75	0.73	0.74	0.74	0.72	0.72	0.76	0.77	0.69	0.72	0.74	0.86	14
	(0.83)	(0.70)	(0.67)	(0.75)	(0.75)	(0.74)	(0.69)	(0.68)	(0.69)	(0.71)	(0.73)	(0.67)	(0.72)	(0.77)	(0.85)	(13)
BVAR	0.83	0.75	0.72	0.75	0.74	0.74	0.75	0.74	0.74	0.79	0.79	0.72	0.75	0.79	0.99	15
	(0.81)	(0.72)	(0.68)	(0.75)	(0.75)	(0.73)	(0.69)	(0.69)	(0.70)	(0.73)	(0.74)	(0.67)	(0.75)	(0.79)	(0.92)	(13)
Bagging	0.82	0.74	0.72	0.78	0.76	0.77	0.81	0.80	0.76	0.80	0.81	0.73	0.71	0.72	0.77	13
	(0.84)	(0.74)	(0.71)	(0.83)	(0.84)	(0.82)	(0.80)	(0.79)	(0.76)	(0.80)	(0.82)	(0.74)	(0.73)	(0.78)	(0.78)	(6)
CSR	0.86	0.75	0.74	0.78	0.78	0.79	0.80	0.77	0.78	0.82	0.83	0.75	0.77	0.84	1.12	11
	(0.82)	(0.71)	(0.69)	(0.78)	(0.79)	(0.78)	(0.74)	(0.73)	(0.75)	(0.78)	(0.80)	(0.73)	(0.76)	(0.84)	(1.05)	(6)
JMA	1.00	0.78	0.79	0.83	0.80	0.77	0.89	0.83	0.79	0.91	0.88	0.77	0.72	0.75	0.84	8
	(0.99)	(0.78)	(0.79)	(0.92)	(0.91)	(0.84)	(0.85)	(0.82)	(0.81)	(0.88)	(0.87)	(0.78)	(0.77)	(0.83)	(0.82)	(2)
Factor	0.87	0.77	0.75	0.77	0.76	0.77	0.79	0.80	0.79	0.81	0.81	0.74	0.78	0.83	1.10	9
	(0.84)	(0.76)	(0.72)	(0.77)	(0.78)	(0.76)	(0.74)	(0.76)	(0.78)	(0.79)	(0.77)	(0.69)	(0.79)	(0.84)	(1.02)	(5)
T. Factor	0.88	0.76	0.74	0.76	0.74	0.76	0.78	0.78	0.76	0.78	0.80	0.74	0.77	0.82	1.05	9
	(0.85)	(0.75)	(0.71)	(0.74)	(0.75)	(0.76)	(0.75)	(0.75)	(0.74)	(0.76)	(0.76)	(0.69)	(0.79)	(0.83)	(0.96)	(6)
B. Factor	0.95	0.75	0.72	0.76	0.74	0.76	0.77	0.75	0.76	0.81	0.81	0.73	0.77	0.80	1.03	13
	(0.91)	(0.72)	(0.70)	(0.79)	(0.78)	(0.79)	(0.76)	(0.75)	(0.76)	(0.79)	(0.79)	(0.69)	(0.78)	(0.88)	(1.09)	(9)
RF	0.86	**0.72**	**0.69**	0.73	**0.71**	**0.71**	**0.71**	0.70	0.71	**0.75**	**0.76**	**0.68**	**0.69**	**0.68**	**0.74**	15
	(0.81)	**(0.70)**	(0.66)	(0.74)	**(0.71)**	**(0.70)**	**(0.67)**	(0.66)	**(0.67)**	**(0.70)**	(0.72)	**(0.63)**	**(0.69)**	**(0.67)**	**(0.71)**	(15)
Mean	0.84	0.74	0.72	0.75	0.74	0.74	0.75	0.74	0.73	0.76	0.77	0.69	0.73	0.77	0.93	15
	(0.80)	(0.71)	(0.69)	(0.74)	(0.75)	(0.73)	(0.70)	(0.70)	(0.70)	(0.71)	**(0.72)**	(0.65)	(0.73)	(0.77)	(0.90)	(12)
T.Mean	0.85	0.73	0.71	0.75	0.73	0.74	0.74	0.73	0.73	0.77	0.78	0.70	0.73	0.76	0.92	15
	(0.80)	(0.71)	(0.67)	(0.74)	(0.74)	(0.72)	(0.69)	(0.68)	(0.69)	(0.72)	(0.72)	(0.64)	(0.73)	(0.76)	(0.89)	(13)
Median	0.85	0.73	0.71	0.75	0.73	0.74	0.74	0.73	0.73	0.77	0.78	0.70	0.73	0.76	0.92	15
	(0.80)	(0.70)	(0.67)	(0.74)	(0.75)	(0.72)	(0.69)	(0.68)	(0.69)	(0.72)	(0.73)	(0.65)	(0.73)	(0.76)	(0.89)	(13)
RF/OLS	**0.81**	0.72	0.71	0.75	0.74	0.75	0.75	0.73	0.73	0.77	0.78	0.70	0.71	0.75	0.92	15
	(0.78)	(0.70)	(0.67)	(0.75)	(0.76)	(0.74)	(0.70)	(0.69)	(0.70)	(0.73)	(0.76)	(0.68)	(0.73)	(0.76)	(0.89)	(14)
adaLASSO/RF	0.87	0.75	0.69	**0.72**	0.74	0.71	0.72	**0.70**	**0.71**	0.77	0.80	0.70	0.70	0.70	0.77	15
	(0.81)	(0.70)	**(0.66)**	**(0.73)**	(0.74)	(0.71)	(0.68)	**(0.65)**	(0.67)	(0.73)	(0.75)	(0.66)	(0.70)	(0.70)	(0.76)	(15)
RMSE count	11	17	15	19	20	18	18	17	19	19	20	19	15	16	17	
MAE count	(13)	(15)	(16)	(16)	(16)	(16)	(15)	(11)	(12)	(16)	(13)	(12)	(16)	(6)	(6)	

TABLE S.14. Test for Superior Predictive Ability: Recession and Expansions

The table reports the coefficients and the standard deviation of the regression

$$\widehat{e}^2_{t+h,\mathrm{RF}} - \widehat{e}^2_{t+h,\text{other model}} = \alpha_0 \mathsf{I}_{t+h} + \alpha_1 (1 - \mathsf{I}_{t+h}) + \text{error},$$

where I_t is an indicator function that equals one for expansion periods as labeled by the NBER and zero otherwise. The standard errors are heteroskedasticity-autocorrelation robust and are computed with a quadratic spectral kernel and bandwidth selected by Andrew's automatic method. $***$, $**$, and $*$ indicate, respectively, that the coefficients are statistically significant that the 1%, 5%, and 10% levels.

	RW	AR	UCSV	adaLASSO	adaElnet	RR	B. Factor	RF/OLS	adaLASSO/RF
					1-month-ahead				
Expansion	$-2.56 \times 10^{-6***}$	$-8.48 \times 10^{-7***}$	$-1.04 \times 10^{-6***}$	-1.45×10^{-7}	-1.61×10^{-7}	-1.72×10^{-7}	$-1.16 \times 10^{-6***}$	-9.68×10^{-9}	-6.07×10^{-8}
	(5.32×10^{-7})	(2.51×10^{-7})	(3.24×10^{-7})	(1.09×10^{-7})	(1.08×10^{-7})	(1.53×10^{-7})	(3.65×10^{-7})	(1.33×10^{-7})	(1.58×10^{-7})
Recession	-1.06×10^{-6}	-7.66×10^{-7}	-6.63×10^{-6}	2.21×10^{-6}	1.25×10^{-6}	9.32×10^{-7}	-5.71×10^{-6}	4.94×10^{-6}	-5.77×10^{-7}
	(4.02×10^{-6})	(1.58×10^{-6})	(5.11×10^{-6})	(1.86×10^{-6})	(1.28×10^{-6})	(1.40×10^{-6})	(3.56×10^{-6})	(3.50×10^{-6})	(8.46×10^{-7})
					3-month-ahead				
Expansion	$-5.25 \times 10^{-6***}$	$-7.33 \times 10^{-7***}$	$-1.30 \times 10^{-6***}$	-3.01×10^{-7}	-1.72×10^{-7}	-1.69×10^{-7}	$-1.24 \times 10^{-6***}$	-1.54×10^{-7}	-7.05×10^{-8}
	(1.36×10^{-6})	(2.49×10^{-7})	(4.44×10^{-7})	(1.75×10^{-7})	(1.71×10^{-7})	(1.66×10^{-7})	(3.78×10^{-7})	(1.58×10^{-7})	(1.69×10^{-7})
Recession	$-2.39 \times 10^{-5*}$	-1.07×10^{-5}	-7.48×10^{-6}	-3.56×10^{-6}	-3.76×10^{-6}	-1.34×10^{-6}	-1.35×10^{-6}	-2.16×10^{-6}	-1.30×10^{-6}
	(1.41×10^{-5})	(6.80×10^{-6})	(5.00×10^{-6})	(2.23×10^{-6})	(2.38×10^{-6})	(1.90×10^{-6})	(1.03×10^{-6})	(1.77×10^{-6})	(1.80×10^{-6})
					12-month-ahead				
Expansion	$-8.01 \times 10^{-6***}$	$-1.32 \times 10^{-6***}$	$-1.78 \times 10^{-6***}$	$-7.36 \times 10^{-7**}$	$-8.92 \times 10^{-7***}$	-2.00×10^{-7}	$-1.03 \times 10^{-6***}$	-4.90×10^{-7}	-2.68×10^{-7}
	(2.45×10^{-6})	(2.60×10^{-7})	(4.38×10^{-7})	(3.15×10^{-7})	(2.90×10^{-7})	(2.68×10^{-7})	(3.36×10^{-7})	(3.14×10^{-7})	(2.06×10^{-7})
Recession	-1.17×10^{-5}	-3.36×10^{-6}	-5.98×10^{-6}	$-2.01 \times 10^{-6**}$	$-2.07 \times 10^{-6*}$	$-1.49 \times 10^{-6*}$	$-3.22 \times 10^{-6*}$	$-1.39 \times 10^{-6***}$	-1.72×10^{-6}
	(8.29×10^{-6})	(3.79×10^{-6})	(4.88×10^{-6})	(1.01×10^{-6})	(1.22×10^{-6})	(8.28×10^{-7})	(1.97×10^{-6})	(4.93×10^{-7})	(1.66×10^{-6})
					acc. 12m				
Expansion	$-4.34 \times 10^{-5*}$	$-1.18 \times 10^{-4***}$	-1.50×10^{-5}	$-4.90 \times 10^{-5***}$	$-5.05 \times 10^{-5***}$	$-4.68 \times 10^{-5***}$	$-2.27 \times 10^{-4***}$	$-4.92 \times 10^{-5***}$	$-1.53 \times 10^{-5***}$
	(2.57×10^{-5})	(1.90×10^{-5})	(2.11×10^{-5})	(1.10×10^{-5})	(1.12×10^{-5})	(1.80×10^{-5})	(7.11×10^{-5})	(1.79×10^{-5})	(4.64×10^{-6})
Recession	$-6.30 \times 10^{-4***}$	$-11.73 \times 10^{-4**}$	$-4.43 \times 10^{-4**}$	$-3.91 \times 10^{-4**}$	$-3.85 \times 10^{-4**}$	$-9.59 \times 10^{-5***}$	$-4.98 \times 10^{-5***}$	-3.06×10^{-4}	4.90×10^{-6}
	(2.52×10^{-4})	(5.25×10^{-4})	(2.00×10^{-4})	(1.96×10^{-4})	(1.90×10^{-4})	(1.45×10^{-4})	(2.08×10^{-4})	(2.30×10^{-4})	(5.53×10^{-5})

Table S.15. Test for Superior Predictive Ability: Macroeconomic Uncertainty

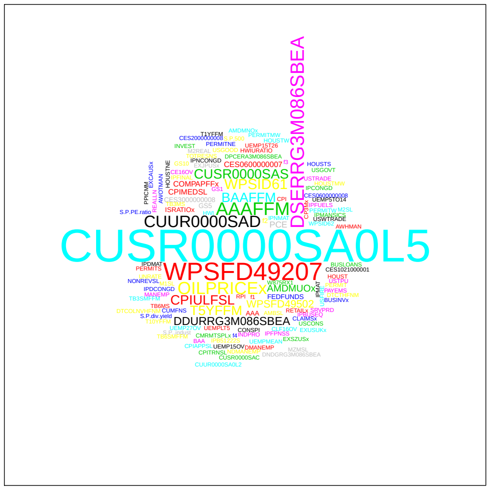
The table reports the coefficients and the standard deviation of the regression

$$\widehat{e}^2_{t+h,\mathrm{RF}} - \widehat{e}^2_{t+h,\text{other model}} = \alpha_0 \mathsf{I}_{t+h} + \alpha_1(1 - \mathsf{I}_{t+h}) + \text{error},$$

where I_t is an indicator function that equals one for periods of high macroeconomic uncertainty. The standard errors are heteroskedasticity-autocorrelation robust and are computed with a quadratic spectral kernel and bandwidth selected by Andrew's automatic method. $***$, $**$, and $*$ indicate, respectively, that the coefficients are statistically significant that the 1%, 5%, and 10% levels.

