GDP, investment and consumption (all experiments)
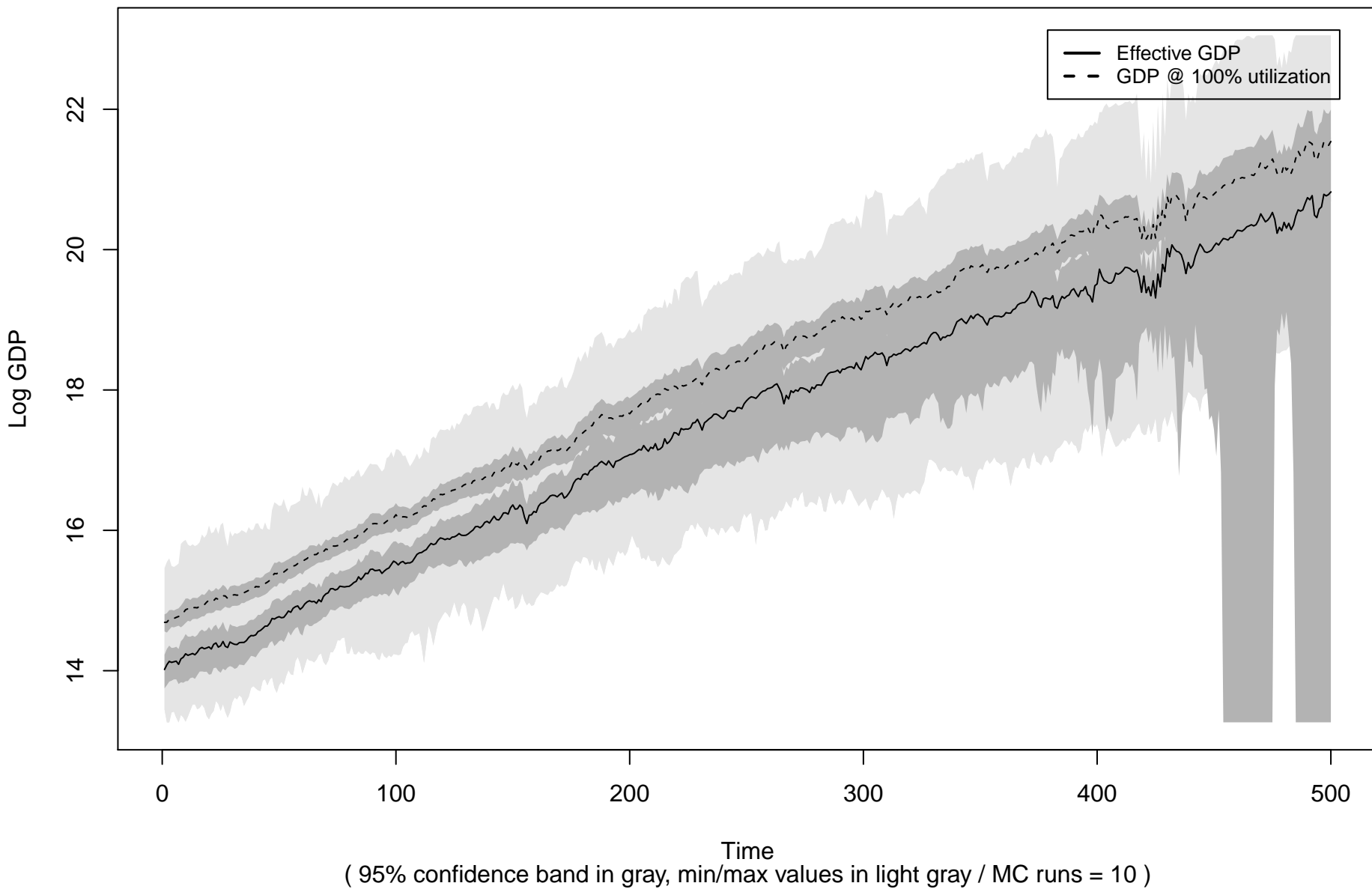

Logs

Time
(MC runs = 10)
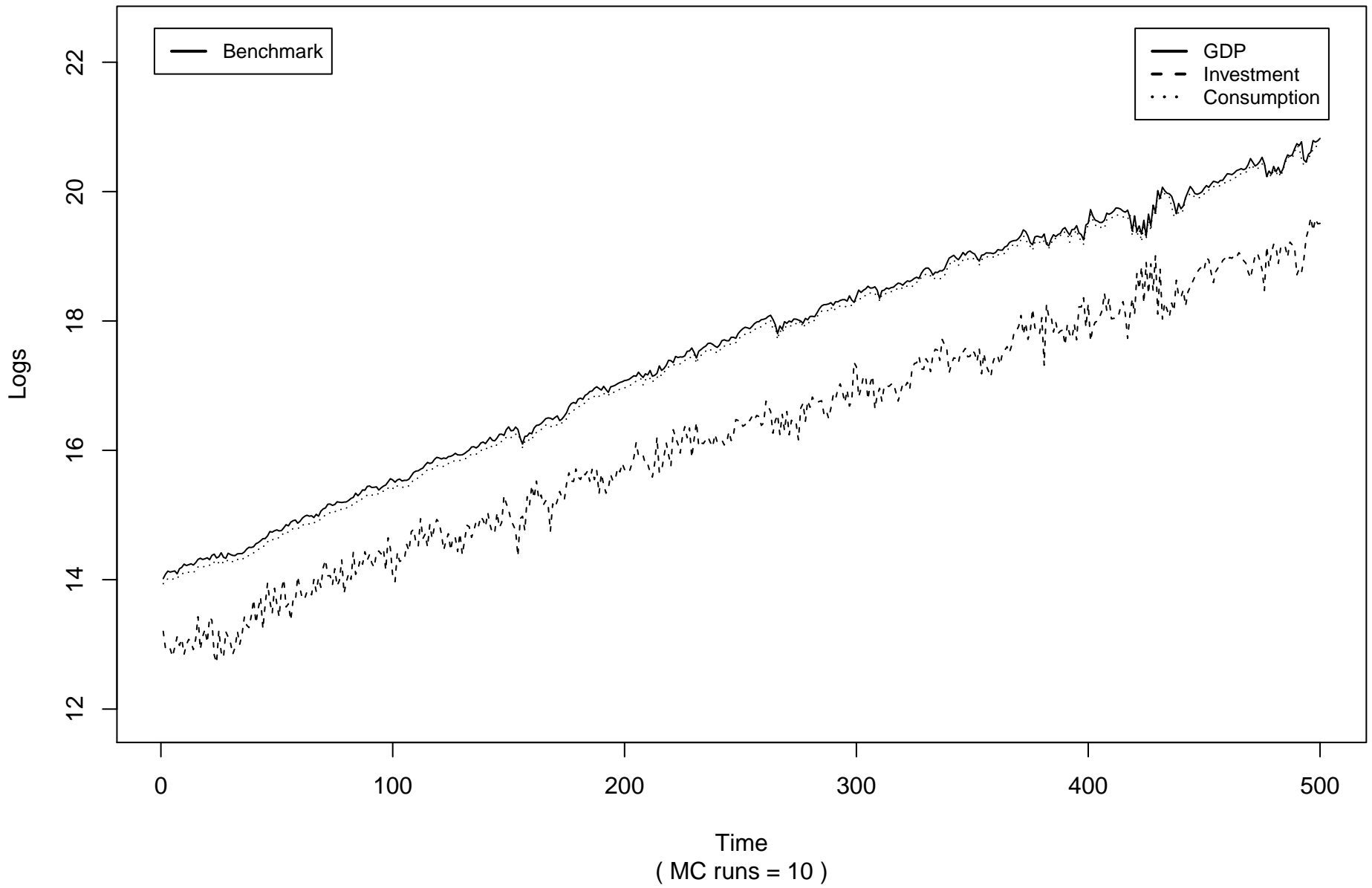
GDP, investment and consumption (Benchmark)

