GDP, investment and consumption (all experiments)

Free entry

GDP
Investment
Consumption

Logs

Time
(MC runs = 5)
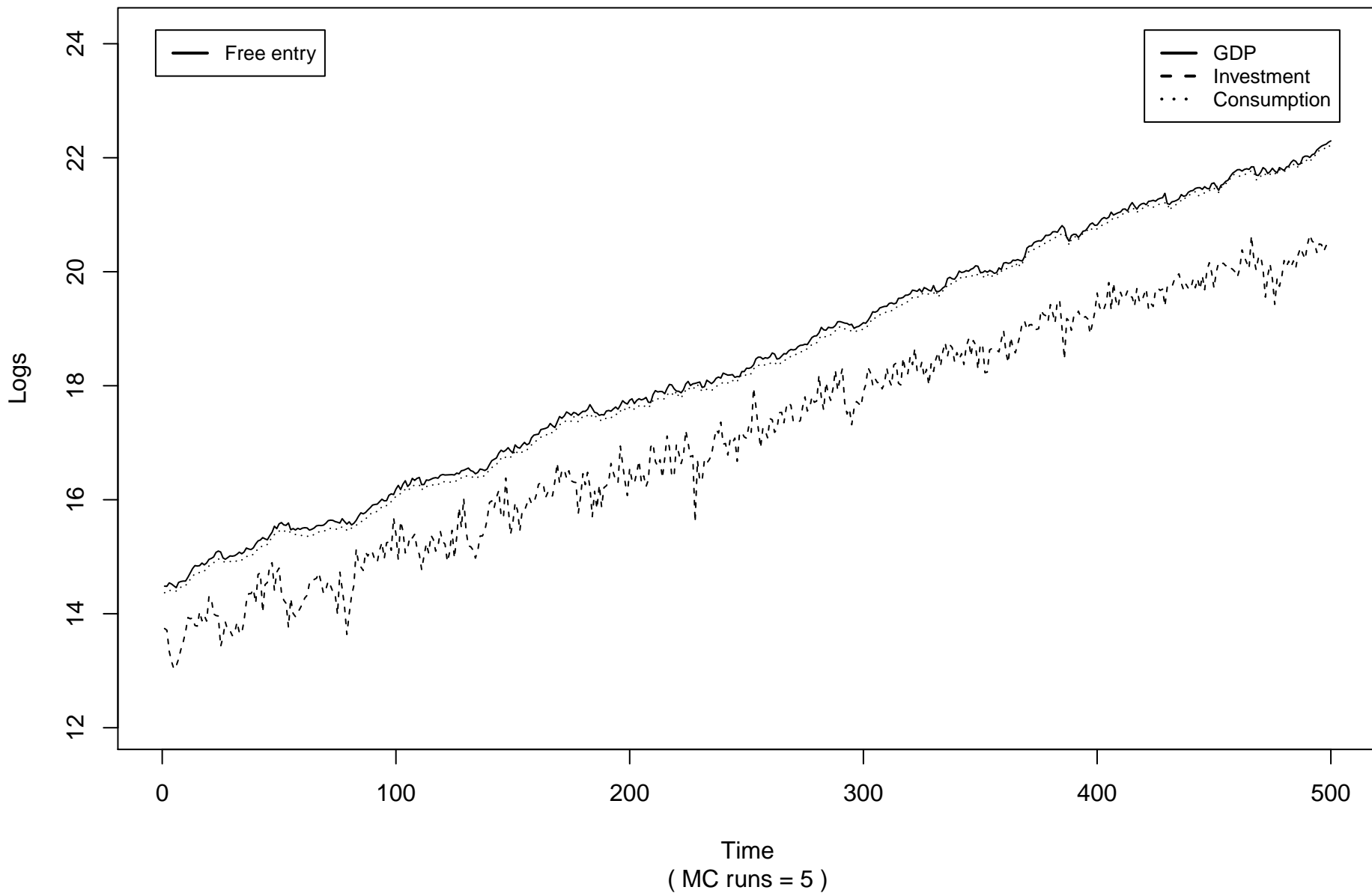
GDP, investment and consumption (Free entry)

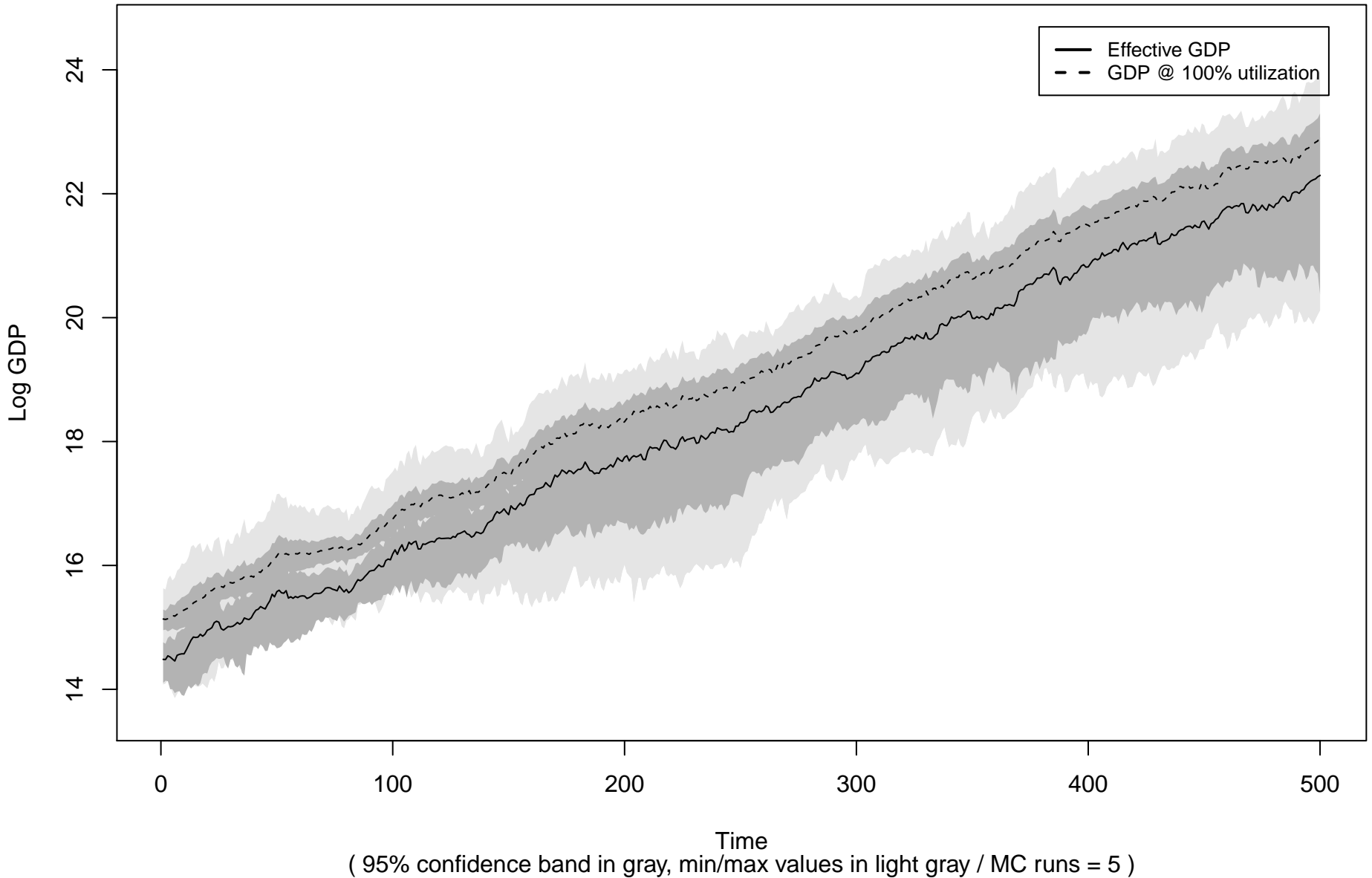Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)

GDP (all experiments)

Legend: Free entry — Effective GDP (solid line), GDP @ 100% utilization (dashed line)

Log GDP

24
22
20
18
16
14

0   100   200   300   400   500

Time
(MC runs = 5)

GDP (Free entry)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
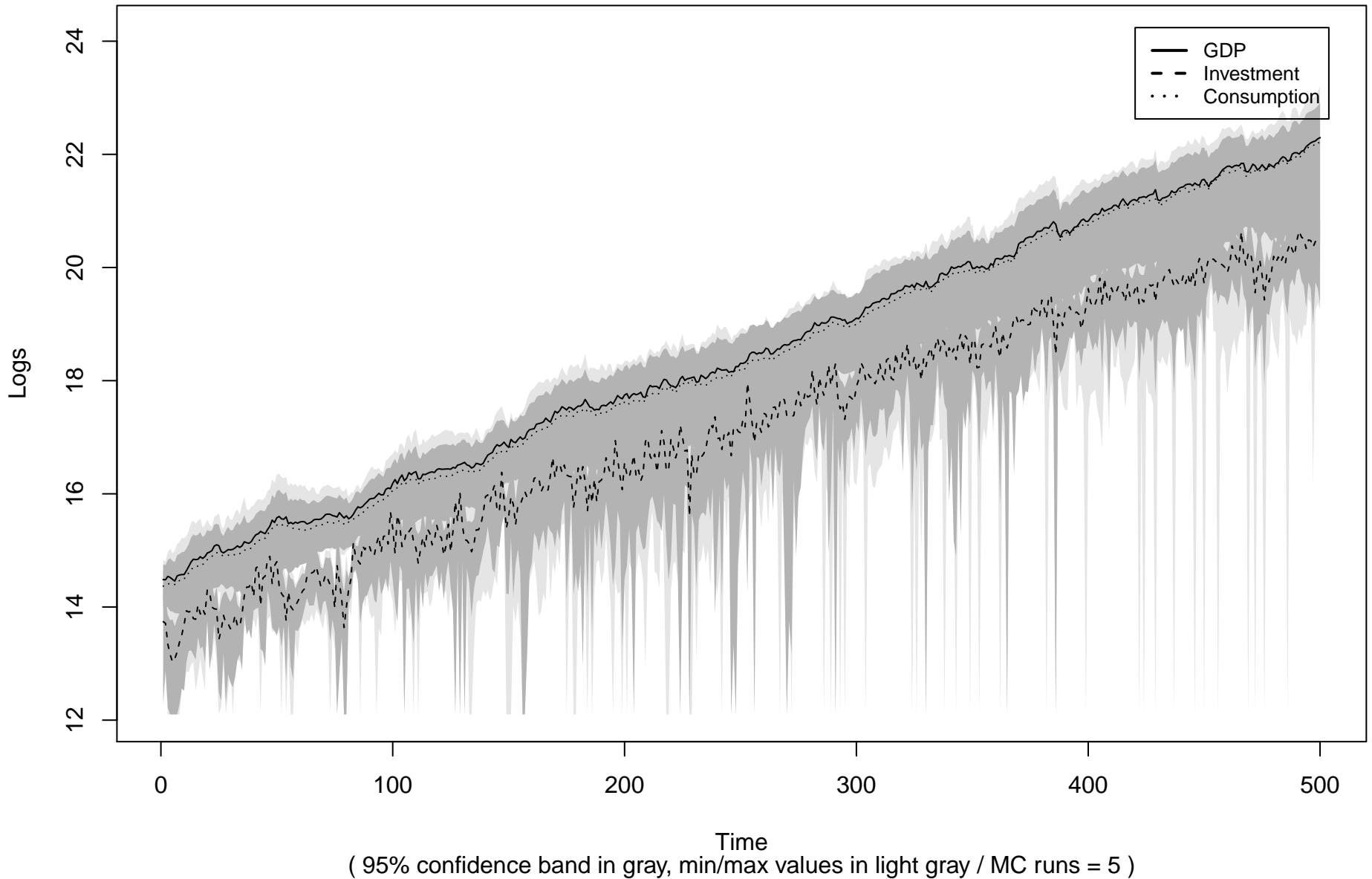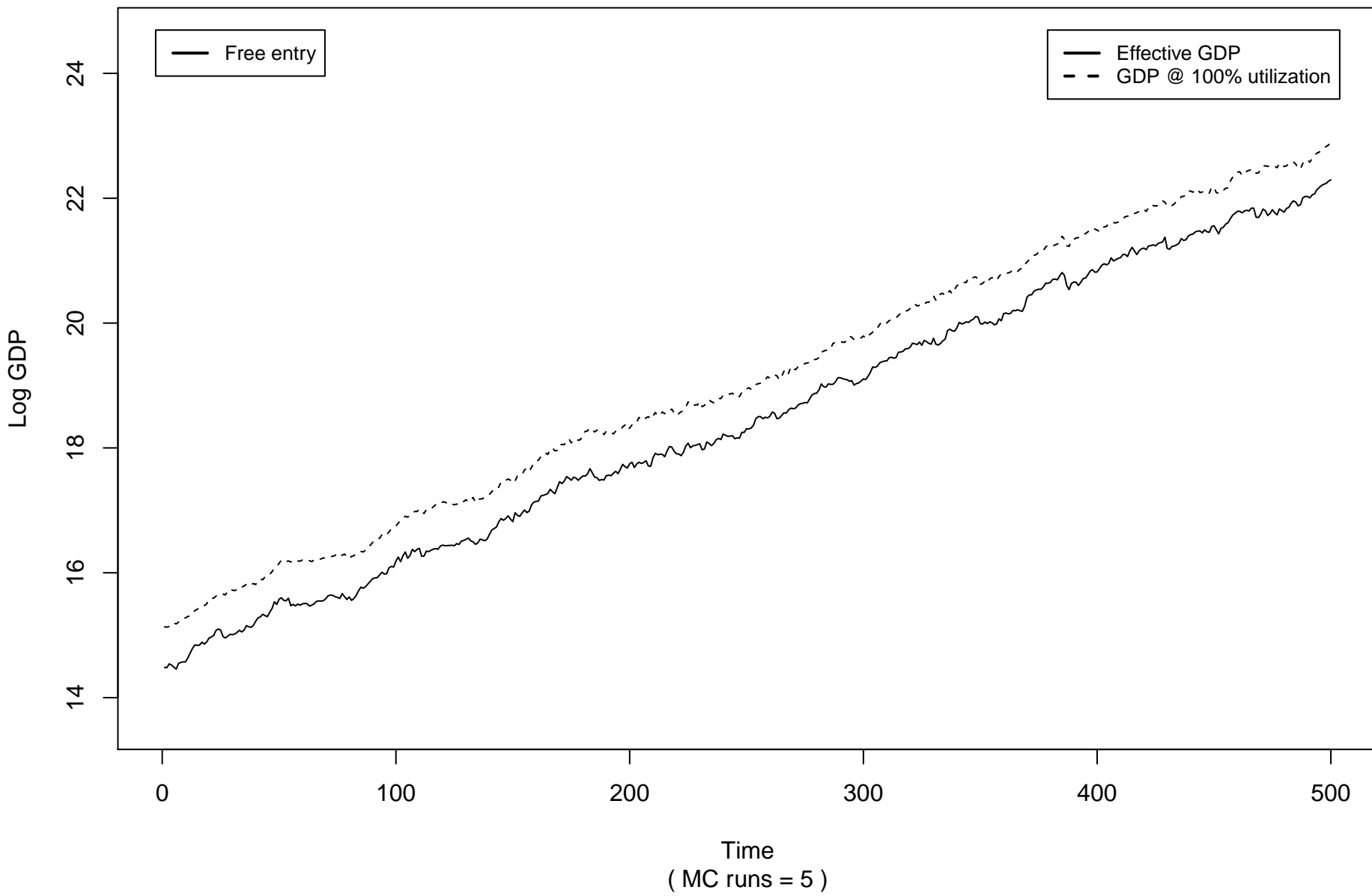
Government income and expenditure on GDP (all experiments)

Log government tax income and expenditure over GDP

Time
(MC runs = 5)

Free entry

Tax
Total expenditure
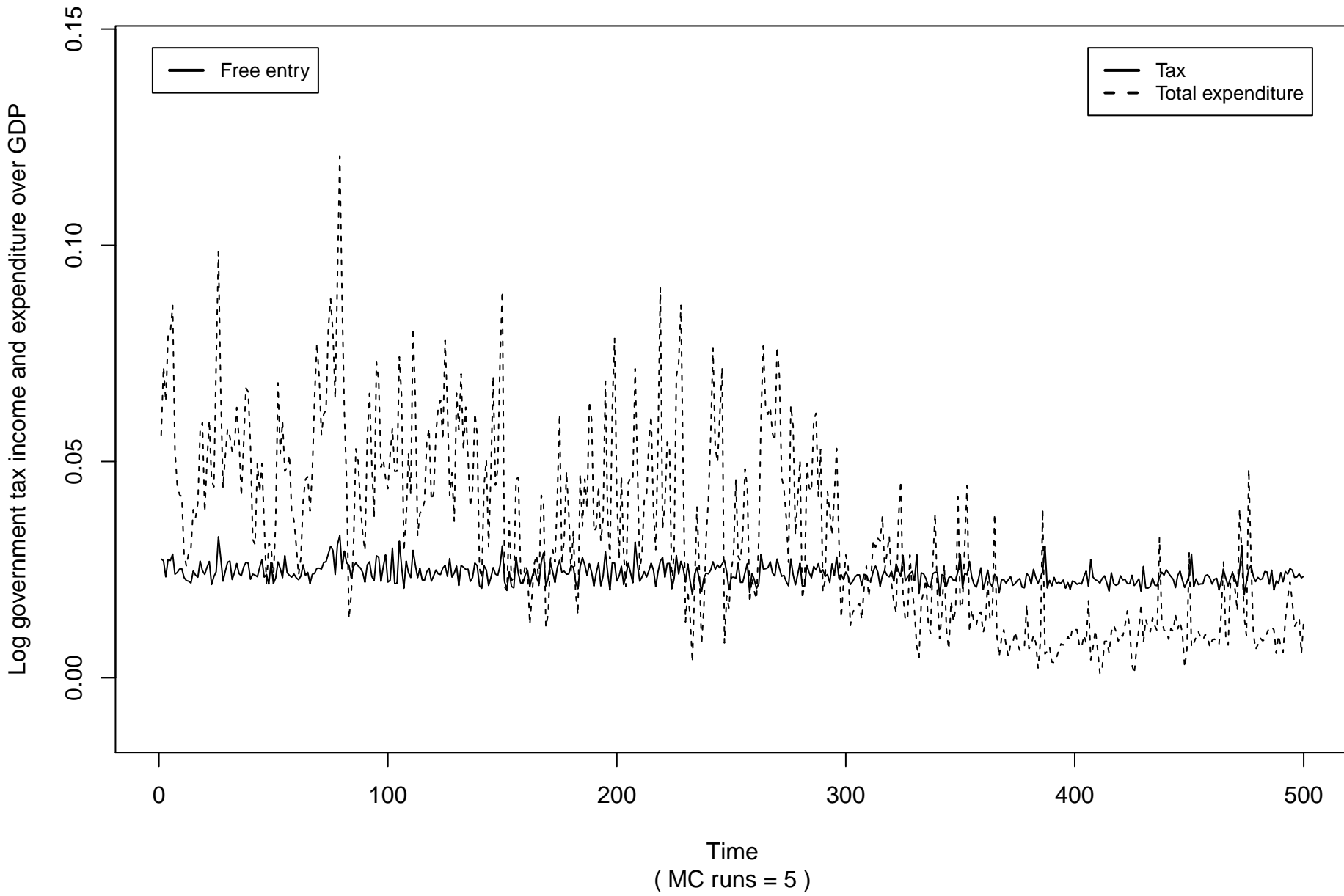
Government income and expenditure on GDP (Free entry)

Log government tax income and expenditure over GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)

Legend:
— Tax
- - Total expenditure
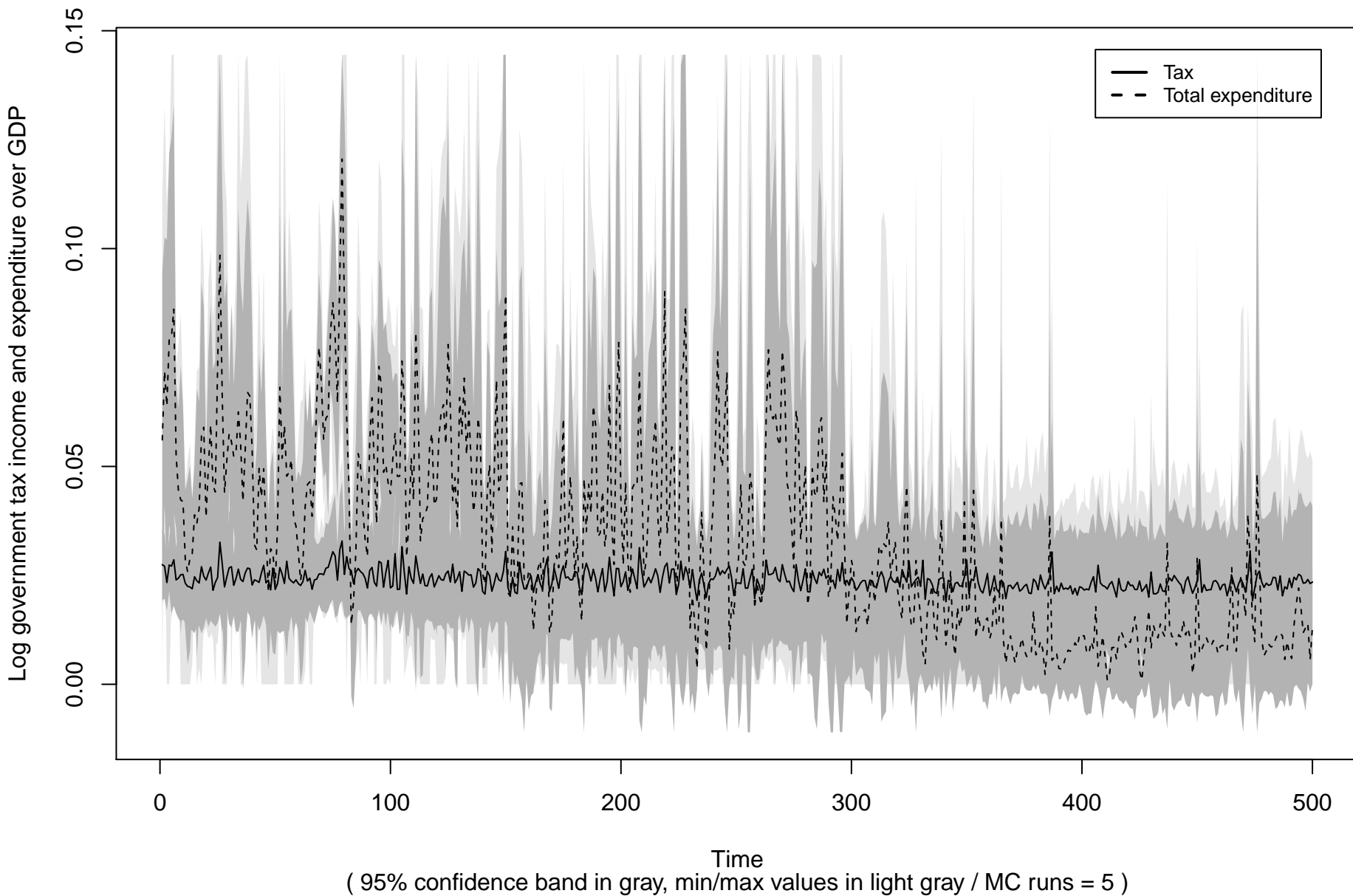
Government deficit on GDP (all experiments)