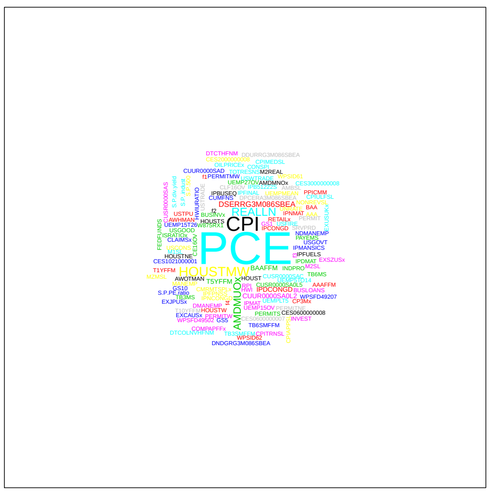
	RW	**AR**	**UCSV**	**adaLASSO**	**adaElnet**	**RR**	**B. Factor**	**RF/OLS**	**adaLASSO/RF**
					1-month-ahead				
Low	$-1.28\times10^{-6***}$ (3.75×10^{-7})	$-4.89\times10^{-7***}$ (1.36×10^{-7})	$-6.79\times10^{-7***}$ (2.50×10^{-7})	-6.82×10^{-8} (9.38×10^{-8})	-1.06×10^{-7} (8.98×10^{-8})	-2.87×10^{-8} (9.91×10^{-8})	$-1.13\times10^{-6***}$ (3.29×10^{-7})	9.40×10^{-8} (1.01×10^{-7})	-2.14×10^{-8} (9.46×10^{-8})
High	$-2.59\times10^{-6***}$ (1.45×10^{-6})	$-1.30\times10^{-6**}$ (6.33×10^{-7})	$-2.93\times10^{-6**}$ (1.46×10^{-6})	3.50×10^{-7} (5.30×10^{-7})	1.22×10^{-7} (3.92×10^{-7})	-8.12×10^{-8} (4.63×10^{-7})	$-2.36\times10^{-6**}$ (1.16×10^{-6})	1.11×10^{-6} (9.50×10^{-7})	-2.44×10^{-7} (3.71×10^{-7})
					3-month-ahead				
Low	$-2.52\times10^{-6***}$ (8.53×10^{-7})	$-2.86\times10^{-7**}$ (1.70×10^{-7})	-5.54×10^{-7} (4.05×10^{-7})	-1.58×10^{-7} (1.40×10^{-7})	-1.47×10^{-7} (1.33×10^{-7})	-1.72×10^{-7} (1.27×10^{-7})	$-1.39\times10^{-6***}$ (3.44×10^{-7})	-1.27×10^{-7} (1.06×10^{-7})	$-2.61\times10^{-7**}$ (1.36×10^{-7})
High	$-1.41\times10^{-5***}$ (4.64×10^{-6})	$-4.02\times10^{-6**}$ (2.25×10^{-6})	$-4.02\times10^{-6**}$ (1.78×10^{-6})	-1.37×10^{-6} (7.31×10^{-7})	-1.16×10^{-6} (7.84×10^{-7})	-4.75×10^{-7} (5.51×10^{-7})	-1.04×10^{-6} (7.19×10^{-7})	-7.26×10^{-7} (5.35×10^{-7})	-1.23×10^{-7} (5.76×10^{-7})
					12-month-ahead				
Low	$-3.37\times10^{-6***}$ (7.17×10^{-7})	$-1.09\times10^{-6***}$ (2.74×10^{-7})	$-1.14\times10^{-6***}$ (3.91×10^{-7})	$-1.09\times10^{-6***}$ 3.45×10^{-7}	$-1.32\times10^{-6***}$ (3.28×10^{-7})	-2.91×10^{-7} (2.75×10^{-7})	$-6.05\times10^{-7**}$ (3.05×10^{-7})	-4.37×10^{-7} (3.58×10^{-7})	-4.31×10^{-7} (2.46×10^{-7})
High	$-1.55\times10^{-5***}$ (5.23×10^{-6})	$-2.18\times10^{-6**}$ (1.07×10^{-6})	$-3.78\times10^{-6***}$ (1.38×10^{-6})	-5.67×10^{-7} (5.27×10^{-7})	-5.96×10^{-7} (5.13×10^{-7})	-4.10×10^{-7} (5.24×10^{-7})	$-2.19\times10^{-6***}$ (8.03×10^{-7})	-8.01×10^{-7} (4.67×10^{-7})	-4.18×10^{-7} (5.38×10^{-7})
					acc. 12m				
Low	-2.32×10^{-5} (2.46×10^{-5})	$-9.19\times10^{-5***}$ (2.11×10^{-5})	-1.81×10^{-5} (2.25×10^{-5})	$-3.91\times10^{-5***}$ (1.39×10^{-5})	$-4.34\times10^{-5***}$ (1.49×10^{-5})	-2.09×10^{-5} (1.43×10^{-5})	$-1.65\times10^{-4*}$ (8.84×10^{-5})	$-2.24\times10^{-5*}$ (1.32×10^{-5})	$4.13\times10^{-6*}$ (-1.32×10^{-5})
High	-2.30×10^{-4} $1.24\times10^{-4*}$	$-4.39\times10^{-4**}$ 2.21×10^{-4}	-1.26×10^{-4} 8.67×10^{-5}	$7.35\times10^{-5**}$ -1.55×10^{-4}	$7.35\times10^{-5**}$ -1.51×10^{-4}	$-9.59\times10^{-5**}$ 5.06×10^{-5}	$1.21\times10^{-4**}$ -2.64×10^{-4}	$-1.56\times10^{-4**}$ 8.15×10^{-5}	-1.28×10^{-5} 1.66×10^{-5}

Figure S.19. Word clouds for the adaLASSO method (1990–2000).

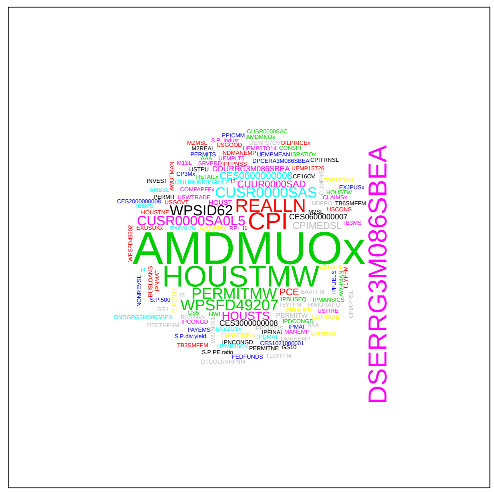


(a) h=1

(b) h=3

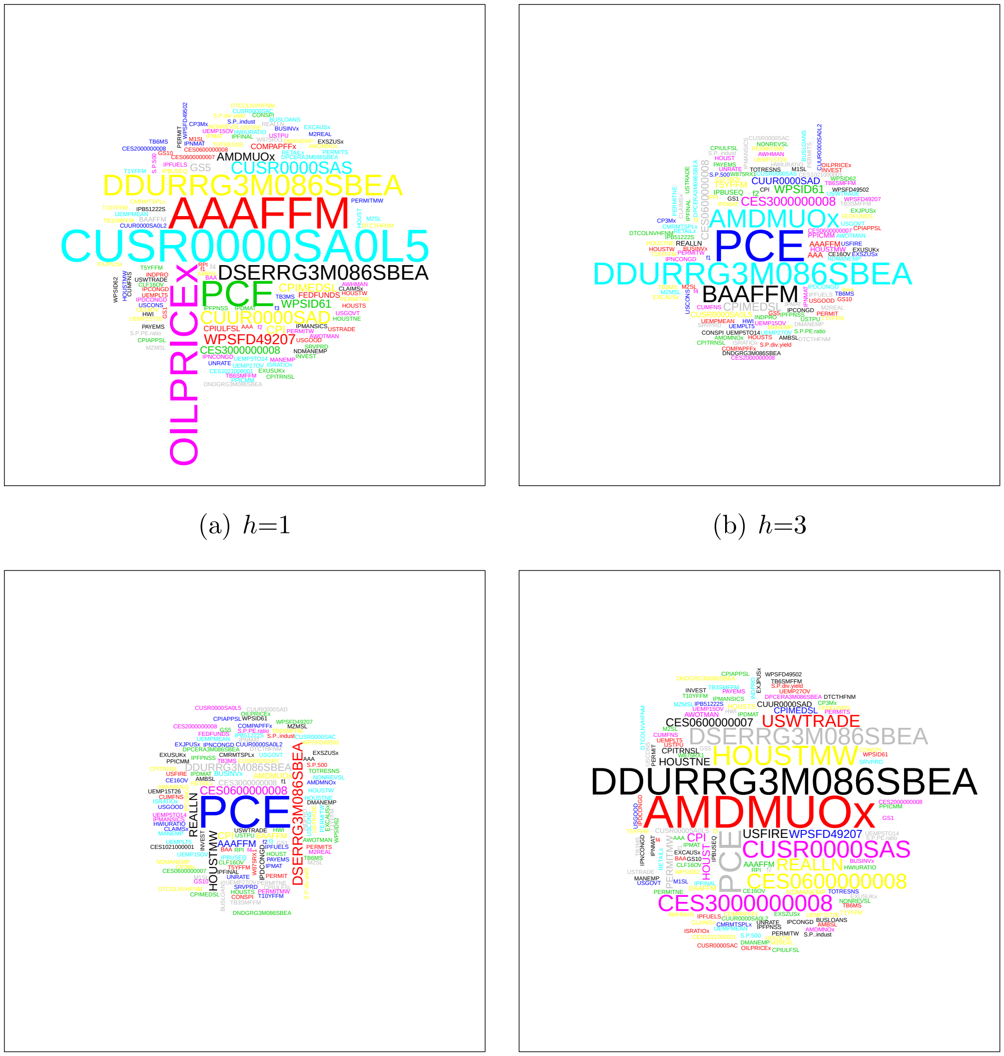


(c) h=6



(d) h=12

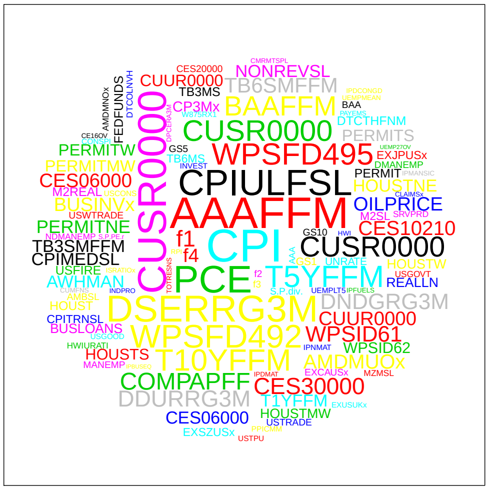
Figure S.20. Word clouds for the adaLASSO method (2001–2015).



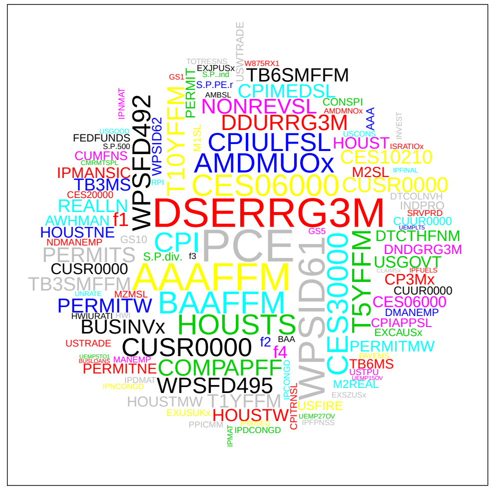
(a) h=1 (b) h=3

(c) h=6 (d) h=12

FIGURE S.21. Word clouds for the Random Forest model (1990-2000).



(a) h=1



(b) h=3

(c) h=6

(d) h=12

Figure S.22. Word clouds for the Random Forest model (2001—2015).

