Common Time Variation of Parameters in Reduced-Form Macroeconomic Models

SUPPLEMENTARY MATERIAL

Dalibor Stevanovic *

Previous version: May 2014
This version: March 2015

Abstract

This document contains supplementary material for the paper entitled "Common Time Variation of Parameters in Reduced-Form Macroeconomic Models". It contains: (i) additional simulation results, (ii) additional empirical results, and (iii) data appendix.

JEL Classification: C32, E17, E32.
Keywords: time varying parameter model, factor analysis, VAR.

*Département des sciences économiques, Université du Québec à Montréal. 315, Ste-Catherine Est, Montréal, QC, H2X 3X2. (dstevanovic.econ@gmail.com)
I would like to thank Jean Boivin, Frank Diebold, Jean-Marie Dufour, Jesus Fernandez-Villaverde, and Frank Schorfheide for valuable discussions and comments. A previous version of this paper circulated as "Common Sources of Parameter Instability in Macroeconomic Models: A Factor-TVP Approach". The author acknowledges financial support from the Fonds de recherche sur la société et la culture (Québec).

1 Additional simulation results

In this section I present standard graphical analysis of the factor structure, scree and trace tests, from the Monte Carlo experiment. The simulation models are summarized as follows:

- Model 1: Univariate Factor-TVP Regression

$$
\begin{aligned}
y_t &= x_t'\beta_t + w_t && (1)\\
\beta_t &= \lambda f_t + \sigma_\beta e_t && (2)\\
f_{t+1} &= \rho f_t + v_{t+1} && (3)
\end{aligned}
$$

  where y_t is a scalar, x_t is $(K \times 1)$ and f_t contains q elements. The error terms are all drawn independently from a standardized Normal distribution. σ_β is the variance of e_t, and in particular when it is equal to 0, we have a case where the time-varying parameters are exact linear combinations of underlying common shocks. Note that x_t includes the constant. The parameters are set as follows: $T = 300$, $N = 1$, $K = 6$, $q = 1$, $\sigma_\beta = 0.4$, $\rho = 0.95$ and $Q = 0.1$.

- Model 2: Multivariate Factor-TVP Regression

$$y_t = c_t + b_t x_t + w_t$$

  where y_t is $(N \times 1)$ and x_t contains K independent variables. Let $X_t = I_N \otimes [1, x_t']$ and $\beta_t = [\text{vec}(c_t)', \quad \text{vec}(b_t)']'$ contains all the $K(N + 1)$ time-varying coefficients. Then the Factor-TVP is

$$y_t = X_t'\beta_t + w_t \qquad (4)$$

  with (2)-(3) describing the TVPs dynamics. The parameters are set as follows: $T = 600$, $N = 4$, $K = 4$, $q = 3$, $\sigma_\beta = 0.4$, $\rho = \text{diag}(0.95\ 0.9\ 0.85)$ and $Q = \text{diag}(0.4)$.

- Model 3: Factor-TVP VAR
  I consider only VAR(1) specification since it is always possible to rewrite the VAR(p) in its companion form:

$$y_t = c_t + b_t y_{t-1} + w_t.$$

  The Factor-TVP representation is the same as in the previous multivariate case, but the number of elements in β_t is $N(N + 1)$.[1] The parameters are set as follows: $T = 300$, $N = 3$,

[1]The simulation of TVP-VAR model is tricky. To avoid explosive roots, for each t, I decompose b_t using singular value decomposition and check if the eigenvalues of b_t are inside the unit circle. If not, I scale them such that they are less than one and reproduce the corresponding coefficient matrix.

$p = 1$, $q = 1$, $\sigma_\beta = 0.4$, $\rho = \text{diag}(0.95)$ and $Q = \text{diag}(0.1)$.

The results are presented in Figures 1 - 3. They suggest that the sorting eigenvalues can detect the presence of the factor structure and even recover the true number of latent factors.

2 Additional results from TVP-VAR application

In this section I present additional results from TVP-VAR applications. Figures 4 - 5 verify if the linearity approximation of the factor structure is plausible for the TVPs estimated recursively without stochastic volatility. Recall that TVPs in estimable models will in general be nonlinear functions of the true latent drifting coefficients (or components). To make it feasible and tractable, I approximate it by a linear factor model. According to graphs, the linear hypothesis seems plausible, but adding a polynomial structure would capture some nonlinearities. Figure 6 plots the marginal contribution of first 4 factors to the variance of each of these OLS estimated TVPs. The coefficients of the interest rate equation are mostly explained by the first factor. The same factor is important for some parameters in two other VAR equations, together with the second and third common component.

Figures 7 - 8 show that linearity assumption, within TVPs estimated by likelihood method without factor structure, is quite realistic especially with respect to the first factor. Figure 9 shows the predominance of the first factor to explain the variability in TVPs.

Figures 10 and 11 present the factorability of TVPs and marginal contribution of factors within two-step rolling OLS procedure on the data set updated to 2013Q4. The Figure 12 present the stability condition for the Factor-TVP VAR estimated on data set updated to 2013Q4.

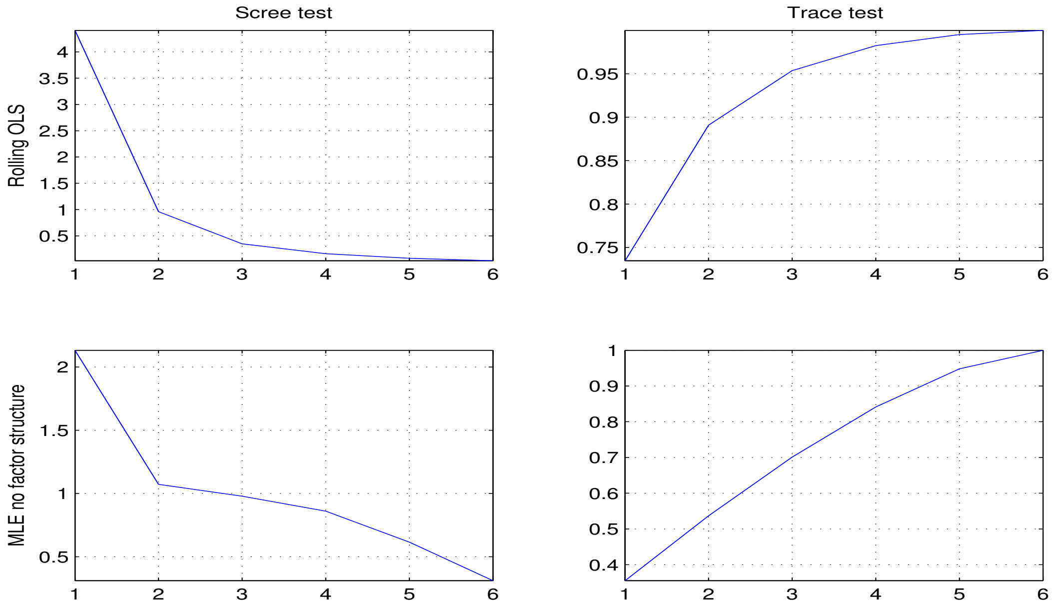
Figures 13 and 16 show the R^2 between individual time series of the large macroeconomic panel, grouped by category, and the corresponding factors.

The predictive content of TVP factors is studied in Figures 17 and 20. It shows the p-values for null hypothesis $\beta_h = 0$ from the predictive regression

$$\hat{f}_t^i = \alpha + \rho \hat{f}_{t-1}^i + \beta \hat{F}_{t-1}^i + u_t \tag{5}$$

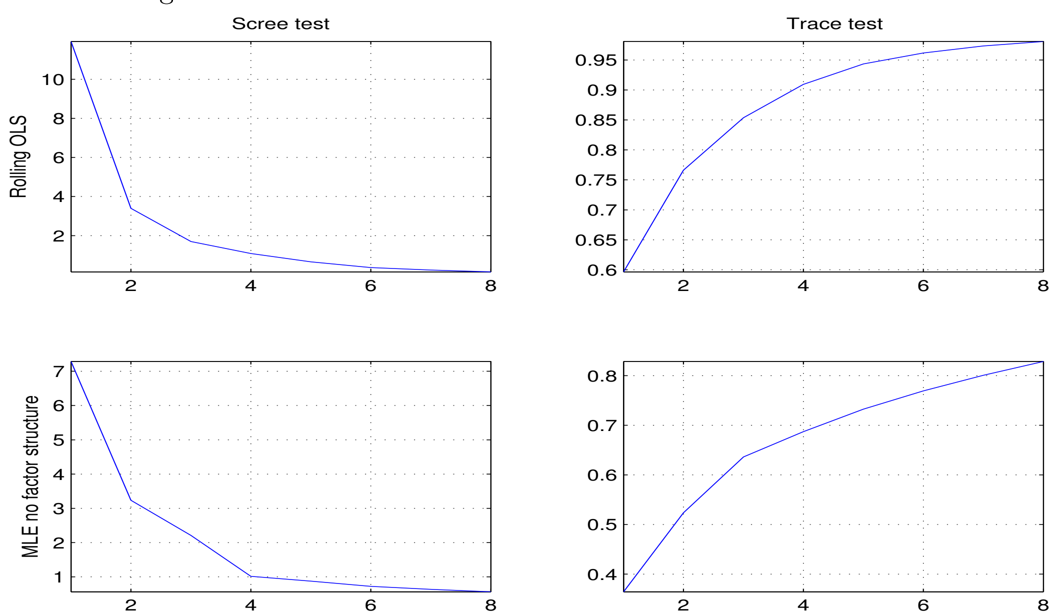
where $i \in (2006,\ 2013)$.

Figure 1: Scree and trace tests from simulations with Model 1



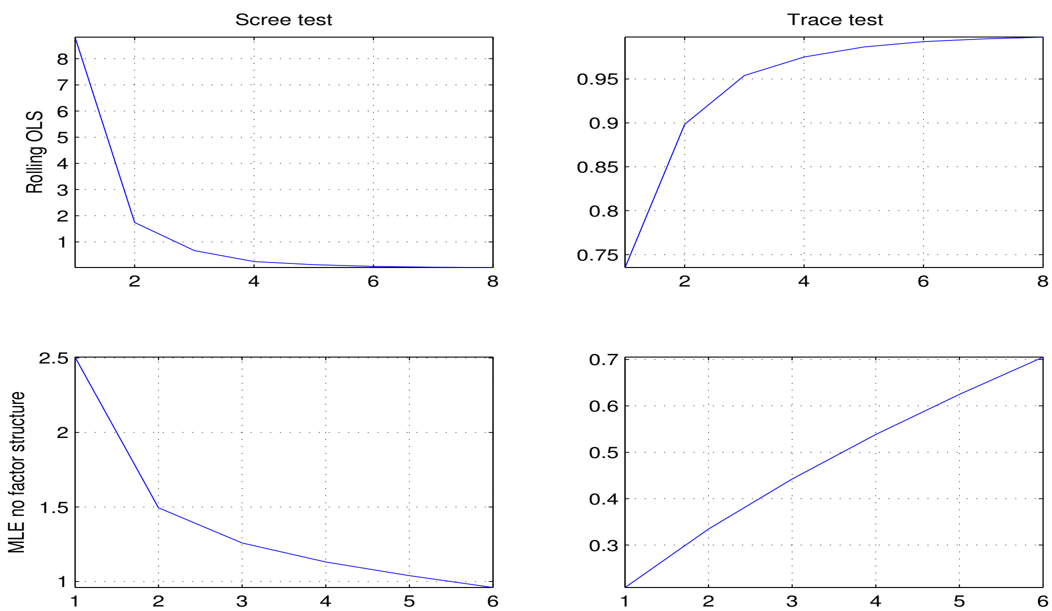
This Figure presents sorted eigenvalues of the correlation matrix of TVPs (scree test), as well as the proportion of their variance explained by consecutive factors (trace test). TVPs have been estimated by rolling least squares (top panels) or ML without factor structure (bottom panels). The Model 1 corresponds to the univariate regression with drifting coefficients generated from the factor structure (2)-(3).