Government deficit over GDP

Time
(MC runs = 5)
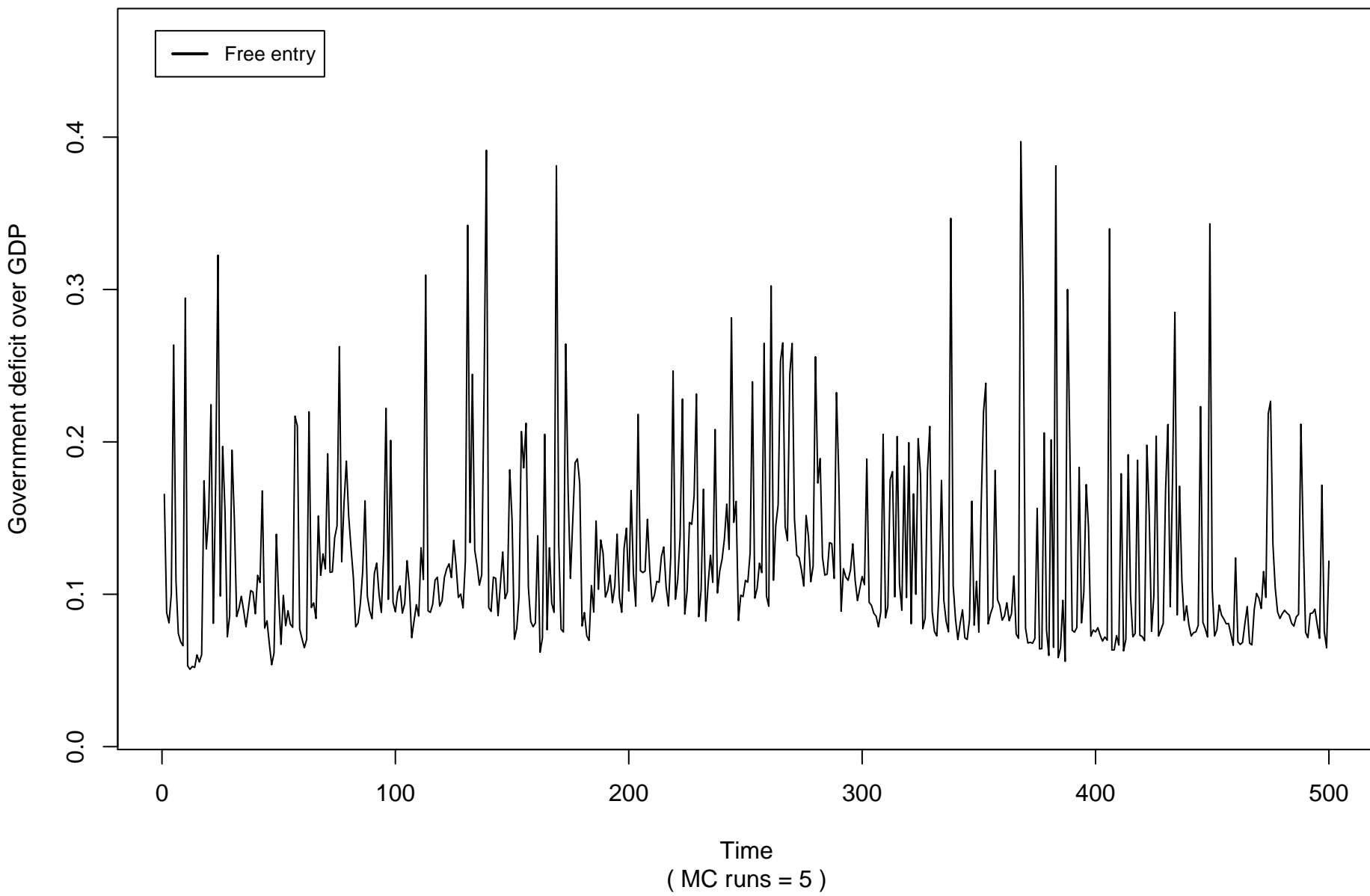
Free entry

Government deficit on GDP (Free entry)

Government deficit over GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
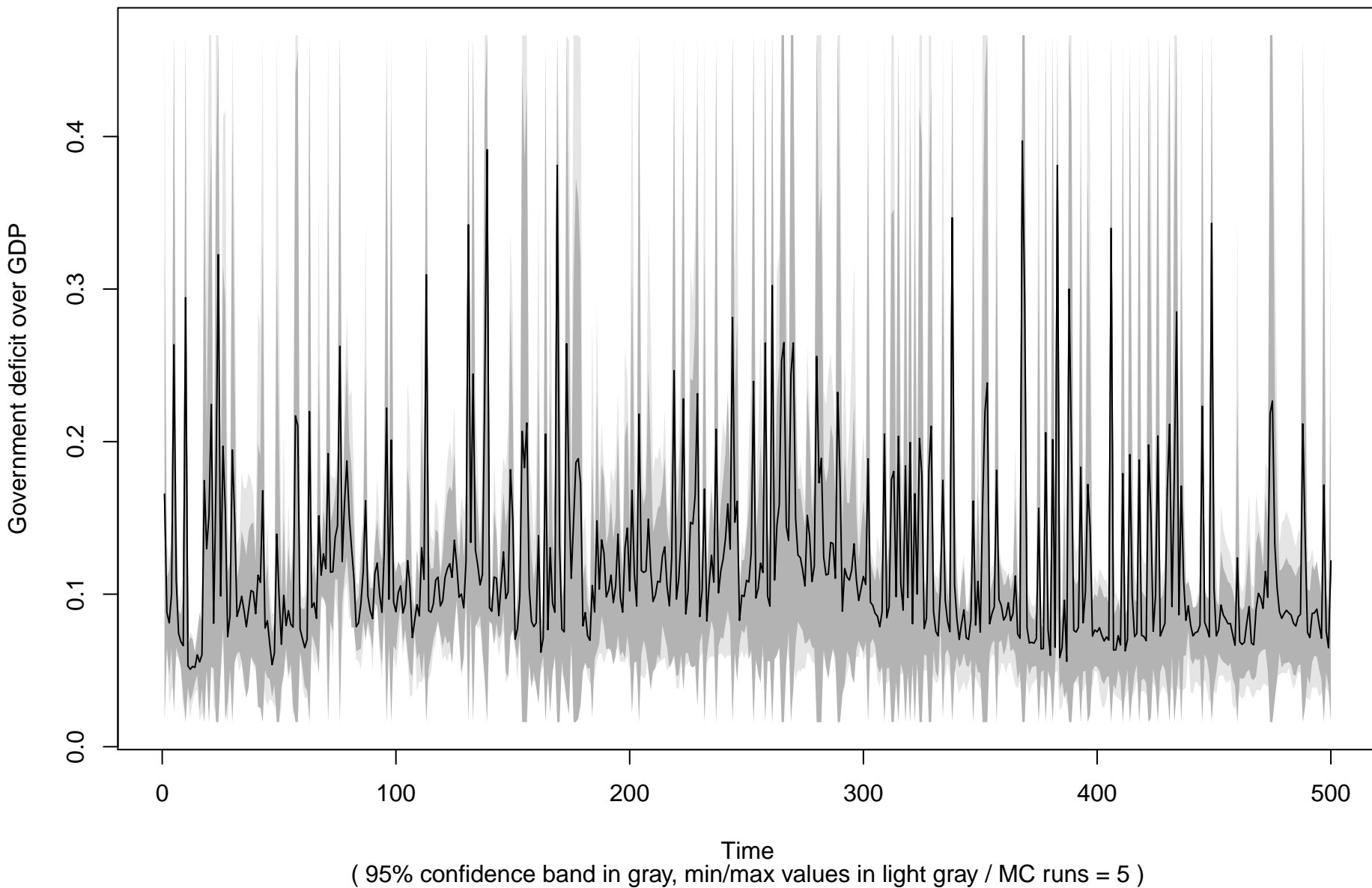
Government debt on GDP (all experiments)

Government debt over GDP

Free entry

Time
(MC runs = 5)
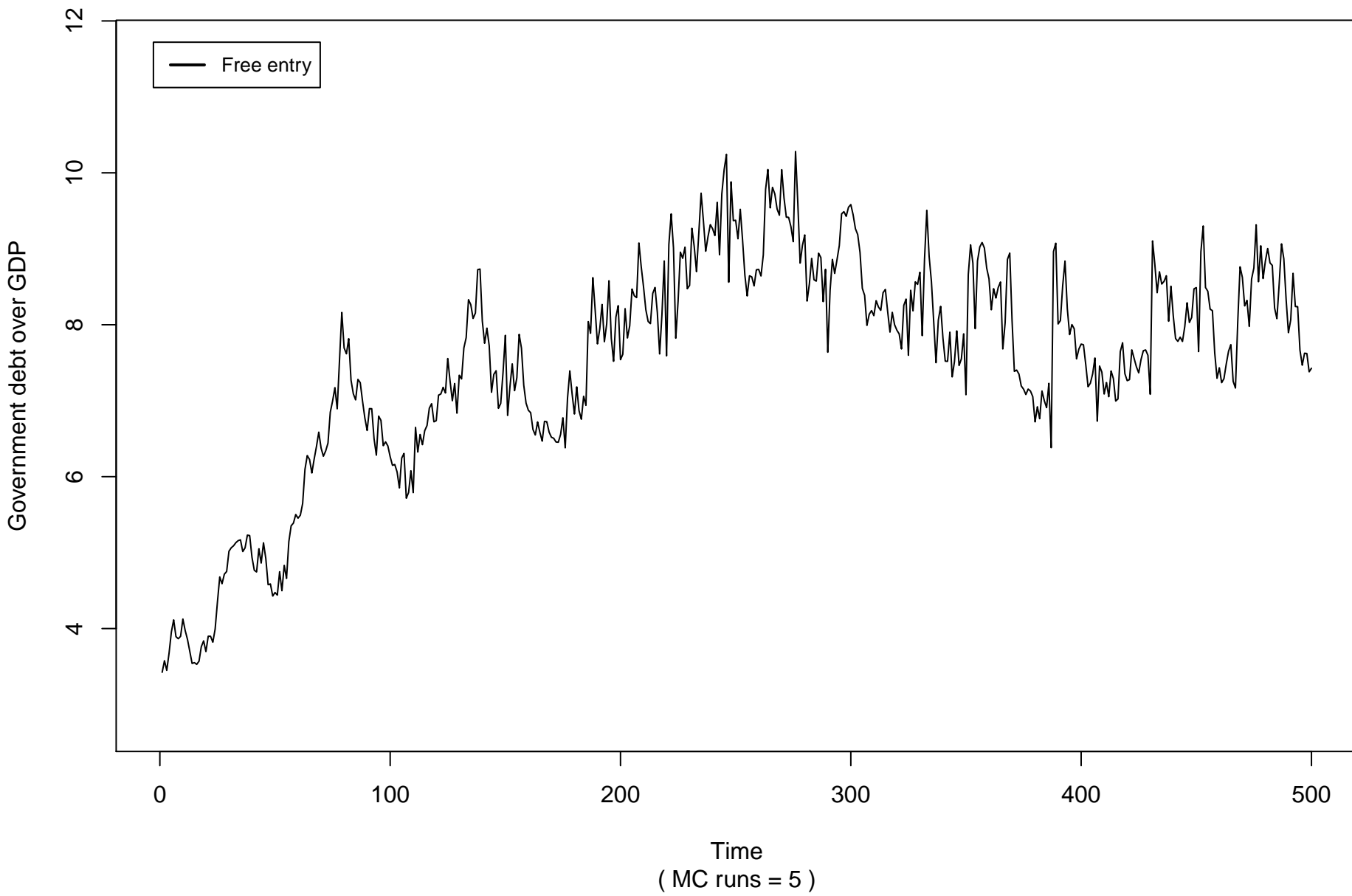
Government debt on GDP (Free entry)

Government debt over GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
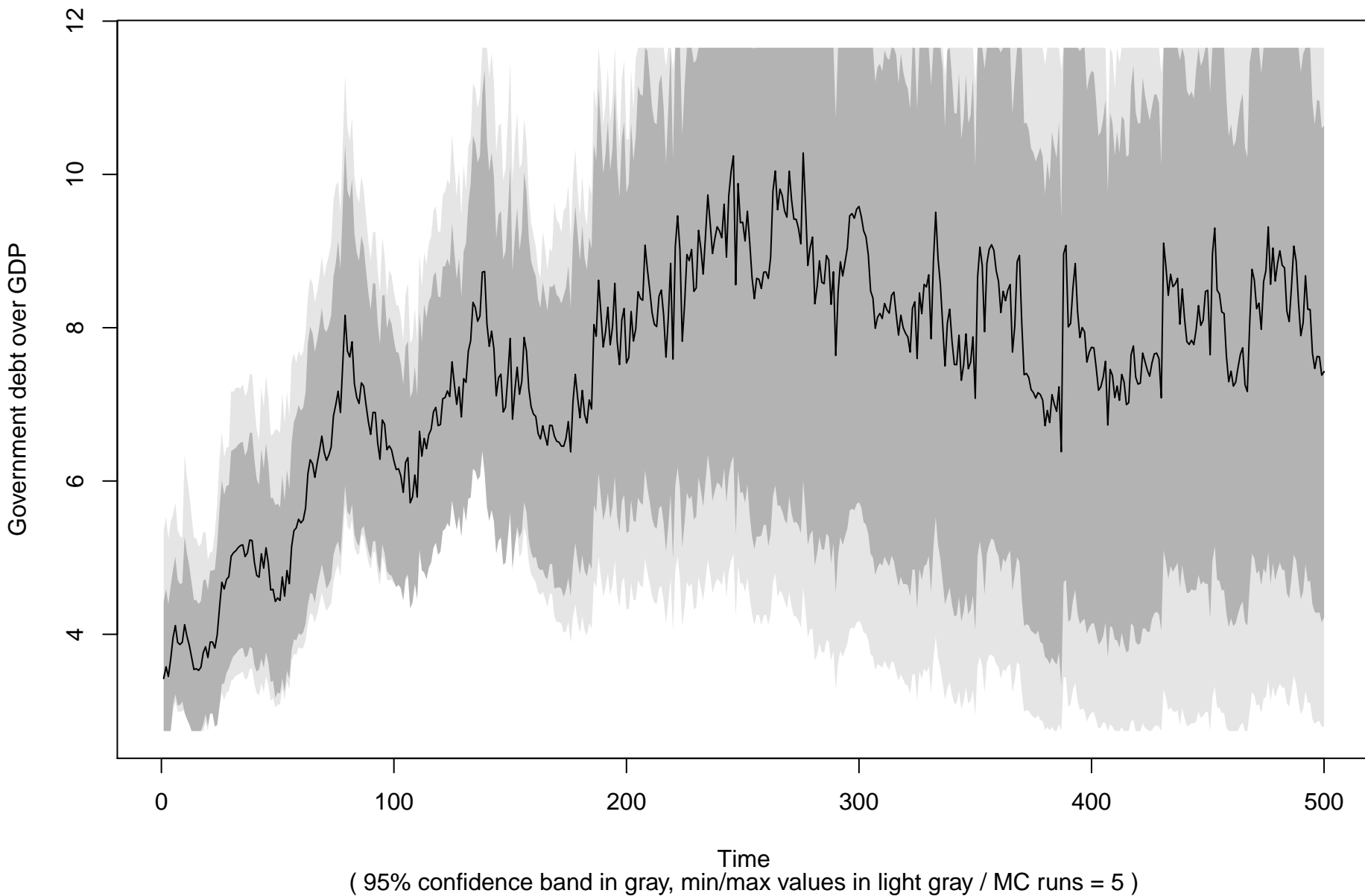
Total credit supply and loans on GDP (all experiments)

Total banks credit supply and firms loans debt over GDP

Free entry

Total credit
Loans

Time
(MC runs = 5)
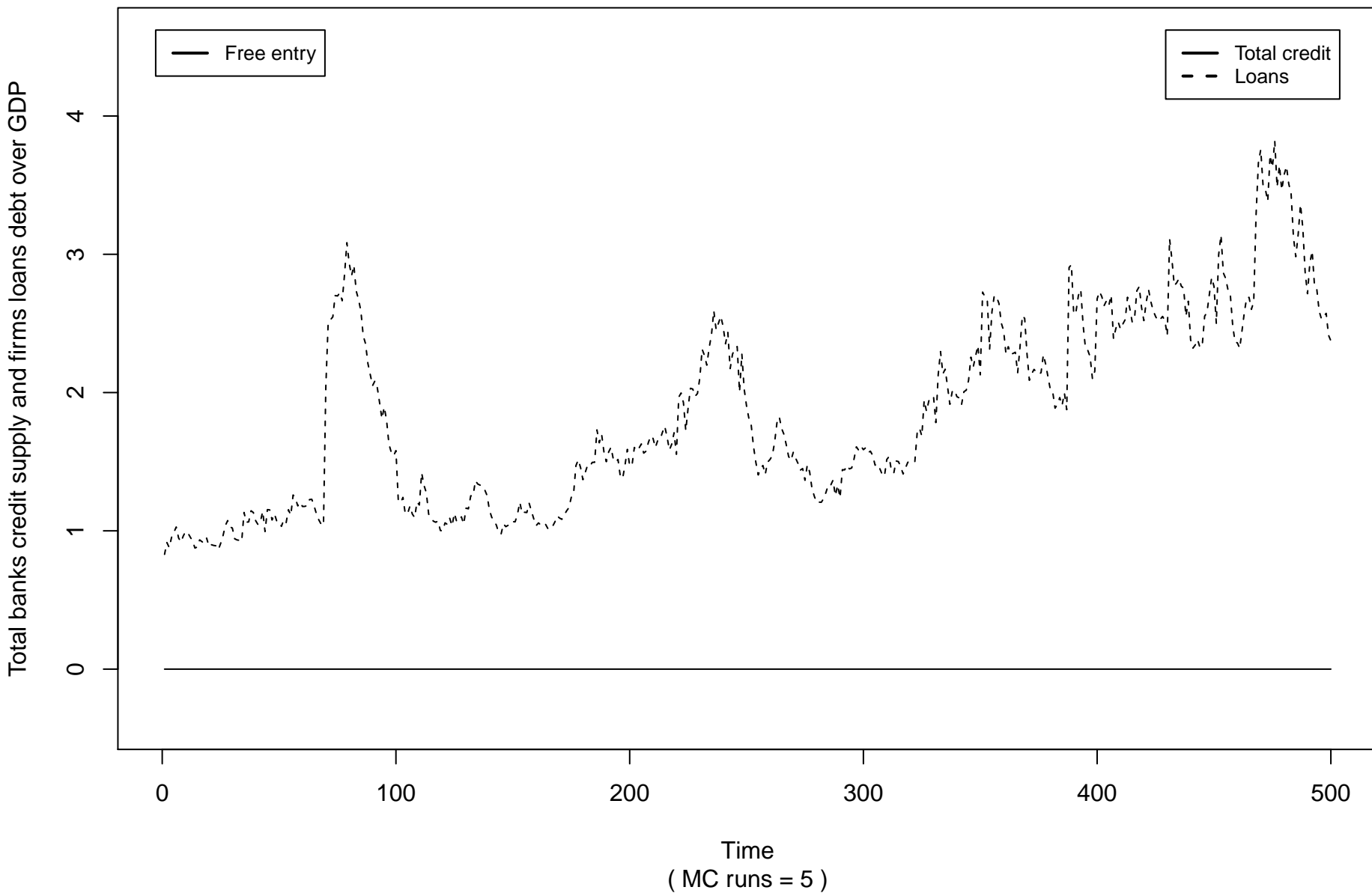
Total credit supply and loans on GDP (Free entry)

Total banks credit supply and firms loans debt over GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)

Legend:
- Total credit
- Loans
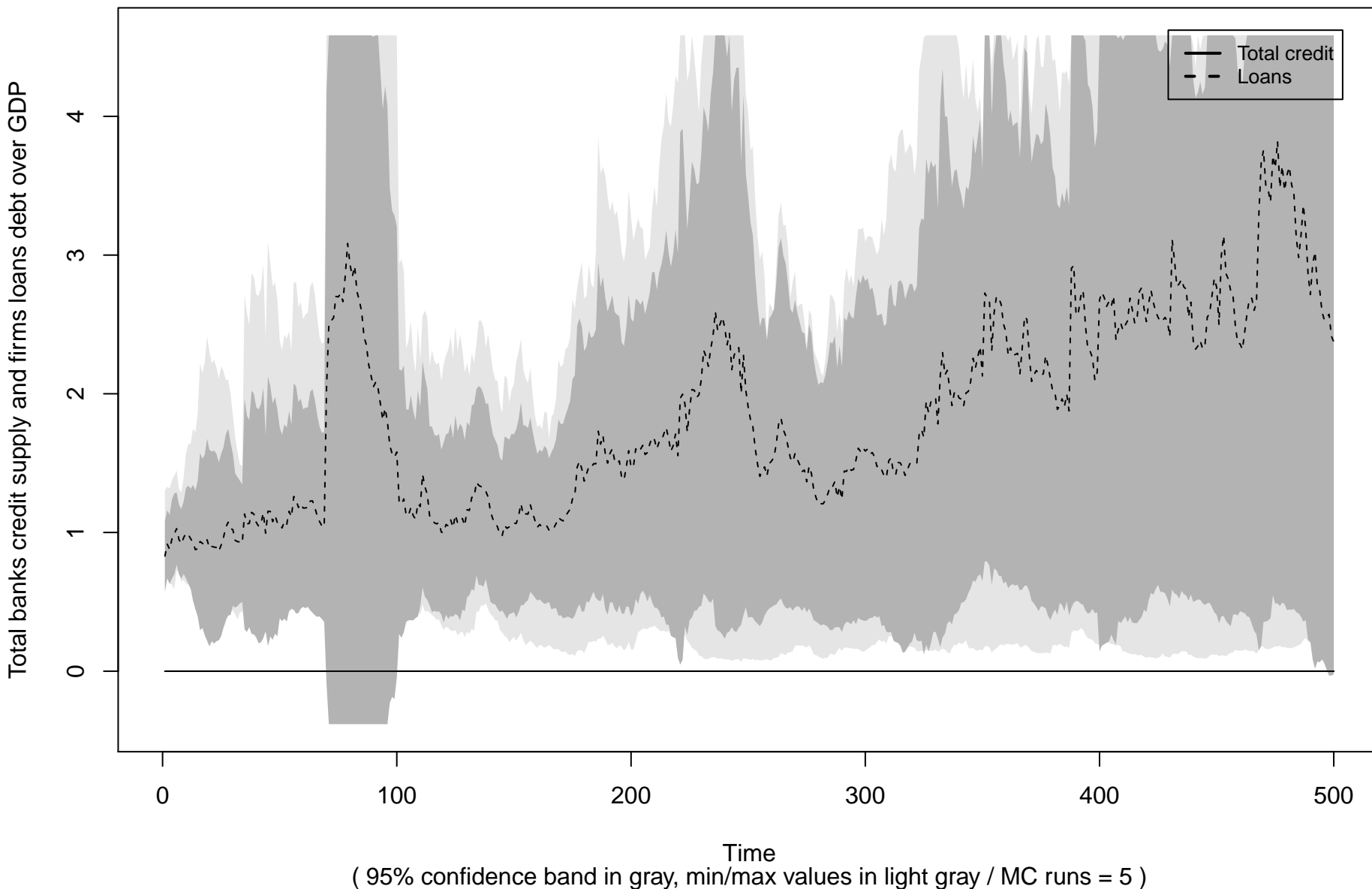
Unemployment and vacancy rates (all experiments)

Free entry

Unemployment
Vacancy

Rate

Time
(MC runs = 5)
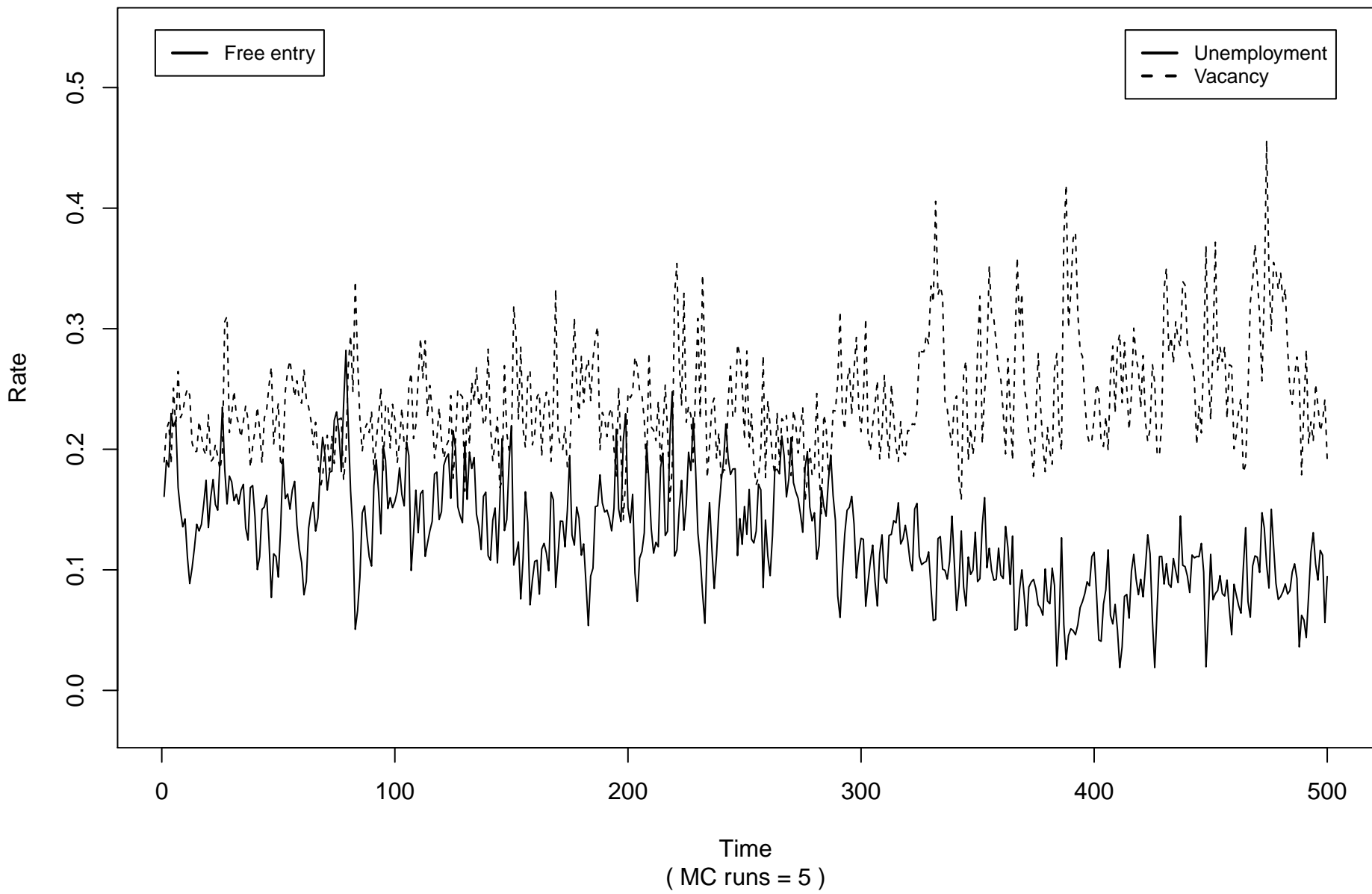
Unemployment and vacancy rates (Free entry)