Logs

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)

Legend:
- GDP
- Investment
- Consumption

GDP (all experiments)

Benchmark

Effective GDP

GDP @ 100% utilization

Log GDP

Time
(MC runs = 10)

GDP (Benchmark)

Effective GDP
GDP @ 100% utilization

Log GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
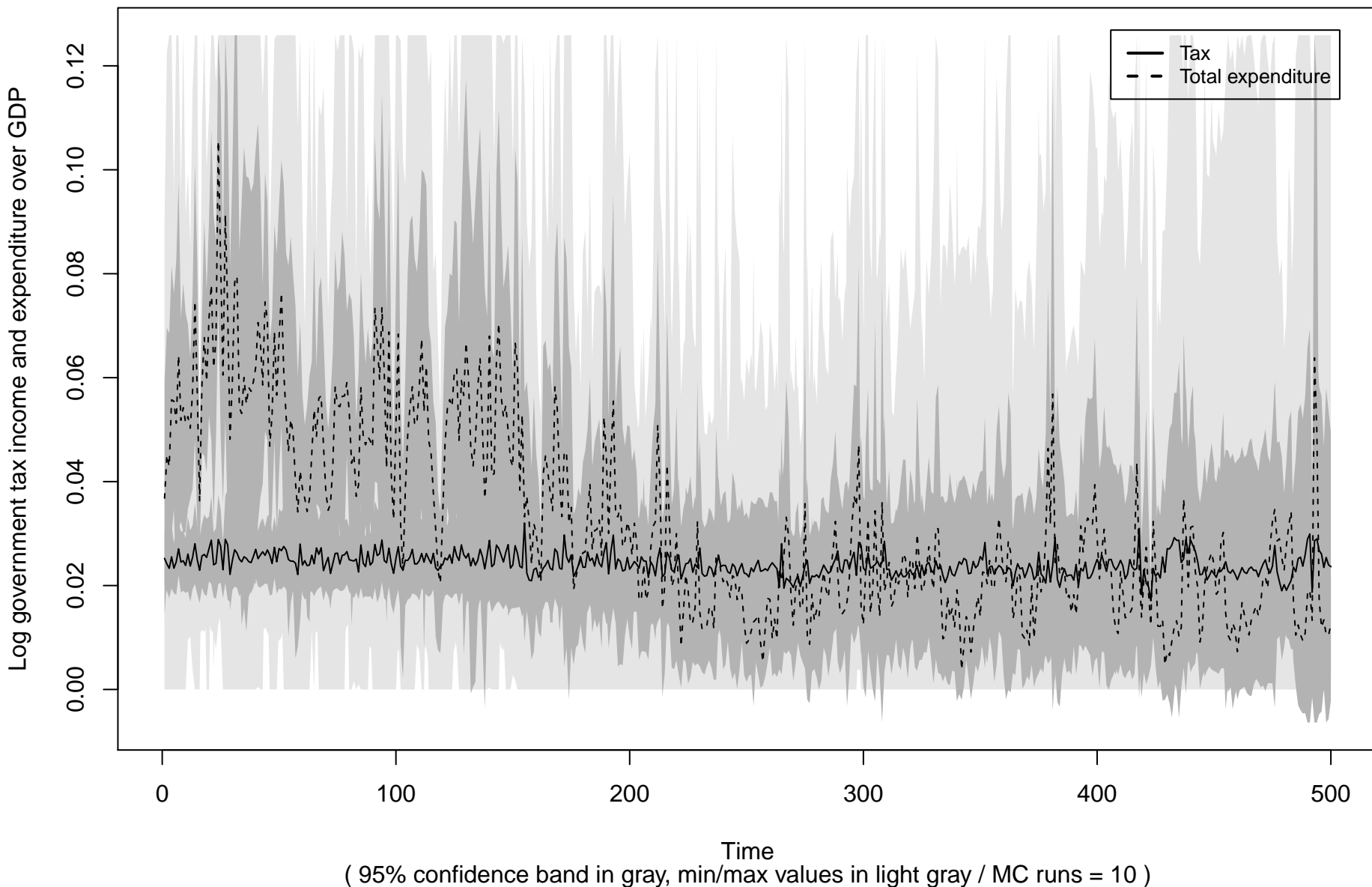
Government income and expenditure on GDP (all experiments)