(a) h=1

(b) h=3

(c) h=6

(d) h=12

Table S.16. Forecasting Results PCE: Summary statistics for the out-of-sample period from 1990–2015

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	ave.	ave.	ave.	max.	max.	max.	min.	min.	min.	# min.	# min.	# min.	ave. p.v.	ave. p.v.	ave. p.v.	ave. p.v.	p.v.
Model	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	sq	abs	Tmax sq	Tmax abs	m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	0.02	0.01	0.12	0.08	0.00
AR	0.85	0.85	0.83	1.00	1.08	1.15	0.78	0.75	0.72	0	0	0	0.07	0.04	0.45	0.31	0.00
UCSV	0.86	0.86	0.88	0.94	0.96	0.97	0.82	0.82	0.81	0	0	0	0.03	0.03	0.35	0.29	0.00
LASSO	0.80	0.80	0.78	0.88	1.01	1.03	0.75	0.73	0.69	0	0	1	0.14	0.17	0.60	0.55	0.62
adaLASSO	0.81	0.81	0.79	0.88	0.99	1.08	0.76	0.74	0.66	0	0	0	0.11	0.18	0.55	0.48	0.03
ElNet	0.80	0.81	0.78	0.87	1.01	1.00	0.75	0.73	0.65	0	0	1	0.15	0.17	0.60	0.54	0.99
adaElnet	0.81	0.81	0.79	0.89	1.00	1.12	0.76	0.74	0.65	0	0	0	0.09	0.10	0.55	0.45	0.00
RR	0.78	0.79	0.81	0.85	0.97	1.08	0.74	0.72	0.66	0	0	1	0.27	0.40	0.68	0.66	0.87
BVAR	0.85	0.87	0.85	0.96	1.09	1.26	0.79	0.78	0.68	0	0	0	0.06	0.05	0.42	0.33	0.00
Bagging	0.81	0.84	0.86	0.87	0.94	1.16	0.76	0.76	0.69	1	1	1	0.22	0.15	0.61	0.46	0.05
CSR	0.82	0.81	0.81	0.90	0.98	1.09	0.77	0.73	0.71	0	0	1	0.18	0.29	0.59	0.56	0.00
JMA	0.86	0.91	0.96	0.95	0.97	1.16	0.79	0.83	0.80	0	0	0	0.06	0.01	0.29	0.17	0.00
Factor	0.87	0.88	0.86	0.99	1.12	1.24	0.83	0.81	0.72	0	0	1	0.01	0.00	0.20	0.11	0.00
T. Factor	0.85	0.87	0.89	0.96	1.11	1.26	0.80	0.77	0.76	0	0	0	0.02	0.03	0.27	0.16	0.00
B. Factor	0.88	0.93	1.00	1.05	1.33	1.82	0.81	0.83	0.74	0	0	0	0.01	0.00	0.46	0.19	0.00
RF	0.75	0.75	0.75	0.86	0.86	0.89	0.67	0.63	0.56	12	10	4	0.94	0.95	0.96	0.97	1
Mean	0.78	0.78	0.79	0.85	0.95	1.04	0.75	0.71	0.65	0	0	0	0.34	0.52	0.68	0.69	0.99
T.Mean	0.78	0.78	0.78	0.85	0.95	1.01	0.75	0.71	0.63	0	1	1	0.26	0.54	0.68	0.70	0.99
Median	0.78	0.78	0.77	0.85	0.95	1.01	0.75	0.71	0.63	0	0	1	0.28	0.53	0.68	0.70	0.97
RF/OLS	0.78	0.79	0.81	0.84	0.94	1.07	0.75	0.72	0.68	1	1	1	0.44	0.53	0.69	0.68	0.99
adaLASSO/RF	0.76	0.77	0.76	0.85	0.91	1.01	0.70	0.68	0.63	1	2	2	0.49	0.54	0.75	0.78	0.91

Table S.17. Forecasting Results PCE: Summary statistics for the out-of-sample period from 1990–2000

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Model	ave. RMSE	ave. MAE	ave. MAD	max. RMSE	max. MAE	max. MAD	min. RMSE	min. MAE	min. MAD	# min. RMSE	# min. MAE	# min. MAD	ave. p.v. sq	ave. p.v. abs	ave. p.v. Tmax sq	ave. p.v. Tmax abs	p.v. m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	0.06	0.06	0.38	0.39	0.00
AR	0.88	0.91	0.83	1.22	1.35	1.29	0.79	0.79	0.66	0	0	1	0.27	0.23	0.67	0.68	0.20
UCSV	0.89	0.90	0.91	1.03	1.12	1.08	0.84	0.84	0.80	2	2	0	0.30	0.43	0.78	0.80	0.23
LASSO	0.92	0.97	0.83	1.38	1.60	1.14	0.79	0.82	0.65	0	0	1	0.04	0.08	0.50	0.44	0.01
adaLASSO	0.90	0.92	0.85	1.28	1.43	1.20	0.81	0.82	0.67	0	0	0	0.07	0.18	0.62	0.65	0.01
ElNet	0.93	0.99	0.81	1.40	1.65	1.00	0.80	0.81	0.66	1	0	2	0.08	0.07	0.46	0.33	0.78
adaElnet	0.90	0.94	0.85	1.31	1.48	1.21	0.80	0.82	0.60	0	0	0	0.05	0.07	0.54	0.53	0.00
RR	0.86	0.89	0.87	1.22	1.37	1.36	0.76	0.75	0.67	0	1	0	0.36	0.37	0.81	0.79	0.87
BVAR	1.07	1.14	0.89	1.61	1.81	1.29	0.83	0.80	0.67	0	0	1	0.05	0.04	0.38	0.27	0.01
Bagging	0.91	0.95	0.97	1.13	1.28	1.48	0.82	0.80	0.72	0	0	0	0.27	0.30	0.76	0.74	0.19
CSR	0.86	0.88	0.87	1.18	1.29	1.20	0.76	0.76	0.74	3	4	0	0.47	0.51	0.81	0.83	0.99
JMA	1.05	1.08	1.08	1.27	1.44	1.35	0.92	0.92	0.79	0	0	0	0.02	0.02	0.29	0.26	0.00
Factor	1.00	1.06	0.93	1.50	1.71	1.49	0.86	0.87	0.69	0	0	2	0.01	0.01	0.24	0.22	0.00
T. Factor	0.99	1.04	0.95	1.52	1.74	1.58	0.83	0.84	0.71	0	0	1	0.03	0.06	0.31	0.28	0.00
B. Factor	1.07	1.14	1.20	1.81	2.15	2.49	0.90	0.91	0.84	0	0	0	0.02	0.03	0.47	0.41	0.00
RF	0.84	0.87	0.73	1.19	1.35	0.82	0.68	0.64	0.58	7	5	6	0.83	0.68	0.91	0.86	1
Mean	0.85	0.88	0.82	1.20	1.33	1.16	0.75	0.75	0.65	0	0	0	0.59	0.56	0.82	0.82	0.96
T.Mean	0.86	0.89	0.81	1.22	1.35	1.13	0.75	0.76	0.69	0	0	0	0.24	0.26	0.77	0.82	0.10
Median	0.87	0.89	0.81	1.22	1.35	1.14	0.75	0.76	0.65	0	0	0	0.25	0.29	0.76	0.79	0.15
RF/OLS	0.84	0.87	0.87	1.14	1.25	1.25	0.76	0.76	0.66	2	3	0	0.77	0.70	0.86	0.87	0.94
adaLASSO/RF	0.88	0.91	0.81	1.27	1.42	0.97	0.72	0.71	0.66	0	0	1	0.34	0.32	0.71	0.68	0.80

TABLE S.18. Forecasting Results PCE: Summary statistics for the out-of-sample period from 2001–2015

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Model	ave. RMSE	ave. MAE	ave. MAD	max. RMSE	max. MAE	max. MAD	min. RMSE	min. MAE	min. MAD	# min. RMSE	# min. MAE	# min. MAD	ave. p.v. sq	ave. p.v. abs	ave. p.v. Tmax sq	ave. p.v. Tmax abs	p.v. m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	0.02	0.00	0.11	0.02	0.00
AR	0.84	0.82	0.82	0.99	1.00	1.11	0.77	0.72	0.69	0	0	0	0.08	0.03	0.51	0.27	0.00
UCSV	0.85	0.85	0.86	0.96	0.95	1.06	0.81	0.80	0.78	0	0	0	0.03	0.01	0.33	0.15	0.00
LASSO	0.77	0.74	0.73	0.83	0.82	0.91	0.73	0.67	0.59	0	1	0	0.27	0.42	0.77	0.67	0.89
adaLASSO	0.79	0.76	0.74	0.84	0.85	0.95	0.73	0.69	0.61	0	0	0	0.20	0.22	0.73	0.59	0.21
ElNet	0.77	0.74	0.73	0.84	0.81	0.91	0.72	0.67	0.60	0	0	2	0.26	0.45	0.78	0.68	0.83
adaElnet	0.79	0.76	0.74	0.84	0.85	0.92	0.73	0.68	0.60	0	0	0	0.19	0.19	0.73	0.60	0.15
RR	0.76	0.75	0.73	0.87	0.84	0.94	0.71	0.67	0.56	0	0	1	0.30	0.37	0.79	0.63	0.41
BVAR	0.79	0.76	0.72	0.85	0.87	0.93	0.75	0.69	0.62	0	0	0	0.21	0.28	0.74	0.66	0.20
Bagging	0.78	0.79	0.79	0.88	0.88	1.02	0.68	0.69	0.57	0	0	4	0.33	0.16	0.70	0.39	0.18
CSR	0.81	0.78	0.78	0.92	0.89	0.95	0.75	0.68	0.62	0	0	0	0.17	0.16	0.65	0.51	0.01
JMA	0.82	0.85	0.88	0.96	0.93	1.13	0.72	0.72	0.66	0	0	0	0.16	0.06	0.52	0.21	0.00
Factor	0.84	0.82	0.79	0.95	0.93	1.06	0.80	0.75	0.68	0	0	1	0.06	0.02	0.40	0.24	0.00
T. Factor	0.81	0.80	0.79	0.91	0.90	0.98	0.76	0.72	0.66	0	0	0	0.10	0.04	0.51	0.27	0.00
B. Factor	0.83	0.85	0.88	1.00	1.08	1.39	0.77	0.73	0.69	0	0	0	0.04	0.03	0.65	0.38	0.00
RF	0.73	0.70	0.70	0.88	0.82	0.79	0.67	0.63	0.54	10	6	3	0.88	0.89	0.94	0.90	1
Mean	0.77	0.74	0.74	0.85	0.83	0.97	0.72	0.68	0.59	0	0	0	0.34	0.35	0.79	0.65	0.88
T.Mean	0.77	0.74	0.74	0.84	0.82	0.92	0.72	0.67	0.60	0	0	1	0.29	0.54	0.78	0.67	0.80
Median	0.77	0.74	0.73	0.84	0.82	0.93	0.72	0.67	0.60	0	0	1	0.33	0.55	0.79	0.68	0.87
RF/OLS	0.77	0.76	0.73	0.83	0.84	0.92	0.74	0.68	0.51	1	0	1	0.33	0.30	0.79	0.64	0.94
adaLASSO/RF	0.73	0.71	0.70	0.86	0.81	0.86	0.69	0.64	0.57	4	8	1	0.75	0.70	0.88	0.85	0.91

Table S.19. Forecasting Errors for the PCE from 1990 to 2015

The table shows the root mean squared error (RMSE) and, between parenthesis, the mean absolute errors (MAE) for all models relative to the Random Walk (RW). The error measures were calculated from 132 rolling windows covering the 1990-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss function. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table reports how many models were included in the MCS for square and absolute losses.