Rate

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
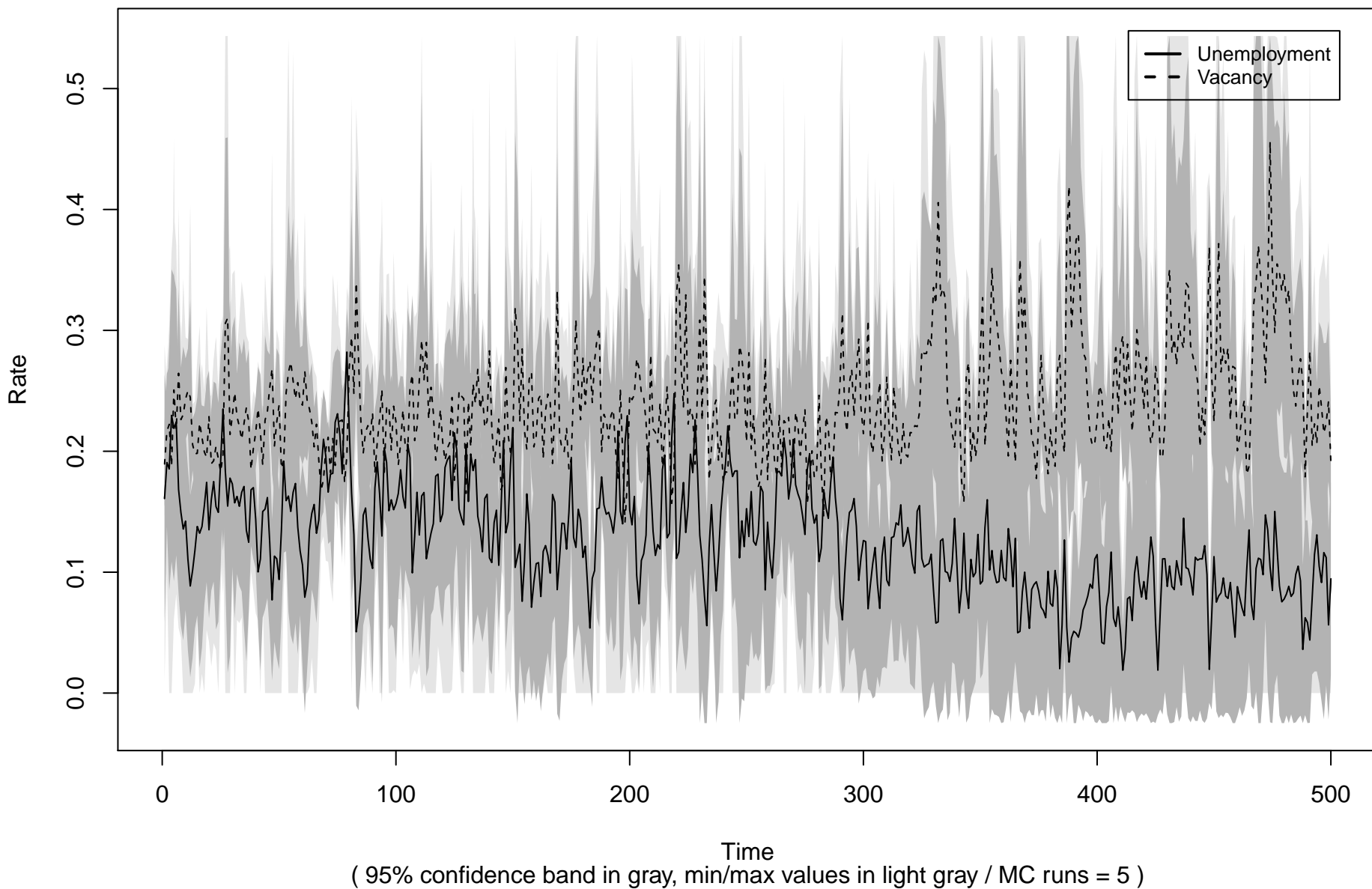
Real wages average (all experiments)

Log wages

Time
(MC runs = 5)
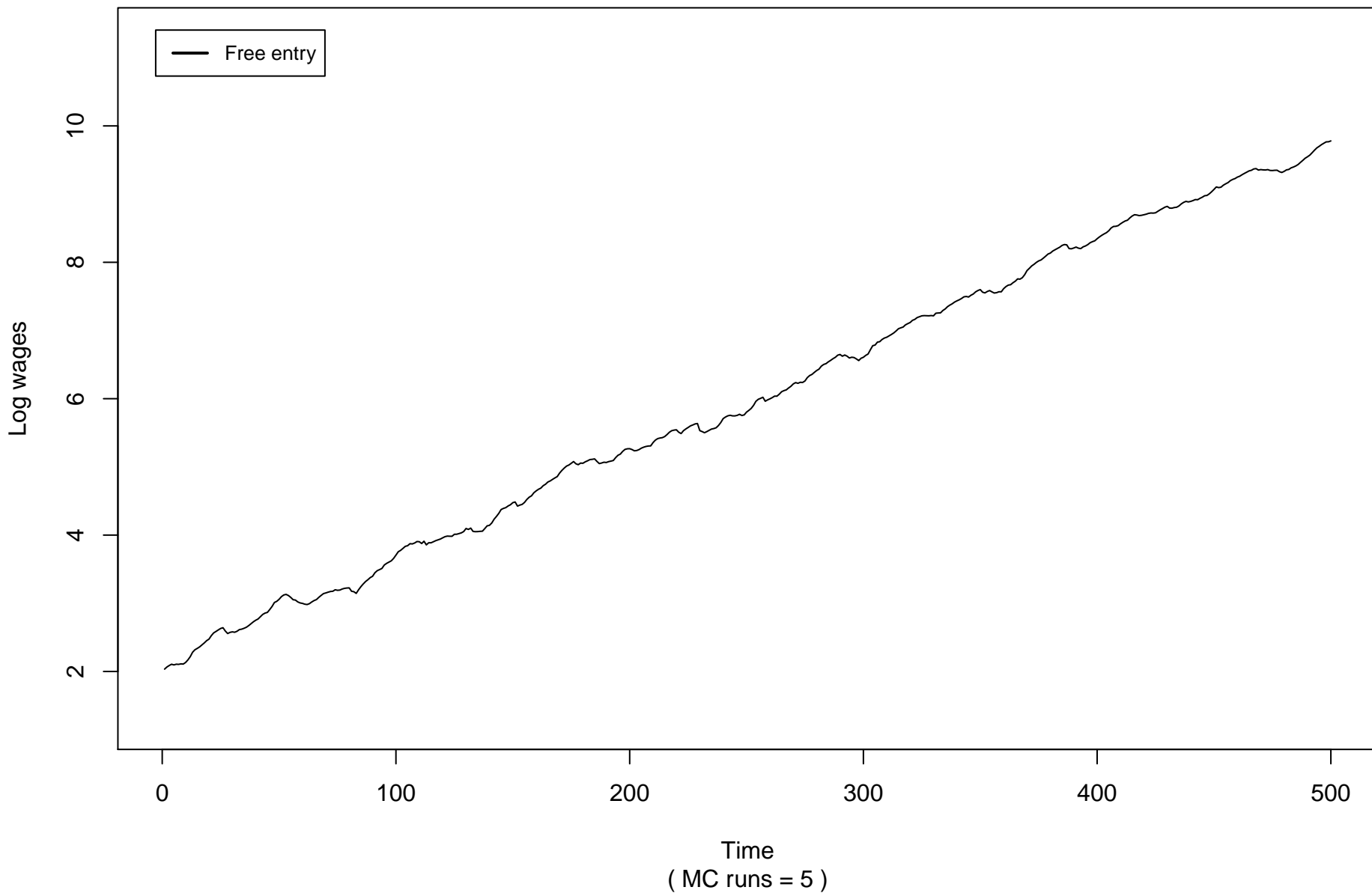
Real wages average (Free entry)

Log wages

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
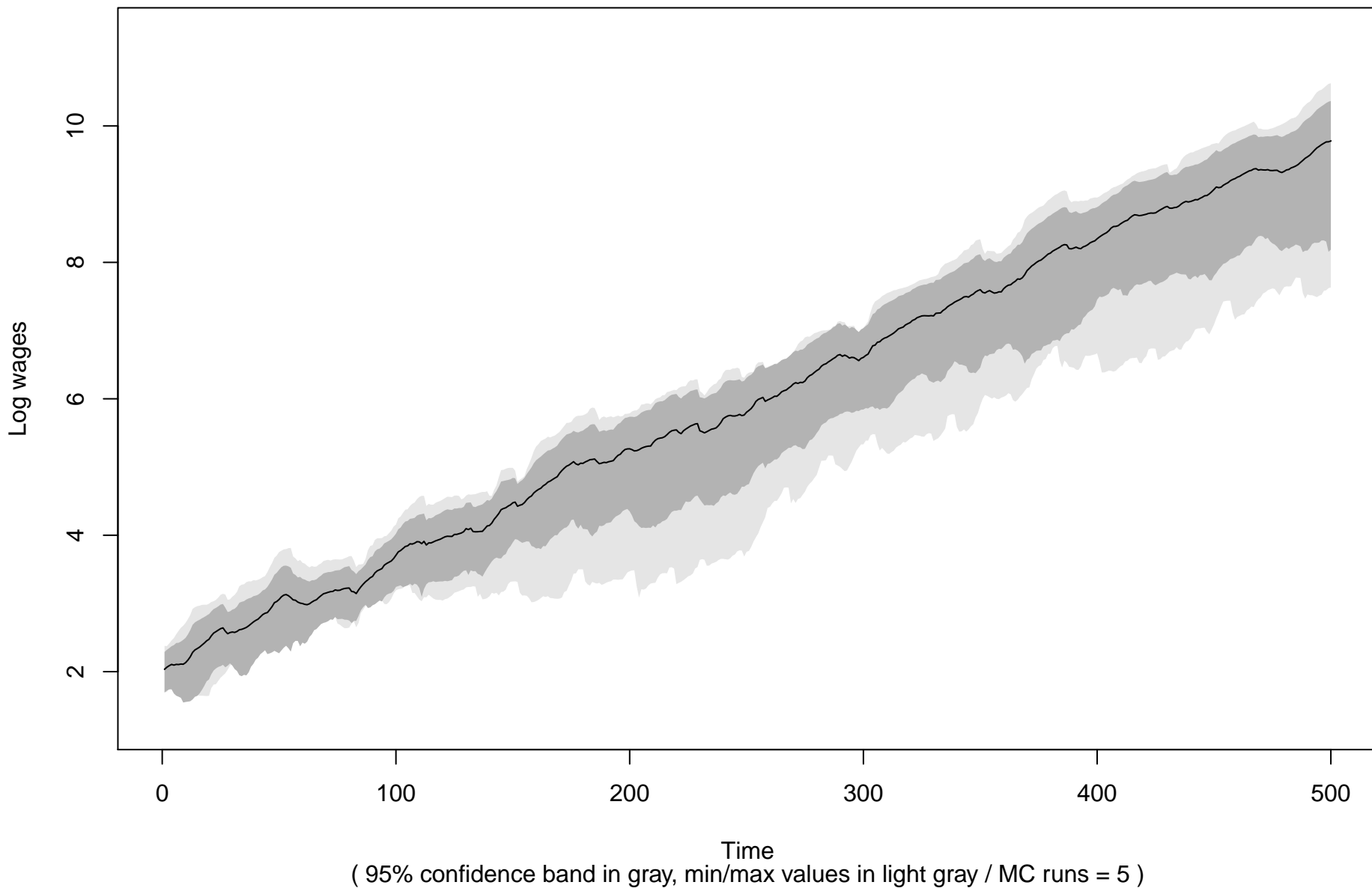
Wage share (all experiments)

Total real wages on GDP

Time
(MC runs = 5)

— Free entry

Wage share (Free entry)

Total real wages on GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
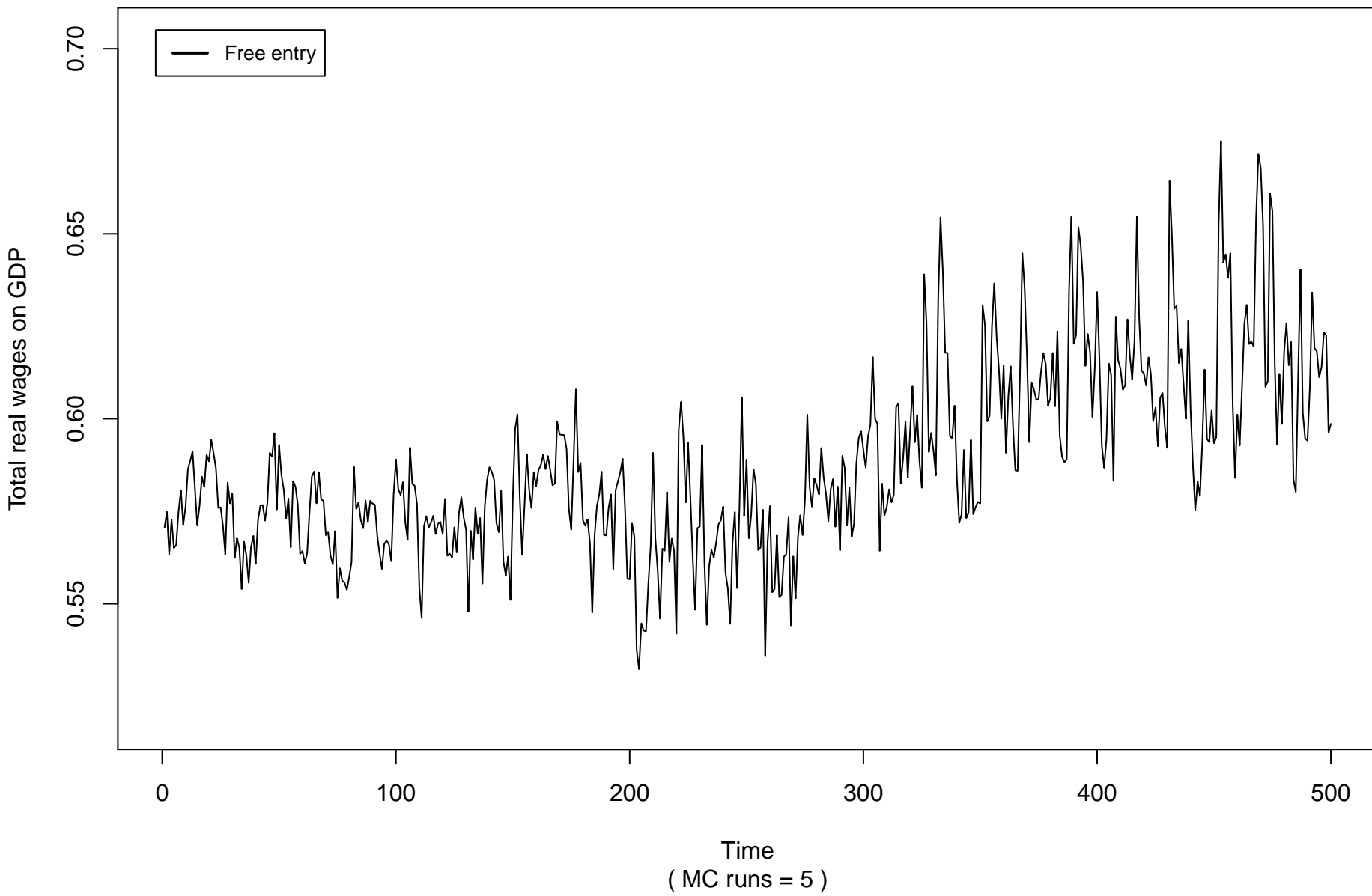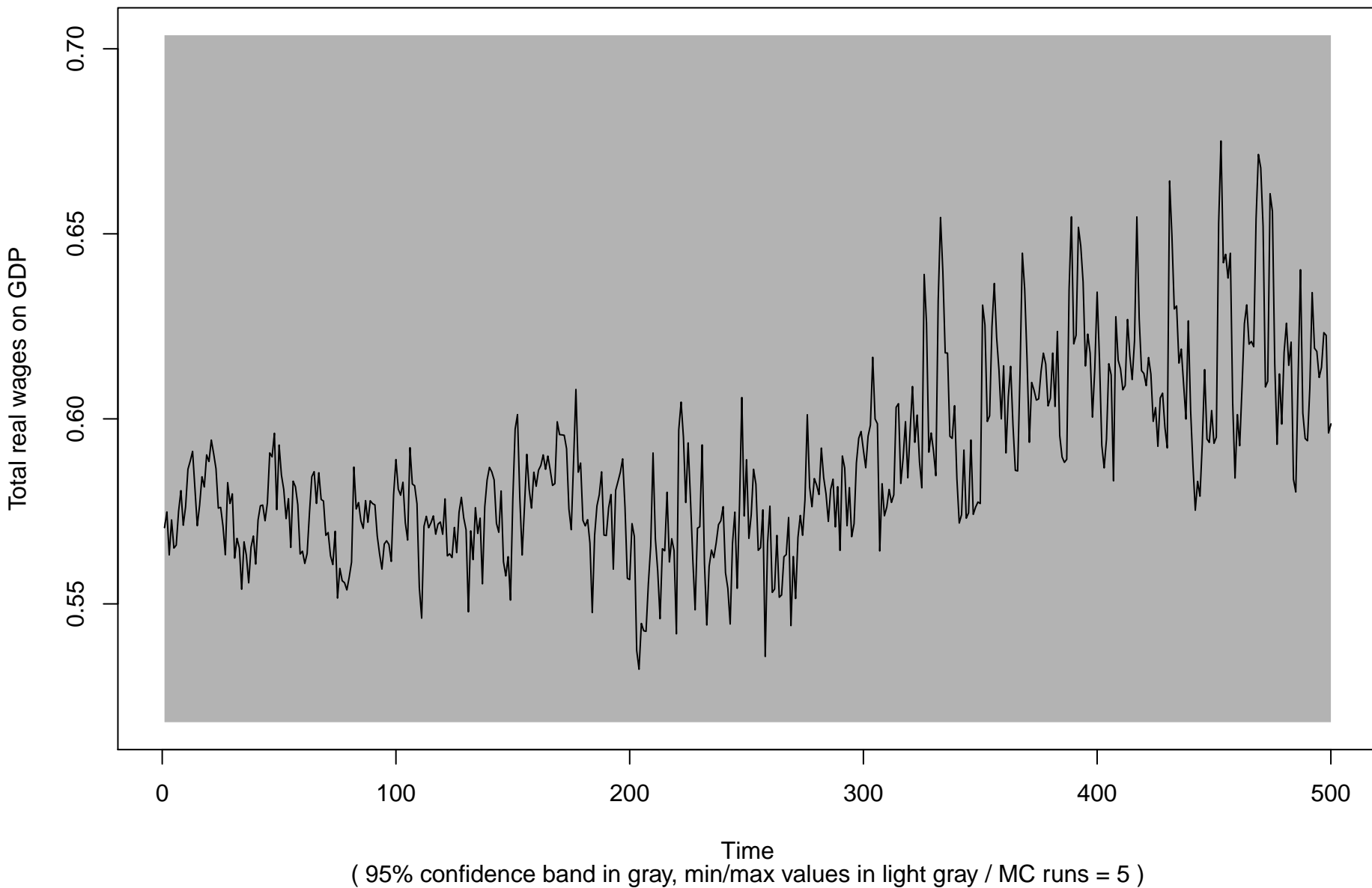
Innovation and imitation (all experiments)

Free entry

Innovation

Imitation

Share of innovating and imitating firms

Time
(sector 1 only / MC runs = 5)
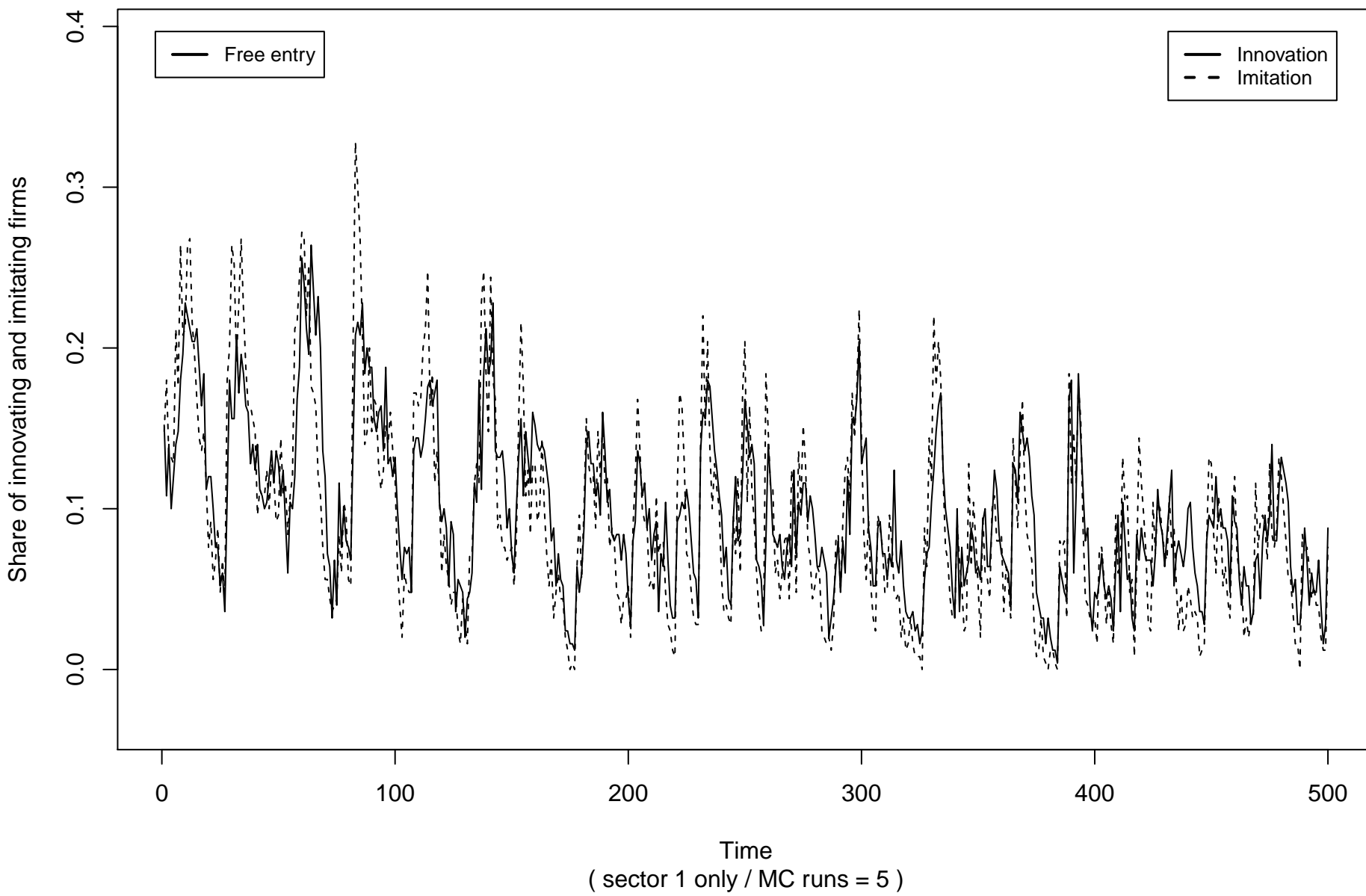
Innovation and imitation (Free entry)