Figure 2: Scree and trace tests from simulations with Model 2



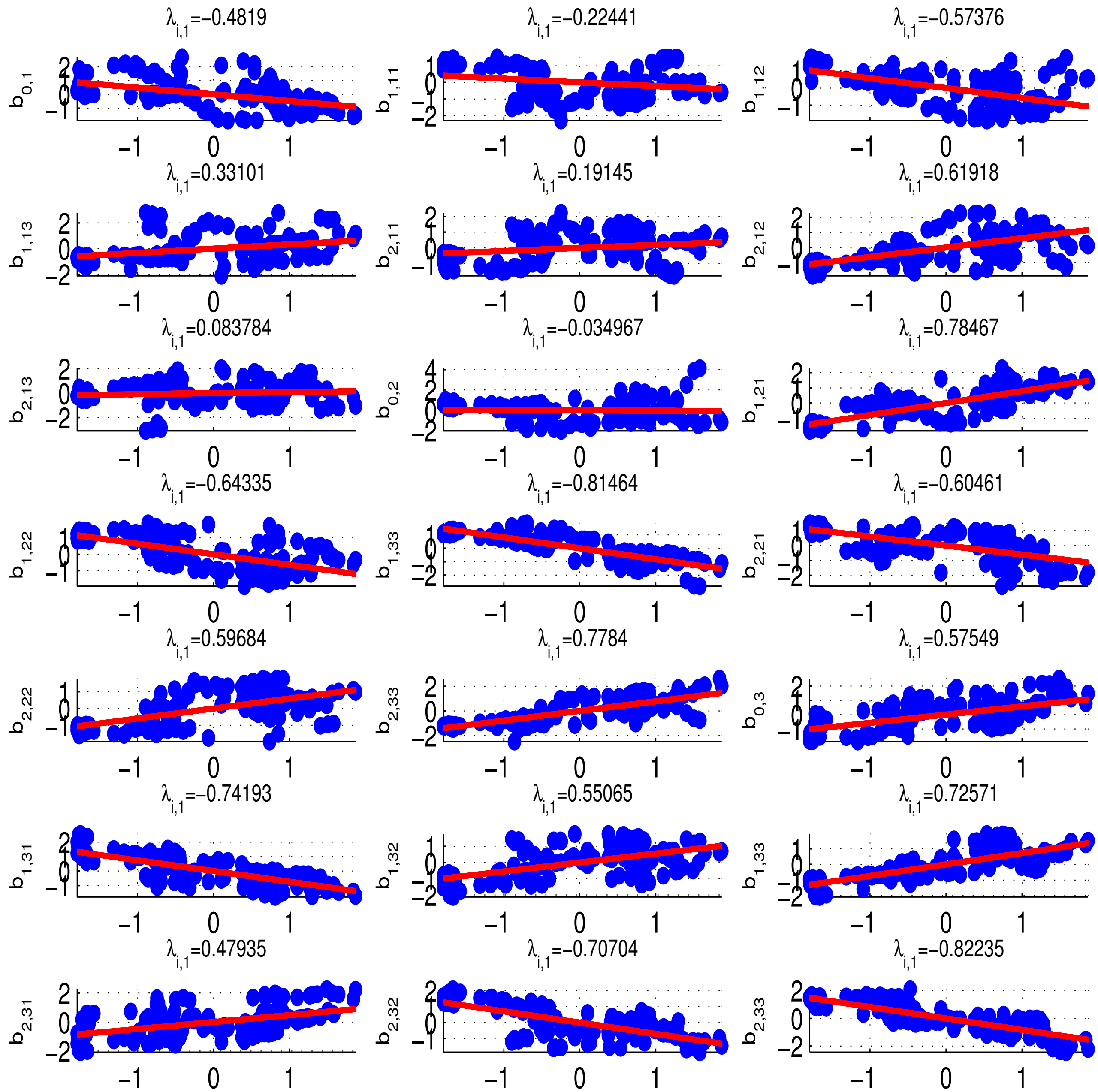
This Figure presents sorted eigenvalues of the correlation matrix of TVPs (scree test), as well as the proportion of their variance explained by consecutive factors (trace test). These are medians over all simulation replications. TVPs have been estimated by rolling least squares (top panels) or ML without factor structure (bottom panels). The Model 2 corresponds to the multivariate regression with drifting coefficients generated from the factor structure (2)-(3).

Figure 3: Scree and trace tests from simulations with Model 3



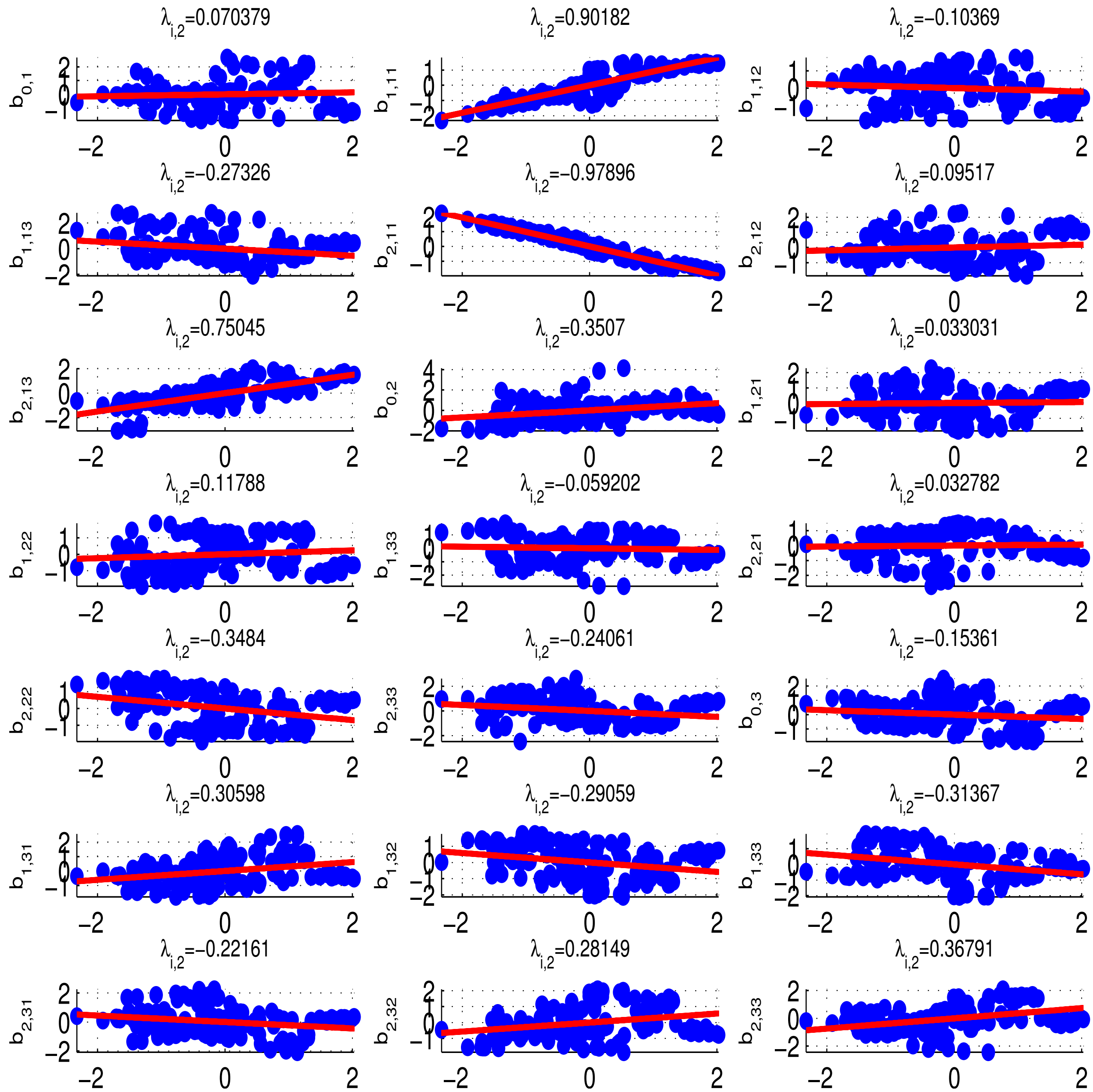
This Figure presents sorted eigenvalues of the correlation matrix of TVPs (scree test), as well as the proportion of their variance explained by consecutive factors (trace test). These are medians over all simulation replications. TVPs have been estimated by rolling least squares (top panels) or ML without factor structure (bottom panels). The Model 3 corresponds to the TVP-VAR with drifting coefficients generated from the factor structure (2)-(3).

Figure 4: Scatter plots for factor 1 and VAR model TVPs estimated by rolling OLS



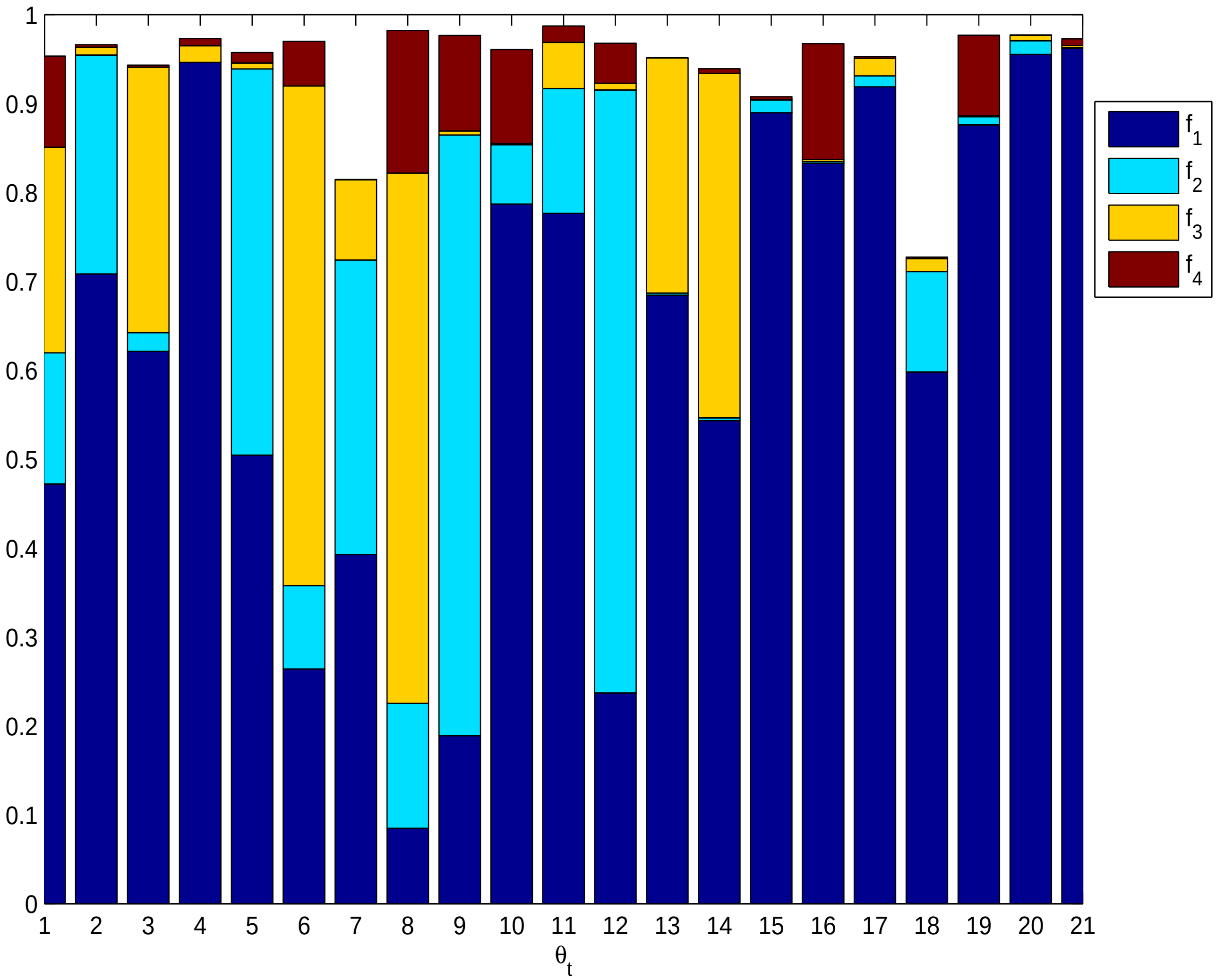
This Figure inspects linear *factor structure assumption. TVPs have been estimated by rolling least squares. The first factor is the first principal component. The graphs present scatter plots between each VAR time-varying coefficient and the linear fit with the first factor.*