Personal Consumer Expenditure 1990–2015															
	Forecasting Horizon														
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1)
AR	0.89	0.83	0.82	0.84	0.82	0.80	0.79	0.78	0.82	0.84	0.87	0.80	0.90	1.00	0.96	6
	(0.87)	(0.81)	(0.79)	(0.83)	(0.82)	(0.81)	(0.79)	(0.75)	(0.82)	(0.84)	(0.89)	(0.82)	(0.92)	(1.08)	(0.91)	(3)
UCSV	0.94	0.86	0.84	0.86	0.84	0.83	0.83	0.82	0.83	0.84	0.86	0.83	0.93	0.93	0.85	5
	(0.92)	(0.86)	(0.82)	(0.85)	(0.84)	(0.83)	(0.84)	(0.82)	(0.84)	(0.84)	(0.90)	(0.83)	(0.91)	(0.96)	(0.90)	(1)
LASSO	0.83	0.78	0.75	0.79	0.78	0.78	0.78	0.77	0.81	0.82	0.84	0.76	0.80	0.88	0.79	10
	(0.80)	(0.77)	(0.73)	(0.80)	(0.81)	(0.79)	(0.78)	(0.73)	(0.80)	(0.81)	(0.86)	(0.77)	(0.84)	(1.01)	(0.77)	(7)
adaLASSO	0.84	0.79	0.77	0.80	0.79	0.78	0.78	0.79	0.82	0.82	0.84	0.76	0.80	0.88	0.83	8
	(0.82)	(0.78)	(0.74)	(0.80)	(0.79)	(0.77)	(0.77)	(0.74)	(0.80)	(0.80)	(0.85)	(0.77)	(0.85)	(0.99)	(0.82)	(5)
ElNet	0.83	0.78	0.75	0.79	0.78	0.78	0.77	0.77	0.81	0.82	0.85	0.76	0.79	0.87	0.79	10
	(0.80)	(0.77)	(0.73)	(0.81)	(0.81)	(0.80)	(0.78)	(0.74)	(0.81)	(0.81)	(0.87)	(0.78)	(0.83)	(1.01)	(0.78)	(8)
adaElnet	0.84	0.79	0.76	0.80	0.79	0.78	0.78	0.78	0.82	0.82	0.84	0.76	0.81	0.89	0.83	8
	(0.83)	(0.79)	(0.74)	(0.80)	(0.80)	(0.78)	(0.77)	(0.74)	(0.80)	(0.81)	(0.86)	(0.77)	(0.85)	(1.00)	(0.81)	(4)
RR	0.85	0.76	0.76	0.79	0.76	0.77	0.76	0.75	0.79	0.78	0.81	0.74	0.79	0.84	0.77	14
	(0.83)	(0.75)	(0.73)	(0.78)	(0.79)	(0.78)	(0.75)	(0.72)	(0.79)	(0.78)	(0.83)	(0.75)	(0.82)	(0.97)	(0.77)	(10)
BVAR	0.90	0.80	0.79	0.81	0.79	0.80	0.81	0.82	0.86	0.87	0.90	0.83	0.87	0.96	0.90	6
	(0.89)	(0.78)	(0.79)	(0.83)	(0.83)	(0.84)	(0.83)	(0.82)	(0.89)	(0.89)	(0.94)	(0.87)	(0.90)	(1.09)	(0.89)	(3)
Bagging	0.87	0.78	0.78	0.83	0.82	0.81	0.82	0.80	0.83	0.81	0.84	0.76	**0.77**	0.79	0.76	9
	(0.86)	(0.76)	(0.76)	(0.86)	(0.90)	(0.86)	(0.83)	(0.80)	(0.86)	(0.83)	(0.88)	(0.78)	**(0.79)**	(0.94)	(0.82)	(6)
CSR	0.85	0.78	0.77	0.80	0.78	0.79	0.79	0.78	0.82	0.84	0.87	0.81	0.82	0.89	0.90	10
	(0.82)	(0.78)	(0.74)	(0.80)	(0.79)	(0.78)	(0.76)	(0.73)	(0.80)	(0.82)	(0.87)	(0.81)	(0.84)	(0.98)	(0.87)	(8)
JMA	0.95	0.88	0.84	0.89	0.87	0.84	0.88	0.85	0.92	0.87	0.91	0.82	0.82	0.81	0.79	3
	(0.94)	(0.91)	(0.85)	(0.97)	(0.97)	(0.91)	(0.91)	(0.86)	(0.97)	(0.92)	(0.95)	(0.88)	(0.88)	(0.96)	(0.83)	(1)
Factor	0.89	0.84	0.83	0.84	0.83	0.84	0.83	0.83	0.87	0.87	0.89	0.85	0.90	0.99	0.95	0
	(0.87)	(0.84)	(0.83)	(0.84)	(0.85)	(0.85)	(0.84)	(0.81)	(0.89)	(0.88)	(0.90)	(0.88)	(0.96)	(1.12)	(0.92)	(0)
T. Factor	0.90	0.83	0.81	0.81	0.81	0.81	0.80	0.80	0.83	0.84	0.85	0.82	0.89	0.96	0.92	1
	(0.91)	(0.85)	(0.82)	(0.80)	(0.83)	(0.83)	(0.81)	(0.77)	(0.84)	(0.86)	(0.87)	(0.84)	(0.97)	(1.11)	(0.90)	(1)
B. Factor	0.99	0.83	0.82	0.84	0.82	0.84	0.84	0.84	0.87	0.86	0.88	0.81	0.94	1.05	0.91	7
	(1.00)	(0.83)	(0.83)	(0.89)	(0.89)	(0.89)	(0.88)	(0.85)	(0.91)	(0.88)	(0.92)	(0.83)	(1.05)	(1.33)	(1.02)	(0)
RF	0.86	**0.76**	**0.74**	**0.76**	**0.73**	**0.73**	**0.72**	0.72	**0.75**	**0.75**	**0.78**	**0.71**	0.77	**0.77**	**0.67**	15
	(0.82)	**(0.74)**	(0.73)	**(0.77)**	**(0.77)**	(0.75)	**(0.72)**	(0.68)	**(0.73)**	**(0.74)**	**(0.78)**	**(0.70)**	(0.79)	**(0.86)**	**(0.63)**	(15)
Mean	0.84	0.77	0.76	0.78	0.77	0.77	0.76	0.75	0.78	0.78	0.80	0.75	0.80	0.85	0.80	14
	(0.81)	(0.77)	(0.73)	(0.78)	(0.78)	(0.77)	(0.76)	(0.71)	(0.77)	(0.77)	(0.81)	(0.75)	(0.82)	(0.95)	(0.77)	(11)
T.Mean	0.84	0.77	0.75	0.78	0.77	0.76	0.76	0.75	0.78	0.79	0.81	0.75	0.80	0.85	0.80	14
	(0.81)	(0.76)	**(0.73)**	(0.78)	(0.78)	(0.77)	(0.75)	(0.71)	(0.77)	(0.77)	(0.82)	(0.75)	(0.82)	(0.95)	(0.77)	(11)
Median	0.83	0.77	0.75	0.78	0.77	0.77	0.76	0.76	0.78	0.79	0.81	0.75	0.79	0.85	0.79	14
	(0.81)	(0.76)	(0.73)	(0.78)	(0.78)	(0.77)	(0.75)	(0.71)	(0.77)	(0.77)	(0.82)	(0.75)	(0.82)	(0.95)	(0.77)	(11)
RF/OLS	**0.82**	0.76	0.75	0.78	0.76	0.76	0.76	0.76	0.79	0.79	0.82	0.76	0.79	0.84	0.82	14
	(0.80)	(0.76)	(0.73)	(0.78)	(0.78)	(0.78)	(0.75)	(0.72)	(0.79)	(0.79)	(0.85)	(0.78)	(0.81)	(0.94)	(0.82)	(10)
adaLASSO/RF	0.85	0.79	0.75	0.76	0.74	0.74	0.72	**0.72**	0.76	0.76	0.80	0.74	0.78	0.80	0.70	14
	(0.81)	(0.78)	(0.73)	(0.78)	(0.77)	**(0.75)**	(0.72)	**(0.68)**	(0.74)	(0.76)	(0.81)	(0.73)	(0.82)	(0.91)	(0.68)	(13)
RMSE count	13	16	16	16	16	17	8	8	16	1	7	8	12	13	16	
MAE count	(10)	(12)	(13)	(15)	(14)	(13)	(7)	(2)	(1)	(3)	(1)	(8)	(10)	(11)	(9)	

Table S.20. Forecasting Errors for the PCE from 1990 to 2000

The table shows the root mean squared error (RMSE) and, between parenthesis, the mean absolute errors (MAE) for all models relative to the Random Walk (RW). The error measures were calculated from 132 rolling windows covering the 1990-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss function. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table reports how many models were included in the MCS for square and absolute losses.

Personal Consumer Expenditure 1990–2000															
	Forecasting Horizon														
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(3)
AR	0.84	0.80	0.86	0.82	0.79	0.80	0.83	0.84	0.90	0.86	0.95	0.92	1.00	1.21	0.82	13
	(0.86)	(0.79)	(0.88)	(0.85)	(0.79)	(0.84)	(0.89)	(0.80)	(0.89)	(0.90)	(1.00)	(0.98)	(1.05)	(1.33)	(0.84)	(11)
UCSV	0.89	0.85	0.86	0.88	0.85	0.84	0.86	0.87	0.89	0.87	0.90	0.89	0.93	**0.98**	1.04	14
	(0.90)	(0.84)	(0.87)	(0.88)	(0.84)	(0.85)	(0.89)	(0.86)	(0.86)	(0.87)	(0.93)	(0.89)	**(0.93)**	**(0.99)**	(1.15)	(12)
LASSO	0.83	0.83	0.86	0.89	0.85	0.88	0.89	0.89	0.96	0.88	0.95	0.88	1.03	1.38	0.78	8
	(0.83)	(0.82)	(0.87)	(0.94)	(0.89)	(0.93)	(1.00)	(0.86)	(0.96)	(0.91)	(1.02)	(0.95)	(1.11)	(1.58)	(0.81)	(5)
adaLASSO	0.84	0.84	0.86	0.85	0.81	0.83	0.86	0.88	0.93	0.83	0.90	0.87	1.02	1.27	0.82	11
	(0.84)	(0.83)	(0.87)	(0.87)	(0.82)	(0.85)	(0.92)	(0.83)	(0.91)	(0.85)	(0.94)	(0.92)	(1.09)	(1.41)	(0.85)	(8)
ElNet	**0.80**	0.83	0.87	0.90	0.86	0.89	0.92	0.91	0.95	0.88	1.00	0.91	1.01	1.39	0.80	8
	(0.81)	(0.83)	(0.89)	(0.97)	(0.92)	(0.96)	(1.02)	(0.88)	(0.96)	(0.92)	(1.08)	(0.98)	(1.08)	(1.63)	(0.83)	(2)
adaElnet	0.85	0.84	0.86	0.86	0.80	0.84	0.86	0.88	0.95	0.84	0.92	0.88	1.04	1.30	0.80	9
	(0.86)	(0.84)	(0.87)	(0.90)	(0.82)	(0.87)	(0.93)	(0.84)	(0.93)	(0.87)	(0.97)	(0.94)	(1.12)	(1.47)	(0.83)	(6)
RR	0.82	0.77	0.85	0.83	0.78	0.82	0.83	0.84	0.90	0.83	0.91	0.84	0.97	1.22	0.76	14
	(0.82)	**(0.75)**	(0.86)	(0.85)	(0.82)	(0.87)	(0.90)	(0.80)	(0.90)	(0.87)	(0.96)	(0.87)	(1.00)	(1.35)	(0.80)	(14)
BVAR	0.99	0.83	0.95	0.91	0.87	0.94	1.02	1.07	1.15	1.05	1.16	1.10	1.23	1.60	1.11	7
	(1.00)	(0.80)	(1.00)	(0.99)	(0.95)	(1.05)	(1.14)	(1.08)	(1.22)	(1.15)	(1.29)	(1.22)	(1.22)	(1.79)	(1.17)	(1)
Bagging	0.85	0.82	0.94	0.90	0.86	0.86	0.84	0.83	0.91	0.86	0.97	0.89	**0.93**	1.13	1.09	13
	(0.85)	(0.80)	(0.95)	(0.94)	(0.93)	(0.92)	(0.91)	(0.80)	(0.90)	(0.88)	(1.00)	(0.91)	(0.94)	(1.28)	(1.19)	(10)
CSR	0.83	0.83	0.86	0.81	**0.76**	**0.78**	0.80	**0.81**	0.87	0.83	0.90	0.85	1.01	1.17	0.81	14
	(0.83)	(0.81)	(0.87)	(0.83)	**(0.78)**	**(0.80)**	**(0.85)**	**(0.76)**	(0.86)	(0.86)	(0.93)	(0.89)	(1.02)	(1.27)	(0.87)	(12)
JMA	0.94	1.00	1.06	1.04	1.00	0.92	1.02	1.01	1.17	1.00	1.08	1.00	1.10	1.25	1.09	5
	(0.97)	(1.03)	(1.10)	(1.06)	(1.06)	(0.95)	(1.11)	(0.92)	(1.15)	(1.03)	(1.06)	(0.99)	(1.18)	(1.40)	(1.16)	(2)
Factor	0.89	0.89	0.96	0.88	0.86	0.92	0.91	0.92	1.05	0.98	1.05	1.04	1.21	1.49	0.96	3
	(0.91)	(0.89)	(1.01)	(0.89)	(0.87)	(0.95)	(0.98)	(0.89)	(1.09)	(1.04)	(1.10)	(1.13)	(1.30)	(1.68)	(1.04)	(1)
T. Factor	0.95	0.91	1.01	0.84	0.83	0.88	0.89	0.88	1.00	0.96	0.99	0.97	1.28	1.50	0.94	6
	(0.96)	(0.91)	(1.07)	(0.85)	(0.84)	(0.91)	(0.98)	(0.86)	(1.01)	(1.01)	(1.03)	(1.02)	(1.41)	(1.71)	(1.02)	(3)
B. Factor	0.99	0.90	1.01	0.96	0.91	0.98	1.00	1.04	1.06	0.94	0.99	0.92	1.33	1.77	1.09	7
	(1.03)	(0.91)	(1.09)	(1.02)	(0.97)	(1.05)	(1.09)	(1.01)	(1.06)	(0.96)	(1.03)	(0.94)	(1.47)	(2.07)	(1.30)	(3)
RF	0.82	**0.77**	0.86	0.83	0.78	0.80	**0.80**	0.81	**0.84**	**0.78**	**0.85**	**0.79**	0.97	1.19	**0.67**	14
	(0.82)	(0.77)	(0.90)	(0.87)	(0.81)	(0.85)	(0.85)	(0.76)	**(0.82)**	**(0.80)**	**(0.90)**	**(0.82)**	(1.03)	(1.35)	**(0.63)**	(13)
Mean	0.82	0.79	0.84	0.82	0.78	0.80	0.81	0.81	0.88	0.82	0.87	0.84	0.98	1.19	0.74	14
	(0.83)	(0.79)	(0.85)	(0.84)	(0.79)	(0.83)	(0.88)	(0.77)	(0.86)	(0.84)	(0.92)	(0.88)	(1.01)	(1.30)	(0.74)	(13)
T.Mean	0.82	0.80	0.85	0.82	0.79	0.80	0.82	0.83	0.90	0.82	0.89	0.85	0.99	1.21	0.75	14
	(0.83)	(0.79)	(0.86)	(0.84)	(0.80)	(0.83)	(0.89)	(0.79)	(0.88)	(0.85)	(0.94)	(0.90)	(1.02)	(1.33)	(0.76)	(13)
Median	0.82	0.80	0.84	0.82	0.79	0.81	0.83	0.84	0.90	0.82	0.89	0.85	0.99	1.21	0.75	14
	(0.83)	(0.79)	(0.85)	(0.85)	(0.81)	(0.83)	(0.89)	(0.79)	(0.89)	(0.85)	(0.94)	(0.90)	(1.02)	(1.33)	(0.76)	(13)
RF/OLS	0.81	0.77	**0.83**	**0.80**	0.76	0.79	0.80	0.83	0.87	0.80	0.87	0.83	0.94	1.13	0.81	14
	(0.81)	(0.76)	**(0.84)**	**(0.82)**	(0.79)	(0.84)	(0.87)	(0.78)	(0.86)	(0.84)	(0.93)	(0.87)	(0.95)	(1.24)	(0.89)	(14)
adaLASSO/RF	0.81	0.89	0.91	0.87	0.81	0.82	0.84	0.81	0.85	0.79	0.90	0.84	1.05	1.27	0.71	13
	(0.82)	(0.87)	(0.94)	(0.90)	(0.83)	(0.87)	(0.89)	(0.77)	(0.84)	(0.83)	(0.94)	(0.87)	(1.10)	(1.41)	(0.71)	(10)
RMSE count	13	14	18	15	17	20	11	12	11	15	18	16	18	1	21	
MAE count	(12)	(10)	(11)	(11)	(13)	(13)	(11)	(11)	(11)	(15)	(18)	(13)	(6)	(2)	(12)	