Share of innovating and imitating firms

Time
(95% confidence band in gray, min/max values in light gray / sector 1 only / MC runs = 5)
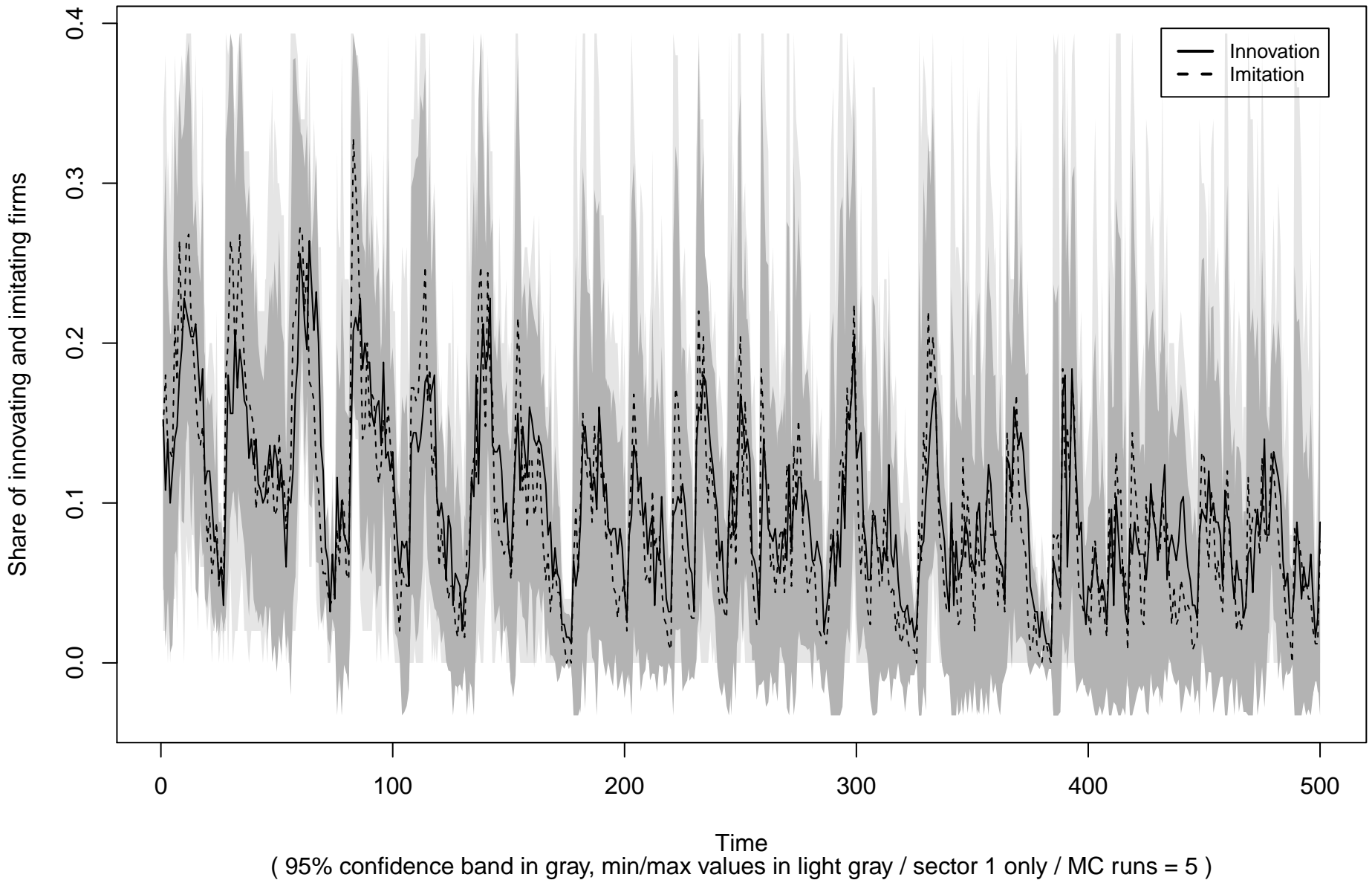
Net entry of firms trend (all experiments)

Free entry

Consumption−good sector
Capital−good sector

Number of net entrant firms (HP−filtered)

Time
(MC runs = 5)
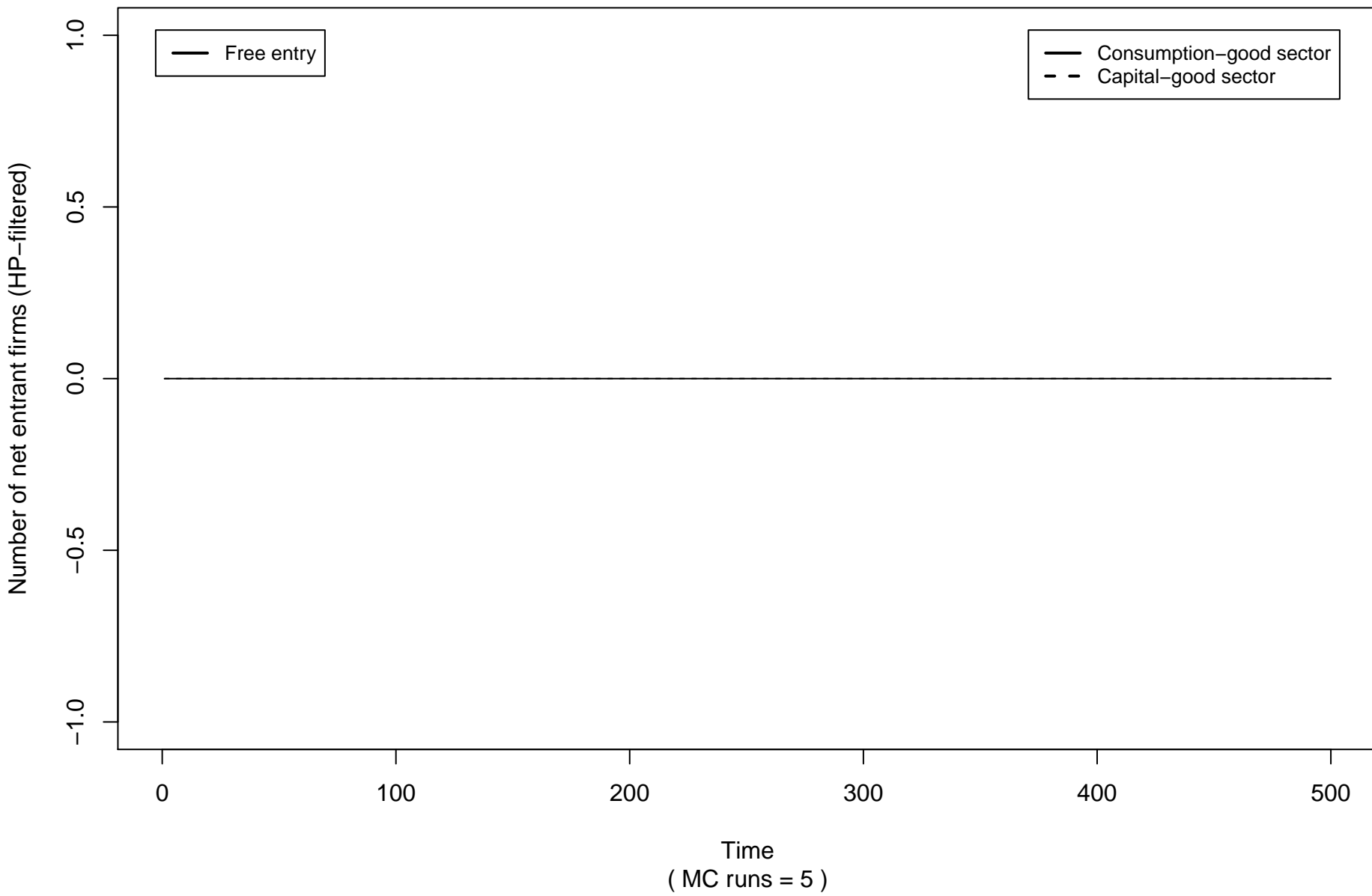
Net entry of firms trend (Free entry)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 5)
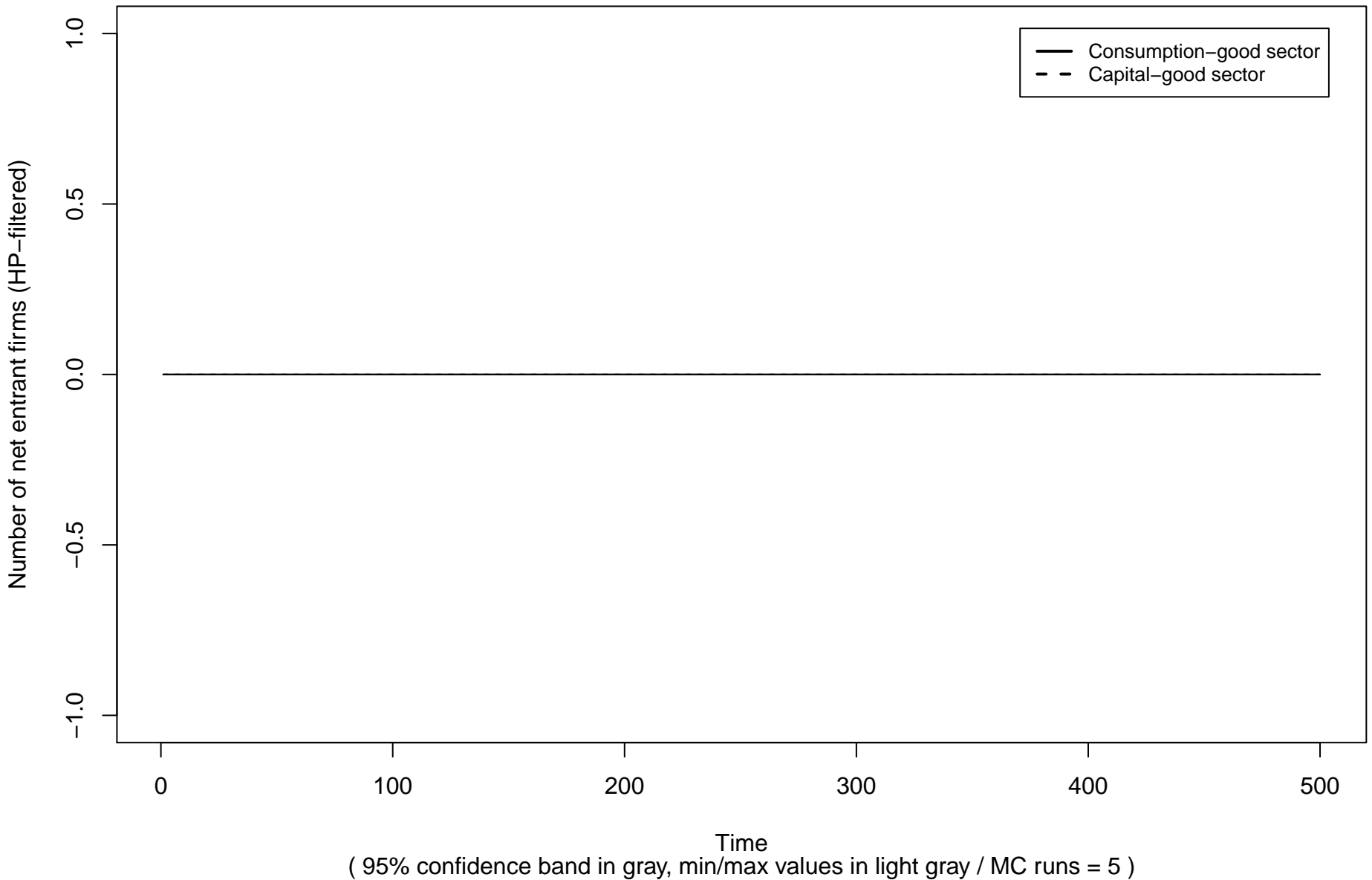
Market concentration (all experiments)

Standardized Herfindahl–Hirschman index

Free entry

Time
(Sector 2 only / MC runs = 5)
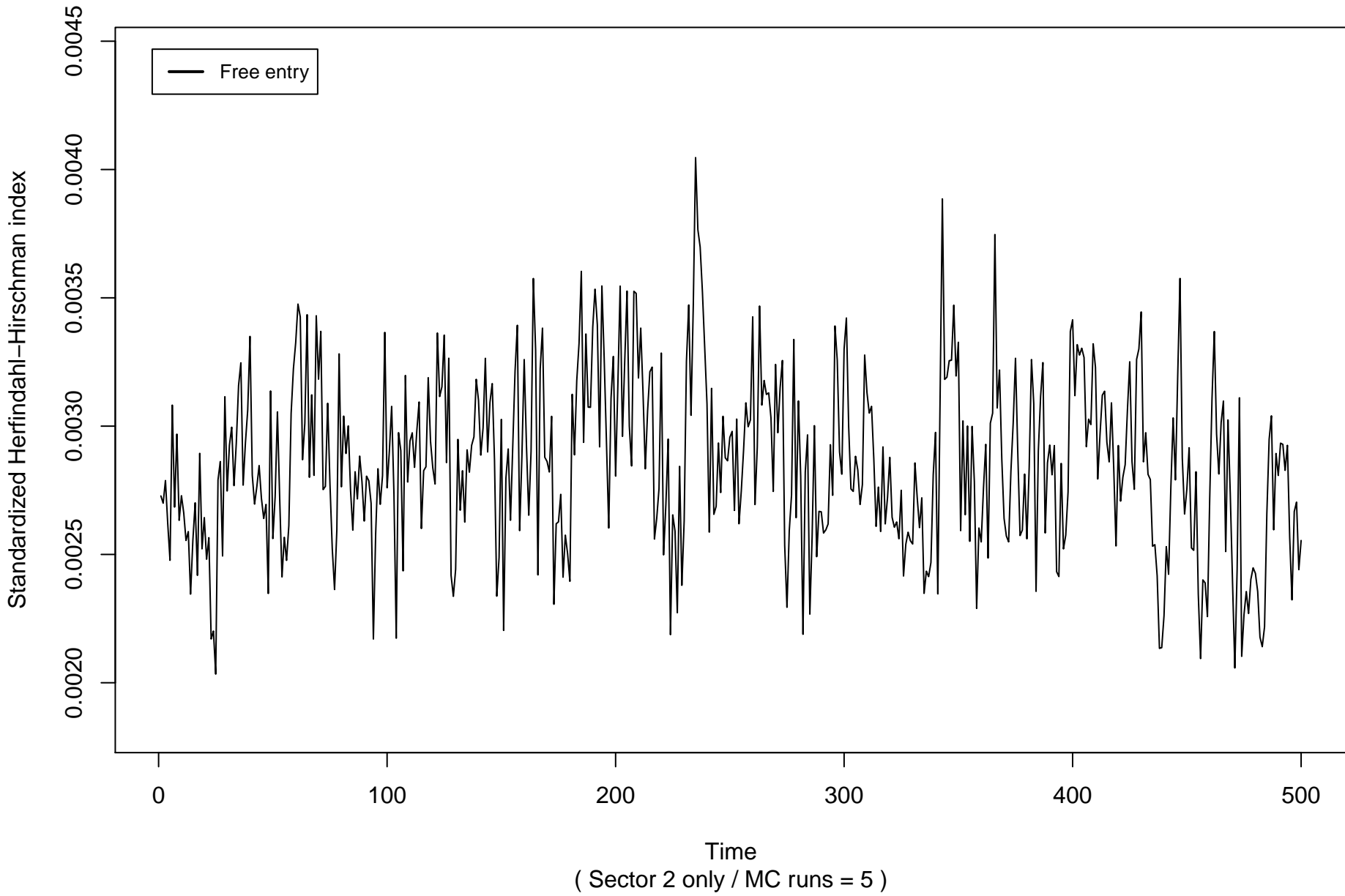
Market concentration (Free entry)

Standardized Herfindahl–Hirschman index

Time

(95% confidence band in gray, min/max values in light gray / Sector 2 only / MC runs = 5)
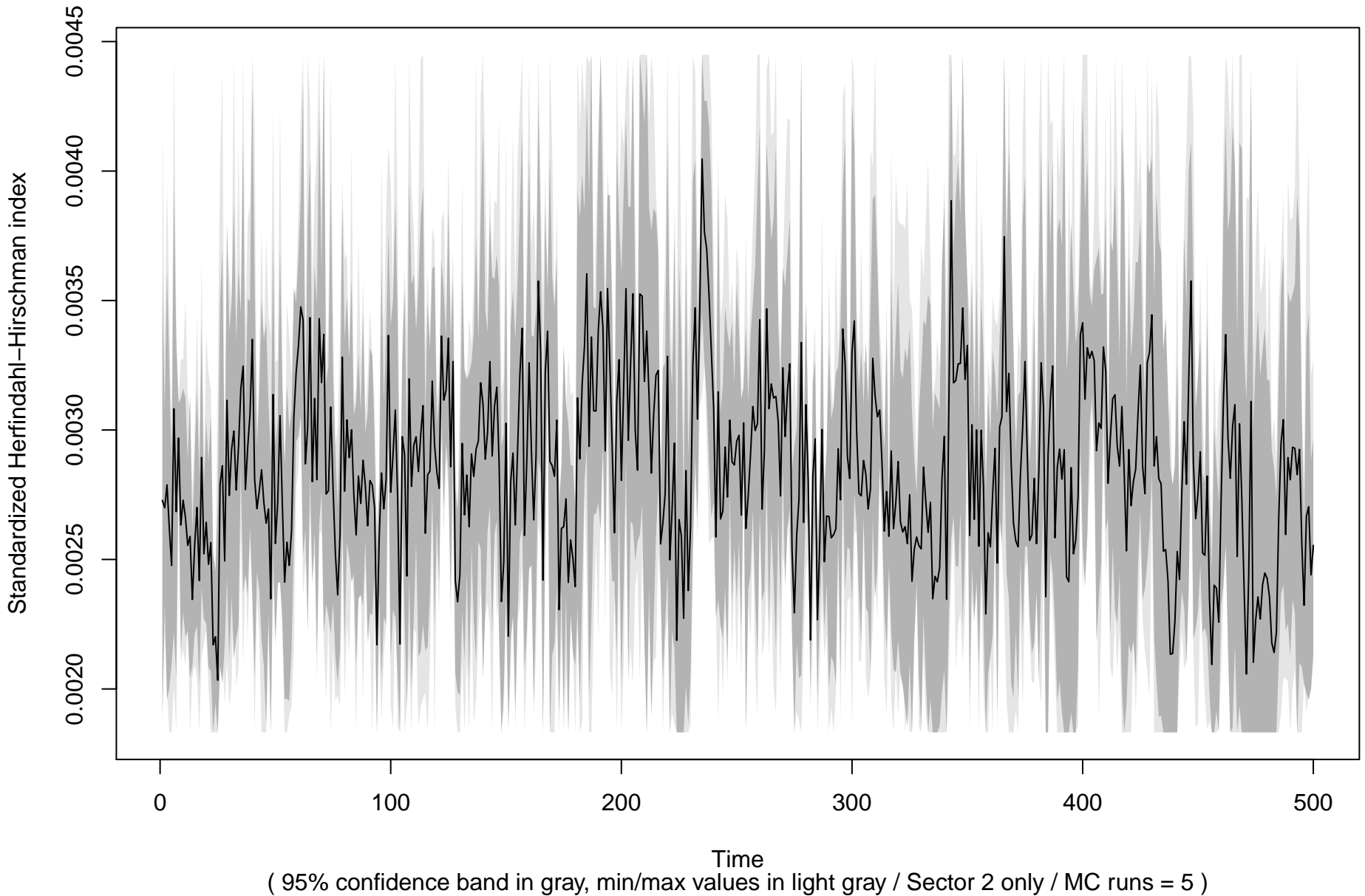
Mark−up average (all experiments)

Weighted average mark−up rate

Time
(Sector 2 only / MC runs = 5)
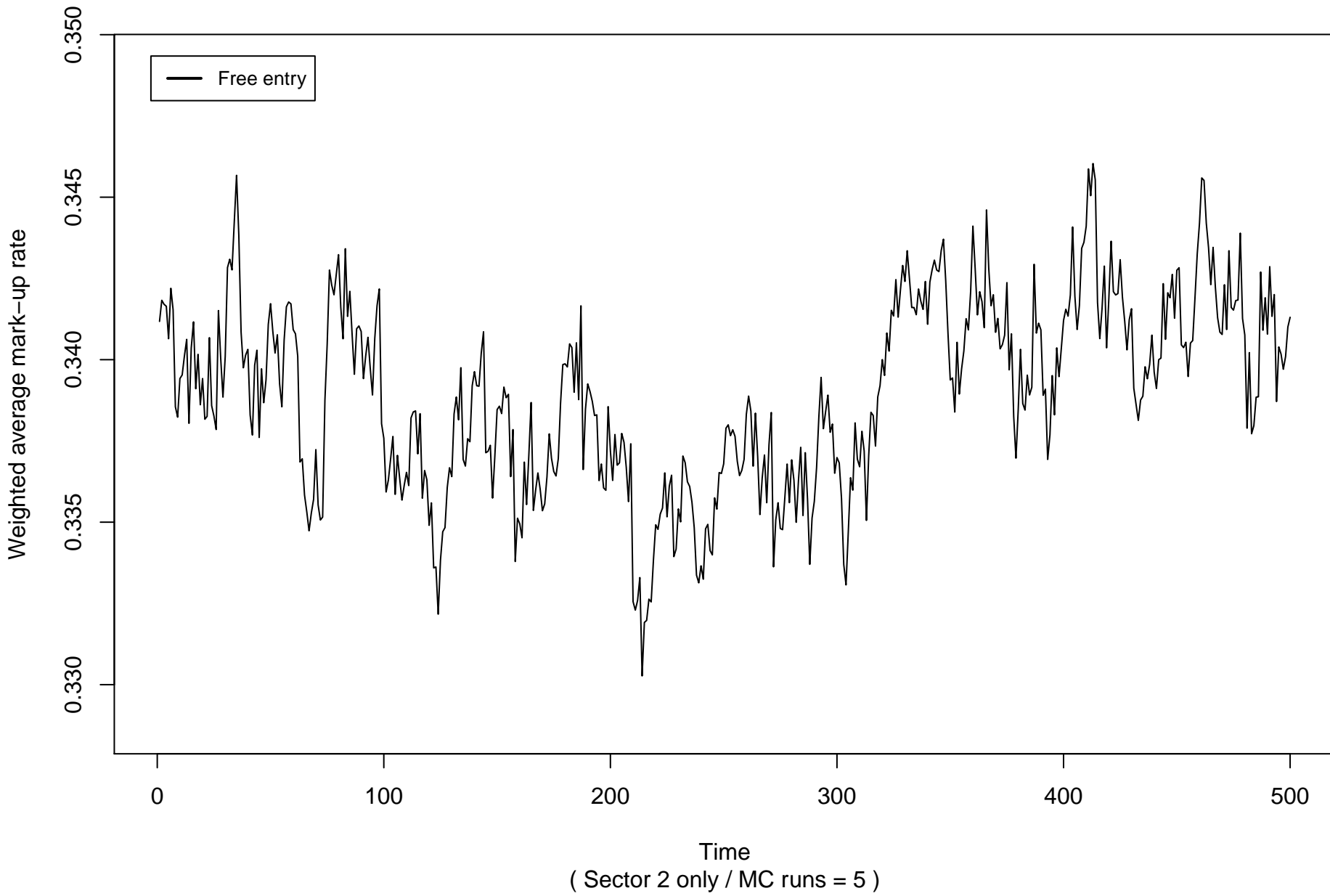
Mark−up average (Free entry)
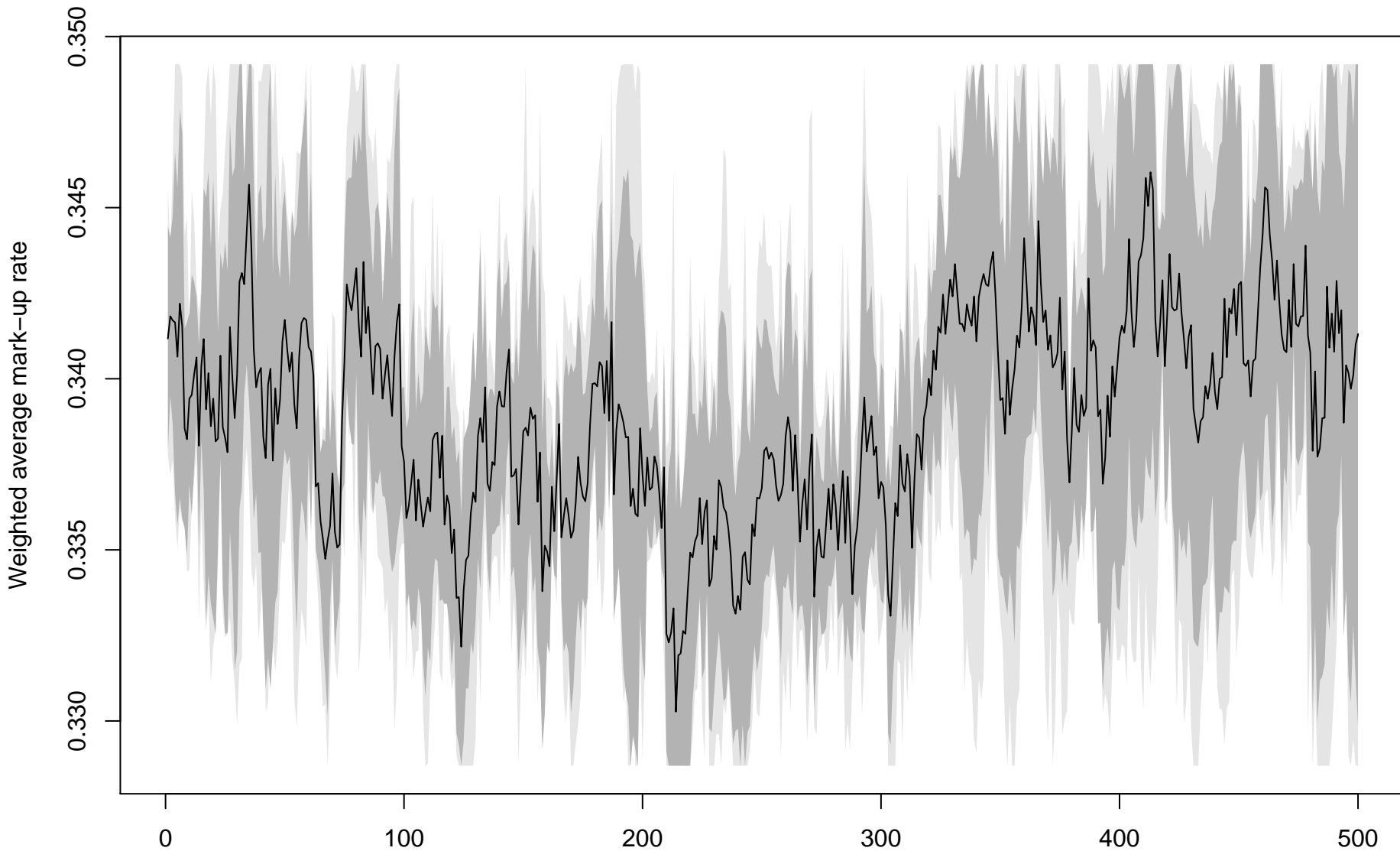
Time
(95% confidence band in gray, min/max values in light gray / Sector 2 only / MC runs = 5)