Figure 5: Scatter plots for factor 2 and VAR model TVPs estimated by rolling OLS



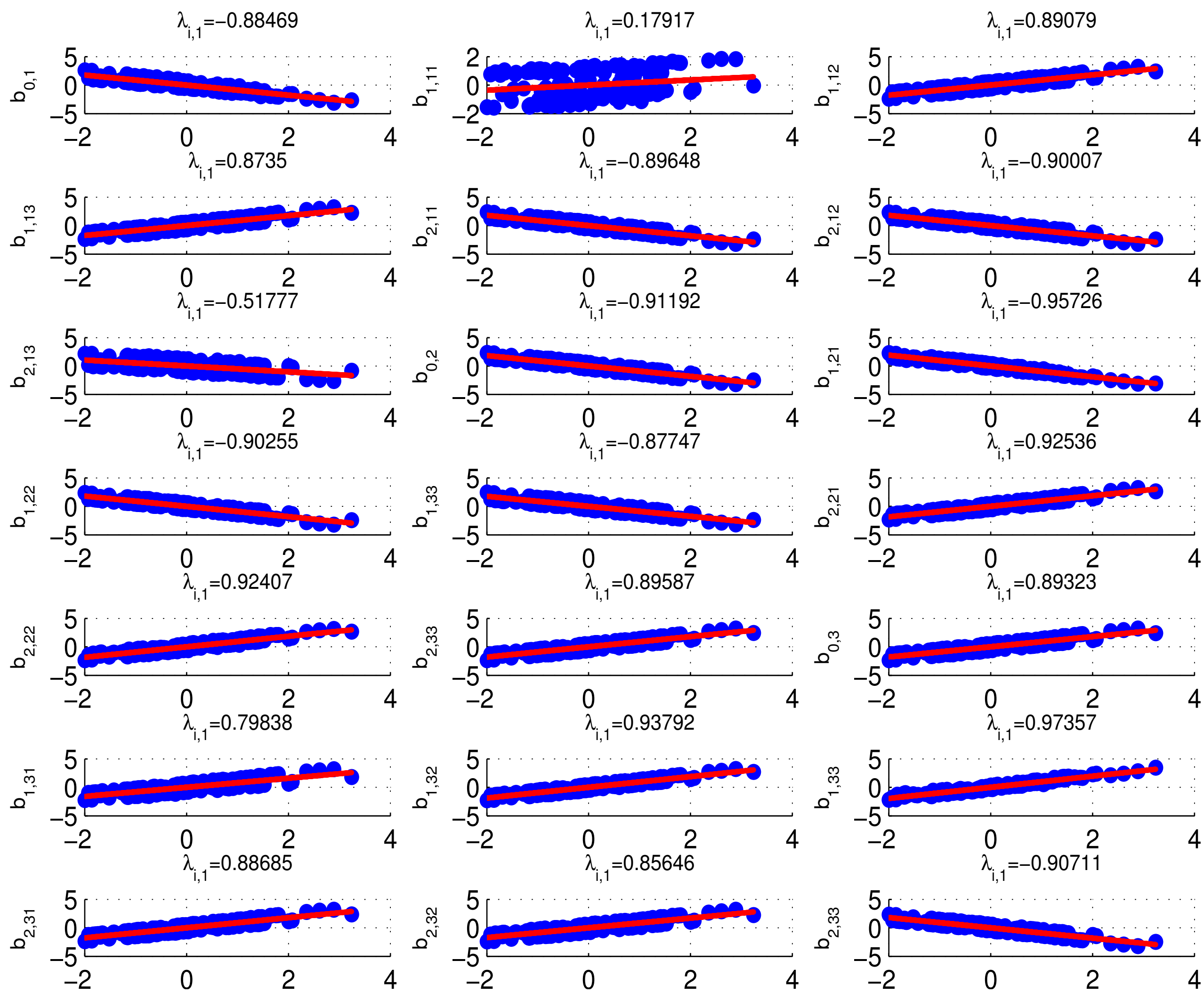
This Figure inspects linear *factor structure assumption. TVPs have been estimated by rolling least squares. The second factor is the second principal component. The graphs present scatter plots between each VAR time-varying coefficient and the linear fit with the second factor.*

Figure 6: Marginal contributions of factors to total R_2 on TVPs estimated by rolling OLS



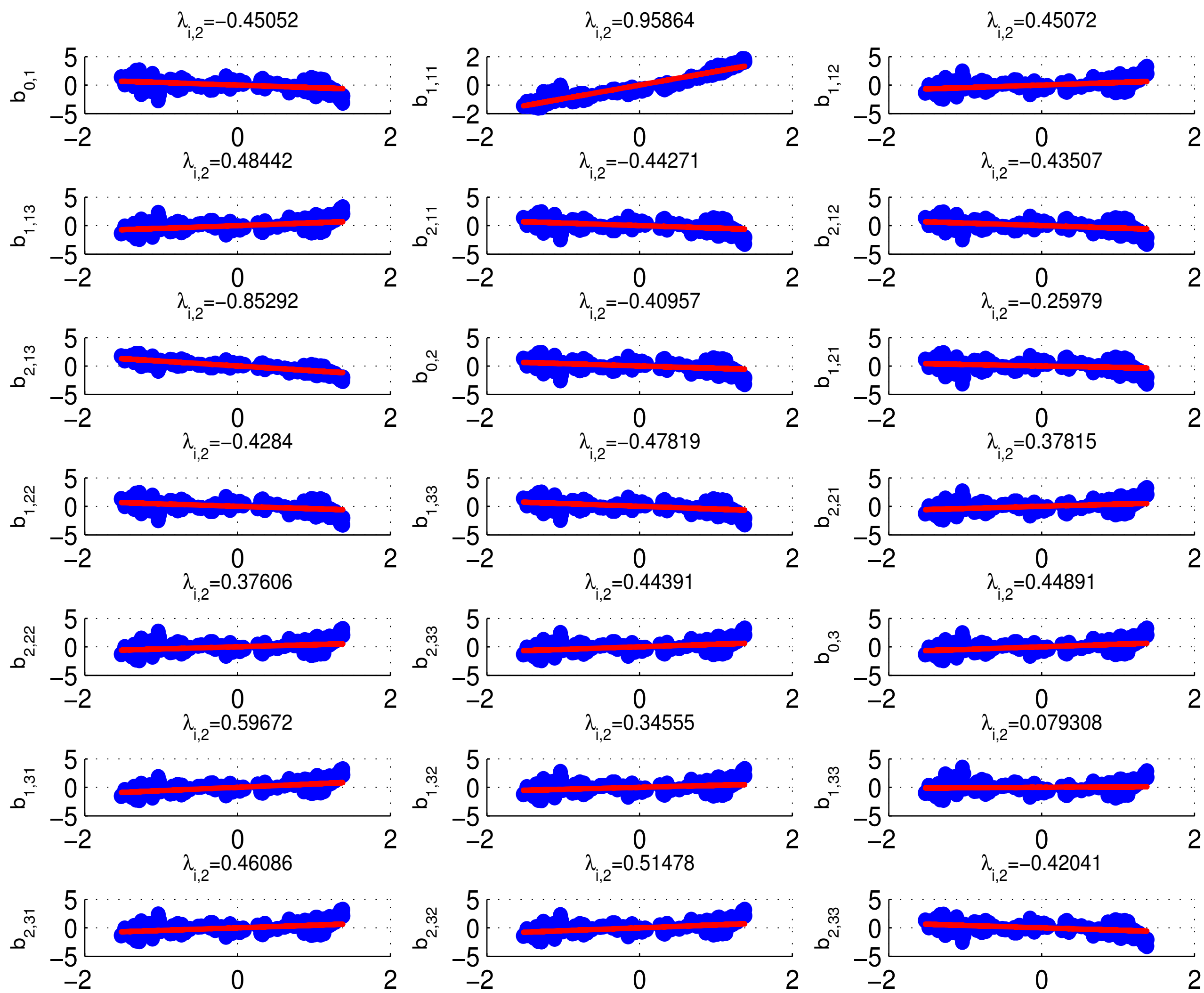
This Figure decompose the contribution of first 4 principal components to the variance of each TVP estimated using rolling least squares. The elements 1-7 represent coefficients from inflation equation, $[b_{0,1},\ b_{1,11},\ b_{1,12}, \ldots b_{2,13}]$*, 8-14 those from unemployment rate equation and 15-21 for interest rate.*

Figure 7: Scatter plots for factor 1 and VAR model TVPs estimated by two-step likelihood method