Log government tax income and expenditure over GDP

Benchmark

Tax
Total expenditure

Time
(MC runs = 10)
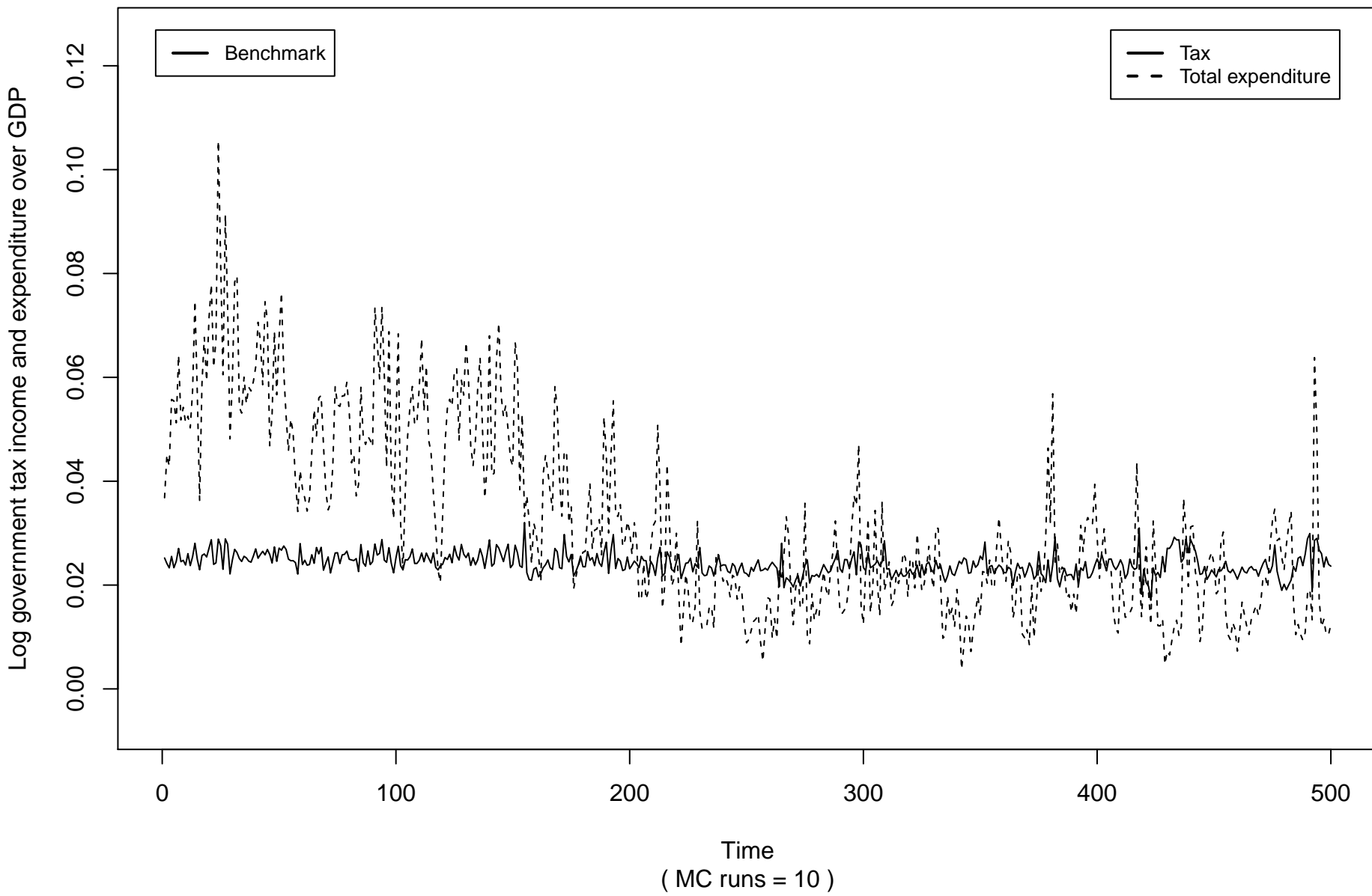
Government income and expenditure on GDP (Benchmark)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)

Government deficit on GDP (all experiments)