GDP cycles (Free entry)

Filtered series

Time

(Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 5)

Legend:
- GDP
- Consumption
- Investment
- Productivity
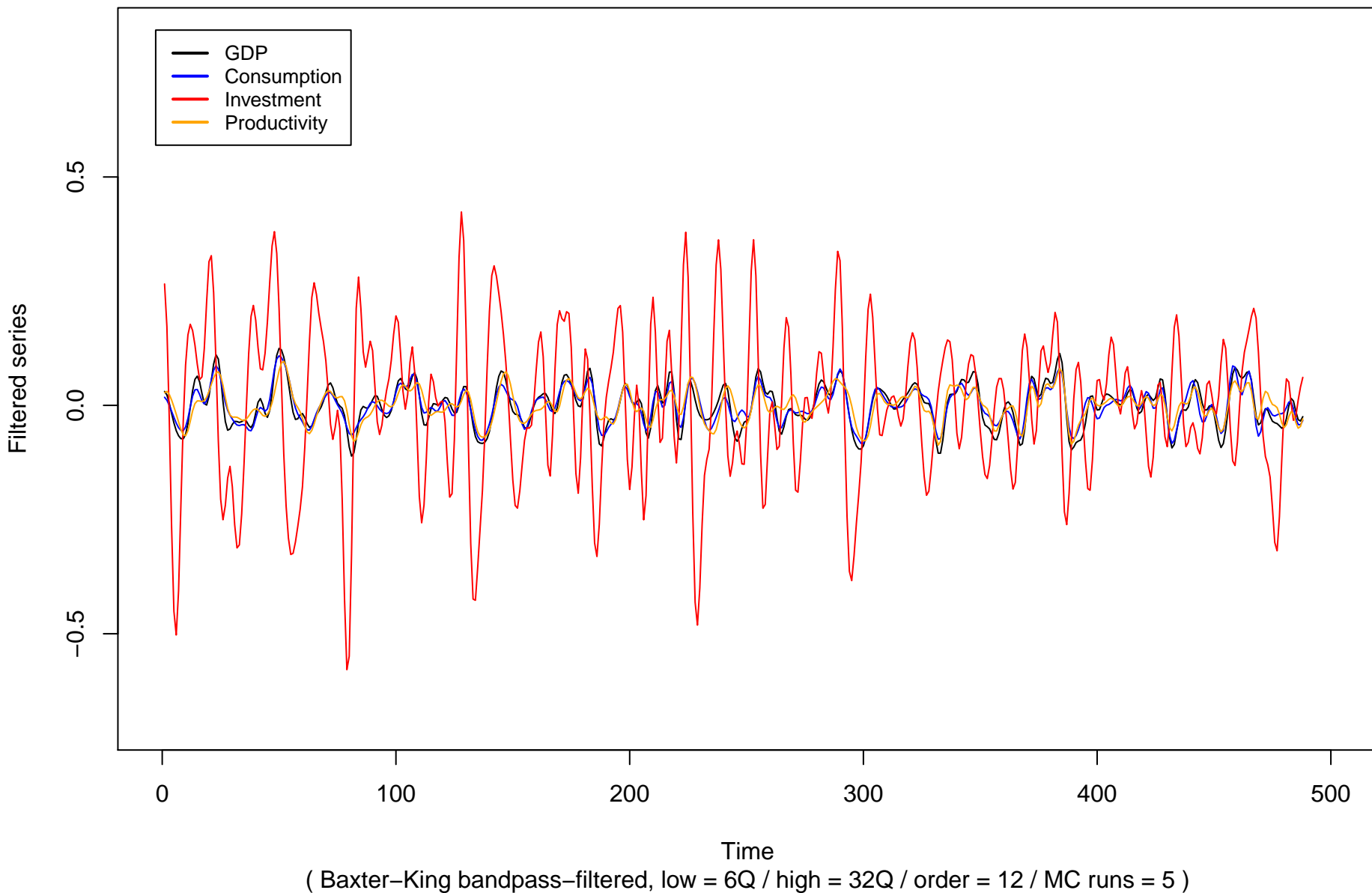
Shimer puzzle (Free entry)

Productivity
Unemployment
Vacancy

Filtered series

Time
(Baxter–King bandpass–filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 5)
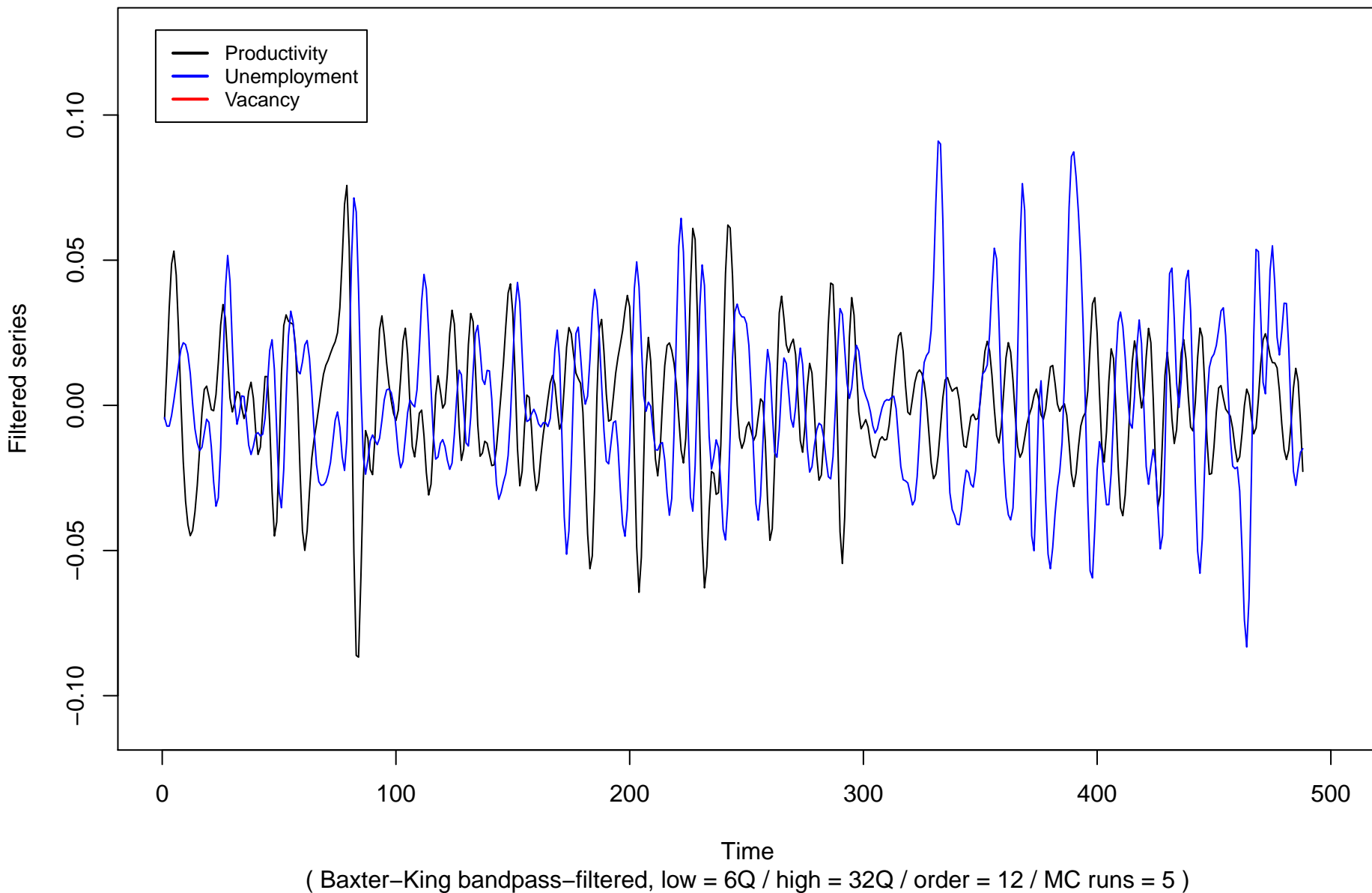
Net entry dynamics and business cycle (Free entry)

Time

(Baxter–King bandpass–filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 5)
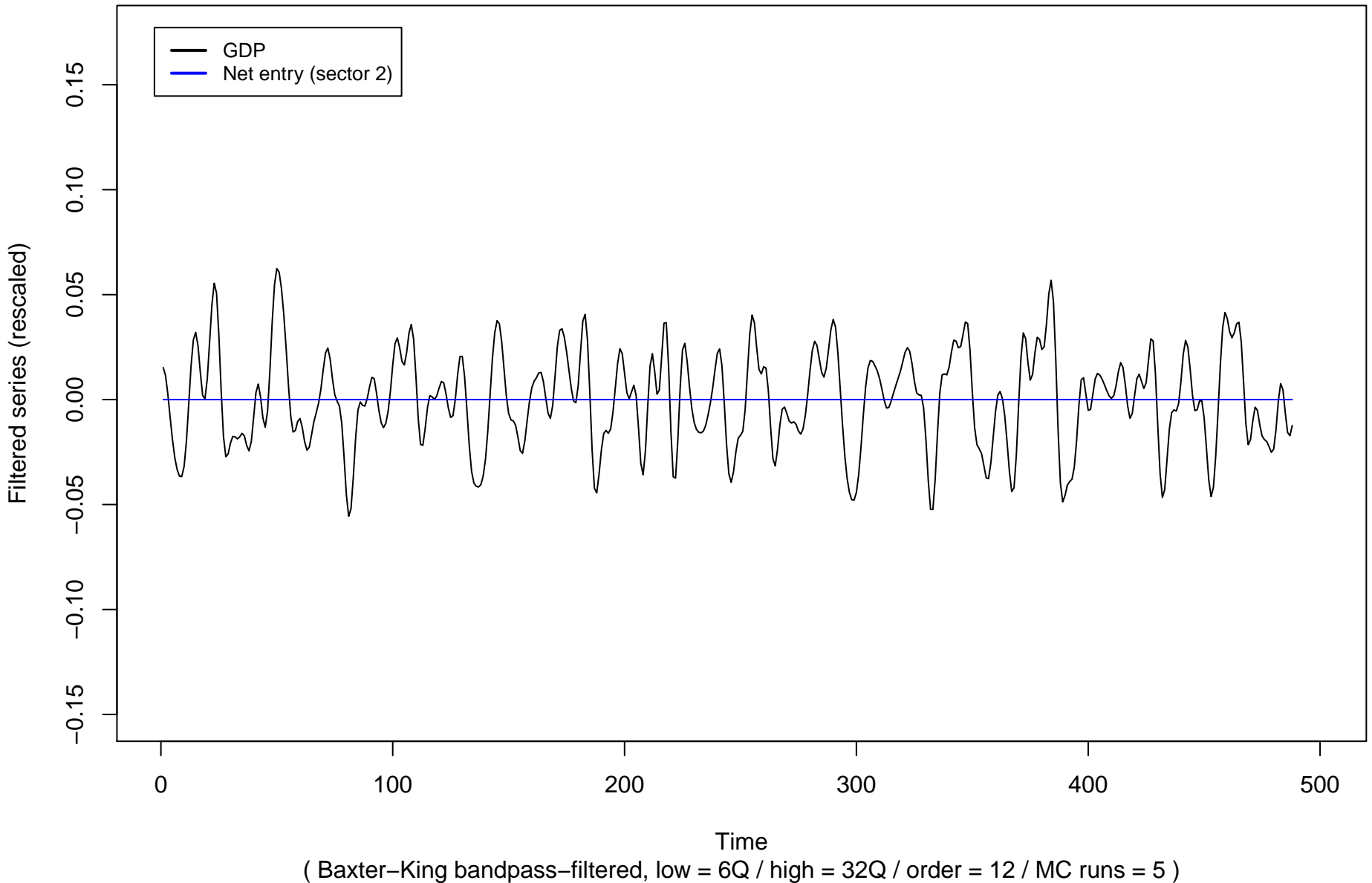
Key statistics and unit roots tests for cycles (Free entry)

	GDP (output)	Consumption	Investment	Product.	Real wage
avg. growth rate	0.01457	0.01467	0.02389	0.0144	0.01457
(s.e.)	0.0009889	0.0009339	0.01012	0.0008368	0.0009313
ADF test (logs)	−3.15	−2.867	−7.057	−2.724	−3.215
(s.e.)	0.3632	0.4475	0.1815	0.324	0.4637
(p−val.)	0.2012	0.3138	0.01	0.3104	0.2188
(s.e.)	0.08518	0.1228	0	0.1131	0.09976
ADF test (bpf)	−6.116	−6.049	−6.761	−6.084	−6.812
(s.e.)	0.1967	0.1679	0.1013	0.2664	0.4913
(p−val.)	0.01	0.01	0.01	0.01	0.01
(s.e.)	0	0	0	0	0
s.d. (bpf)	0.09534	0.07702	1.634	0.0693	0.07628
(s.e.)	0.001921	0.004187	0.08582	0.003283	0.007445
relative s.d. (GDP)	1	0.8078	17.14	0.7269	0.8001

(bpf: Baxter−King bandpass−filtered series, low = 6Q / high = 32Q / order = 12 / MC runs = 5 / period = 301 − 600)
(ADF test H0: there are unit roots / non−stationary at 5% level)

Correlation structure for GDP (Free entry)

	−4	−3	−2	−1	0	1	2	3	4
GDP (output)	−0.01386	0.2579	0.5972	0.8851	1	0.8851	0.5972	0.2579	−0.01386
(s.e.)	0.01574	0.007595	0.003576	0.0006879	0	0.0006879	0.003576	0.007595	0.01574
(p−val.)	0.9994	9.843e−06	6.857e−09	1.599e−12	NA	1.599e−12	6.857e−09	9.843e−06	0.9994
Consumption	0.0895	0.3289	0.6122	0.8484	0.9422	0.8441	0.5941	0.2852	0.01589
(s.e.)	0.02868	0.03008	0.0258	0.01732	0.009706	0.006209	0.008886	0.01488	0.02532
(p−val.)	0.3787	0.0005822	1.633e−05	7.714e−07	4.813e−08	1.307e−08	2.674e−07	8.012e−05	0.9603
Investment	−0.3179	−0.462	−0.5016	−0.3758	−0.1036	0.2149	0.4508	0.5218	0.4367
(s.e.)	0.02679	0.02916	0.03218	0.044	0.06212	0.07431	0.0704	0.04939	0.02674
(p−val.)	0.0004448	9.809e−05	9.805e−05	0.001275	0.2131	0.07179	0.003112	0.0004319	9.126e−05
Net investment	−0.2662	−0.4081	−0.455	−0.3472	−0.09992	0.1939	0.413	0.4784	0.3979
(s.e.)	0.02187	0.02368	0.02609	0.04317	0.07021	0.08944	0.08768	0.0631	0.02963
(p−val.)	0.0005215	7.862e−05	6.803e−05	0.001732	0.1821	0.07361	0.009574	0.001609	0.0002137
Change in inventories	−0.3297	−0.2326	−0.0179	0.2229	0.3741	0.3698	0.2392	0.07819	−0.02161
(s.e.)	0.03032	0.02739	0.01649	0.01076	0.02453	0.03366	0.03564	0.03624	0.0381
(p−val.)	0.0005925	0.002543	0.9965	9.309e−05	0.0001388	0.0005	0.005555	0.5189	0.6109
Unemployment rate	0.1854	0.2688	0.2546	0.1417	−0.01432	−0.1369	−0.1687	−0.1115	−0.01603
(s.e.)	0.07537	0.06332	0.0464	0.02433	0.02869	0.06683	0.1	0.114	0.1059
(p−val.)	0.06253	0.02033	0.009863	0.03213	0.9395	0.05453	0.05992	0.07925	0.01588
Productivity	0.09974	0.311	0.5653	0.7836	0.8786	0.799	0.5768	0.2941	0.04185
(s.e.)	0.02167	0.02009	0.01464	0.01363	0.01098	0.02706	0.05667	0.07664	0.07537
(p−val.)	0.207	0.0001633	2.471e−06	4.215e−07	1.069e−07	5.963e−06	0.0004667	0.02456	0.003522
Mark−up (sector 2)	0.2148	0.1815	0.1015	0.002085	−0.0794	−0.1175	−0.1082	−0.07533	−0.04917
(s.e.)	0.08343	0.06009	0.06575	0.08307	0.09127	0.08546	0.07125	0.05843	0.05482
(p−val.)	0.09072	0.08319	0.1388	0.06833	0.2177	0.2377	0.26	0.3536	0.3324
Total firm debt	0.2081	0.07892	−0.06759	−0.206	−0.3126	−0.3703	−0.3825	−0.3577	−0.3079
(s.e.)	0.03451	0.02733	0.02249	0.0136	0.01174	0.02982	0.04479	0.04947	0.04577
(p−val.)	0.0103	0.5145	0.695	0.0003779	1.913e−05	0.0003118	0.001254	0.002475	0.003803
Liquidity−to−sales ratio	0.2237	−0.005482	−0.2826	−0.5368	−0.6947	−0.7126	−0.6101	−0.4412	−0.2665
(s.e.)	0.03542	0.03043	0.02597	0.02355	0.02818	0.03529	0.0347	0.01914	0.01082
(p−val.)	0.007698	0.9174	0.0007274	2.082e−05	1.306e−05	2.846e−05	5.351e−05	2.32e−05	3.332e−05
Bankruptcy rate	0.4751	0.4836	0.3756	0.1842	−0.01731	−0.1553	−0.2033	−0.1906	−0.1666
(s.e.)	0.03088	0.05999	0.09378	0.1048	0.09	0.0597	0.03249	0.02251	0.03273
(p−val.)	0.0001075	0.001272	0.01723	0.04283	0.0175	0.1379	0.009585	0.003986	0.02863

(non−rate/ratio series are Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 5 / period = 301 − 600)
(test H0: lag coefficient is not significant at 5% level)

Correlation structure for GDP (Free entry)

	−4	−3	−2	−1	0	1	2	3	4
GDP (output)	−0.01386	0.2579	0.5972	0.8851	1	0.8851	0.5972	0.2579	−0.01386
(s.e.)	0.01574	0.007595	0.003576	0.0006879	0	0.0006879	0.003576	0.007595	0.01574
(p−val.)	0.9994	9.843e−06	6.857e−09	1.599e−12	NA	1.599e−12	6.857e−09	9.843e−06	0.9994
Consumption	0.0895	0.3289	0.6122	0.8484	0.9422	0.8441	0.5941	0.2852	0.01589
(s.e.)	0.02868	0.03008	0.0258	0.01732	0.009706	0.006209	0.008886	0.01488	0.02532
(p−val.)	0.3787	0.0005822	1.633e−05	7.714e−07	4.813e−08	1.307e−08	2.674e−07	8.012e−05	0.9603
Investment	−0.3179	−0.462	−0.5016	−0.3758	−0.1036	0.2149	0.4508	0.5218	0.4367
(s.e.)	0.02679	0.02916	0.03218	0.044	0.06212	0.07431	0.0704	0.04939	0.02674
(p−val.)	0.0004448	9.809e−05	9.805e−05	0.001275	0.2131	0.07179	0.003112	0.0004319	9.126e−05
Productivity	0.09974	0.311	0.5653	0.7836	0.8786	0.799	0.5768	0.2941	0.04185
(s.e.)	0.02167	0.02009	0.01464	0.01363	0.01098	0.02706	0.05667	0.07664	0.07537
(p−val.)	0.207	0.0001633	2.471e−06	4.215e−07	1.069e−07	5.963e−06	0.0004667	0.02456	0.003522
Net entry	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
(s.e.)	NA	NA	NA	NA	NA	NA	NA	NA	NA
(p−val.)	1	1	1	1	1	1	1	1	1
Entry	−0.1344	0.06756	0.3149	0.5424	0.6766	0.6689	0.533	0.3288	0.1326
(s.e.)	0.06507	0.06516	0.05887	0.04398	0.02151	0.01074	0.02573	0.03292	0.03156
(p−val.)	0.1153	0.1325	0.008134	0.0002315	5.024e−06	3.318e−07	3.06e−05	0.0008216	0.08546
Wage	0.3245	0.5343	0.7093	0.7934	0.7555	0.6017	0.3879	0.1743	0.003681
(s.e.)	0.07601	0.05294	0.02467	0.02518	0.05331	0.06973	0.0717	0.06385	0.05655
(p−val.)	0.0162	0.0005067	7.016e−06	4.617e−06	0.0001117	0.0008529	0.006353	0.02917	0.4135
Unemployment rate	0.1854	0.2688	0.2546	0.1417	−0.01432	−0.1369	−0.1687	−0.1115	−0.01603
(s.e.)	0.07537	0.06332	0.0464	0.02433	0.02869	0.06683	0.1	0.114	0.1059
(p−val.)	0.06253	0.02033	0.009863	0.03213	0.9395	0.05453	0.05992	0.07925	0.01588
Vacancy rate	0.3102	0.07444	−0.2278	−0.4908	−0.6185	−0.5738	−0.413	−0.2299	−0.103
(s.e.)	0.06995	0.07042	0.07622	0.08053	0.07119	0.04636	0.02092	0.04321	0.06404
(p−val.)	0.01509	0.2104	0.06223	0.003489	0.000819	0.0002199	4.551e−05	0.01281	0.3057

(non−rate/ratio series are Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 5 / period = 301 − 600)
(test H0: lag coefficient is not significant at 5% level)

Stationarity, i.i.d. and ergodicity tests (Free entry)

	avg.ADF	rej.ADF	avg.PP	rej.PP	avg.KPSS	rej.KPSS	avg.BDS	rej.BDS	avg.KS	rej.KS	AD	
dGDP	0.01	1.00	0.01	1.00	0.10	0.00	0.14	0.60	0.30	0.10	0.15	
dA	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.22	0.40	0.00	
dw	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.22	0.40	0.00	
V	0.01	1.00	0.01	1.00	0.08	0.20	0.00	1.00	0.21	0.60	0.00	
U	0.01	1.00	0.01	1.00	0.03	0.80	0.00	1.00	0.09	0.90	0.00	
mu2avg	0.09	0.60	0.01	1.00	0.04	0.60	0.00	1.00	0.00	1.00	0.00	
HH1	0.01	1.00	0.01	1.00	0.09	0.00	0.00	1.00	0.09	0.70	0.00	
HH2	0.01	1.00	0.01	1.00	0.08	0.20	0.00	1.00	0.08	0.90	0.00	

(average p−values for testing H0 and rate of rejection of H0 / MC runs = 5 / period = 301 − 600)
(ADF/PP H0: non−stationary, KPSS H0: stationary, BDS H0: i.i.d., KS/AD/WW H0: ergodic)
(significance = 0.05)

GDP growth
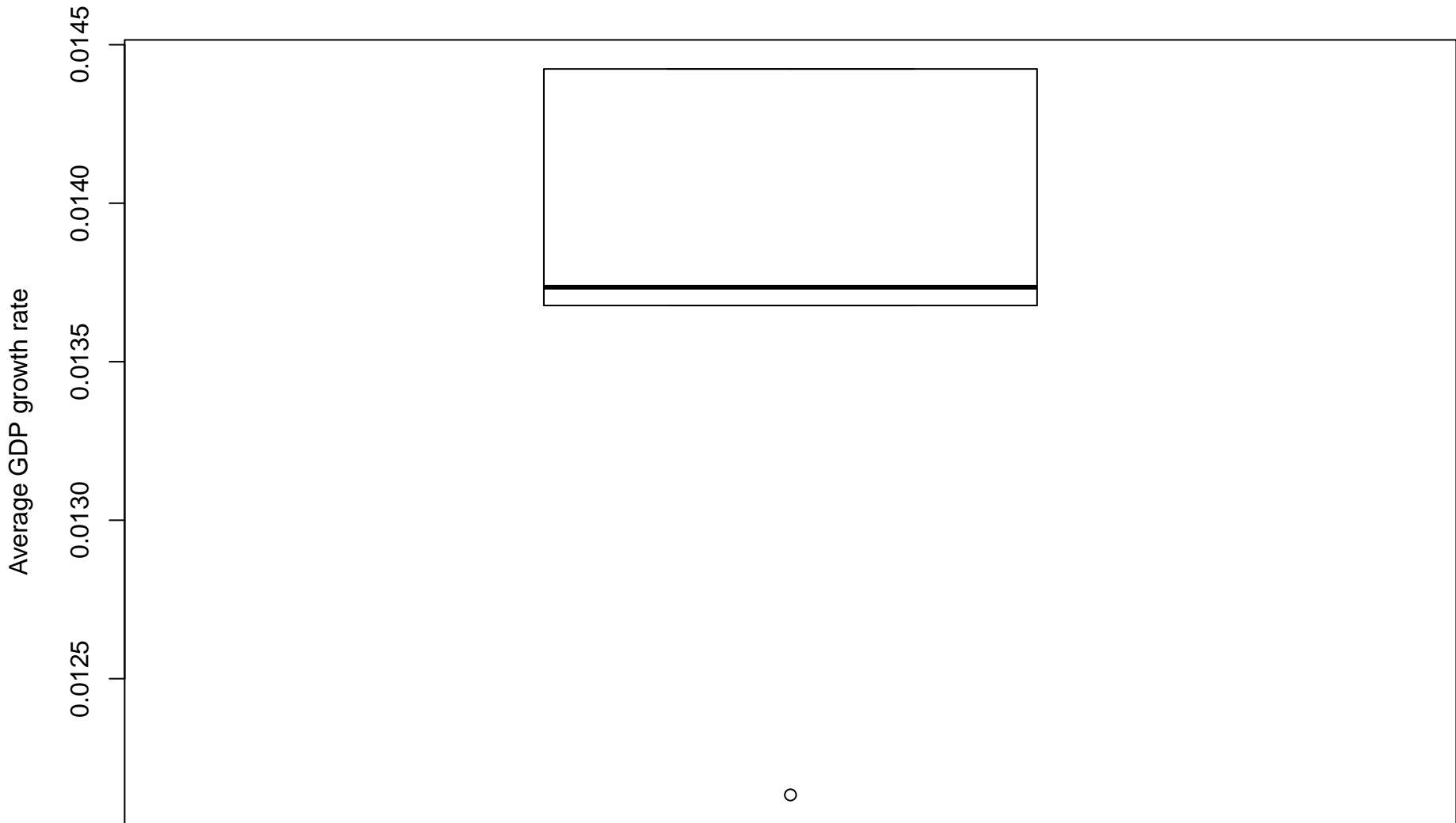
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)