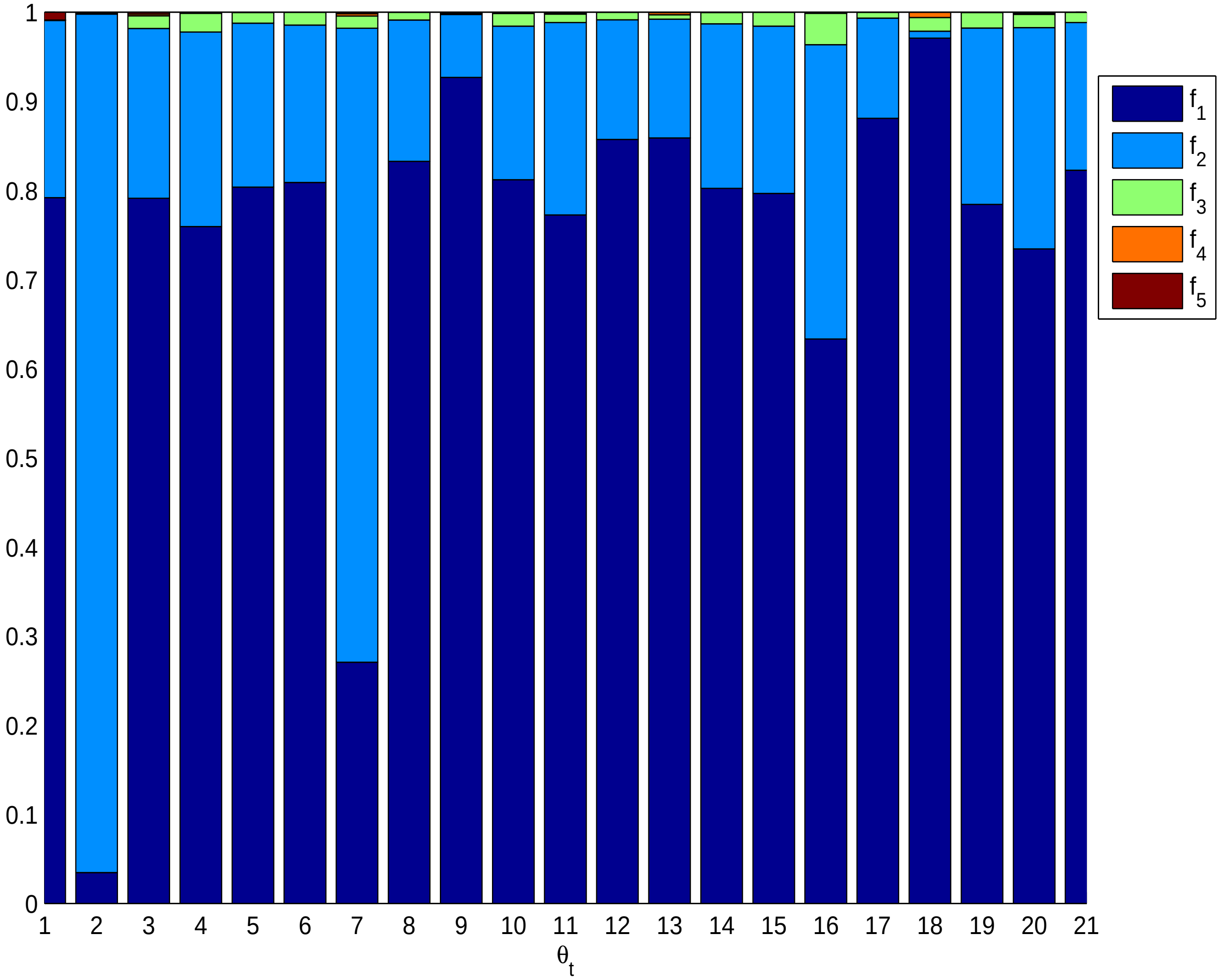
This Figure inspects linear *factor structure assumption. TVPs are those from Primiceri (2005). The first factor is estimated by MLE. The graphs present scatter plots between each VAR time-varying coefficient and the linear fit with the first factor.*

Figure 8: Scatter plots for factor 2 and VAR model TVPs estimated by two-step likelihood method



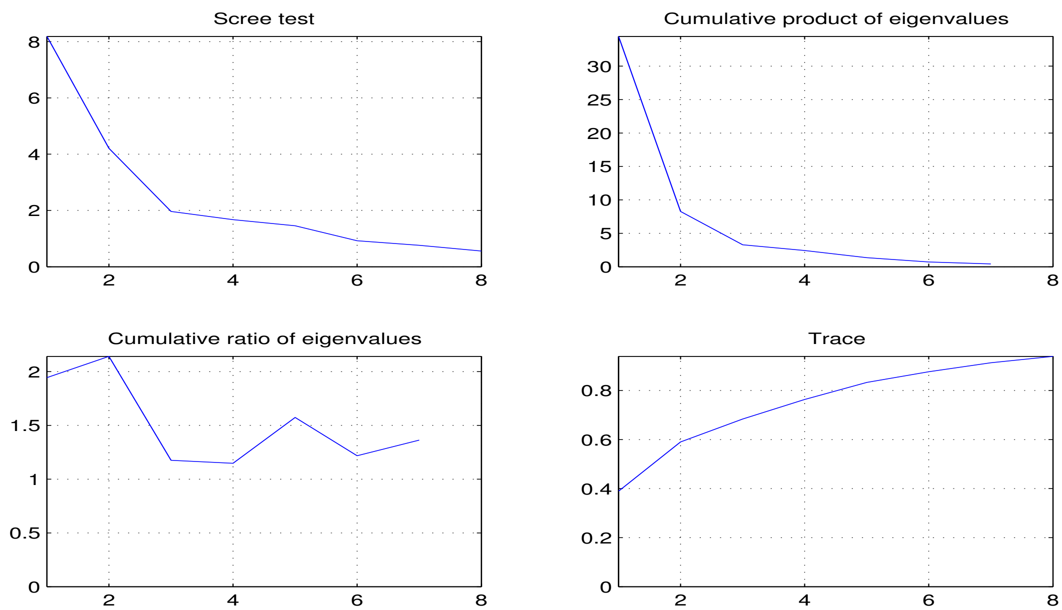
This Figure inspects linear *factor structure assumption. TVPs are those from Primiceri (2005). The second factor is estimated by MLE. The graphs present scatter plots between each VAR time-varying coefficient and the linear fit with the second factor.*

Figure 9: Marginal contribution to total R^2 of TVPs of VAR estimated by two-step likelihood method



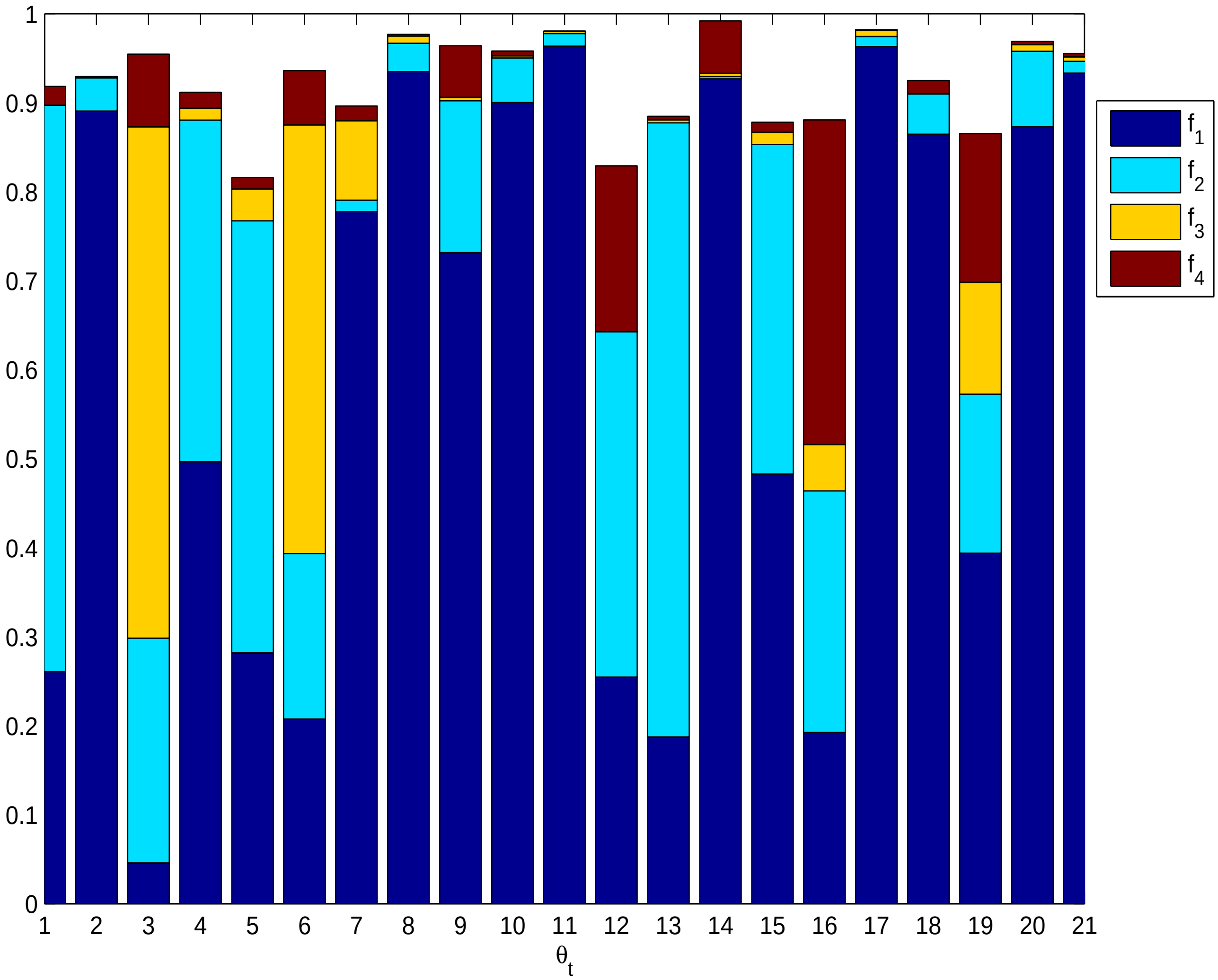
This Figure decompose the contribution of first 5 MLE factors to the variance of each TVP estimated as in Primiceri (2005) without imposing factor structure. The elements 1-7 represent coefficients from inflation equation, [$b_{0,1}$, $b_{1,11}$, $b_{1,12}, \ldots b_{2,13}$], 8-14 those from unemployment rate equation and 15-21 for interest rate.

Figure 10: Scree and trace tests for VAR model TVPs estimated by recursive OLS



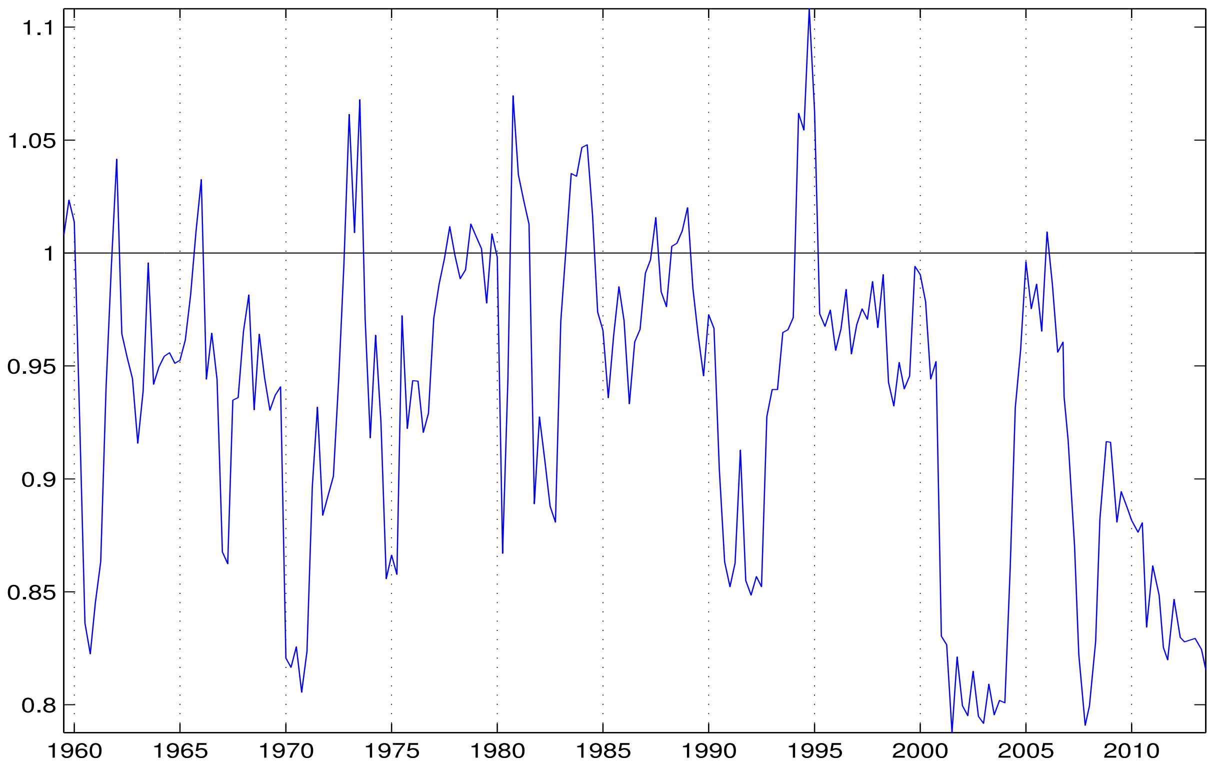
This Figure presents sorted eigenvalues of the correlation matrix of TVPs (scree test), their cumulated product and ratio, as well as the proportion of TVP variances explained by consecutive factors (trace test). TVPs have been estimated by rolling least squares on data set updated to 2013Q4.