Government deficit over GDP

Benchmark

Time
(MC runs = 10)
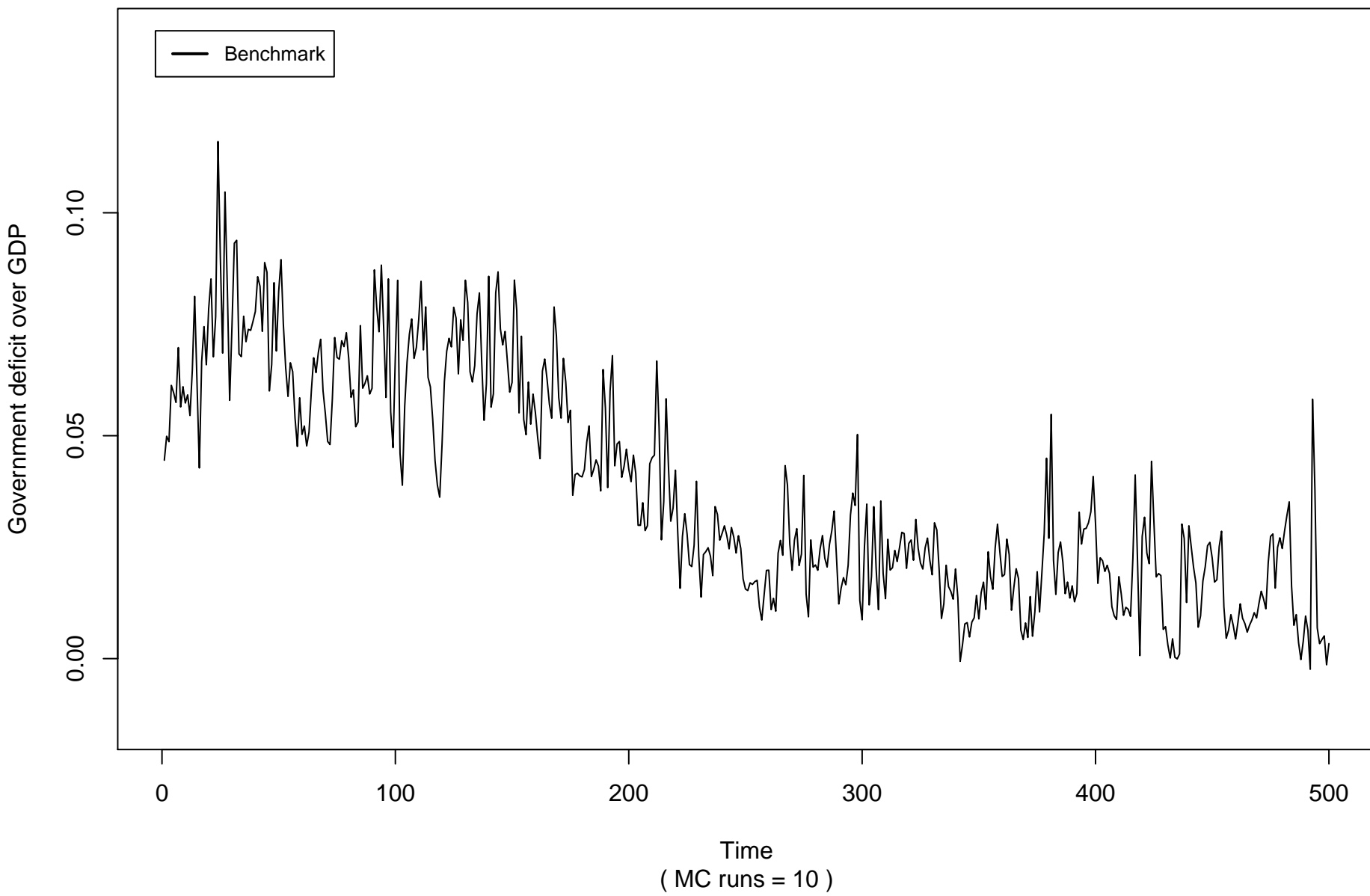
Government deficit on GDP (Benchmark)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
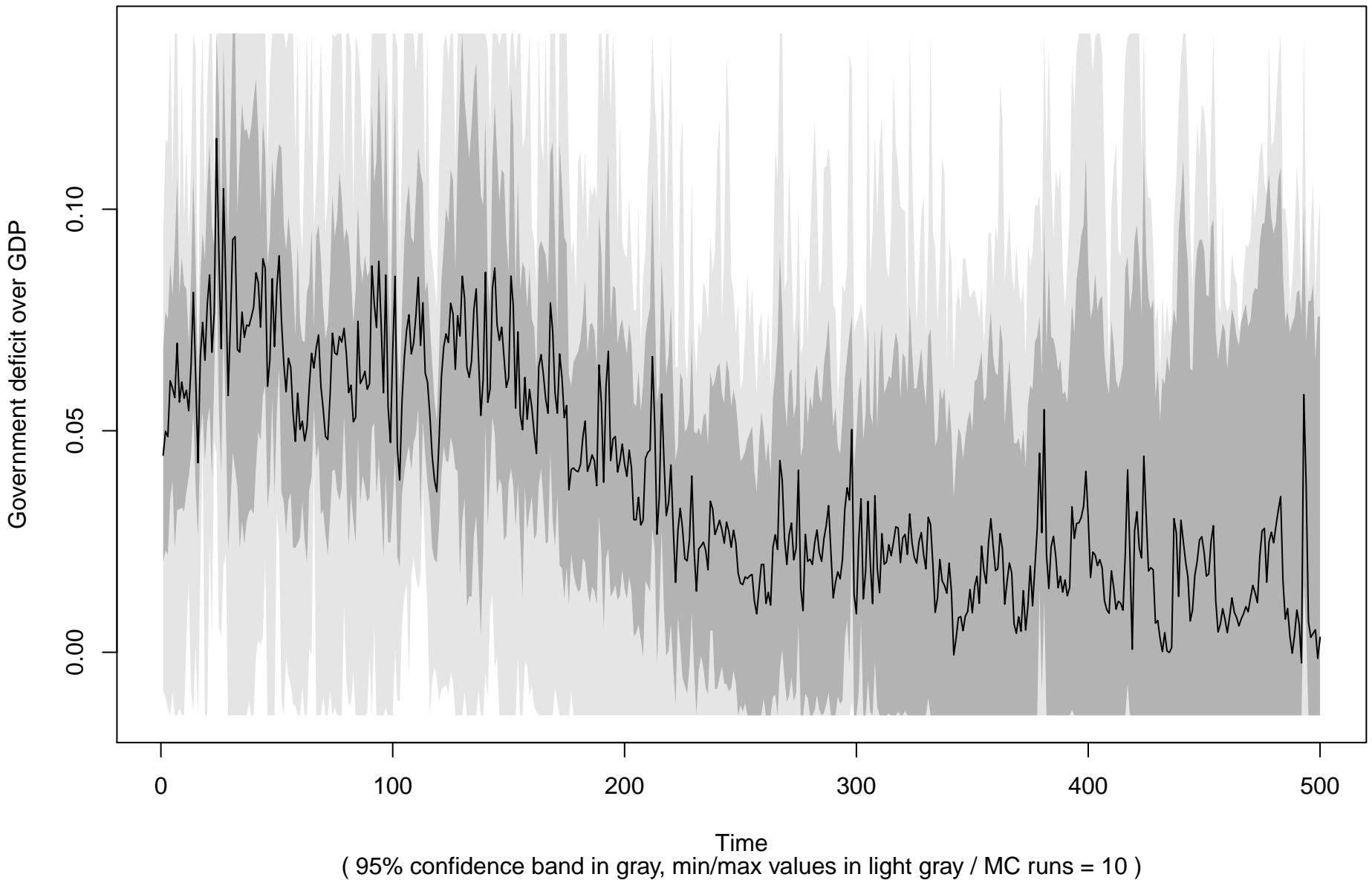
Government debt on GDP (all experiments)