Table S.21. Forecasting Errors for the PCE from 2001 to 2015

The table shows the root mean squared error (RMSE) and, between parenthesis, the mean absolute errors (MAE) for all models relative to the Random Walk (RW). The error measures were calculated from 132 rolling windows covering the 2001-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss function. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table reports how many models were included in the MCS for square and absolute losses.

Personal Consumer Expenditure 2001–2015															
	Forecasting Horizon														
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(0)
AR	0.91	0.84	0.81	0.84	0.82	0.80	0.79	0.77	0.80	0.83	0.85	0.77	0.88	0.97	0.99	8
	(0.88)	(0.82)	(0.75)	(0.82)	(0.83)	(0.79)	(0.74)	(0.72)	(0.78)	(0.81)	(0.83)	(0.74)	(0.87)	(1.00)	(0.93)	(1)
UCSV	0.96	0.86	0.84	0.86	0.83	0.83	0.82	0.81	0.82	0.83	0.85	0.81	0.93	0.93	0.81	4
	(0.94)	(0.87)	(0.81)	(0.84)	(0.84)	(0.83)	(0.82)	(0.81)	(0.83)	(0.83)	(0.88)	(0.80)	(0.90)	(0.95)	(0.81)	(1)
LASSO	0.83	0.77	0.73	0.77	0.76	0.76	0.75	0.75	0.78	0.80	0.81	0.73	0.75	0.80	0.79	15
	(0.79)	(0.74)	(0.67)	(0.74)	(0.77)	(0.72)	(0.69)	(0.68)	(0.73)	(0.76)	(0.78)	(0.68)	(0.74)	(0.82)	(0.76)	(13)
adaLASSO	0.84	0.77	0.74	0.78	0.78	0.77	0.76	0.77	0.79	0.81	0.83	0.73	0.76	0.82	0.83	14
	(0.80)	(0.76)	(0.69)	(0.77)	(0.78)	(0.74)	(0.71)	(0.70)	(0.74)	(0.78)	(0.81)	(0.70)	(0.76)	(0.85)	(0.80)	(11)
ElNet	0.84	0.76	0.72	0.76	0.76	0.75	0.74	0.74	0.78	0.80	0.81	0.72	0.75	0.78	0.78	15
	(0.80)	(0.74)	(0.67)	(0.73)	(0.76)	(0.72)	(0.68)	(0.67)	(0.74)	(0.76)	(0.78)	(0.68)	(0.74)	(0.81)	(0.75)	(14)
adaElnet	0.84	0.78	0.74	0.78	0.79	0.77	0.76	0.76	0.79	0.81	0.82	0.73	0.77	0.82	0.83	15
	(0.81)	(0.76)	(0.68)	(0.76)	(0.78)	(0.74)	(0.71)	(0.69)	(0.75)	(0.78)	(0.81)	(0.70)	(0.76)	(0.85)	(0.80)	(11)
RR	0.87	0.76	0.73	0.77	0.76	0.75	0.74	0.73	0.76	0.77	0.78	0.71	0.76	0.78	0.77	15
	(0.84)	(0.74)	(0.67)	(0.75)	(0.78)	(0.75)	(0.69)	(0.68)	(0.74)	(0.74)	(0.76)	(0.70)	(0.75)	(0.84)	(0.76)	(13)
BVAR	0.85	0.79	0.75	0.78	0.77	0.77	0.76	0.76	0.79	0.81	0.82	0.76	0.80	0.85	0.85	14
	(0.83)	(0.77)	(0.70)	(0.76)	(0.77)	(0.74)	(0.69)	(0.70)	(0.75)	(0.76)	(0.78)	(0.71)	(0.78)	(0.87)	(0.79)	(14)
Bagging	0.88	0.76	0.74	0.81	0.81	0.79	0.82	0.79	0.81	0.80	0.81	0.73	0.74	0.74	0.68	13
	(0.87)	(0.75)	(0.69)	(0.82)	(0.88)	(0.83)	(0.80)	(0.80)	(0.84)	(0.80)	(0.82)	(0.72)	(0.74)	(0.83)	(0.69)	(6)
CSR	0.86	0.77	0.75	0.79	0.79	0.79	0.79	0.77	0.81	0.84	0.86	0.80	0.78	0.84	0.92	12
	(0.81)	(0.76)	(0.68)	(0.79)	(0.80)	(0.77)	(0.73)	(0.71)	(0.77)	(0.81)	(0.84)	(0.77)	(0.77)	(0.89)	(0.87)	(8)
JMA	0.96	0.84	0.78	0.85	0.83	0.82	0.84	0.82	0.86	0.83	0.86	0.77	0.77	0.73	0.72	9
	(0.92)	(0.84)	(0.75)	(0.92)	(0.93)	(0.89)	(0.82)	(0.83)	(0.89)	(0.87)	(0.91)	(0.83)	(0.77)	(0.81)	(0.72)	(2)
Factor	0.89	0.83	0.80	0.83	0.82	0.81	0.81	0.81	0.83	0.83	0.84	0.80	0.84	0.91	0.95	5
	(0.85)	(0.82)	(0.75)	(0.82)	(0.83)	(0.80)	(0.78)	(0.77)	(0.80)	(0.80)	(0.81)	(0.77)	(0.83)	(0.93)	(0.86)	(1)
T. Factor	0.88	0.80	0.76	0.80	0.80	0.79	0.78	0.78	0.79	0.80	0.82	0.78	0.81	0.87	0.91	8
	(0.88)	(0.81)	(0.72)	(0.78)	(0.82)	(0.80)	(0.74)	(0.74)	(0.77)	(0.78)	(0.80)	(0.76)	(0.81)	(0.90)	(0.86)	(2)
B. Factor	1.00	0.80	0.77	0.81	0.79	0.80	0.80	0.79	0.82	0.84	0.85	0.79	0.86	0.91	0.87	12
	(0.98)	(0.79)	(0.73)	(0.82)	(0.84)	(0.82)	(0.79)	(0.78)	(0.85)	(0.84)	(0.87)	(0.78)	(0.90)	(1.08)	(0.92)	(3)
RF	0.88	0.76	**0.71**	0.74	**0.72**	**0.71**	0.70	0.70	**0.73**	**0.74**	**0.76**	**0.70**	**0.73**	**0.71**	**0.67**	15
	(0.82)	(0.73)	(0.66)	(0.73)	(0.74)	(0.71)	(0.67)	(0.65)	(0.70)	**(0.71)**	**(0.72)**	**(0.64)**	**(0.71)**	**(0.71)**	**(0.63)**	(15)
Mean	0.85	0.76	0.74	0.77	0.77	0.76	0.75	0.74	0.76	0.77	0.78	0.72	0.76	0.80	0.81	15
	(0.81)	(0.75)	(0.68)	(0.75)	(0.77)	(0.74)	(0.71)	(0.68)	(0.73)	(0.73)	(0.76)	(0.69)	(0.76)	(0.83)	(0.78)	(13)
T.Mean	0.84	0.76	0.73	0.77	0.76	0.75	0.74	0.74	0.76	0.78	0.79	0.72	0.76	0.80	0.80	15
	(0.80)	(0.75)	(0.67)	(0.75)	(0.77)	(0.73)	(0.69)	(0.67)	(0.72)	(0.74)	(0.76)	(0.68)	(0.75)	(0.82)	(0.77)	(14)
Median	0.84	0.76	0.73	0.77	0.76	0.76	0.74	0.74	0.76	0.78	0.79	0.72	0.76	0.80	0.80	15
	(0.80)	(0.75)	(0.68)	(0.75)	(0.76)	(0.74)	(0.69)	(0.67)	(0.72)	(0.74)	(0.76)	(0.68)	(0.75)	(0.82)	(0.77)	(14)
RF/OLS	**0.83**	0.76	0.74	0.78	0.76	0.76	0.75	0.74	0.77	0.78	0.81	0.74	0.76	0.80	0.82	15
	(0.80)	(0.75)	(0.68)	(0.76)	(0.78)	(0.75)	(0.70)	(0.69)	(0.76)	(0.77)	(0.81)	(0.74)	(0.76)	(0.84)	(0.81)	(13)
adaLASSO/RF	0.86	**0.75**	0.71	**0.73**	0.73	0.72	**0.69**	**0.70**	0.74	0.76	0.78	0.71	0.73	0.72	0.69	15
	(0.81)	**(0.73)**	**(0.65)**	**(0.73)**	**(0.74)**	**(0.70)**	**(0.66)**	**(0.64)**	**(0.70)**	(0.72)	(0.75)	(0.67)	(0.72)	(0.75)	(0.67)	(14)
RMSE count	15	16	18	18	20	17	15	15	18	20	17	13	15	17	15	
MAE count	(12)	(15)	(15)	(9)	(12)	(12)	(10)	(13)	(13)	(17)	(10)	(13)	(15)	(1)	(16)	

TABLE S.22. Forecasting Results CPI-Core: Summary statistics for the out-of-sample period from 1990–2015