Figure 11: Marginal contributions to total R^2 on VAR model TVPs estimated by recursive OLS with post-crisis data



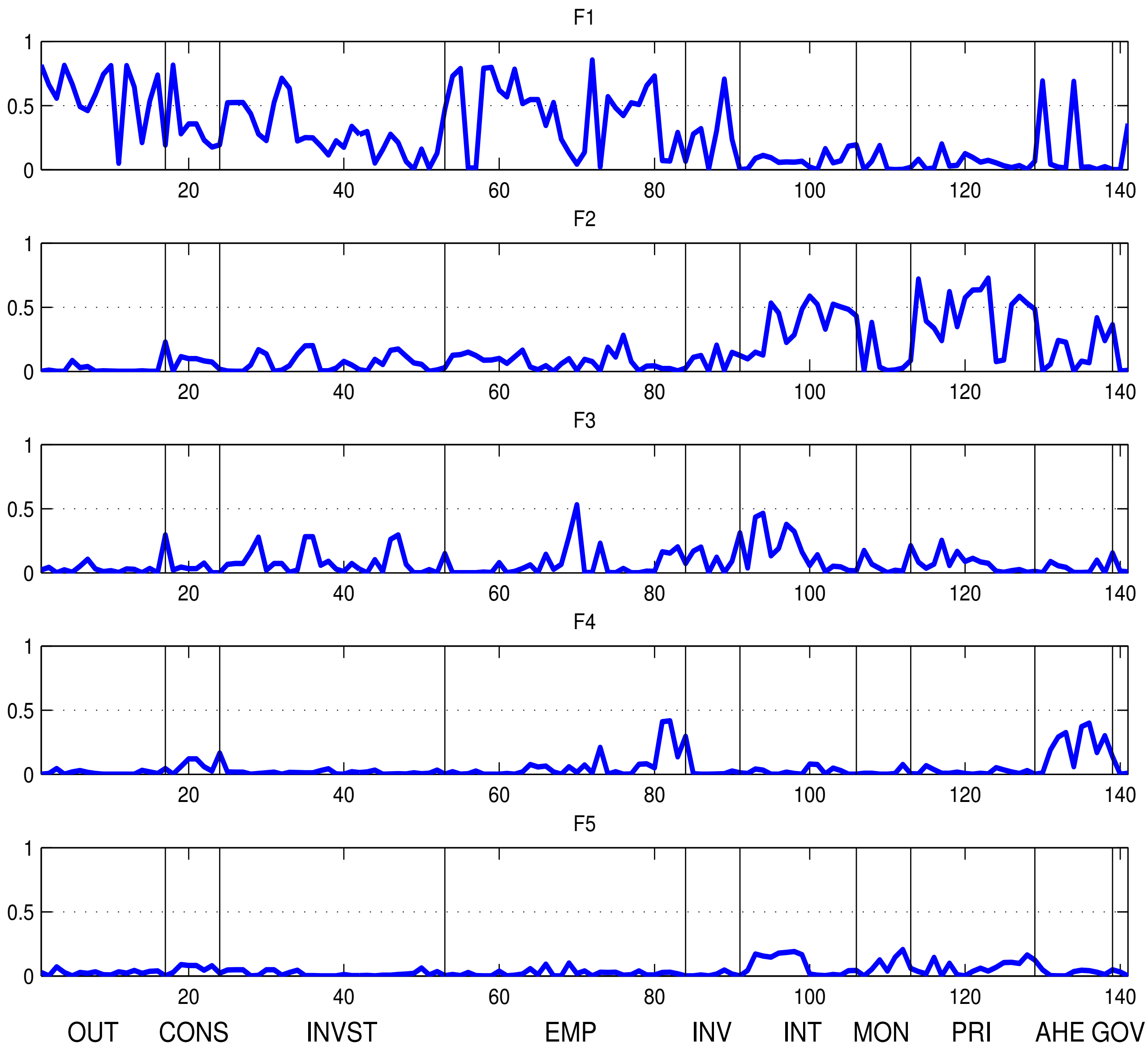
This Figure decompose the contribution of first 4 principal components to the variance of each TVP estimated using rolling least squares on the updated data set including the Great Recession period. The elements 1-7 represent coefficients from inflation equation, [$b_{0,1},\ b_{1,11},\ b_{1,12},\dots b_{2,13}$*], 8-14 those from unemployment rate equation and 15-21 for interest rate.*

Figure 12: Stability of Factor-TVP VAR over time with post-crisis data



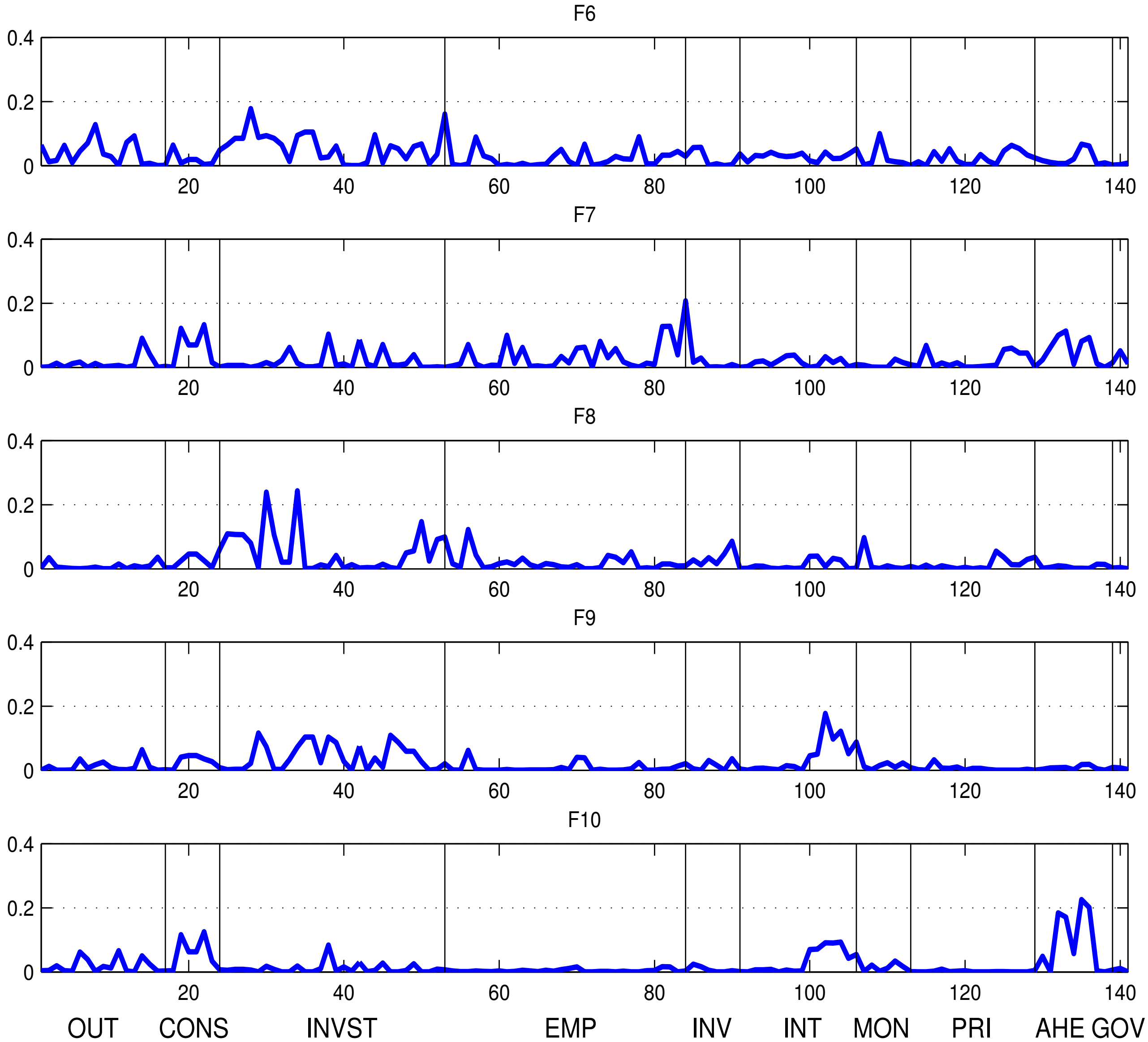
This Figure shows the largest eigenvalue of the companion matrix of the VAR coefficients, at each point of time. The TVPs are calculated as the common component after all the Factor-TVP equations have been estimated simultaneously by maximum likelihood and on the data set updated to 2013Q4. The stability condition is violated if larger than 1.

Figure 13: R^2 Between Factors and Individual Time Series, Grouped by Category



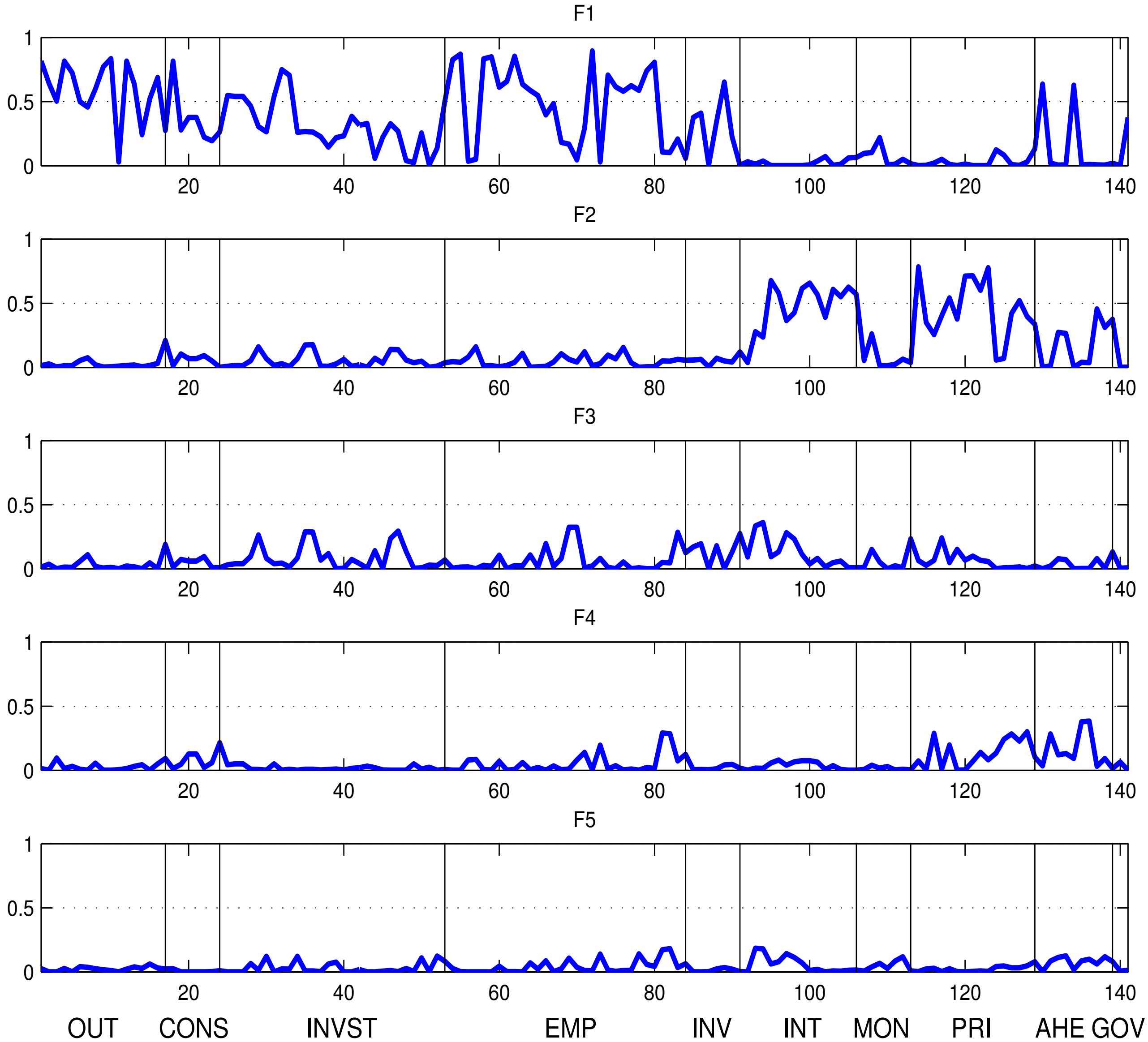
This Figure shows marginal R^2 of factors 1-5 estimated from large the macroeconomic data set on each 141 series grouped by category. Data span is 1959 - 2006. The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.