Government debt over GDP

Benchmark

Time
(MC runs = 10)
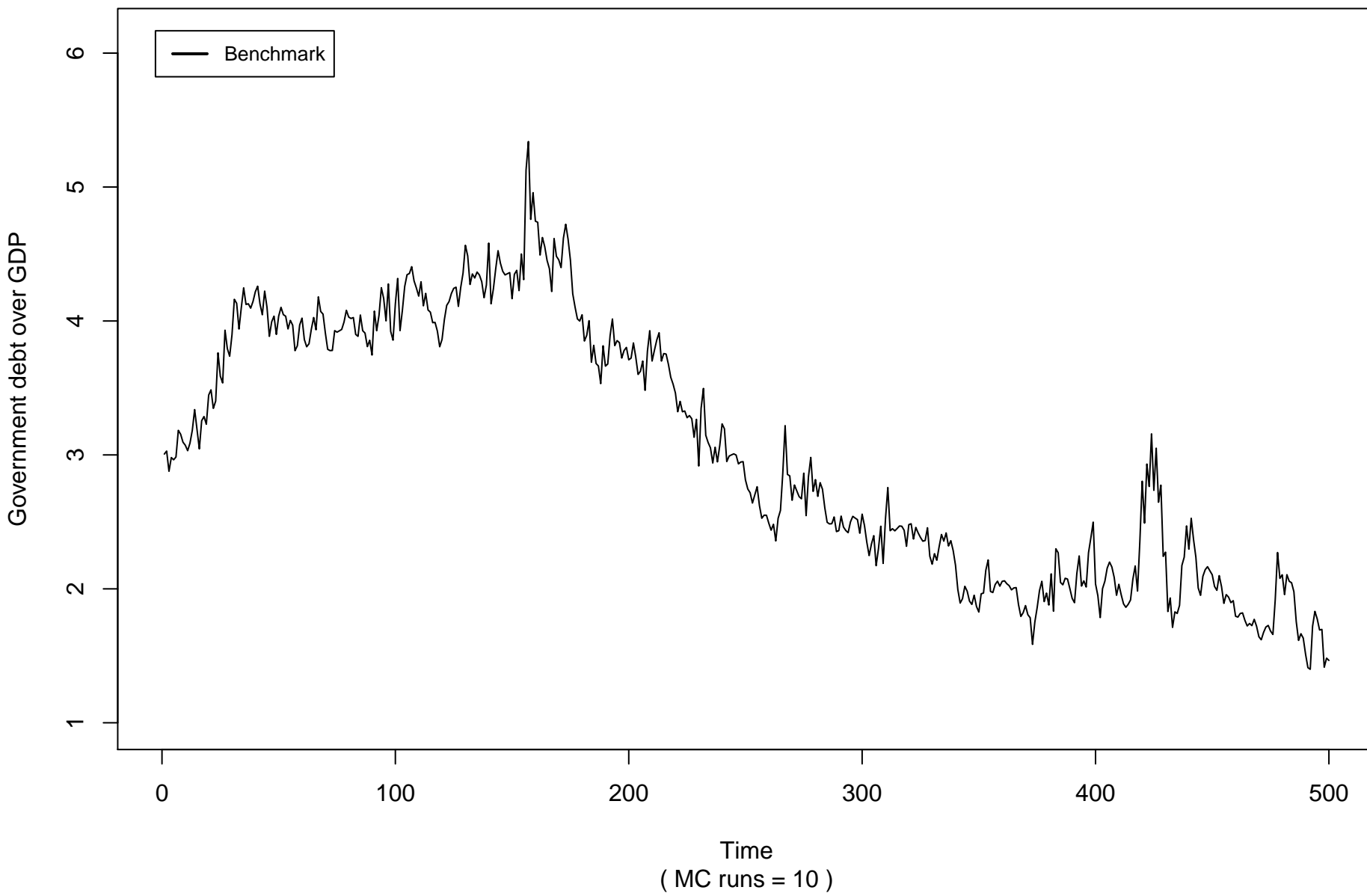
Government debt on GDP (Benchmark)

Government debt over GDP

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
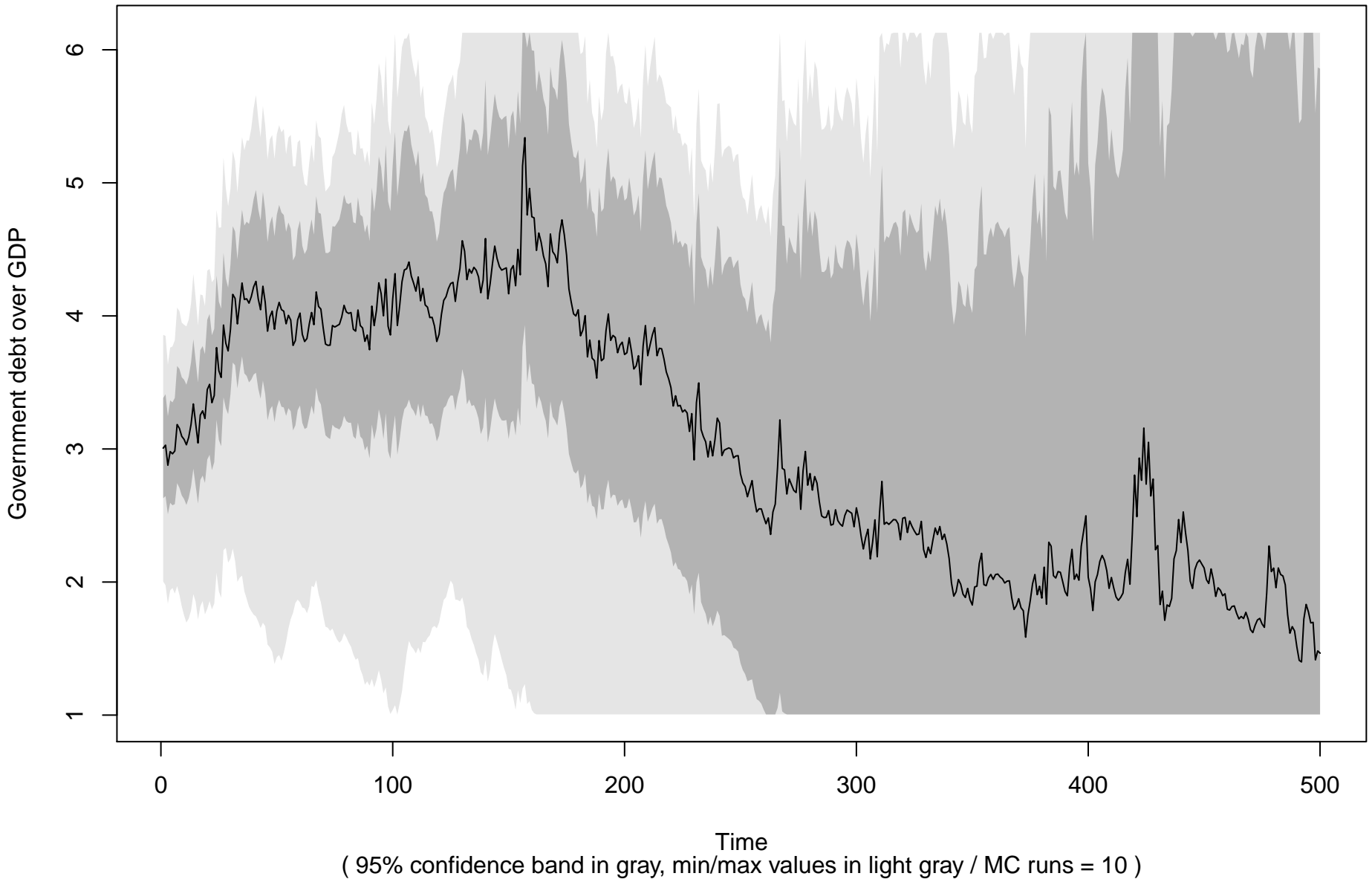
Unemployment and vacancy rates (all experiments)