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	ave.	ave.	ave.	max.	max.	max.	min.	min.	min.	# min.	# min.	# min.	ave. p.v.	ave. p.v.	ave. p.v.	ave. p.v.	p.v.
Model	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	sq	abs	Tmax sq	Tmax abs	m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2	2	2	0.13	0.12	0.16	0.15	1
AR	0.85	0.87	0.76	1.96	2.09	1.59	0.47	0.45	0.37	0	0	0	0.13	0.08	0.35	0.28	0.21
UCSV	0.88	0.88	0.87	1.38	1.38	1.33	0.73	0.74	0.65	0	0	0	0.12	0.11	0.16	0.14	0.00
LASSO	0.89	0.90	0.76	1.90	2.06	1.30	0.54	0.52	0.41	0	0	0	0.00	0.00	0.03	0.02	0.00
adaLASSO	0.83	0.82	0.76	1.64	1.62	1.36	0.51	0.48	0.39	0	0	0	0.02	0.02	0.18	0.19	0.00
ElNet	0.90	0.91	0.77	1.94	2.12	1.42	0.55	0.53	0.43	0	0	0	0.00	0.00	0.02	0.01	0.00
adaElnet	0.84	0.83	0.77	1.66	1.69	1.31	0.50	0.48	0.41	0	0	0	0.00	0.00	0.14	0.14	0.00
RR	0.88	0.89	0.81	1.63	1.69	1.66	0.59	0.58	0.52	0	0	0	0.01	0.00	0.07	0.08	0.00
BVAR	1.13	1.14	0.92	2.97	3.26	2.14	0.70	0.67	0.55	0	0	0	0.00	0.00	0.00	0.00	0.00
Bagging	0.78	0.75	0.73	1.33	1.31	1.41	0.48	0.46	0.43	5	5	3	0.46	0.47	0.65	0.68	1
CSR	0.81	0.81	0.73	1.77	1.78	1.38	0.46	0.45	0.40	1	0	1	0.43	0.36	0.49	0.45	1
JMA	0.90	0.87	0.81	1.50	1.48	1.51	0.55	0.53	0.44	0	0	0	0.00	0.01	0.13	0.17	0.00
Factor	0.89	0.90	0.81	2.07	2.13	1.86	0.47	0.46	0.38	0	0	0	0.01	0.01	0.18	0.18	0.00
T. Factor	0.92	0.92	0.85	2.25	2.25	2.29	0.47	0.47	0.38	0	0	0	0.01	0.01	0.23	0.20	0.00
B. Factor	1.10	1.12	1.08	3.03	3.19	3.44	0.64	0.64	0.53	0	0	0	0.00	0.00	0.01	0.00	0.00
RF	0.75	0.75	0.67	1.36	1.45	1.11	0.43	0.42	0.35	6	5	7	0.68	0.62	0.73	0.69	1
Mean	0.80	0.80	0.73	1.59	1.66	1.36	0.50	0.49	0.40	0	0	0	0.32	0.25	0.38	0.34	1
Median	0.81	0.81	0.72	1.64	1.73	1.36	0.49	0.47	0.39	0	0	0	0.11	0.04	0.27	0.26	1
T.Mean	0.81	0.81	0.72	1.64	1.73	1.32	0.49	0.47	0.40	0	0	0	0.11	0.07	0.26	0.28	0.99
RF/OLS	0.78	0.77	0.74	1.51	1.48	1.36	0.46	0.44	0.39	0	0	0	0.39	0.35	0.51	0.51	1
adaLASSO/RF	0.77	0.76	0.69	1.40	1.43	1.29	0.45	0.43	0.36	1	3	2	0.37	0.45	0.53	0.58	0.97

TABLE S.23. Forecasting Results CPI-Core: Summary statistics for the out-of-sample period from 1990–2000

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	ave.	ave.	ave.	max.	max.	max.	min.	min.	min.	# min.	# min.	# min.	ave. p.v.	ave. p.v.	ave. p.v.	ave. p.v.	p.v.
Model	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	RMSE	MAE	MAD	sq	abs	Tmax sq	Tmax abs	m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2	2	2	0.16	0.14	0.21	0.20	1
AR	0.89	0.92	0.79	2.18	2.42	1.80	0.50	0.48	0.37	0	0	0	0.09	0.05	0.32	0.27	0.00
UCSV	0.87	0.87	0.90	1.61	1.75	2.10	0.63	0.60	0.48	0	0	1	0.12	0.12	0.25	0.27	0.00
LASSO	0.91	0.94	0.78	1.96	2.27	1.52	0.59	0.56	0.46	0	0	0	0.00	0.00	0.10	0.11	0.00
adaLASSO	0.82	0.83	0.76	1.45	1.54	1.35	0.56	0.53	0.39	0	0	0	0.14	0.12	0.35	0.30	0.02
ElNet	0.92	0.96	0.80	2.05	2.38	1.72	0.59	0.56	0.47	0	0	0	0.00	0.00	0.12	0.11	0.00
adaElnet	0.83	0.85	0.78	1.52	1.67	1.39	0.55	0.52	0.41	0	0	0	0.10	0.08	0.27	0.24	0.01
RR	0.86	0.88	0.84	1.57	1.73	1.88	0.59	0.57	0.48	0	0	0	0.05	0.03	0.23	0.24	0.00
BVAR	1.26	1.34	0.84	3.79	4.59	1.95	0.72	0.68	0.51	0	0	0	0.00	0.00	0.00	0.00	0.00
Bagging	0.76	0.74	0.72	1.26	1.25	1.45	0.52	0.47	0.37	6	8	6	0.52	0.55	0.73	0.69	1
CSR	0.79	0.80	0.69	1.65	1.79	1.45	0.47	0.45	0.35	4	1	4	0.61	0.56	0.63	0.60	1
JMA	0.89	0.87	0.84	1.48	1.54	1.78	0.57	0.54	0.44	0	0	0	0.04	0.07	0.32	0.33	0.02
Factor	0.98	0.99	0.89	2.53	2.69	2.42	0.52	0.50	0.35	0	0	0	0.01	0.02	0.20	0.20	0.00
T. Factor	1.07	1.10	0.86	2.99	3.27	2.42	0.52	0.51	0.36	0	0	0	0.01	0.01	0.16	0.13	0.00
B. Factor	1.10	1.12	1.03	3.09	3.16	3.41	0.63	0.62	0.47	0	0	0	0.00	0.00	0.09	0.12	0.00
RF	0.77	0.78	0.70	1.43	1.60	1.29	0.46	0.43	0.34	3	2	1	0.54	0.49	0.69	0.57	0.99
Mean	0.82	0.84	0.74	1.70	1.89	1.37	0.53	0.51	0.42	0	0	0	0.18	0.15	0.36	0.27	0.83
T.Mean	0.83	0.85	0.74	1.74	1.94	1.27	0.52	0.50	0.39	0	0	0	0.05	0.06	0.35	0.24	0.33
Median	0.83	0.85	0.74	1.72	1.91	1.27	0.52	0.50	0.39	0	0	0	0.06	0.09	0.34	0.24	0.26
RF/OLS	0.77	0.78	0.73	1.40	1.49	1.30	0.49	0.46	0.36	0	0	0	0.36	0.38	0.58	0.47	0.84
adaLASSO/RF	0.79	0.78	0.74	1.42	1.45	1.46	0.49	0.43	0.36	0	2	1	0.40	0.49	0.59	0.58	0.77

Table S.24. Forecasting Results CPI-Core: Summary statistics for the out-of-sample period from 2001–2015

The table reports for each model a number of different summary statistics across all the forecasting horizons, including the accumulated three-, six-, and twelve-month horizons. Columns (1), (2) and (3) report the average root mean square error (RMSE), the average mean absolute error (MAE) and the average median absolute deviation (MAD). Columns (4), (5), and (6) report, respectively, the maximum RMSE, MAE and MAD over the forecasting horizons. Columns (7), (8), and (9) report, respectively, the minimum RMSE, MAE and MAD over the 15 different horizons considered. Columns (10), (11) and (12) report the number of times (across horizons) each model achieved the lowest RMSE, MAE, and MAD, respectively. Columns (13) and (14) show the average p values of the superior predictive ability (SPA) test proposed by Hansen (2005). Columns (15) and (16) present for square and absolute losses, the average p-values for the Model Confidence Sets (MCS) based on the $\mathsf{t}_{\mathsf{max}}$ statistic as described in Hansen et al. (2011). Column (17) displays the p-value of the multi-horizon MCS proposed by Quaedvlieg (2017). The test is based on the squared errors only.

	Forecasting Precision												Sup. Pred. Ability		Model Confidence Set		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Model	ave. RMSE	ave. MAE	ave. MAD	max. RMSE	max. MAE	max. MAD	min. RMSE	min. MAE	min. MAD	# min. RMSE	# min. MAE	# min. MAD	ave. p.v. sq	ave. p.v. abs	ave. p.v. Tmax sq	ave. p.v. Tmax abs	p.v. m.h. sq.
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1	1	0	0.12	0.11	0.15	0.13	1
AR	0.82	0.82	0.73	1.80	1.86	1.22	0.43	0.43	0.41	0	0	1	0.24	0.25	0.54	0.52	0.35
UCSV	0.89	0.89	0.89	1.09	1.09	1.13	0.74	0.75	0.73	1	1	2	0.16	0.18	0.29	0.31	1
LASSO	0.87	0.87	0.76	1.85	1.91	1.32	0.49	0.49	0.42	0	0	0	0.00	0.00	0.09	0.08	0.00
adaLASSO	0.83	0.81	0.74	1.74	1.68	1.24	0.45	0.44	0.42	0	0	0	0.09	0.15	0.37	0.45	0.22
ElNet	0.88	0.88	0.76	1.86	1.93	1.33	0.52	0.51	0.46	0	0	0	0.00	0.00	0.08	0.05	0.00
adaElnet	0.84	0.82	0.75	1.74	1.71	1.26	0.45	0.44	0.44	0	0	0	0.04	0.11	0.31	0.40	0.12
RR	0.89	0.89	0.81	1.67	1.66	1.66	0.58	0.58	0.57	0	0	0	0.00	0.00	0.10	0.09	0.00
BVAR	1.01	1.00	0.82	2.29	2.35	1.58	0.68	0.66	0.57	0	0	0	0.00	0.00	0.04	0.01	0.00
Bagging	0.79	0.77	0.74	1.38	1.35	1.34	0.45	0.44	0.46	3	5	1	0.46	0.48	0.75	0.75	1
CSR	0.83	0.81	0.75	1.84	1.77	1.39	0.45	0.44	0.43	0	0	0	0.34	0.31	0.52	0.55	0.95
JMA	0.91	0.87	0.78	1.52	1.46	1.41	0.53	0.50	0.45	0	0	0	0.02	0.03	0.25	0.29	0.00
Factor	0.83	0.83	0.76	1.71	1.74	1.30	0.43	0.43	0.44	0	0	0	0.13	0.16	0.43	0.47	0.01
T. Factor	0.79	0.78	0.76	1.61	1.56	1.34	0.42	0.43	0.44	0	1	0	0.39	0.37	0.68	0.68	0.37
B. Factor	1.10	1.12	1.14	2.99	3.20	3.46	0.65	0.66	0.68	0	0	0	0.00	0.00	0.03	0.02	0.00
RF	0.74	0.73	0.66	1.32	1.35	1.21	0.41	0.41	0.41	6	6	8	0.76	0.78	0.83	0.84	1
Mean	0.78	0.77	0.71	1.51	1.50	1.20	0.47	0.46	0.41	2	0	0	0.45	0.47	0.61	0.61	1
T.Mean	0.79	0.78	0.71	1.58	1.58	1.22	0.46	0.45	0.41	0	0	0	0.18	0.19	0.52	0.49	1
Median	0.79	0.79	0.71	1.60	1.60	1.21	0.46	0.45	0.41	0	0	0	0.17	0.20	0.47	0.49	0.51
RF/OLS	0.78	0.77	0.73	1.57	1.47	1.26	0.44	0.42	0.41	0	0	0	0.57	0.52	0.73	0.71	1
adaLASSO/RF	0.76	0.74	0.67	1.39	1.41	1.10	0.42	0.42	0.40	2	1	3	0.47	0.58	0.79	0.79	1

Table S.25. Forecasting Errors for the CPI-Core from 1990 to 2015

The table shows the root mean squared error (RMSE) and, between parenthesis, the mean absolute errors (MAE) for all models relative to the Random Walk (RW). The error measures were calculated from 132 rolling windows covering the 1990-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss function. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table reports how many models were included in the MCS for square and absolute losses.