Figure 14: R^2 Between Factors and Individual Time Series, Grouped by Category



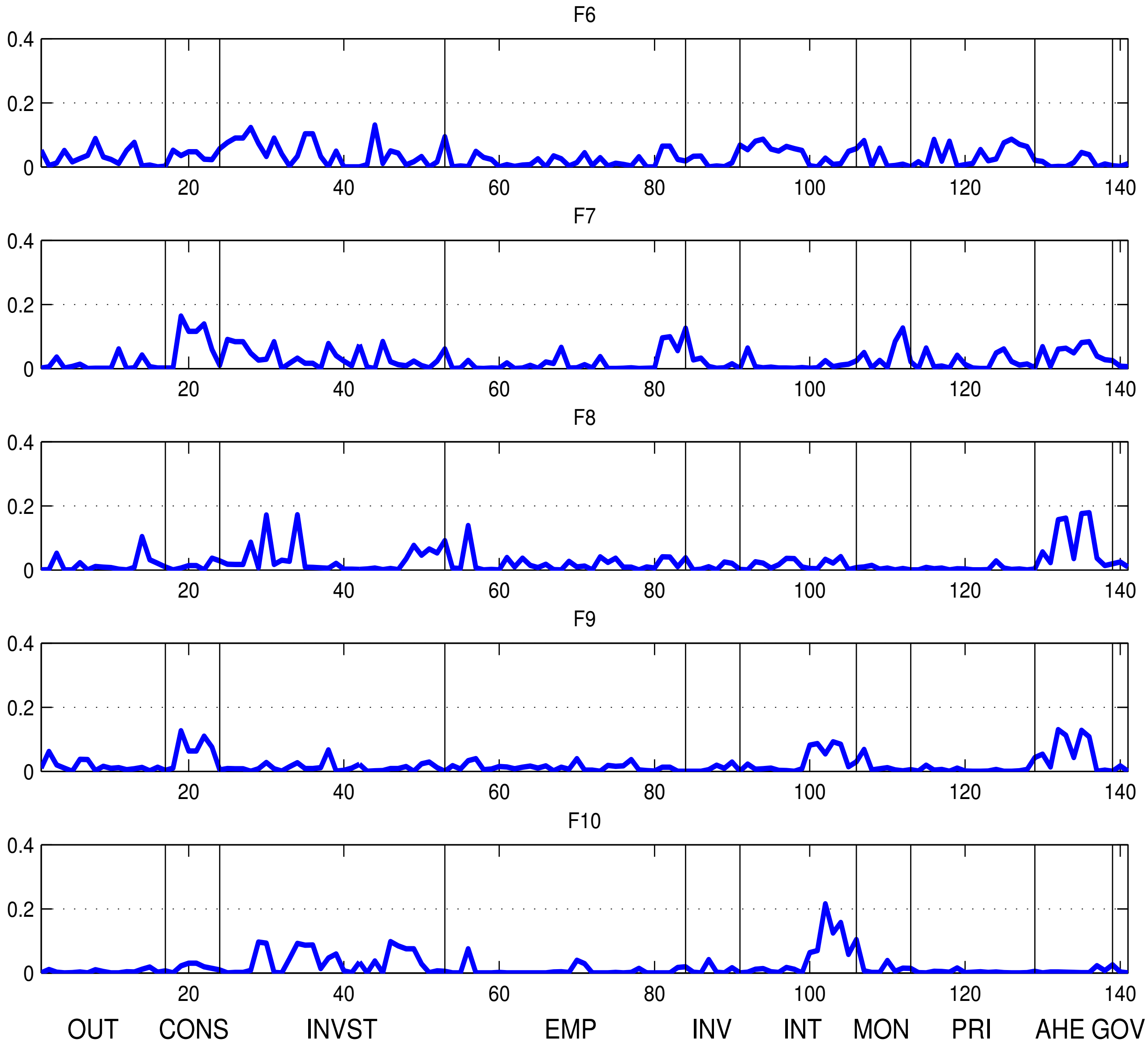
This Figure shows marginal R^2 of factors 6-10 estimated from large the macroeconomic data set on each 141 series grouped by category. Data span is 1959 - 2006. The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.

Figure 15: R^2 Between Factors and Individual Time Series, Grouped by Category



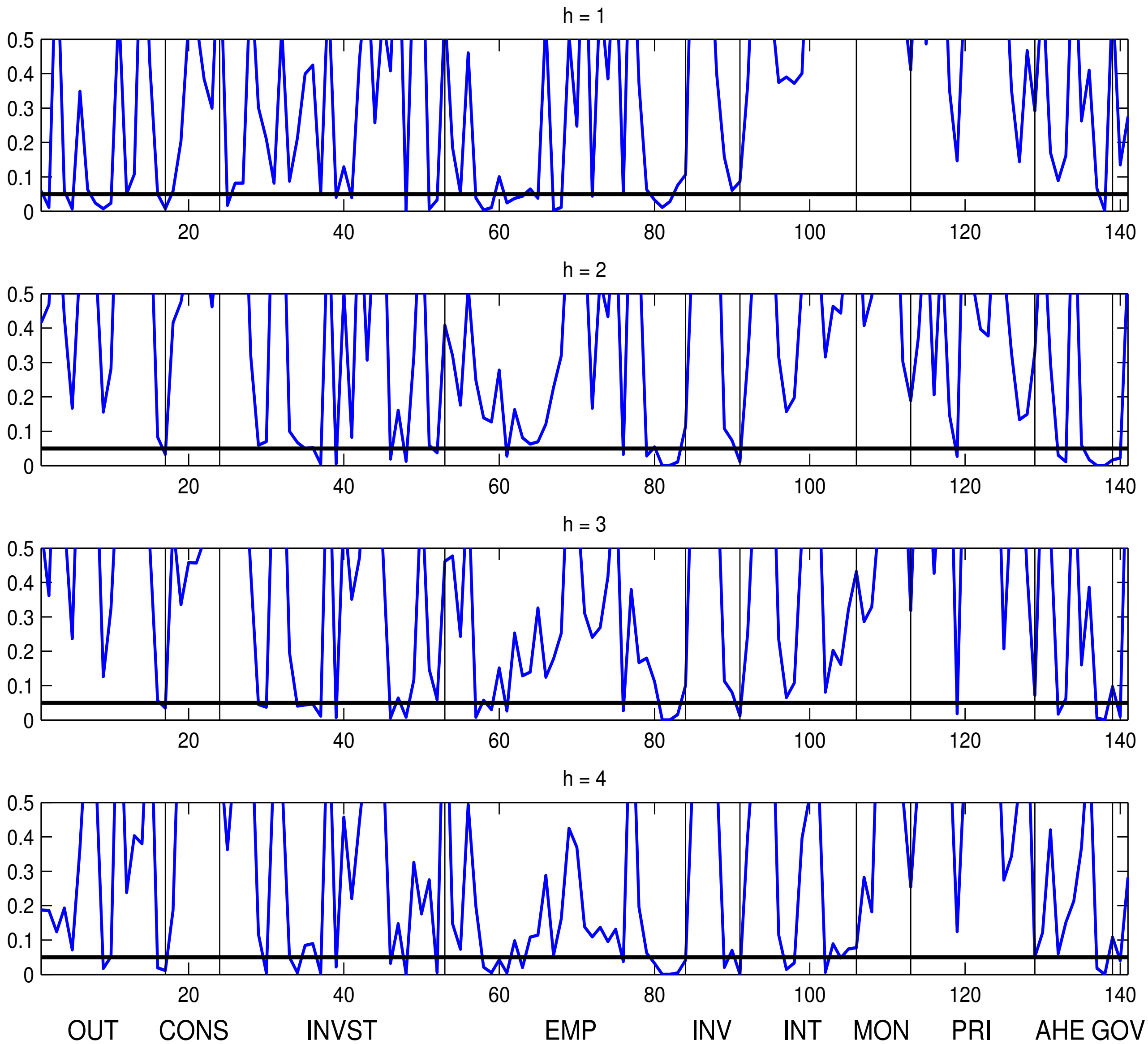
This Figure shows marginal R^2 of factors 1-5 estimated from large the macroeconomic data set on each 141 series grouped by category. Data span is 1959 - 2013. The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.