Time
(MC runs = 10)
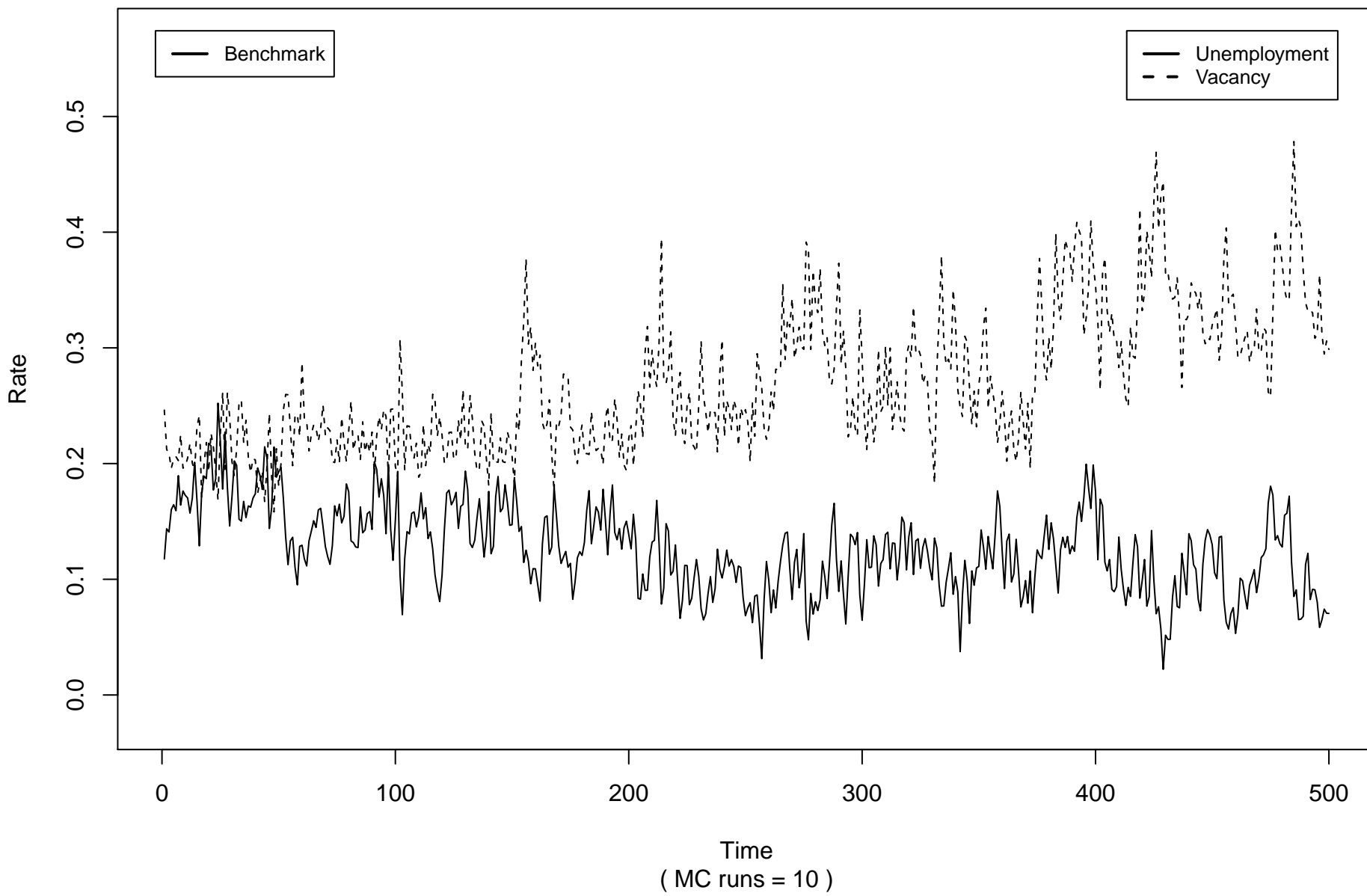
Unemployment and vacancy rates (Benchmark)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
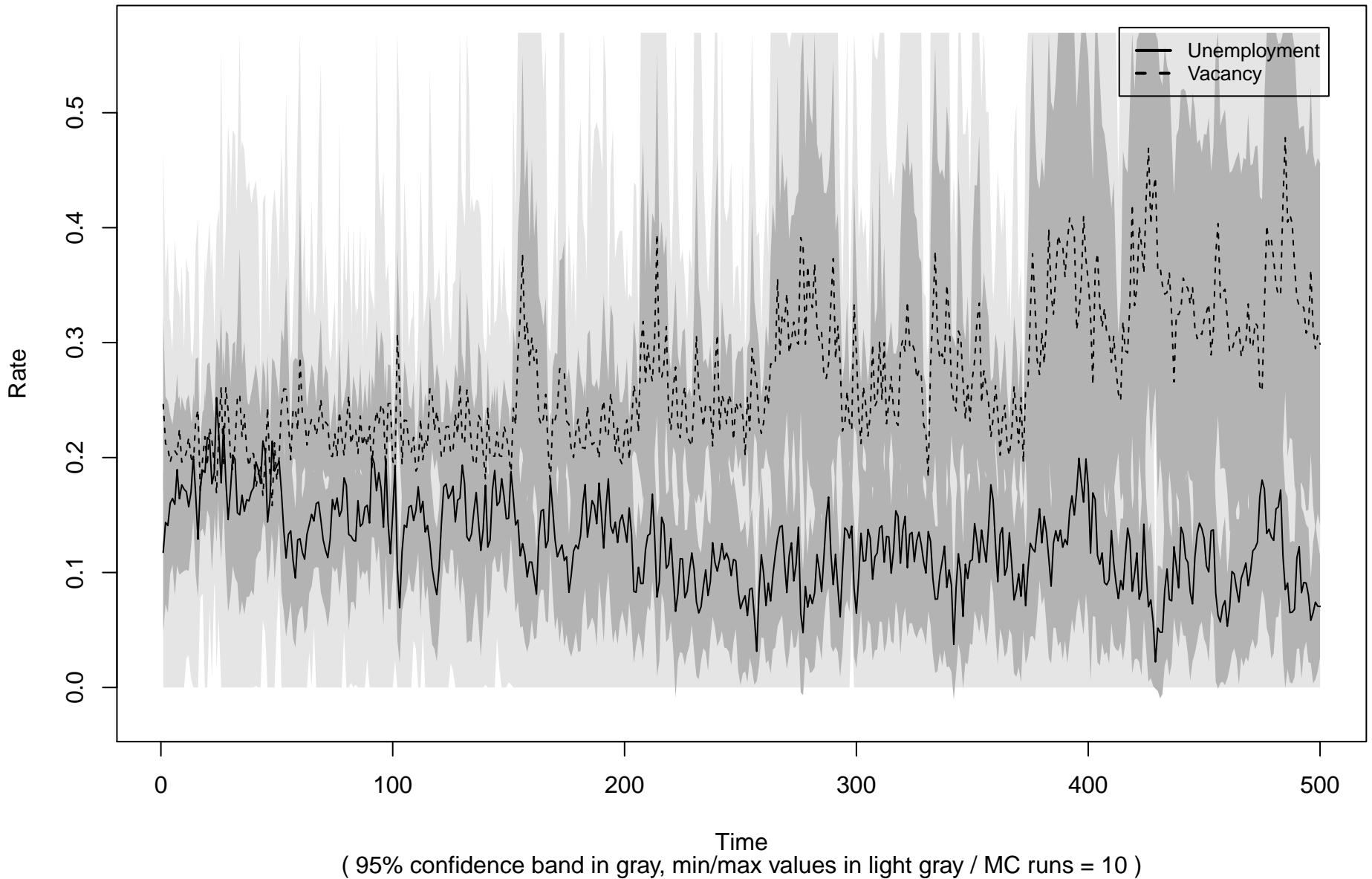
Real wages average (all experiments)