**Volatility of GDP growth**
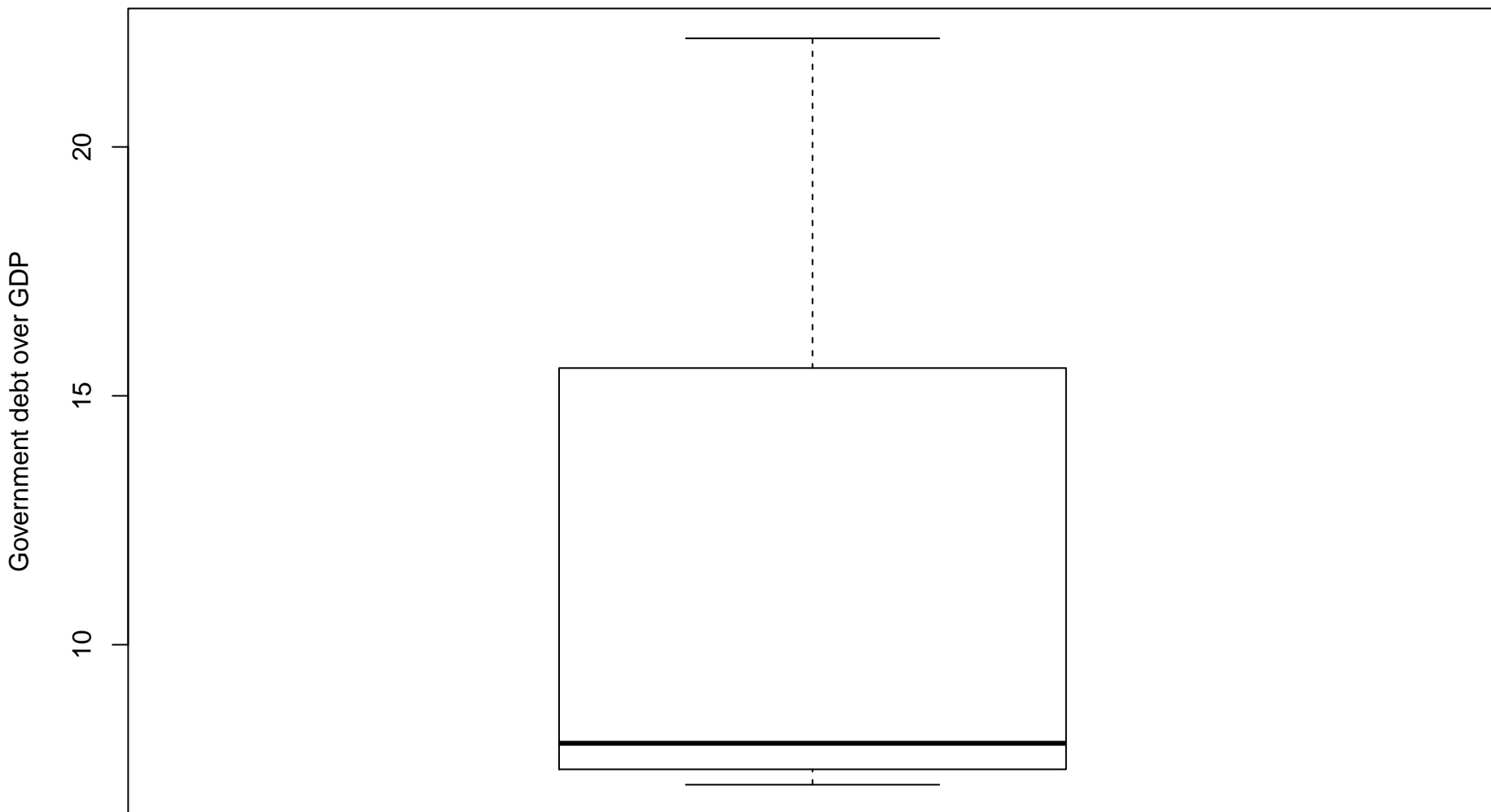
Standard deviation of GDP growth rate

0.096 — 0.094 — 0.092 — 0.090 — 0.088
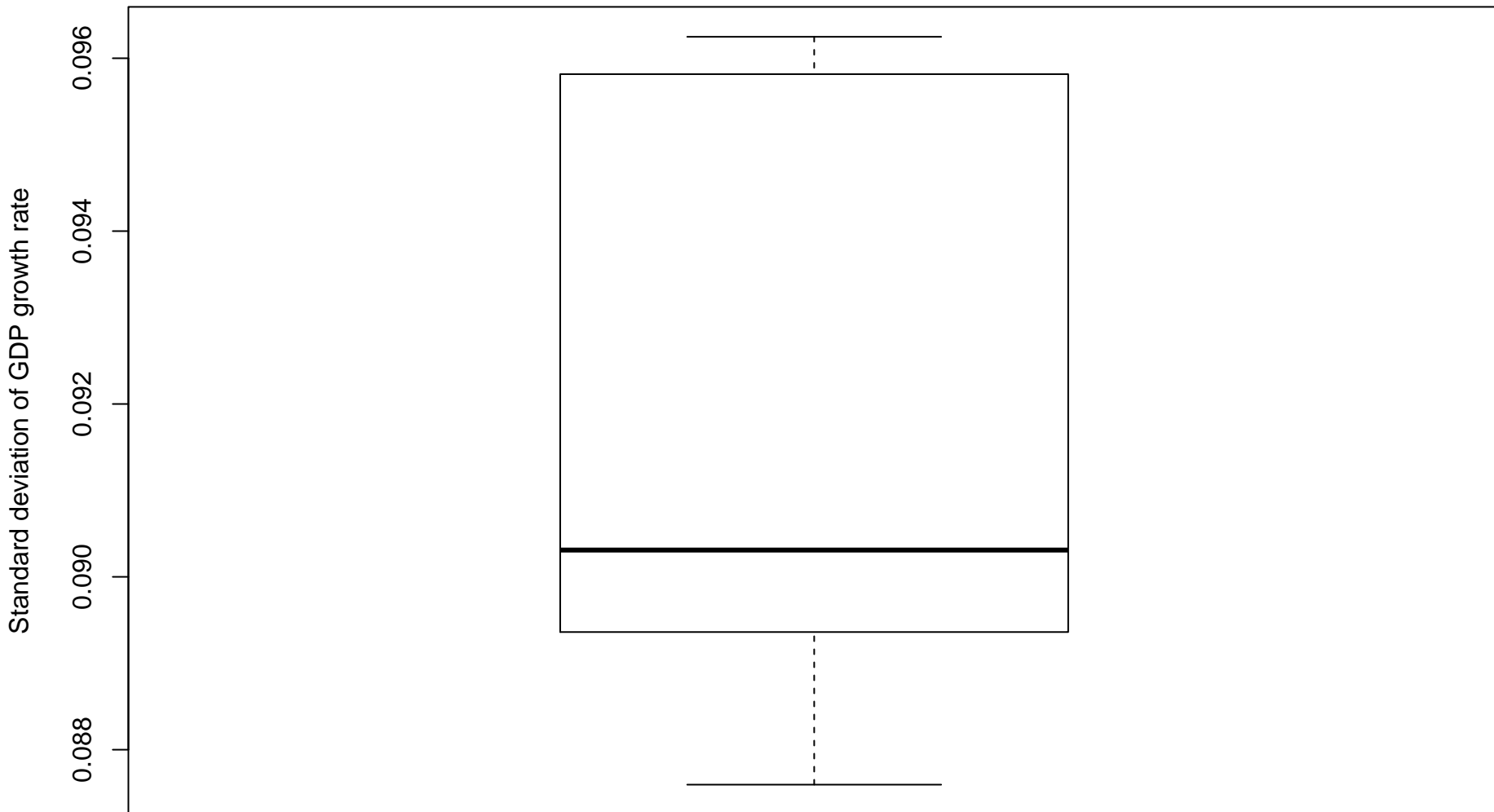
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Likelihood of GDP crises
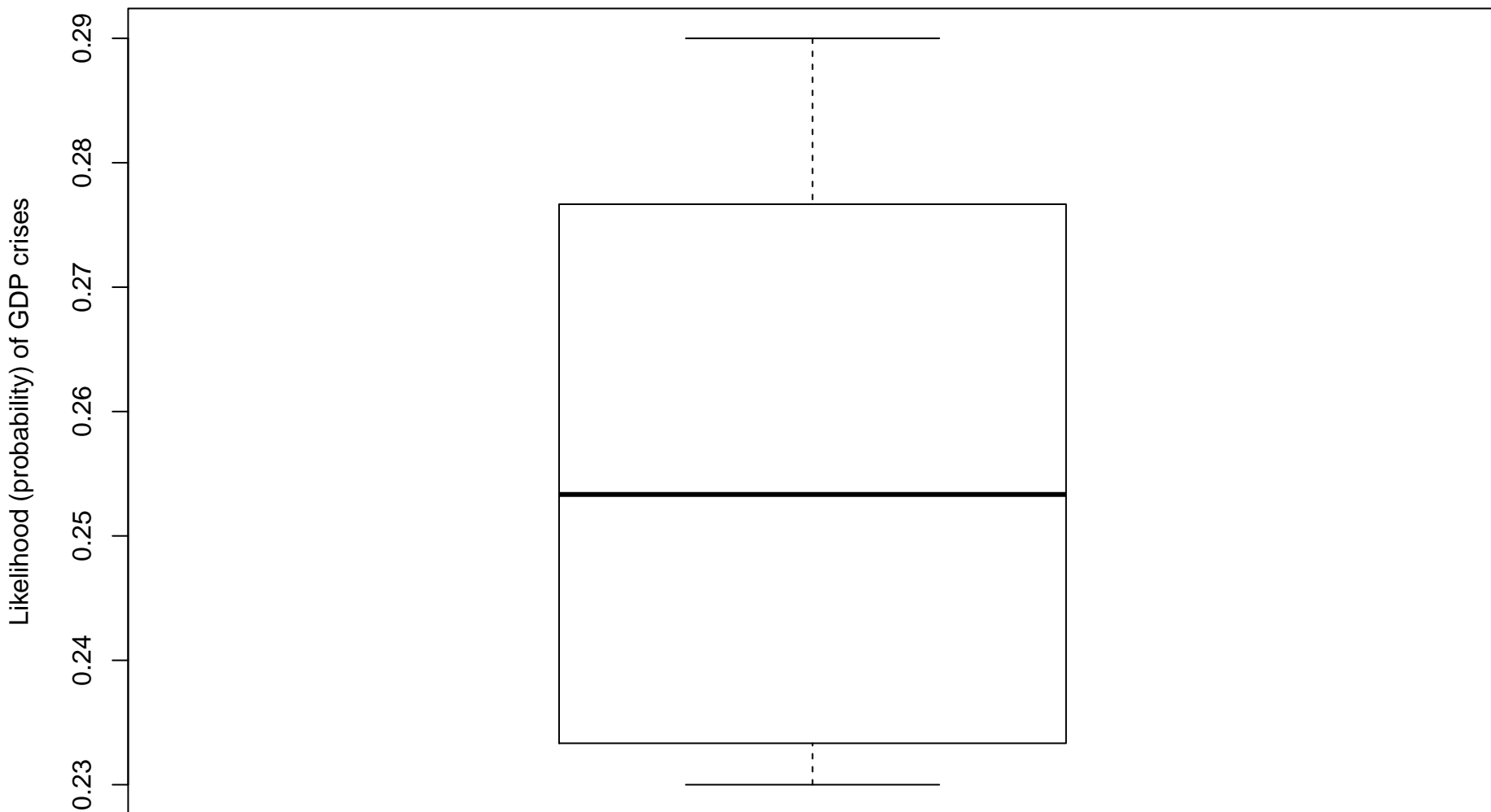
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Inflation
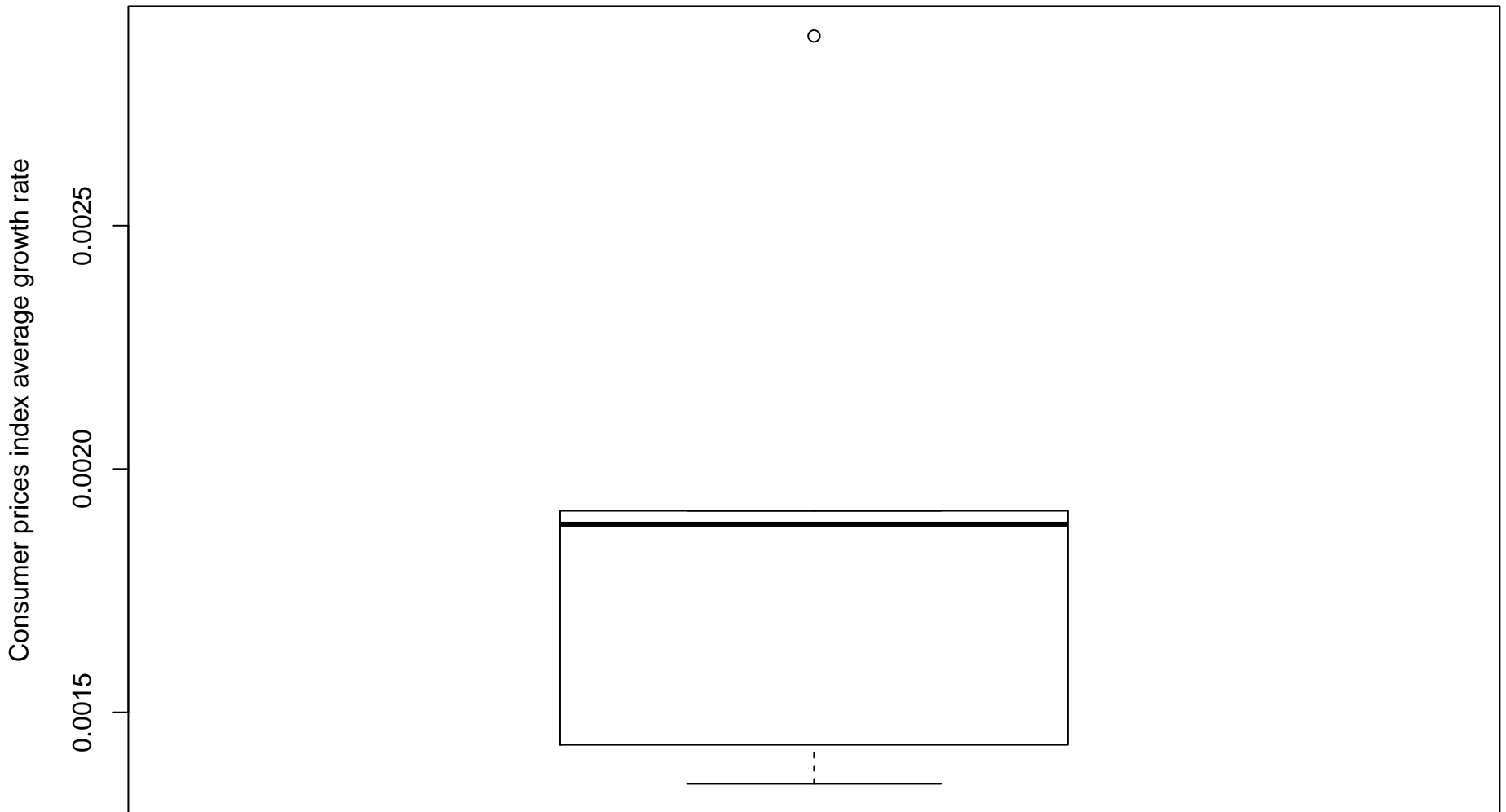
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Tax

Government tax income over GDP
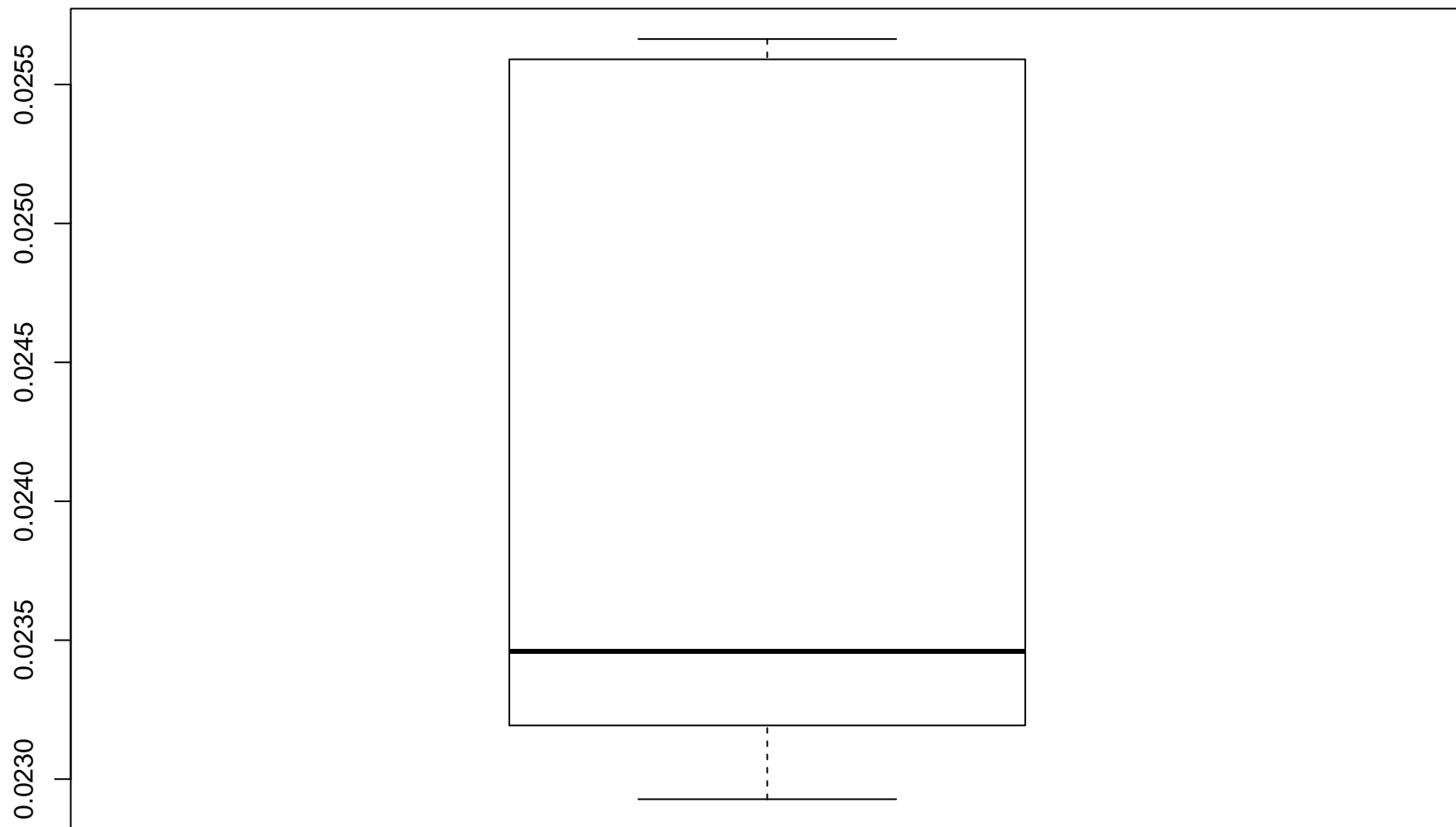
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)

Government total expenditure
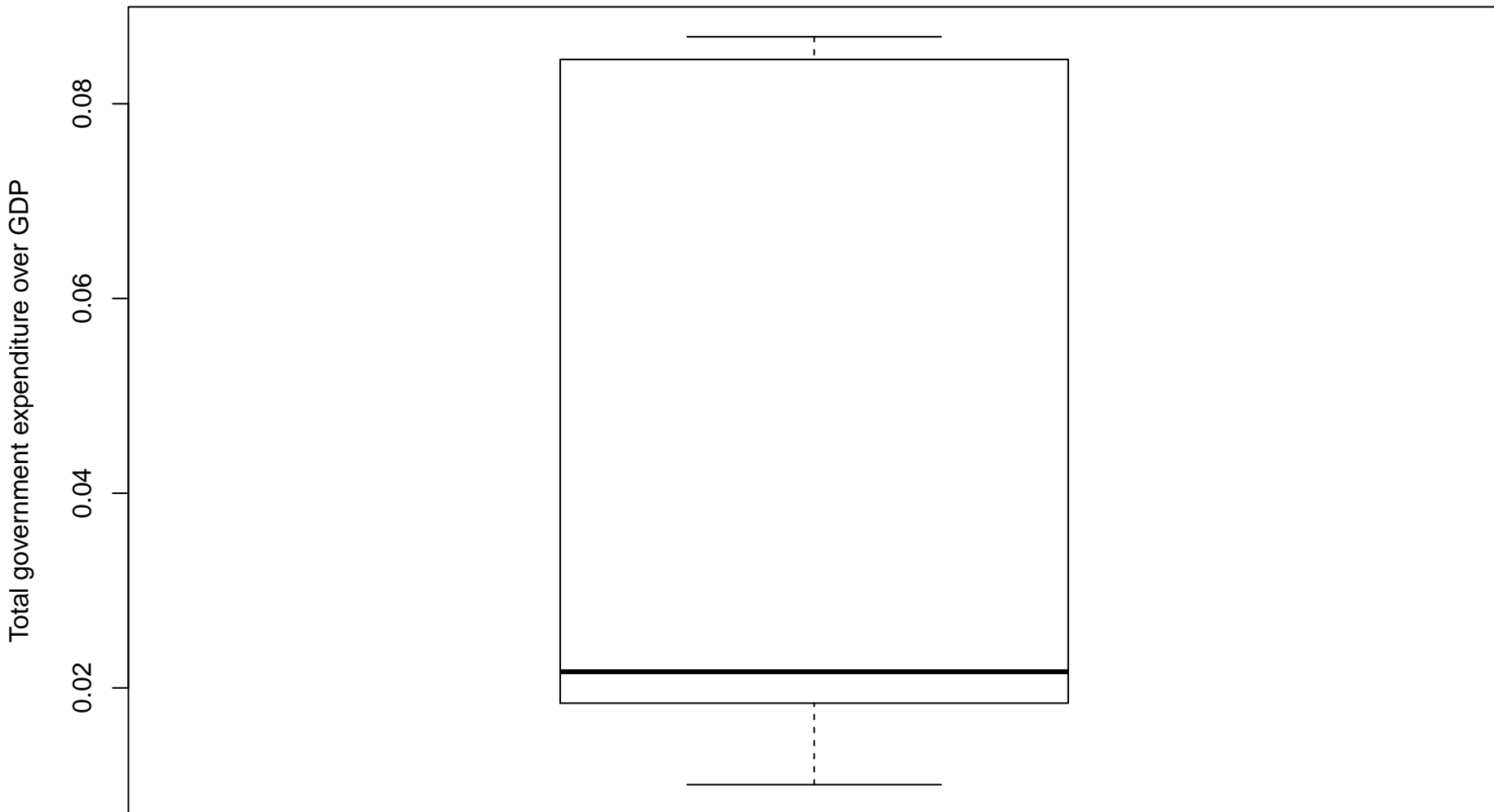
(bar: median / box: 2nd–3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Government deficit
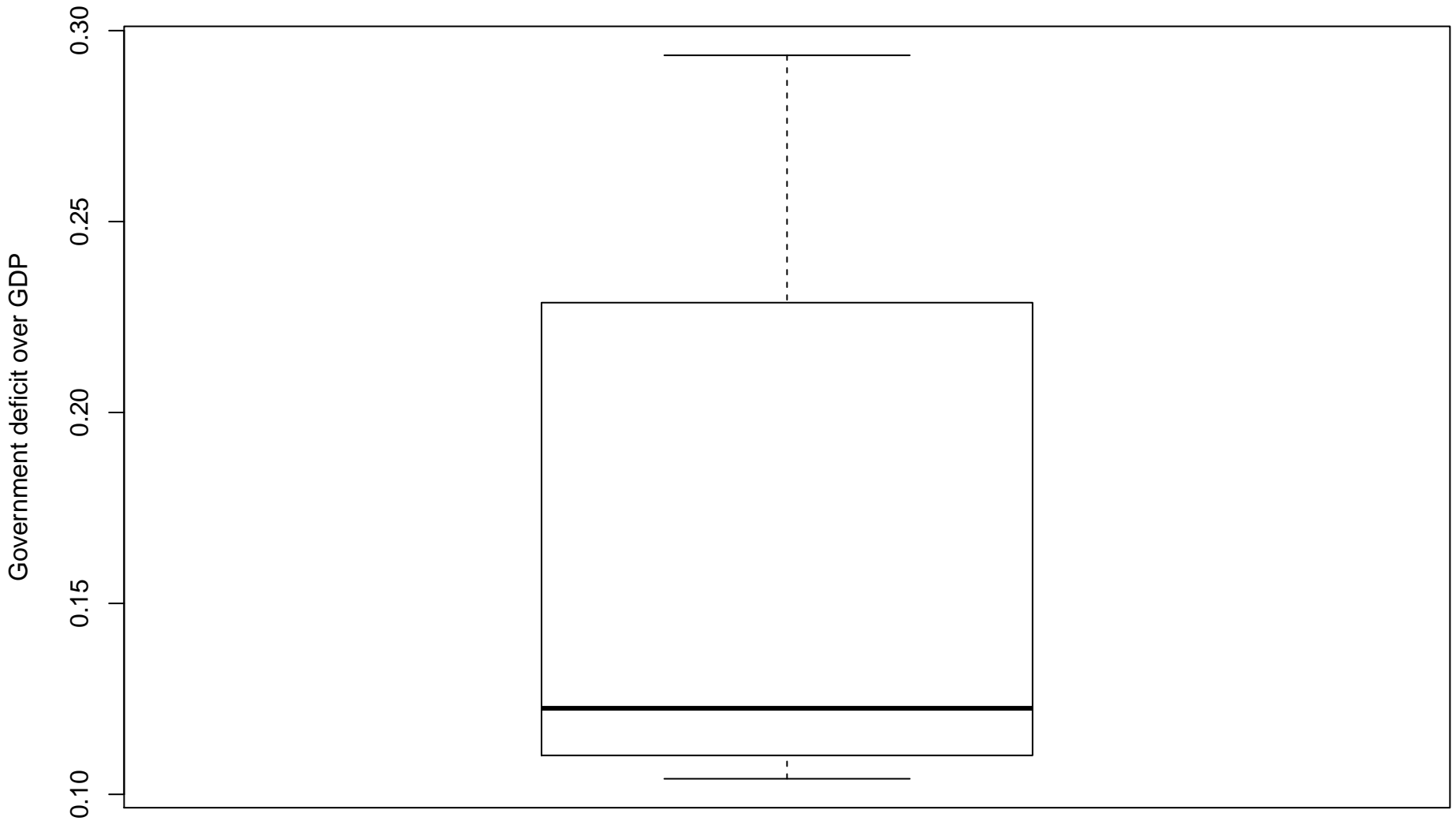
Government deficit over GDP