Figure 16: R^2 Between Factors and Individual Time Series, Grouped by Category



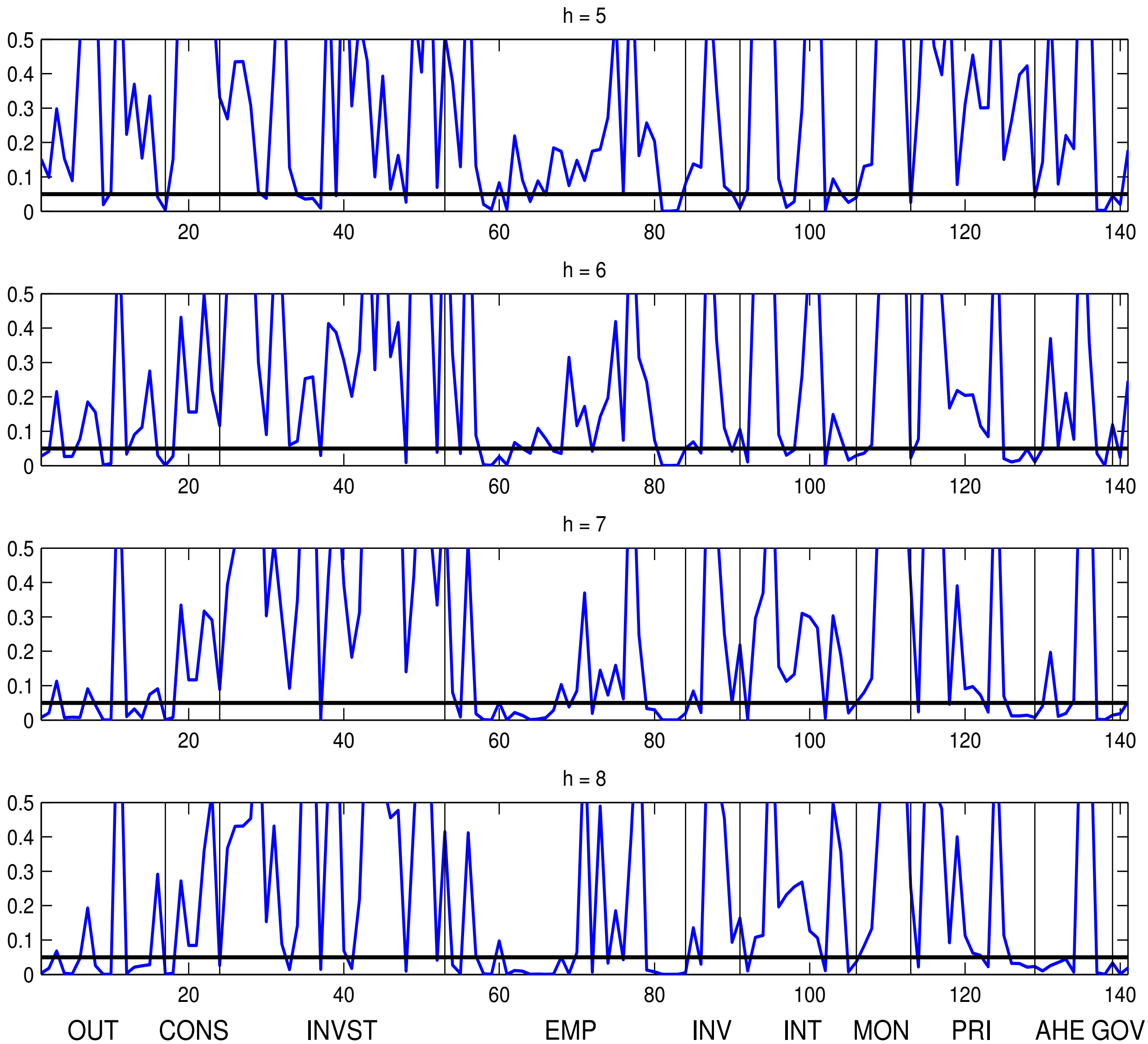
This Figure shows marginal R^2 of factors 6-10 estimated from large the macroeconomic data set on each 141 series grouped by category. Data span is 1959 - 2013. The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.

Figure 17: Predictive power of TVP factors from data set 1959-2006



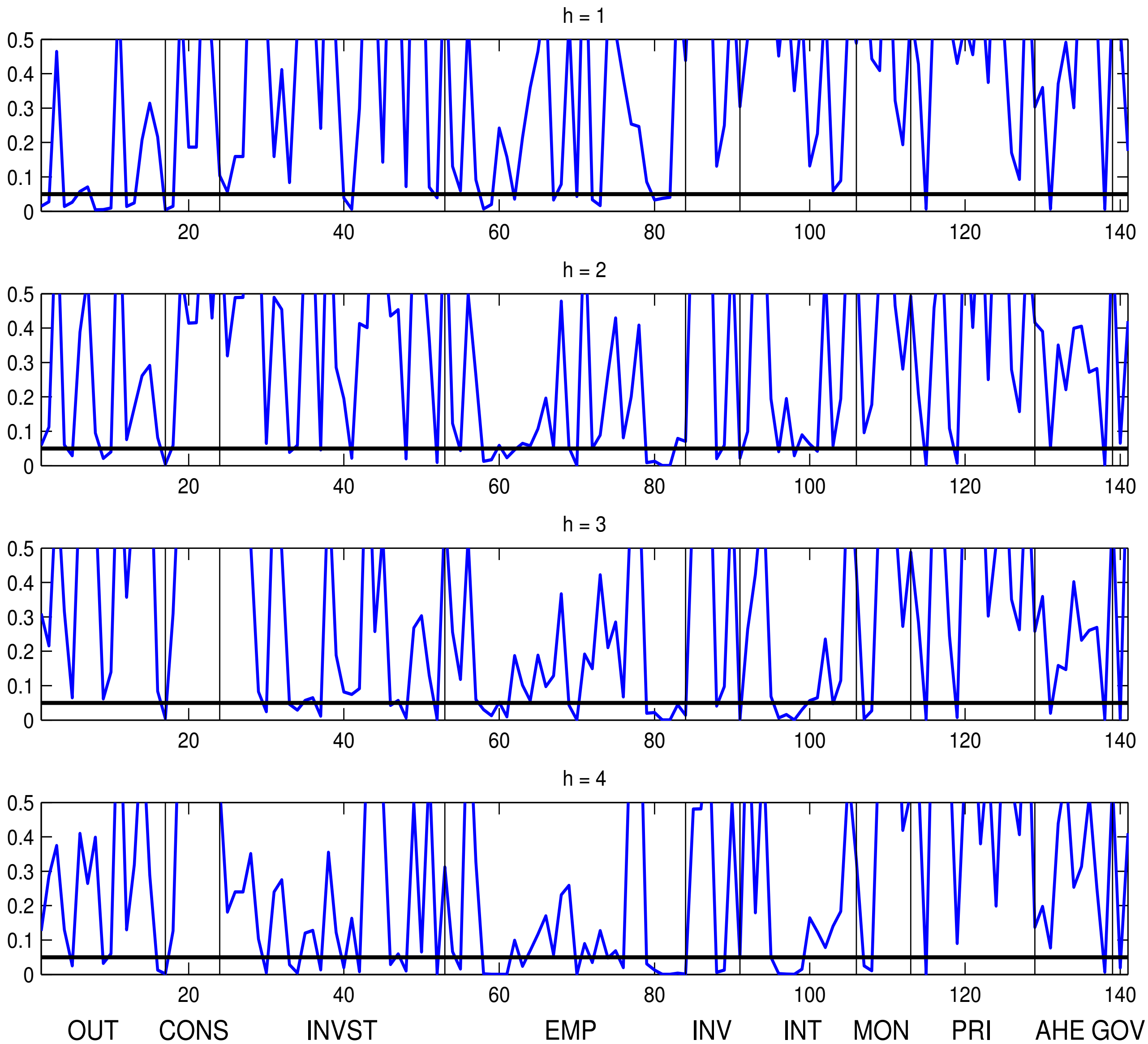
This Figure shows the predictive power of two TVP factors for each of 141 series grouped by category. It plots the p-values for null hypothesis $\beta_h = 0$ *from the predictive regression (5). The black horizontal line fix the level of* 5%. *The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.*

Figure 18: Predictive power of TVP factors from data set 1959-2006



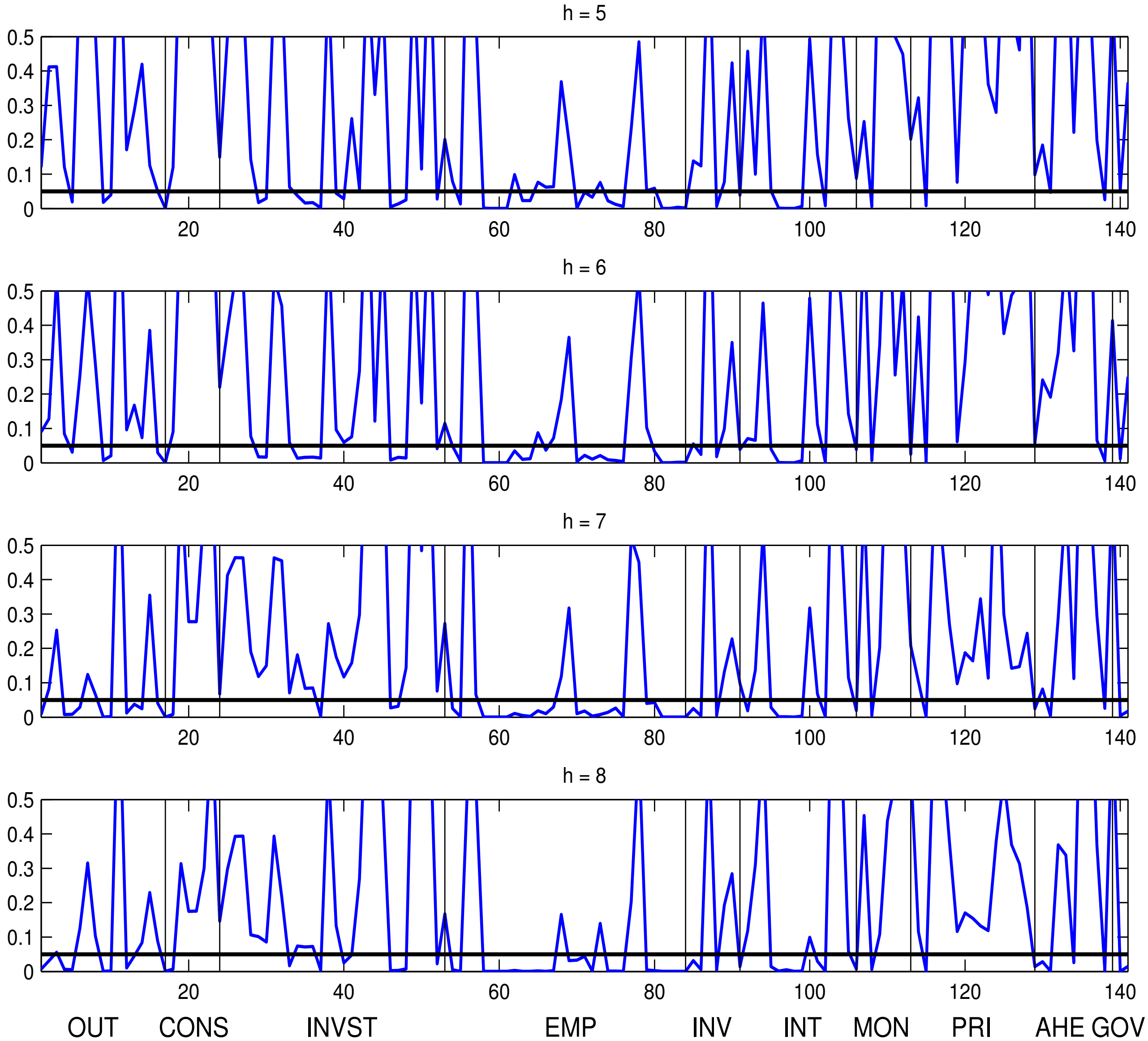
This Figure shows the predictive power of two TVP factors for each of 141 series grouped by category. It plots the p-values for null hypothesis $\beta_h = 0$ *from the predictive regression (5). The black horizontal line fix the level of* 5%. *The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.*

Figure 19: Predictive power of TVP factors from data set 1959-2013



This Figure shows the predictive power of two TVP factors for each of 141 series grouped by category. It plots the p-values for null hypothesis $\beta_h = 0$ from the predictive regression (5). The black horizontal line fix the level of 5%. The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.

Figure 20: Predictive power of TVP factors from data set 1959-2013



This Figure shows the predictive power of two TVP factors for each of 141 series grouped by category. It plots the p-values for null hypothesis $\beta_h = 0$ *from the predictive regression (5). The black horizontal line fix the level of* 5%. *The meaning of each acronym is the following. OUT: Real output and income, CONS: Real consumption; INVST: Real investment, EMP: Employment and hours; INV: Inventories; MON: Money and credit quantity aggregates; PRI: Price indexes; AHE: Average hourly earnings and salaries; GOV: Government spending and revenues.*

3 Data appendix

The 141 series in the large macroeconomic panel are detailed in the following table. All series have been transform to achieve stationarity. The transformation codes are: 1 no transformation; 2 first difference; 4 logarithm; 5 first difference of logarithm.