Log wages

Benchmark

Time
(MC runs = 10)
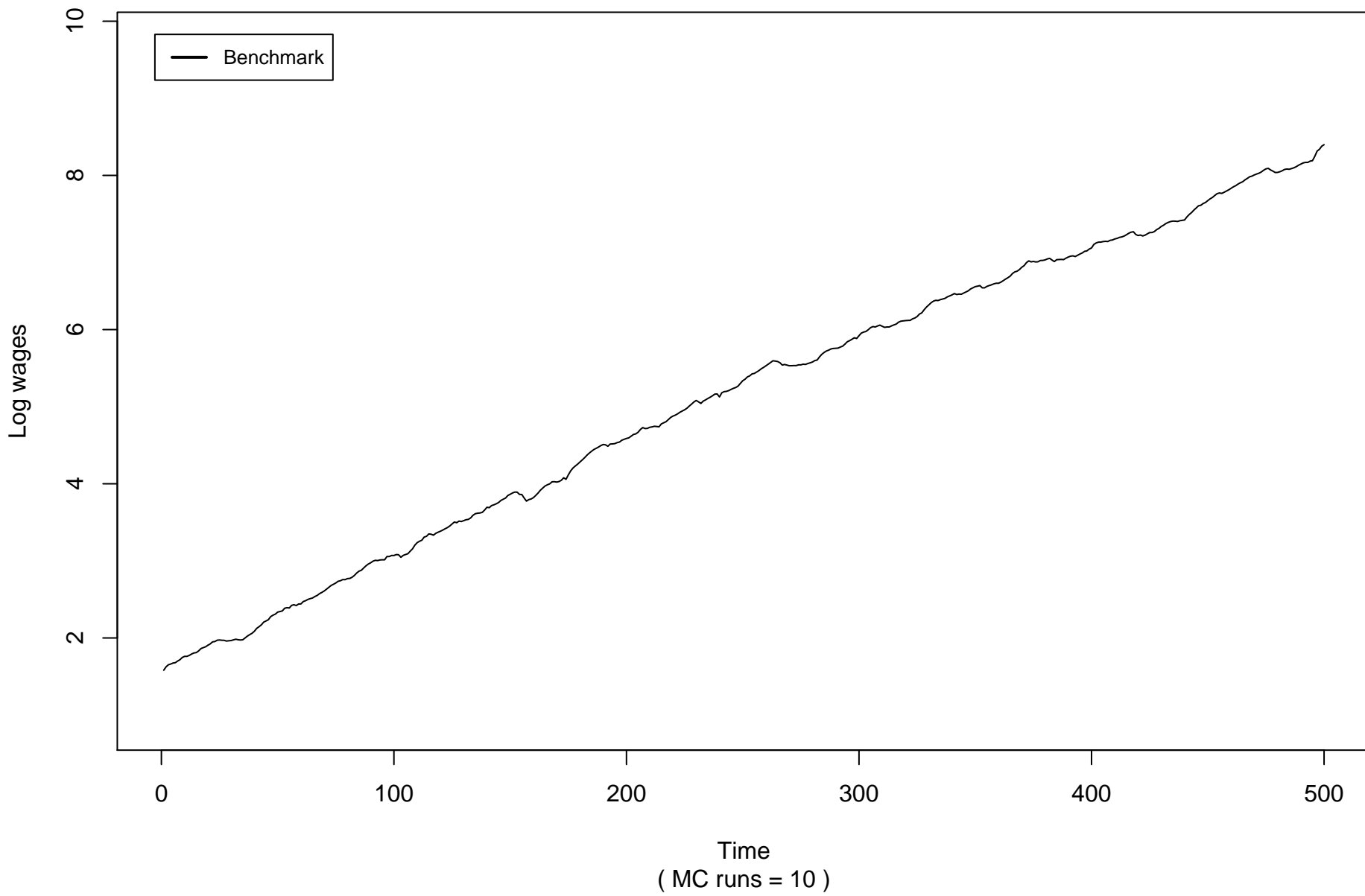
Real wages average (Benchmark)