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Government debt

Government debt over GDP

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Credit supply
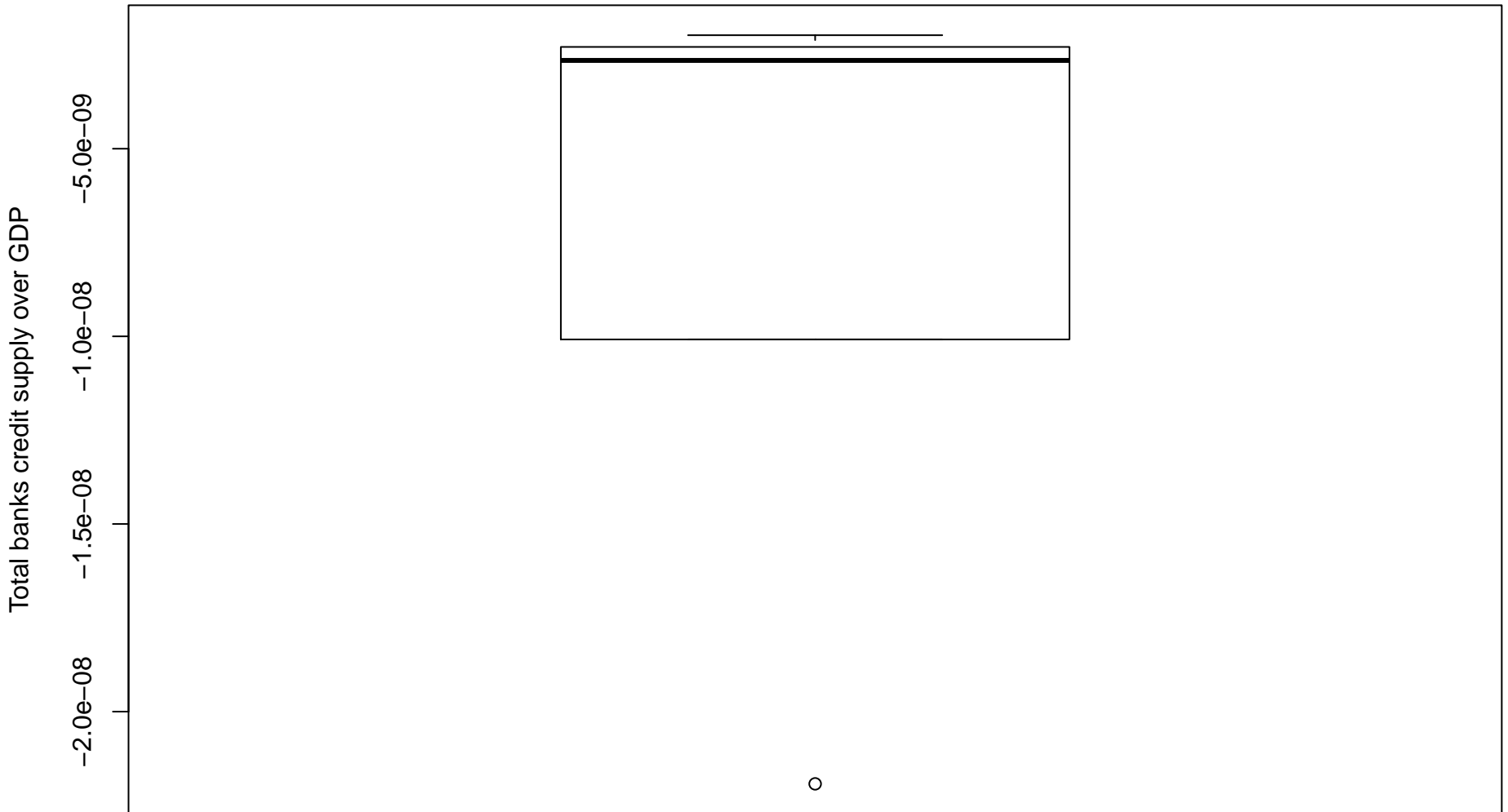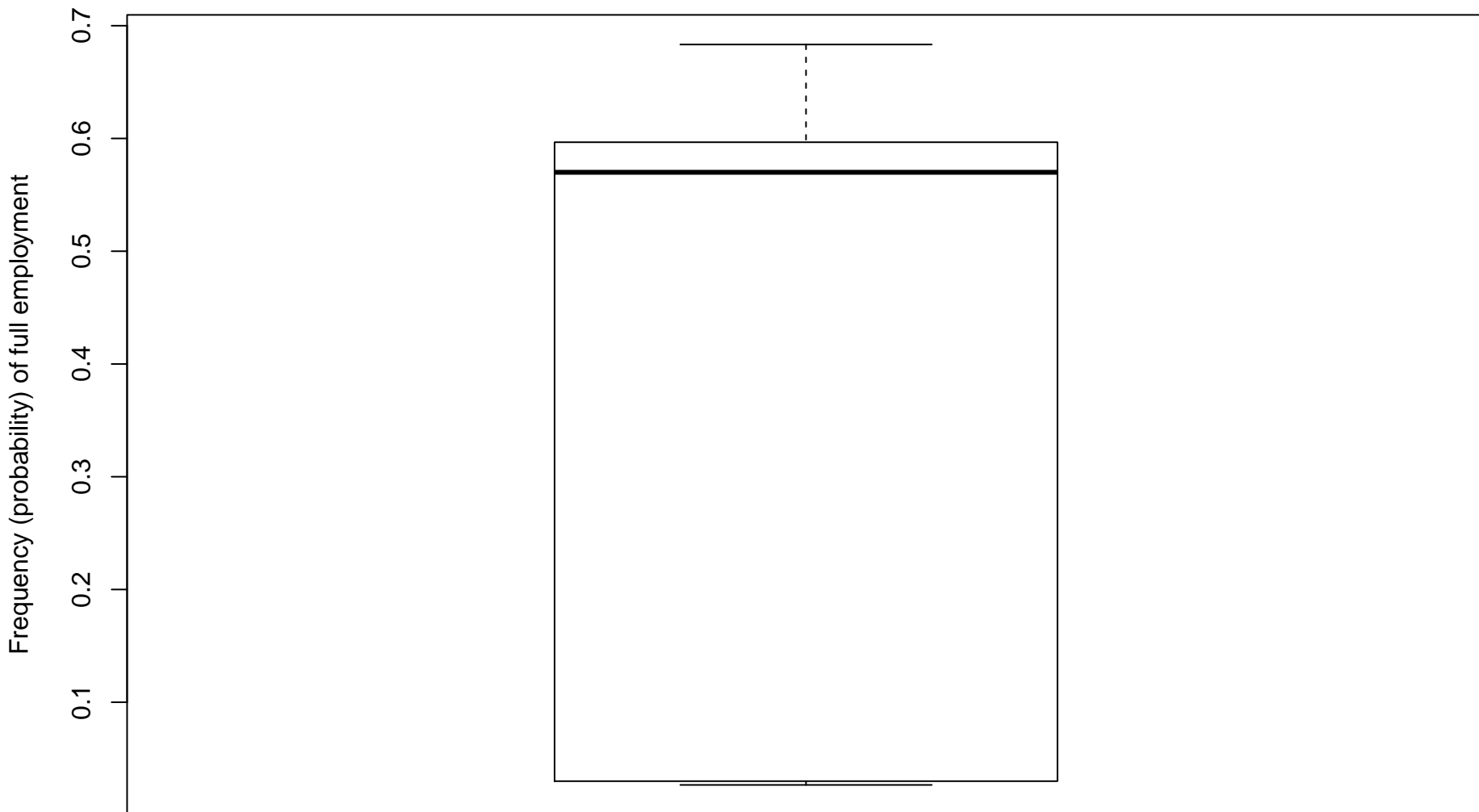

Total banks credit supply over GDP

-5.0e-09
-1.0e-08
-1.5e-08
-2.0e-08

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 − 600)

Loans

Total banks loans over GDP
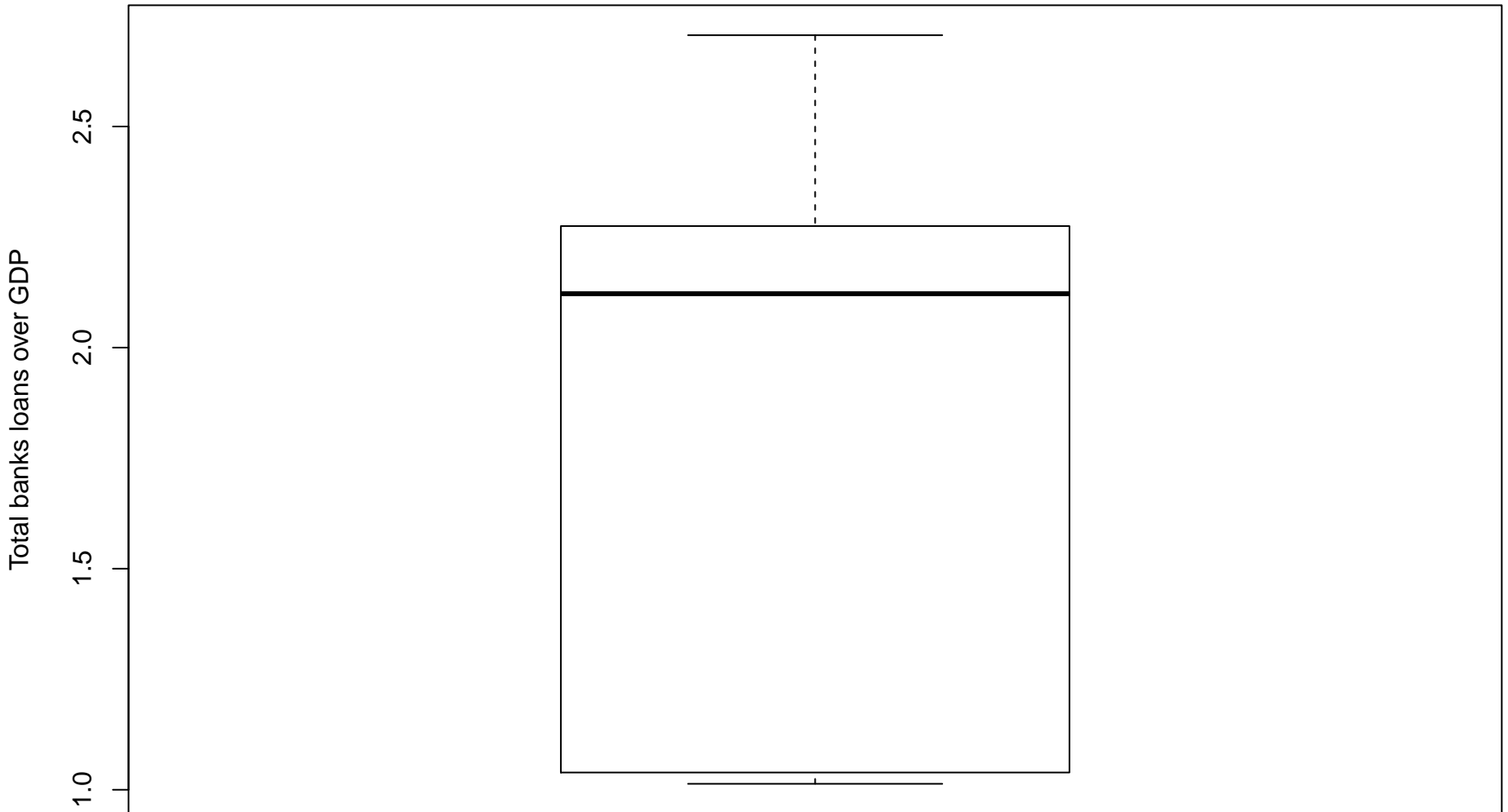
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)

Capacity utilization
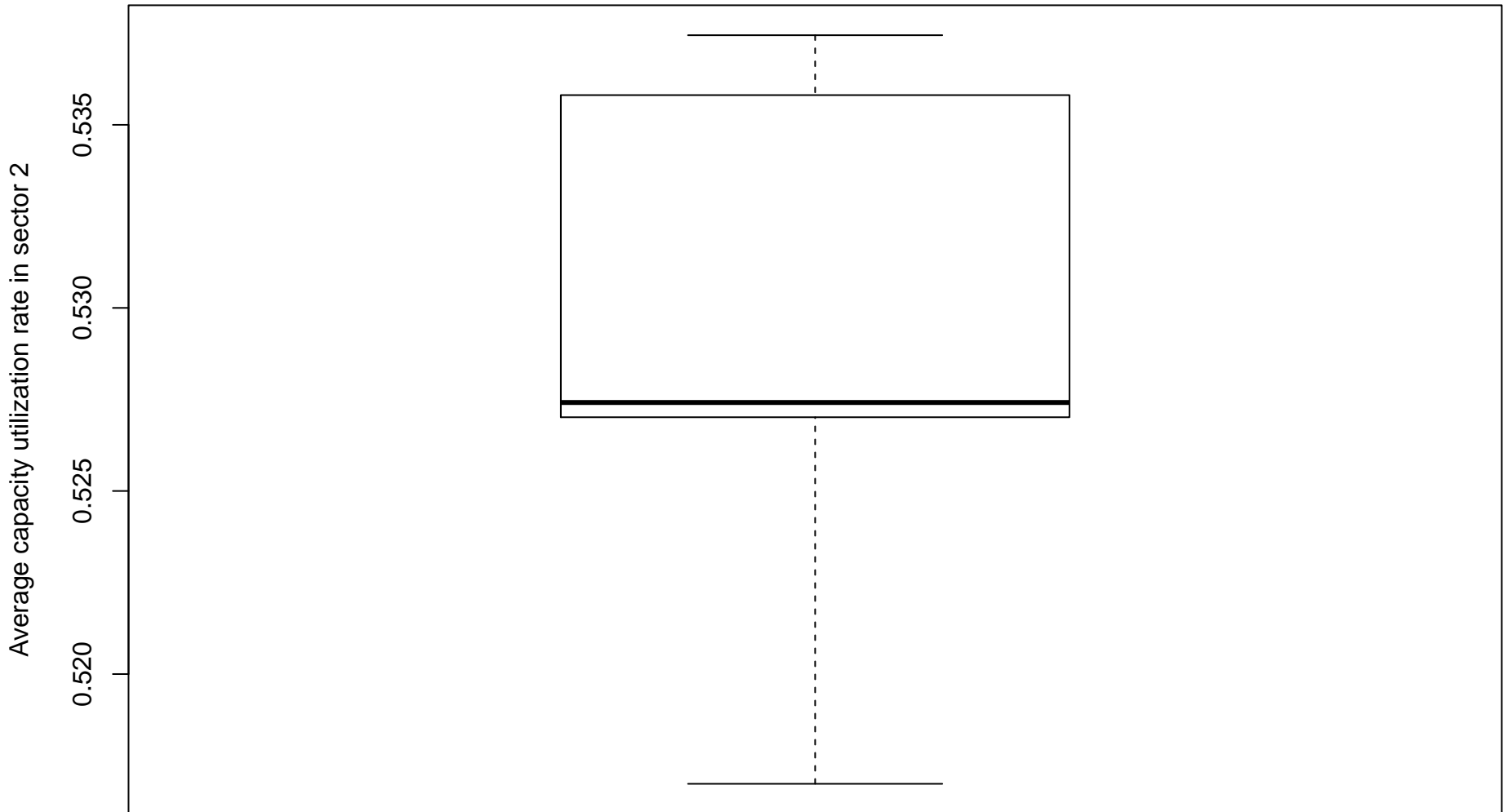
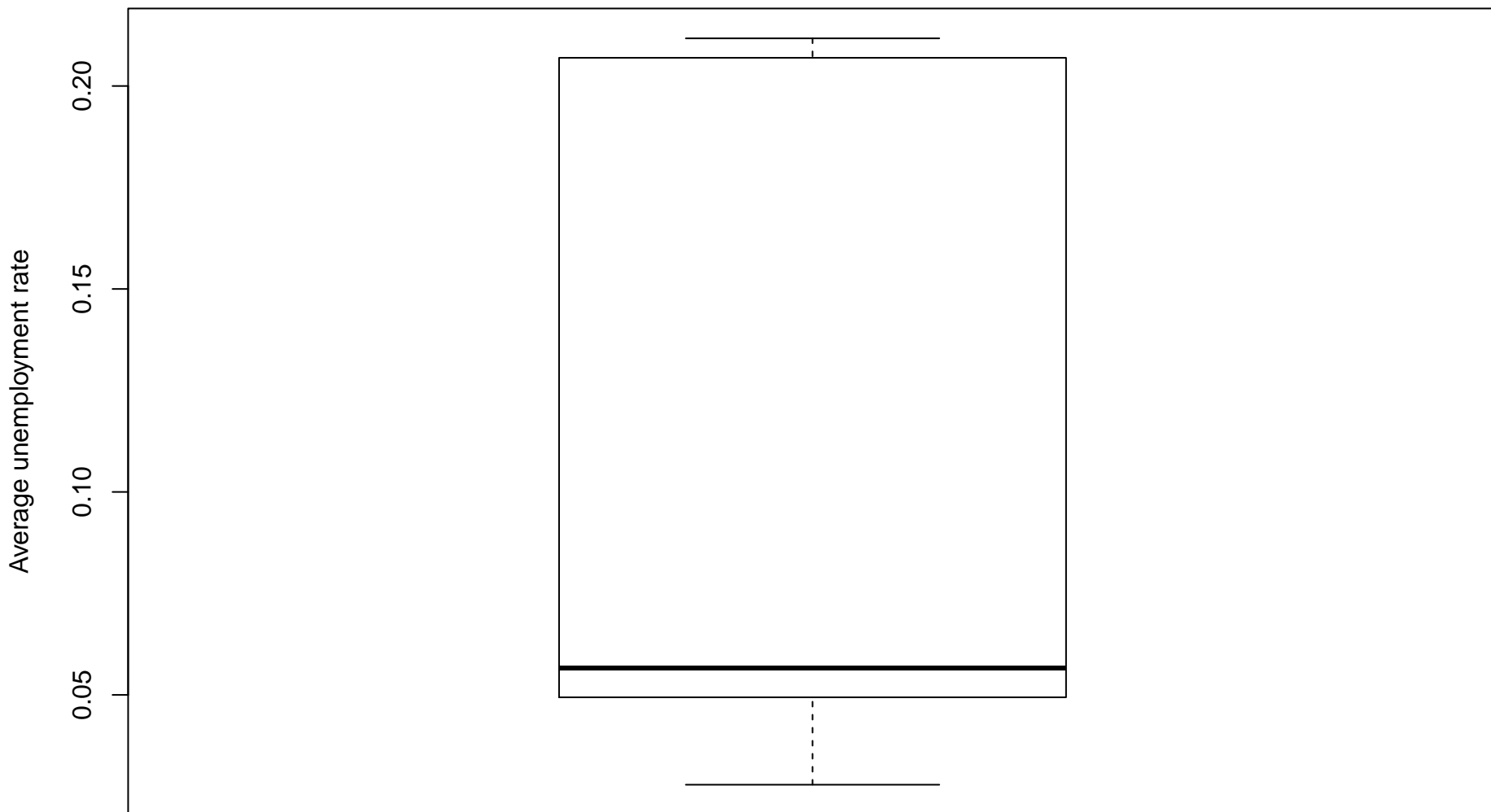(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)
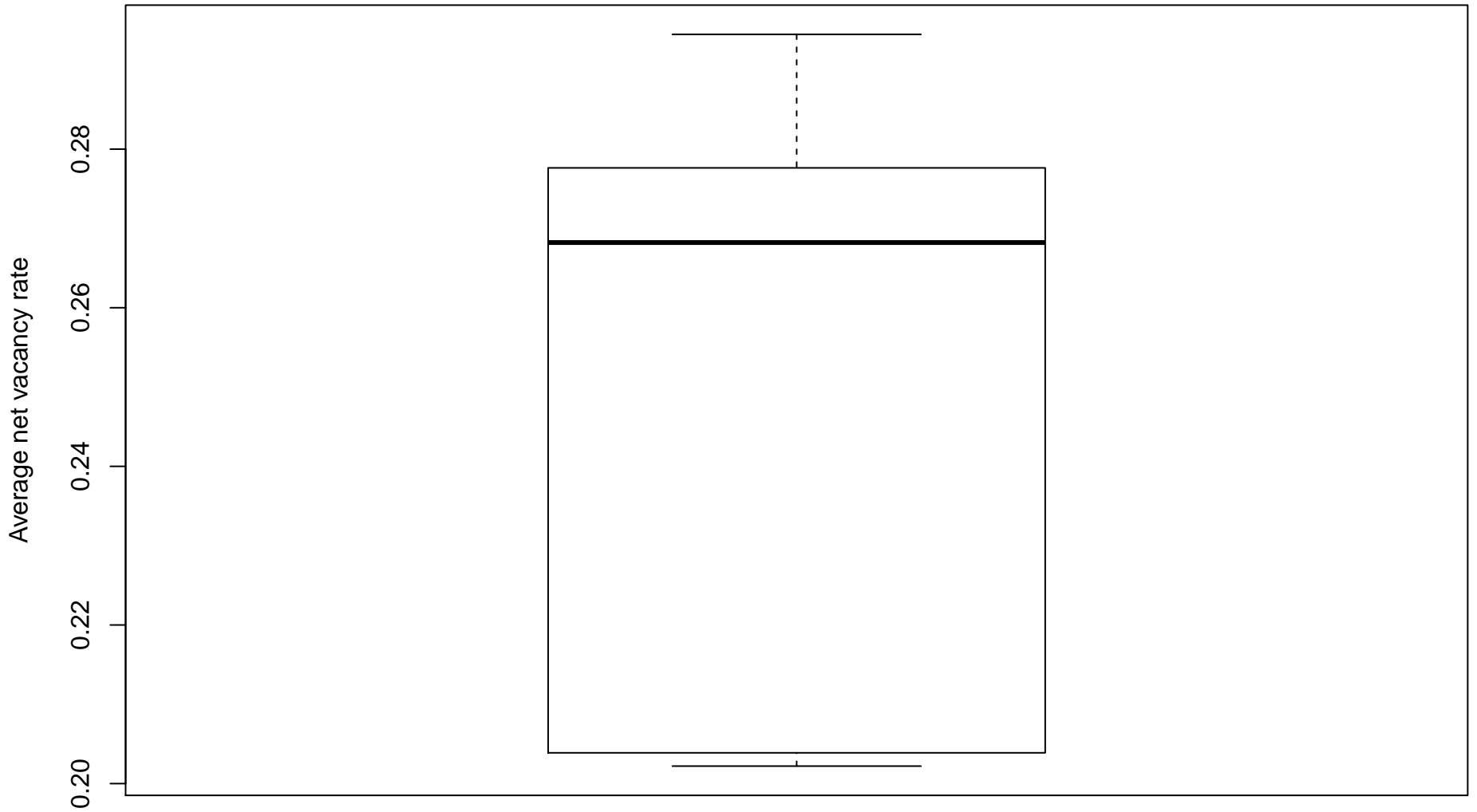
Full employment frequency