No.	Series Code	T-Code	Series Description
1	USAPROINDQISMEI	5	Production of Total Industry in United States
2	GDPC1	5	Real Gross Domestic Product
3	PIECTR	5	Real personal income excluding current transfer receipts
4	INDPRO	5	Industrial Production Index
5	IPBUSEQ	5	Industrial Production: Business Equipment
6	IPCONGD	5	Industrial Production: Consumer Goods
7	IPDCONGD	5	Industrial Production: Durable Consumer Goods
8	IPDMAT	5	Industrial Production: Durable Materials
9	IPFINAL	5	Industrial Production: Final Products (Market Group)
10	IPFPNSS	5	Industrial Production: Final Products and Nonindustrial Supplies
11	IPFUELS	5	Industrial Production: Fuels
12	IPMANSICS	5	Industrial Production: Manufacturing (SIC)
13	IPMAT	5	Industrial Production: Materials
14	IPNCONGD	5	Industrial Production: Nondurable Consumer Goods
15	IPNMAT	5	Industrial Production: nondurable Materials
16	NAPMPI	1	ISM Manufacturing: Production Index
17	CUMFNS	1	Capacity Utilization: Manufacturing (SIC)
18	USAPROINDMISMEI	5	Production of Total Industry in United States
19	DGDSRC1Q027SBEA	5	Personal consumption expenditures: Goods
20	PCECC96	5	Real Personal Consumption Expenditures
21	DPCERA3Q086SBEA	5	Real personal consumption expenditures (chain-type quantity index)
22	DDURRA3Q086SBEA	5	Real personal consumption expenditures: Durable goods (chain-typequantity index)
23	DNDGRA3Q086SBEA	5	Real personal consumption expenditures: Nondurable goods (chain-typequantity index)
24	DSERRA3Q086SBEA	5	Real personal consumption expenditures: Services (chain-type quantityindex)
25	W170RC1Q027SBEA	5	Gross domestic investment
26	GPDIC1	5	Real Gross Private Domestic Investment
27	GPDIC96	5	Real Gross Private Domestic Investment, 3 decimal
28	A349RA3Q086SBEA	5	Real private fixed investment in structures (chain-type quantityindex)
29	A756RA3Q086SBEA	5	Real private fixed investment in new structures: Residentialstructures (chain-type quantity index)
30	A771RA3Q086SBEA	5	Real private fixed investment in new structures: Nonresidentialstructures (chain-type quantity index)
31	B006RA3Q086SBEA	5	Real gross private domestic investment (chain-type quantity index)
32	B007RA3Q086SBEA	5	Real private fixed investment (chain-type quantity index)
33	B008RA3Q086SBEA	5	Real private fixed investment: Nonresidential (chain-type quantityindex)
34	B009RA3Q086SBEA	5	Real private fixed investment: Nonresidential: Structures (chain-typequantity index)
35	B011RA3Q086SBEA	5	Real private fixed investment: Residential (chain-type quantity index)
36	B012RA3Q086SBEA	5	Real private fixed investment: Residential: Structures (chain-typequantity index)
37	B013RA3Q086SBEA	5	Real private fixed investment: Residential: Equipment (chain-typequantity index)
38	B139RA3Q086SBEA	5	Real auto output: Private fixed investment: New autos (chain-typequantity index)
39	B292RA3Q086SBEA	5	Real private fixed investment: Residential: Structures: Permanentsite: Multifamily (chain-type quantity index)
40	B679RA3Q086SBEA	5	Real private fixed investment, chained quantity index: Private fixedinvestment in information processing equipment and
41	B680RA3Q086SBEA	5	Real private fixed investment, chained quantity index: Nonresidential:Equipment: Industrial equipment
42	B681RA3Q086SBEA	5	Real private fixed investment, chained quantity index: Nonresidential:Equipment: Transportation equipment
43	B862RA3Q086SBEA	5	Real private fixed investment, chained quantity index: Nonresidential:Equipment: Other equipment
44	B863RA3Q086SBEA	5	Real private fixed investment: Residential: Other structures(chain-type quantity index)
45	B937RA3Q086SBEA	5	Real private fixed investment, chained quantity index: Nonresidential:Equipment: Information processing equipment: O
46	B943RA3Q086SBEA	5	Real private fixed investment: Residential: Structures: Permanent site(chain-type quantity index)
47	B944RA3Q086SBEA	5	Real private fixed investment: Residential: Structures: Permanentsite: Single family (chain-type quantity index)
48	C307RA3Q086SBEA	5	Real private fixed investment: Nonresidential: Structures:Manufacturing (chain-type quantity index)
49	E318RA3Q086SBEA	5	Real private fixed investment: Nonresidential: Structures: Miningexploration, shafts, and wells (chain-type quantity ind
50	W001RA3Q086SBEA	5	Real private fixed investment: Nonresidential: Structures: Commercialand health care (chain-type quantity index)
51	W003RA3Q086SBEA	5	Real private fixed investment: Nonresidential: Structures: Power andcommunication (chain-type quantity index)
52	W004RA3Q086SBEA	5	Real private fixed investment: Nonresidential: Other structures(chain-type quantity index)
53	W040RA3Q086SBEA	5	Real private fixed investment in new structures (chain-type quantityindex)
54	PRS85006013	5	Nonfarm Business Sector: Employment
55	PRS88003013	5	Nonfinancial Corporations Sector: Employment
56	CES1021000001	5	All Employees: Mining and Logging: Mining
57	CLF16OV	5	Civilian Labor Force
58	DMANEMP	5	All Employees: Durable goods
59	MANEMP	5	All Employees: Manufacturing
60	NAPMEI	1	ISM Manufacturing: Employment Index
61	NDMANEMP	5	All Employees: Nondurable goods
62	PAYEMS	5	All Employees: Total nonfarm
63	SRVPRD	5	All Employees: Service-Providing Industries

64	UEMP15OV	5	Number of Civilians Unemployed for 15 Weeks & Over
65	UEMP15T26	5	Number of Civilians Unemployed for 15 to 26 Weeks
66	UEMP27OV	5	Number of Civilians Unemployed for 27 Weeks and Over
67	UEMP5TO14	5	Number of Civilians Unemployed for 5 to 14 Weeks
68	UEMPLT5	5	Number of Civilians Unemployed - Less Than 5 Weeks
69	UEMPMEAN	5	Average (Mean) Duration of Unemployment
70	UNRATE	1	Civilian Unemployment Rate
71	USFIRE	5	All Employees: Financial Activities
72	USGOOD	5	All Employees: Goods-Producing Industries
73	USGOVT	5	All Employees: Government
74	USTPU	5	All Employees: Trade, Transportation & Utilities
75	USTRADE	5	All Employees: Retail Trade
76	USWTRADE	5	All Employees: Wholesale Trade
77	CE16OV	5	Civilian Employment
78	USCONS	5	All Employees: Construction
79	HOABS	5	Business Sector: Hours of All Persons
80	HOANBS	5	Nonfarm Business Sector: Hours of All Persons
81	PRS84006023	1	Business Sector: Average Weekly Hours
82	PRS85006023	1	Nonfarm Business Sector: Average Weekly Hours
83	AWHMAN	1	Average Weekly Hours of Production and Nonsupervisory Employees:Manufacturing
84	AWOTMAN	1	Average Weekly Overtime Hours of Production and NonsupervisoryEmployees: Manufacturing
85	A371RX1Q020SBEA	5	Real private inventories
86	A373RX1Q020SBEA	5	Real private inventories: Nonfarm
87	B372RX1Q020SBEA	5	Real private inventories: Farm
88	NAPMII	1	ISM Manufacturing: Inventories Index
89	NAPMNOI	1	ISM Manufacturing: New Orders Index
90	NAPMSDI	1	ISM Manufacturing: Supplier Deliveries Index
91	NAPM	1	ISM: PMI Composite Index
92	SP500	5	S&P 500 Stock Price Index
93	AAA	1	Moody s Seasoned Aaa Corporate Bond Yield
94	BAA	1	Moody s Seasoned Baa Corporate Bond Yield
95	FEDFUNDS	1	Effective Federal Funds Rate
96	GS1	1	1-Year Treasury Constant Maturity Rate
97	GS10	1	10-Year Treasury Constant Maturity Rate
98	GS5	1	5-Year Treasury Constant Maturity Rate
99	TB3MS	1	3-Month Treasury Bill: Secondary Market Rate
100	AAA-S	1	AAA-FEDFUNDS spread
101	BAA-S	1	BAA-FEDFUNDS spread
102	GS1-S	1	1-Year Treasury Constant Maturity Rate-FEDFUNDS spread
103	GS10-S	1	10-Year Treasury Constant Maturity Rate-FEDFUNDS spread
104	GS5-S	1	5-Year Treasury Constant Maturity Rate-FEDFUND spread
105	TB3MS-S	1	3-Month Treasury Bill: Secondary Market Rate-FEDFUNDS spread
106	TB6MS-S	1	6-Month Treasury Bill: Secondary Market Rate-FEDFUNDS spread
107	AMBSL	5	St. Louis Adjusted Monetary Base
108	BUSLOANS	5	Commercial and Industrial Loans, All Commercial Banks
109	NONREVSL	5	Total Nonrevolving Credit Owned and Securitized, Outstanding
110	REALLN	5	Real Estate Loans, All Commercial Banks
111	DTCOLNVHFNM	5	Consumer Motor Vehicle Loans Owned by Finance Companies, Outstanding
112	DTCTHFNM	5	Total Consumer Loans and Leases Owned and Securitized by Finance Companies, Outstanding
113	INVEST	5	Securities in Bank Credit at All Commercial Banks
114	CPIAUCSL	5	Consumer Price Index for All Urban Consumers: All Items
115	CPIAPPSL	5	Consumer Price Index for All Urban Consumers: Apparel
116	CPITRNSL	5	Consumer Price Index for All Urban Consumers: Transportation
117	CPIMEDSL	5	Consumer Price Index for All Urban Consumers: Medical Care
118	CUSR0000SAC	5	Consumer Price Index for All Urban Consumers: Commodities
119	CUUR0000SAD	5	Consumer Price Index for All Urban Consumers: Durables
120	CUSR0000SAS	5	Consumer Price Index for All Urban Consumers: Services
121	CPIULFSL	5	Consumer Price Index for All Urban Consumers: All Items Less Food
122	CUUR0000SA0L2	5	Consumer Price Index for All Urban Consumers: All items less shelter
123	CUSR0000SA0L5	5	Consumer Price Index for All Urban Consumers: All items less medicalcare
124	PPICMM	5	Producer Price Index: Commodities: Metals and metal products: Primarynonferrous metals
125	PPICRM	5	Producer Price Index: Crude Materials for Further Processing
126	PPIFCG	5	Producer Price Index: Finished Consumer Goods
127	PPIFGS	5	Producer Price Index: Finished Goods
128	PPIIDC	5	Producer Price Index: Industrial Commodities
129	NAPMPRI	1	ISM Manufacturing: Price
130	A132RC1Q027SBEA	5	Compensation of employees: Wages and salaries: Private industries
131	B202RC1Q027SBEA	5	Compensation of employees: Wages and salaries: Government
132	COMPNFB	5	Nonfarm Business Sector: Compensation Per Hour
133	HCOMPBS	5	Business Sector: Compensation Per Hour
134	W209RC1Q027SBEA	5	Compensation of employees
135	COMPRNFB	5	Nonfarm Business Sector: Real Compensation Per Hour
136	RCPHBS	5	Business Sector: Real Compensation Per Hour
137	CES0600000008	5	Average Hourly Earnings of Production and Nonsupervisory Employees:Goods-Producing

138	CES2000000008	5	Average Hourly Earnings of Production and Nonsupervisory Employees:Construction
139	CES3000000008	5	Average Hourly Earnings of Production and Nonsupervisory Employees:Manufacturing
140	GCEC96	5	Real Government Consumption Expenditures & Gross Investment
141	W066RC1Q027SBEA	5	Government total receipts