Consumer Price Index (Core) 1990–2015															
	Forecasting Horizon														
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	**1.00**	2
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	**(1.00)**	(1.00)	(1.00)	**(1.00)**	(2)
AR	0.87	0.69	0.59	0.62	0.79	0.93	0.90	0.68	0.47	0.49	0.67	1.21	0.73	1.21	1.96	4
	(0.92)	(0.70)	(0.59)	(0.62)	(0.80)	(0.91)	(0.85)	(0.63)	(0.45)	(0.49)	(0.70)	(1.27)	(0.74)	(1.24)	(2.09)	(3)
UCSV	0.96	0.80	0.76	0.77	0.86	0.96	0.93	0.84	0.76	0.73	0.82	1.38	0.78	0.91	1.02	2
	(1.03)	(0.80)	(0.74)	(0.76)	(0.87)	(0.93)	(0.90)	(0.80)	(0.74)	(0.74)	(0.84)	(1.38)	(0.76)	(0.88)	(1.01)	(2)
LASSO	0.85	0.66	0.62	0.69	0.86	0.97	0.90	0.72	0.54	0.58	0.80	1.39	0.68	1.14	1.90	0
	(0.92)	(0.66)	(0.60)	(0.68)	(0.85)	(0.93)	(0.86)	(0.68)	(0.52)	(0.57)	(0.83)	(1.43)	(0.68)	(1.17)	(2.06)	(0)
adaLASSO	0.84	0.65	0.59	0.66	0.84	0.94	0.89	0.73	0.51	0.52	0.72	1.24	0.66	1.06	1.64	0
	(0.89)	(0.65)	(0.57)	(0.65)	(0.82)	(0.90)	(0.85)	(0.68)	(0.48)	(0.51)	(0.74)	(1.27)	(0.64)	(1.02)	(1.62)	(1)
ElNet	0.86	0.67	0.61	0.68	0.86	0.98	0.89	0.72	0.55	0.59	0.83	1.46	0.69	1.15	1.94	0
	(0.92)	(0.67)	(0.60)	(0.67)	(0.85)	(0.94)	(0.85)	(0.68)	(0.53)	(0.58)	(0.85)	(1.49)	(0.69)	(1.19)	(2.12)	(0)
adaElnet	0.85	0.66	0.60	0.68	0.83	0.94	0.90	0.72	0.50	0.52	0.73	1.26	0.67	1.07	1.66	0
	(0.90)	(0.66)	(0.58)	(0.67)	(0.82)	(0.90)	(0.85)	(0.68)	(0.48)	(0.52)	(0.75)	(1.30)	(0.66)	(1.04)	(1.69)	(0)
RR	0.92	0.66	0.61	0.67	0.85	0.95	0.84	0.68	0.59	0.62	0.87	1.56	0.67	1.04	1.63	0
	(0.99)	(0.67)	(0.60)	(0.66)	(0.85)	(0.93)	(0.81)	(0.65)	(0.58)	(0.63)	(0.92)	(1.62)	(0.67)	(1.05)	(1.69)	(1)
BVAR	0.91	0.71	0.70	0.79	1.01	1.13	1.01	0.83	0.75	0.80	1.10	1.93	0.76	1.50	2.97	0
	(0.97)	(0.71)	(0.67)	(0.76)	(0.99)	(1.08)	(0.96)	(0.79)	(0.73)	(0.80)	(1.15)	(1.99)	(0.75)	(1.56)	(3.26)	(0)
Bagging	**0.81**	**0.57**	**0.55**	0.67	0.91	0.96	0.81	0.65	0.48	0.50	0.71	1.28	**0.54**	**0.90**	1.33	9
	(0.81)	**(0.56)**	**(0.52)**	(0.65)	(0.87)	(0.88)	(0.77)	(0.62)	(0.46)	(0.49)	(0.73)	(1.28)	**(0.52)**	**(0.85)**	(1.31)	(9)
CSR	0.82	0.65	0.57	0.62	**0.78**	0.89	0.85	0.66	0.46	0.48	0.65	1.21	0.67	1.12	1.77	8
	(0.86)	(0.65)	(0.56)	(0.60)	(0.77)	(0.87)	(0.82)	(0.61)	(0.45)	(0.47)	(0.68)	(1.25)	(0.65)	(1.09)	(1.78)	(7)
JMA	0.91	0.68	0.68	0.75	1.05	1.06	0.96	0.74	0.57	0.55	0.82	1.45	0.64	1.16	1.50	0
	(0.92)	(0.65)	(0.65)	(0.74)	(0.98)	(0.99)	(0.91)	(0.68)	(0.53)	(0.53)	(0.81)	(1.46)	(0.60)	(1.11)	(1.48)	(2)
Factor	0.90	0.71	0.62	0.68	0.86	0.96	0.90	0.73	0.47	0.52	0.73	1.26	0.74	1.26	2.07	1
	(0.95)	(0.71)	(0.61)	(0.67)	(0.87)	(0.93)	(0.86)	(0.68)	(0.46)	(0.51)	(0.75)	(1.29)	(0.74)	(1.29)	(2.13)	(1)
T. Factor	0.90	0.72	0.64	0.69	0.86	0.97	0.92	0.75	0.47	0.51	0.71	1.25	0.78	1.38	2.25	1
	(0.94)	(0.72)	(0.62)	(0.68)	(0.86)	(0.95)	(0.88)	(0.69)	(0.47)	(0.51)	(0.75)	(1.31)	(0.76)	(1.35)	(2.25)	(2)
B. Factor	0.94	0.70	0.69	0.79	1.02	1.10	0.98	0.77	0.64	0.72	0.99	1.67	0.80	1.64	3.03	0
	(1.00)	(0.70)	(0.67)	(0.78)	(1.02)	(1.07)	(0.94)	(0.75)	(0.64)	(0.73)	(1.05)	(1.74)	(0.80)	(1.69)	(3.19)	(0)
RF	0.84	0.61	0.56	0.62	0.78	**0.87**	**0.80**	**0.64**	**0.43**	**0.45**	**0.63**	1.14	0.60	0.91	1.36	10
	(0.89)	(0.61)	(0.54)	(0.60)	(0.78)	**(0.84)**	**(0.77)**	**(0.61)**	**(0.42)**	(0.45)	**(0.66)**	(1.16)	(0.60)	(0.92)	(1.45)	(11)
Mean	0.81	0.64	0.58	0.64	0.79	0.88	0.81	0.66	0.50	0.52	0.69	1.19	0.64	1.02	1.59	5
	(0.86)	(0.63)	(0.57)	(0.63)	(0.79)	(0.86)	(0.78)	(0.62)	(0.49)	(0.52)	(0.72)	(1.22)	(0.63)	(1.02)	(1.66)	(5)
T.Mean	0.83	0.64	0.58	0.63	0.79	0.89	0.83	0.67	0.49	0.51	0.70	1.21	0.65	1.03	1.64	2
	(0.88)	(0.65)	(0.57)	(0.63)	(0.79)	(0.87)	(0.80)	(0.63)	(0.47)	(0.51)	(0.72)	(1.24)	(0.65)	(1.04)	(1.73)	(3)
Median	0.83	0.65	0.58	0.64	0.79	0.89	0.84	0.68	0.49	0.51	0.70	1.22	0.66	1.03	1.64	2
	(0.88)	(0.65)	(0.57)	(0.63)	(0.79)	(0.87)	(0.80)	(0.64)	(0.47)	(0.51)	(0.72)	(1.25)	(0.65)	(1.04)	(1.73)	(4)
RF/OLS	0.82	0.63	0.57	0.64	0.80	0.89	0.81	0.65	0.46	0.48	0.66	1.19	0.63	0.99	1.51	8
	(0.88)	(0.63)	(0.55)	(0.62)	(0.80)	(0.86)	(0.77)	(0.61)	(0.44)	(0.48)	(0.69)	(1.22)	(0.62)	(0.94)	(1.48)	(7)
adaLASSO/RF	0.84	0.62	0.56	**0.61**	0.78	0.91	0.89	0.69	0.45	0.46	0.65	1.16	0.61	0.93	1.40	8
	(0.89)	(0.62)	(0.54)	**(0.60)**	**(0.76)**	(0.86)	(0.82)	(0.64)	(0.43)	**(0.45)**	(0.66)	(1.15)	(0.60)	(0.91)	(1.43)	(10)
RMSE count	3	1	5	4	8	8	4	5	8	2	5	1	1	5	2	
MAE count	(10)	(1)	(3)	(3)	(7)	(8)	(4)	(12)	(8)	(2)	(3)	(1)	(1)	(5)	(2)	

Table S.26. Forecasting Errors for the CPI-Core from 1990 to 2000

The table shows the root mean squared error (RMSE) and, between parenthesis, the mean absolute errors (MAE) for all models relative to the Random Walk (RW). The error measures were calculated from 132 rolling windows covering the 1990-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss function. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table reports how many models were included in the MCS for square and absolute losses.

Consumer Price Index (Core) 1990–2000																
	Forecasting Horizon															
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	**1.00**	3
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	**(1.00)**	(1.00)	(1.00)	**(1.00)**	(3)
AR	0.88	0.69	0.59	0.62	0.79	0.96	0.91	0.71	0.50	0.54	0.71	1.26	0.74	1.36	2.16	5
	(0.92)	(0.70)	(0.58)	(0.62)	(0.82)	(0.96)	(0.90)	(0.65)	(0.48)	(0.53)	(0.76)	(1.43)	(0.73)	(1.40)	(2.38)	(4)
UCSV	0.91	0.68	0.64	0.72	0.90	1.04	0.91	0.75	0.66	0.68	0.90	1.61	0.63	0.89	1.06	3
	(0.98)	(0.67)	(0.60)	(0.69)	(0.93)	(1.02)	(0.91)	(0.70)	(0.61)	(0.70)	(0.95)	(1.75)	(0.60)	**(0.84)**	(1.03)	(2)
LASSO	0.85	0.65	0.61	0.67	0.87	1.01	0.91	0.73	0.59	0.63	0.87	1.44	0.68	1.13	1.91	0
	(0.91)	(0.64)	(0.58)	(0.65)	(0.88)	(0.98)	(0.90)	(0.68)	(0.56)	(0.63)	(0.92)	(1.59)	(0.66)	(1.21)	(2.18)	(1)
adaLASSO	0.85	0.63	0.56	0.63	0.83	0.97	0.90	0.75	0.56	0.56	0.77	1.27	0.65	0.93	1.39	4
	(0.90)	(0.63)	(0.53)	(0.61)	(0.83)	(0.95)	(0.90)	(0.70)	(0.53)	(0.56)	(0.80)	(1.38)	(0.62)	(0.93)	(1.47)	(4)
ElNet	0.85	0.66	0.61	0.68	0.87	1.02	0.90	0.73	0.59	0.64	0.89	1.55	0.67	1.16	2.00	0
	(0.91)	(0.65)	(0.58)	(0.66)	(0.88)	(0.99)	(0.90)	(0.67)	(0.56)	(0.65)	(0.94)	(1.70)	(0.65)	(1.24)	(2.30)	(0)
adaElnet	0.85	0.64	0.58	0.65	0.82	0.97	0.90	0.74	0.55	0.57	0.79	1.32	0.65	0.94	1.47	2
	(0.91)	(0.64)	(0.54)	(0.63)	(0.83)	(0.95)	(0.90)	(0.69)	(0.52)	(0.58)	(0.83)	(1.45)	(0.62)	(0.94)	(1.61)	(2)
RR	0.88	0.65	0.60	0.66	0.84	0.99	0.85	0.69	0.59	0.63	0.86	1.51	0.63	0.99	1.52	2
	(0.95)	(0.65)	(0.57)	(0.63)	(0.85)	(0.97)	(0.85)	(0.65)	(0.58)	(0.65)	(0.92)	(1.62)	(0.61)	(1.02)	(1.66)	(2)
BVAR	0.91	0.72	0.72	0.84	1.09	1.28	1.10	0.90	0.81	0.88	1.19	2.04	0.78	1.90	3.73	0
	(0.97)	(0.71)	(0.68)	(0.80)	(1.10)	(1.26)	(1.10)	(0.85)	(0.79)	(0.90)	(1.27)	(2.26)	(0.78)	(2.13)	(4.49)	(0)
Bagging	**0.77**	**0.57**	0.55	0.65	0.82	0.93	**0.79**	**0.65**	0.52	0.56	0.74	1.19	**0.52**	**0.88**	1.22	11
	(0.79)	**(0.55)**	**(0.50)**	(0.62)	(0.82)	**(0.87)**	**(0.77)**	**(0.59)**	(0.47)	(0.54)	(0.74)	(1.25)	**(0.49)**	(0.84)	(1.19)	(11)
CSR	0.81	0.65	**0.55**	**0.59**	**0.76**	**0.90**	0.83	0.66	0.47	0.49	0.66	1.15	0.64	1.06	1.56	10
	(0.85)	(0.64)	(0.53)	**(0.57)**	(0.77)	(0.89)	(0.82)	(0.61)	(0.45)	(0.48)	(0.67)	(1.22)	(0.62)	(1.08)	(1.68)	(10)
JMA	0.85	0.72	0.62	0.73	1.00	1.11	0.96	0.70	0.58	0.57	0.78	1.44	0.63	1.19	1.40	3
	(0.86)	(0.68)	(0.58)	(0.71)	(0.95)	(1.04)	(0.92)	(0.63)	(0.54)	(0.56)	(0.77)	(1.54)	(0.56)	(1.17)	(1.41)	(3)
Factor	0.88	0.75	0.65	0.70	0.89	1.04	0.93	0.82	0.52	0.57	0.78	1.36	0.77	1.50	2.49	1
	(0.91)	(0.74)	(0.61)	(0.68)	(0.91)	(1.03)	(0.92)	(0.77)	(0.50)	(0.57)	(0.82)	(1.48)	(0.75)	(1.52)	(2.63)	(0)
T. Factor	0.92	0.81	0.72	0.74	0.91	1.07	0.99	0.86	0.52	0.58	0.78	1.35	0.90	1.86	2.91	1
	(0.96)	(0.80)	(0.69)	(0.72)	(0.94)	(1.08)	(0.99)	(0.81)	(0.51)	(0.59)	(0.83)	(1.53)	(0.88)	(1.91)	(3.14)	(0)
B. Factor	0.92	0.69	0.68	0.80	1.03	1.15	0.97	0.77	0.63	0.73	0.96	1.55	0.77	1.76	2.96	0
	(0.98)	(0.69)	(0.66)	(0.77)	(1.05)	(1.13)	(0.96)	(0.72)	(0.62)	(0.74)	(1.03)	(1.70)	(0.76)	(1.76)	(2.93)	(0)
RF	0.83	0.61	0.56	0.62	0.79	0.92	0.82	0.67	**0.46**	**0.48**	**0.64**	1.14	0.60	1.01	1.40	12
	(0.90)	(0.61)	(0.54)	(0.60)	(0.79)	(0.90)	(0.81)	(0.62)	**(0.43)**	**(0.47)**	(0.67)	(1.22)	(0.59)	(1.03)	(1.57)	(8)
Mean	0.81	0.64	0.58	0.63	0.80	0.93	0.83	0.69	0.53	0.56	0.74	1.24	0.64	1.06	1.65	5
	(0.86)	(0.63)	(0.55)	(0.61)	(0.82)	(0.92)	(0.83)	(0.64)	(0.51)	(0.56)	(0.77)	(1.35)	(0.62)	(1.09)	(1.81)	(2)
T.Mean	0.82	0.65	0.58	0.63	0.80	0.94	0.84	0.69	0.52	0.55	0.74	1.26	0.65	1.07	1.68	5
	(0.87)	(0.64)	(0.55)	(0.62)	(0.82)	(0.93)	(0.84)	(0.64)	(0.50)	(0.56)	(0.78)	(1.38)	(0.63)	(1.10)	(1.86)	(1)
Median	0.83	0.65	0.58	0.63	0.80	0.93	0.85	0.69	0.52	0.56	0.74	1.26	0.65	1.06	1.66	4
	(0.88)	(0.64)	(0.56)	(0.62)	(0.81)	(0.92)	(0.84)	(0.64)	(0.50)	(0.56)	(0.78)	(1.39)	(0.64)	(1.09)	(1.83)	(2)
RF/OLS	0.83	0.63	0.56	0.62	0.79	0.93	0.83	0.68	0.49	0.50	0.68	1.18	0.61	0.92	1.35	9
	(0.89)	(0.63)	(0.53)	(0.59)	(0.80)	(0.90)	(0.83)	(0.64)	(0.46)	(0.50)	(0.69)	(1.24)	(0.59)	(0.92)	(1.42)	(8)
adaLASSO/RF	0.85	0.64	0.55	0.61	0.77	0.93	0.91	0.72	0.49	0.49	0.66	1.17	0.63	0.99	1.37	8
	(0.93)	(0.64)	(0.51)	(0.58)	**(0.77)**	(0.89)	(0.87)	(0.65)	(0.43)	(0.47)	**(0.66)**	(1.21)	(0.62)	(0.98)	(1.39)	(9)
RMSE count	9	1	8	9	9	8	3	10	8	3	3	1	5	9	2	
MAE count	(3)	(13)	(5)	(7)	(6)	(5)	(1)	(8)	(6)	(3)	(3)	(1)	(1)	(8)	(2)	