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 − 600)
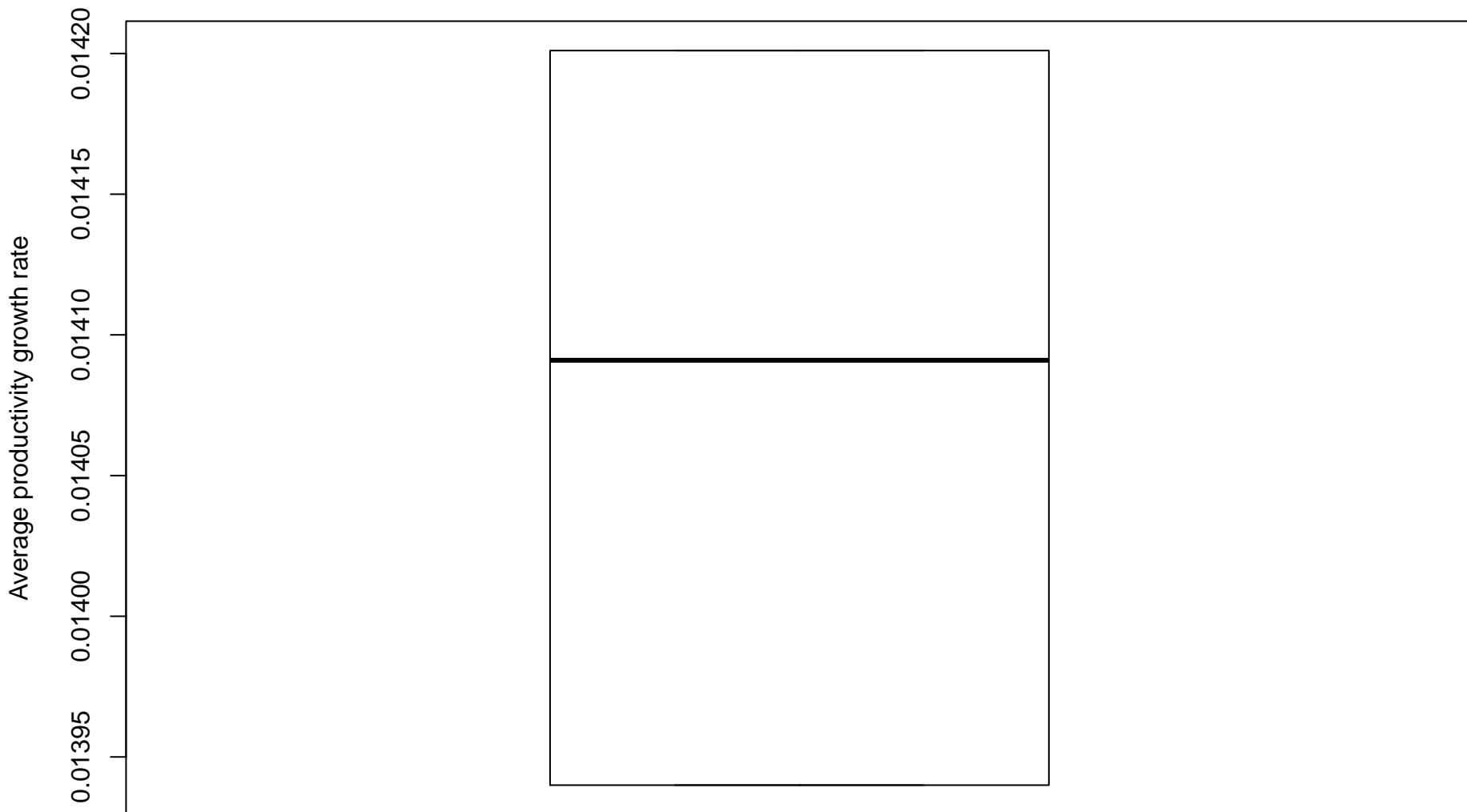
Unemployment

Average unemployment rate

(bar: median / box: 2nd–3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Vacancy
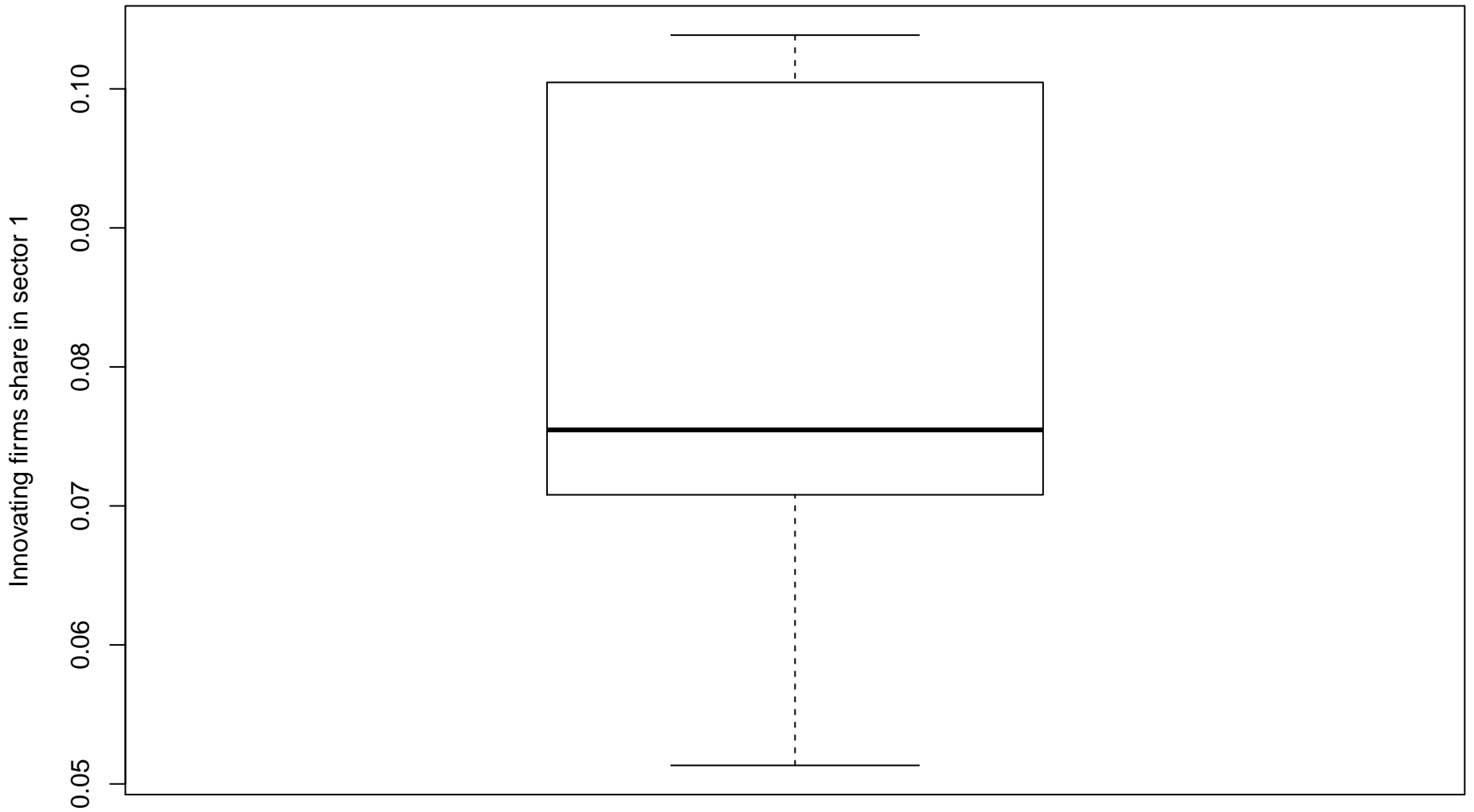

Average net vacancy rate

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)
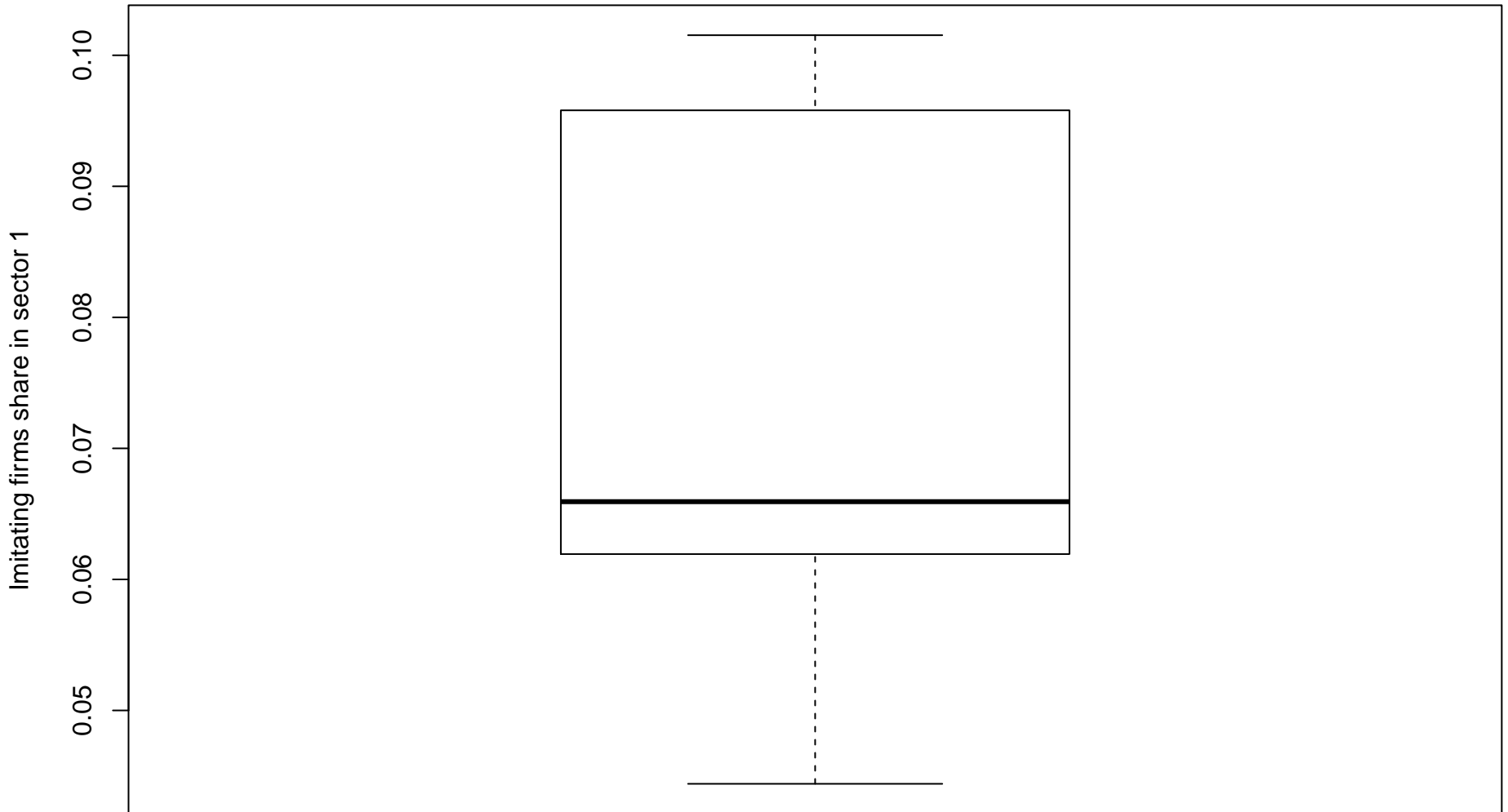
Productivity growth

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)
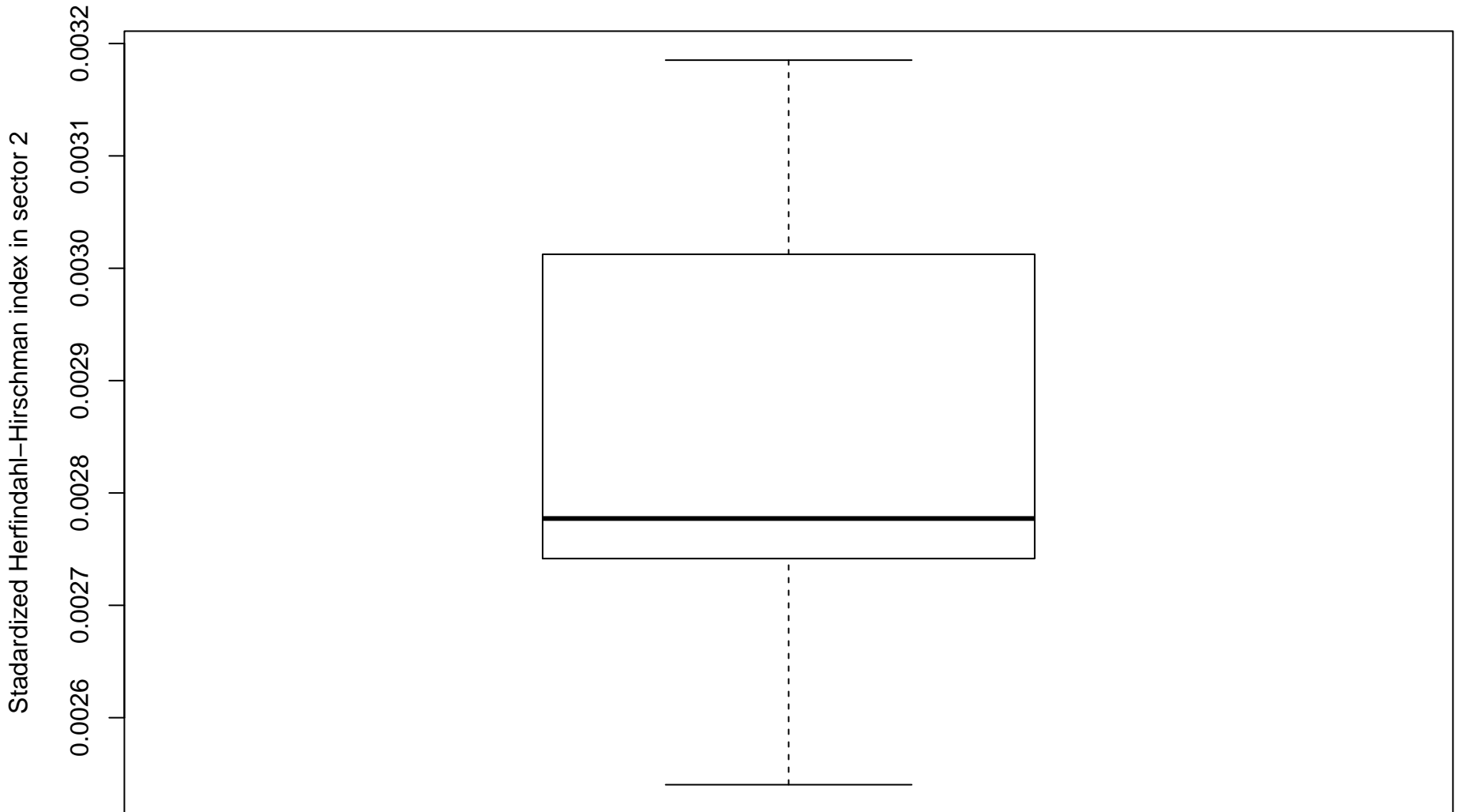
Innovation

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Imitation

Imitating firms share in sector 1
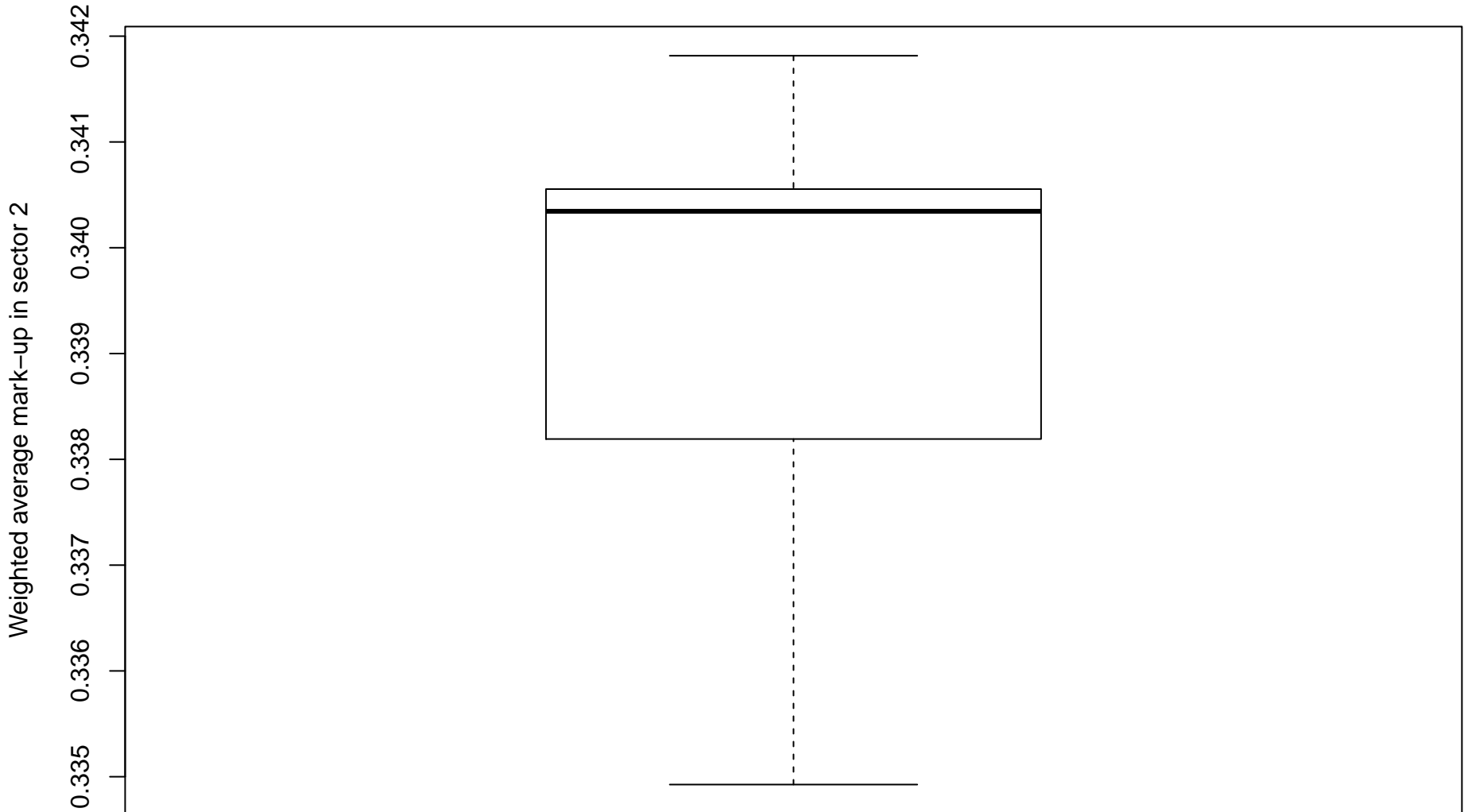
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)

Market concentration

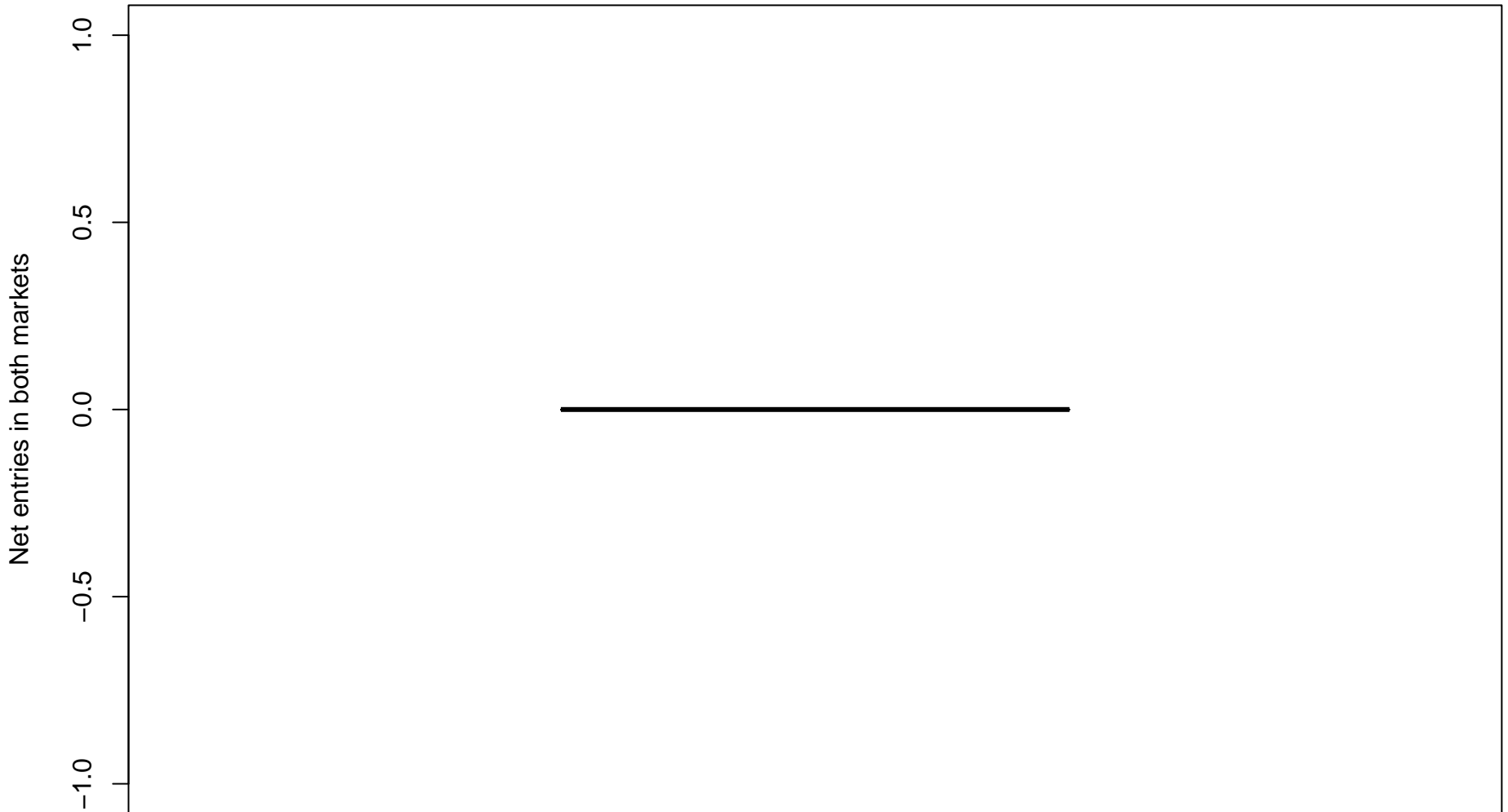Stadardized Herfindahl–Hirschman index in sector 2

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 5 / period = 301 – 600)

Mark-ups

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Net entry of firms

Net entries in both markets

(bar: median / box: 2nd–3rd quartile / whiskers: max−min / points: outliers / MC runs = 5 / period = 301 − 600)

Monte Carlo descriptive statistics (all experiments)

	Avg[1]	SD[1]	Min[1]	Max[1]
GDP growth	0.01452	0.002451	0.01213	0.01864
Volatility of GDP growth	0.09187	0.003929	0.0876	0.09625
Likelihood of GDP crises	0.2567	0.02635	0.23	0.29
Inflation	0.001895	0.0006117	0.001353	0.00289
Tax	0.02417	0.001346	0.02293	0.02566
Government total expenditure	0.04432	0.03804	0.01006	0.08688
Government deficit	0.1718	0.08496	0.1041	0.2935
Government debt	12.09	6.625	7.188	22.18
Credit supply	−7.783e−09	8.596e−09	−2.192e−08	−1.975e−09
Loans	1.831	0.7655	1.013	2.707
Capacity utilization	0.5289	0.008187	0.517	0.5374
Full employment frequency	0.3813	0.325	0.02667	0.6833
Unemployment	0.1105	0.09085	0.02787	0.2117
Vacancy	0.2493	0.04325	0.2022	0.2945
Productivity growth	0.01435	0.001807	0.01228	0.01727
Innovation	0.08039	0.02188	0.05133	0.1039
Imitation	0.07392	0.02408	0.0444	0.1015
Market concentration	0.002851	0.0002508	0.00254	0.003185
Mark−ups	0.3392	0.002705	0.3349	0.3418
Net entry of firms	0	0	0	0

Experiments: [1] Free entry
(numbers in brackets indicate the experiment number / MC runs = 5 / period = 301 − 600)