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Table S.27. Forecasting Errors for the CPI-Core from 2001 to 2015

The table shows the root mean squared error (RMSE) and, between parenthesis, the mean absolute errors (MAE) for all models relative to the Random Walk (RW). The error measures were calculated from 132 rolling windows covering the 1990-2015 period and 180 rolling windows covering the 2001-2015 period. Values in bold show the most accurate model in each horizon. Cells in gray (blue) show the models included in the 50% model confidence set (MCS) using the squared error (absolute error) as loss function. The MCSs were constructed based on the maximum t-statistic. The last column in the table reports in how many horizons the row model was included in the MCS for square (absolute) loss. The last two rows in the table reports how many models were included in the MCS for square and absolute losses.

Consumer Price Index (Core) 2001–2015															
	Forecasting Horizon														
RMSE/(MAE)	1	2	3	4	5	6	7	8	9	10	11	12	3m	6m	12m	RMSE count (MAE count)
RW	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	**1.00**	1.00	1.00	1.00	3
	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	**(1.00)**	(1.00)	(1.00)	(1.00)	(1)
AR	0.86	0.68	0.60	0.62	0.79	0.90	0.89	0.66	0.43	0.45	0.62	1.16	0.72	1.13	1.80	8
	(0.91)	(0.69)	(0.59)	(0.63)	(0.78)	(0.87)	(0.81)	(0.61)	(0.43)	(0.45)	(0.66)	(1.15)	(0.74)	(1.16)	(1.86)	(8)
UCSV	1.00	0.90	0.85	0.81	0.83	0.89	0.94	0.90	0.84	0.78	0.74	1.09	0.87	0.91	**0.99**	5
	(1.07)	(0.91)	(0.85)	(0.82)	(0.82)	(0.87)	(0.90)	(0.87)	(0.84)	(0.77)	(0.75)	(1.09)	(0.88)	(0.91)	**(0.99)**	(5)
LASSO	0.86	0.66	0.62	0.71	0.85	0.94	0.89	0.71	0.49	0.53	0.73	1.34	0.69	1.15	1.85	0
	(0.92)	(0.68)	(0.62)	(0.71)	(0.84)	(0.90)	(0.82)	(0.69)	(0.49)	(0.52)	(0.75)	(1.31)	(0.70)	(1.17)	(1.91)	(0)
adaLASSO	0.84	0.66	0.60	0.69	0.85	0.91	0.88	0.71	0.45	0.48	0.66	1.20	0.67	1.13	1.74	4
	(0.88)	(0.66)	(0.60)	(0.69)	(0.82)	(0.87)	(0.81)	(0.67)	(0.44)	(0.46)	(0.69)	(1.18)	(0.65)	(1.08)	(1.68)	(7)
ElNet	0.87	0.68	0.62	0.69	0.85	0.95	0.88	0.72	0.52	0.54	0.76	1.37	0.70	1.15	1.86	0
	(0.94)	(0.69)	(0.62)	(0.69)	(0.83)	(0.91)	(0.82)	(0.68)	(0.51)	(0.52)	(0.78)	(1.32)	(0.71)	(1.17)	(1.93)	(0)
adaElnet	0.84	0.67	0.62	0.70	0.84	0.91	0.89	0.71	0.45	0.48	0.67	1.20	0.69	1.14	1.74	3
	(0.89)	(0.68)	(0.61)	(0.70)	(0.81)	(0.87)	(0.81)	(0.67)	(0.44)	(0.47)	(0.69)	(1.17)	(0.68)	(1.11)	(1.71)	(7)
RR	0.95	0.68	0.62	0.68	0.86	0.92	0.84	0.68	0.58	0.61	0.87	1.61	0.70	1.07	1.67	0
	(1.01)	(0.68)	(0.62)	(0.68)	(0.85)	(0.90)	(0.78)	(0.66)	(0.58)	(0.61)	(0.92)	(1.61)	(0.71)	(1.08)	(1.66)	(1)
BVAR	0.91	0.71	0.68	0.75	0.93	1.00	0.93	0.76	0.69	0.73	1.02	1.81	0.74	1.25	2.29	0
	(0.97)	(0.70)	(0.66)	(0.73)	(0.90)	(0.95)	(0.86)	(0.74)	(0.69)	(0.73)	(1.05)	(1.78)	(0.72)	(1.22)	(2.35)	(0)
Bagging	0.84	**0.58**	**0.55**	0.69	0.98	0.99	0.82	0.66	0.45	0.46	0.68	1.36	**0.56**	0.92	1.38	13
	(0.83)	**(0.57)**	**(0.54)**	(0.67)	(0.92)	(0.88)	(0.77)	(0.64)	(0.44)	(0.45)	(0.71)	(1.30)	**(0.55)**	**(0.86)**	(1.35)	(12)
CSR	0.82	0.65	0.59	0.64	0.80	0.88	0.87	0.66	0.45	0.47	0.65	1.27	0.68	1.16	1.84	8
	(0.87)	(0.65)	(0.59)	(0.63)	(0.78)	(0.85)	(0.81)	(0.62)	(0.44)	(0.46)	(0.68)	(1.27)	(0.68)	(1.11)	(1.77)	(8)
JMA	0.97	0.65	0.72	0.77	1.09	1.02	0.96	0.77	0.57	0.53	0.86	1.46	0.65	1.14	1.52	2
	(0.97)	(0.63)	(0.70)	(0.77)	(1.00)	(0.95)	(0.91)	(0.72)	(0.52)	(0.50)	(0.85)	(1.40)	(0.62)	(1.08)	(1.46)	(3)
Factor	0.91	0.68	0.60	0.65	0.84	0.90	0.88	0.65	0.43	0.48	0.68	1.15	0.71	1.13	1.71	6
	(0.98)	(0.70)	(0.60)	(0.66)	(0.83)	(0.87)	(0.82)	(0.60)	(0.43)	(0.47)	(0.70)	(1.14)	(0.72)	(1.16)	(1.74)	(7)
T. Factor	0.88	0.63	0.57	0.64	0.81	0.89	0.86	0.63	0.42	0.45	0.63	1.13	0.67	1.05	1.61	12
	(0.92)	(0.65)	(0.57)	(0.64)	(0.80)	(0.85)	(0.80)	**(0.59)**	(0.43)	(0.45)	(0.67)	(1.13)	(0.66)	(1.01)	(1.56)	(11)
B. Factor	0.96	0.71	0.69	0.79	1.01	1.07	0.99	0.78	0.65	0.72	1.00	1.78	0.81	1.57	2.99	0
	(1.01)	(0.71)	(0.68)	(0.79)	(1.00)	(1.03)	(0.93)	(0.78)	(0.66)	(0.73)	(1.07)	(1.78)	(0.82)	(1.64)	(3.20)	(0)
RF	0.86	0.61	0.55	0.62	0.78	**0.83**	**0.78**	**0.62**	**0.41**	0.43	**0.62**	1.13	0.60	**0.86**	1.32	13
	(0.88)	(0.61)	(0.54)	**(0.61)**	**(0.76)**	**(0.79)**	**(0.73)**	(0.60)	**(0.41)**	(0.43)	**(0.65)**	(1.10)	(0.60)	(0.87)	(1.35)	(13)
Mean	**0.81**	0.63	0.58	0.64	**0.78**	0.84	0.80	0.64	0.47	0.49	0.65	1.14	0.65	1.00	1.51	8
	(0.86)	(0.64)	(0.58)	(0.64)	(0.77)	(0.81)	(0.74)	(0.61)	(0.46)	(0.48)	(0.67)	(1.12)	(0.64)	(0.99)	(1.50)	(9)
T.Mean	0.83	0.64	0.58	0.64	0.78	0.86	0.82	0.66	0.46	0.48	0.65	1.16	0.66	1.02	1.58	7
	(0.88)	(0.65)	(0.58)	(0.64)	(0.77)	(0.83)	(0.76)	(0.63)	(0.45)	(0.47)	(0.67)	(1.13)	(0.66)	(1.01)	(1.58)	(8)
Median	0.83	0.64	0.58	0.64	0.79	0.86	0.83	0.66	0.46	0.48	0.65	1.16	0.66	1.03	1.60	5
	(0.88)	(0.66)	(0.58)	(0.64)	(0.77)	(0.83)	(0.77)	(0.63)	(0.45)	(0.47)	(0.67)	(1.14)	(0.66)	(1.02)	(1.60)	(8)
RF/OLS	0.82	0.63	0.57	0.65	0.81	0.86	0.79	0.63	0.44	0.46	0.65	1.20	0.64	1.03	1.57	13
	(0.86)	(0.63)	(0.57)	(0.65)	(0.80)	(0.83)	(0.73)	(0.60)	(0.42)	(0.46)	(0.68)	(1.20)	(0.64)	(0.97)	(1.47)	(11)
adaLASSO/RF	0.83	0.61	0.57	**0.62**	0.80	0.89	0.86	0.66	0.42	**0.43**	0.64	1.16	0.60	0.91	1.39	13
	(0.86)	(0.61)	(0.56)	(0.61)	(0.76)	(0.84)	(0.79)	(0.63)	(0.42)	**(0.42)**	(0.66)	(1.11)	(0.59)	(0.88)	(1.41)	(12)
RMSE count	9	6	5	11	10	14	4	10	9	7	13	9	1	7	8	
MAE count	(11)	(4)	(5)	(11)	(12)	(14)	(8)	(9)	(10)	(14)	(13)	(12)	(1)	(6)	(1)	

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