Log wages

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
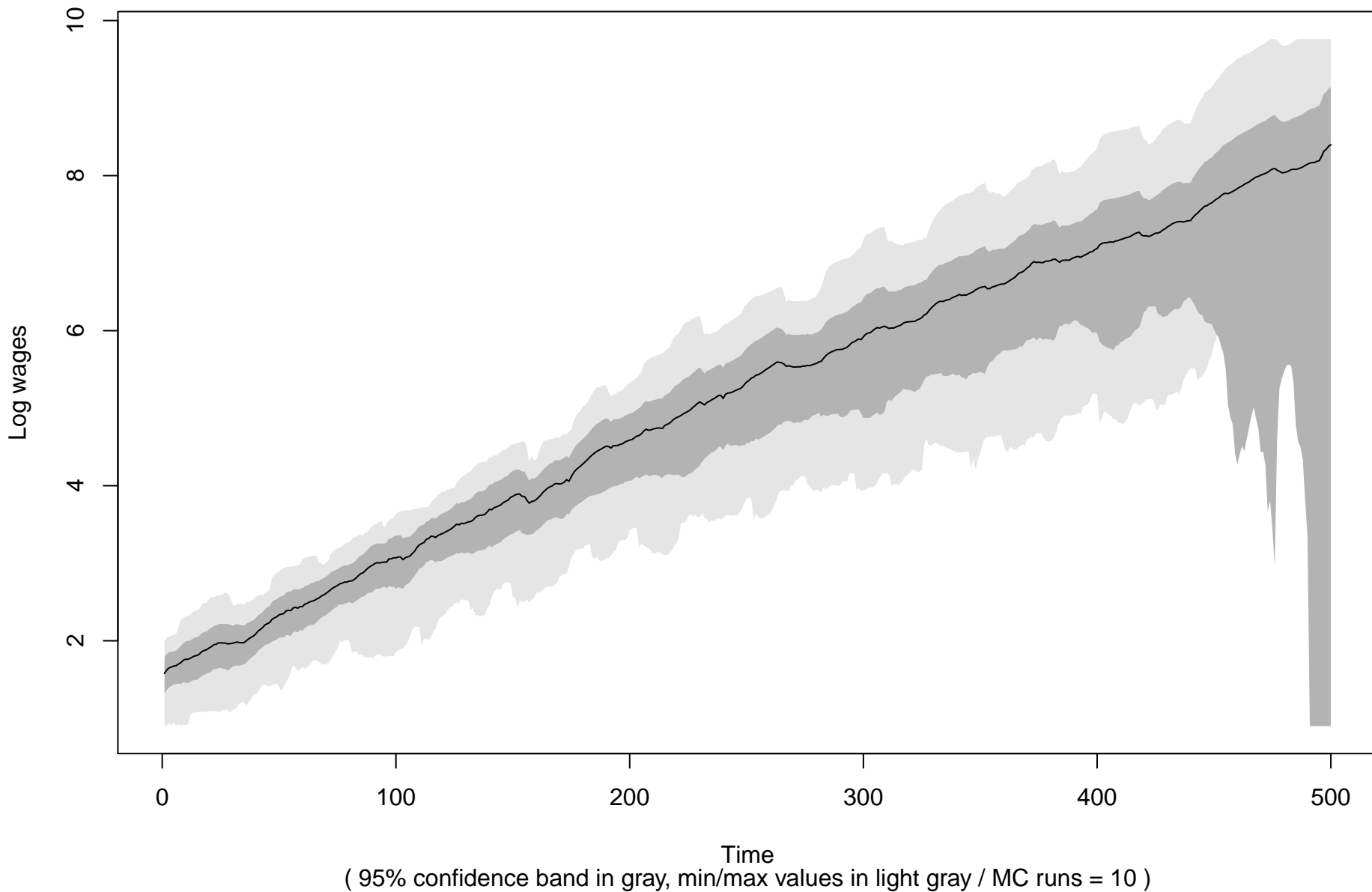
Wage share (all experiments)

Total real wages on GDP

Time
(MC runs = 10)

Benchmark

Wage share (Benchmark)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
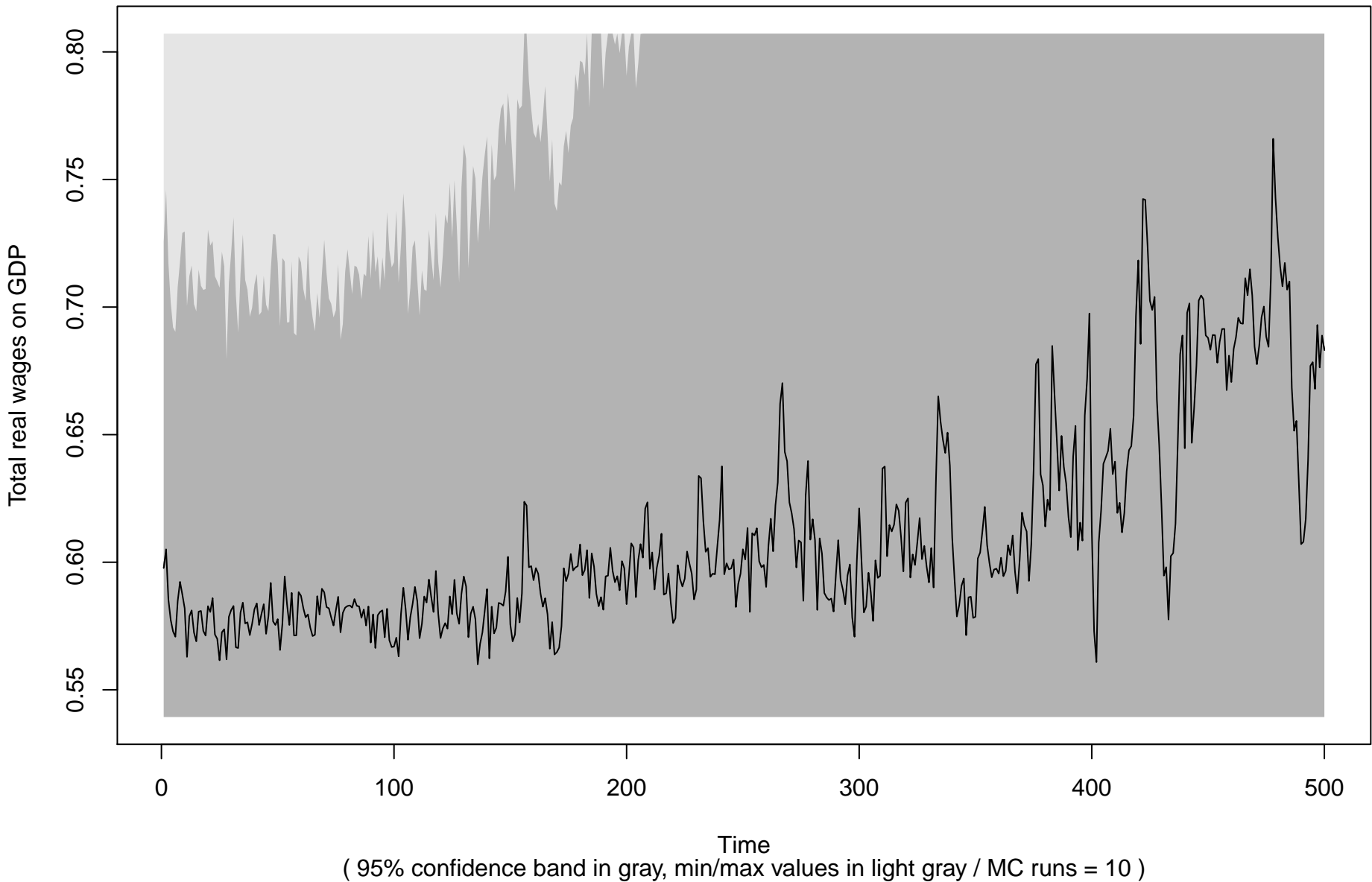
Innovation and imitation (all experiments)

Share of innovating and imitating firms

| Benchmark |

| Innovation |
| Imitation |

Time
(sector 1 only / MC runs = 10)
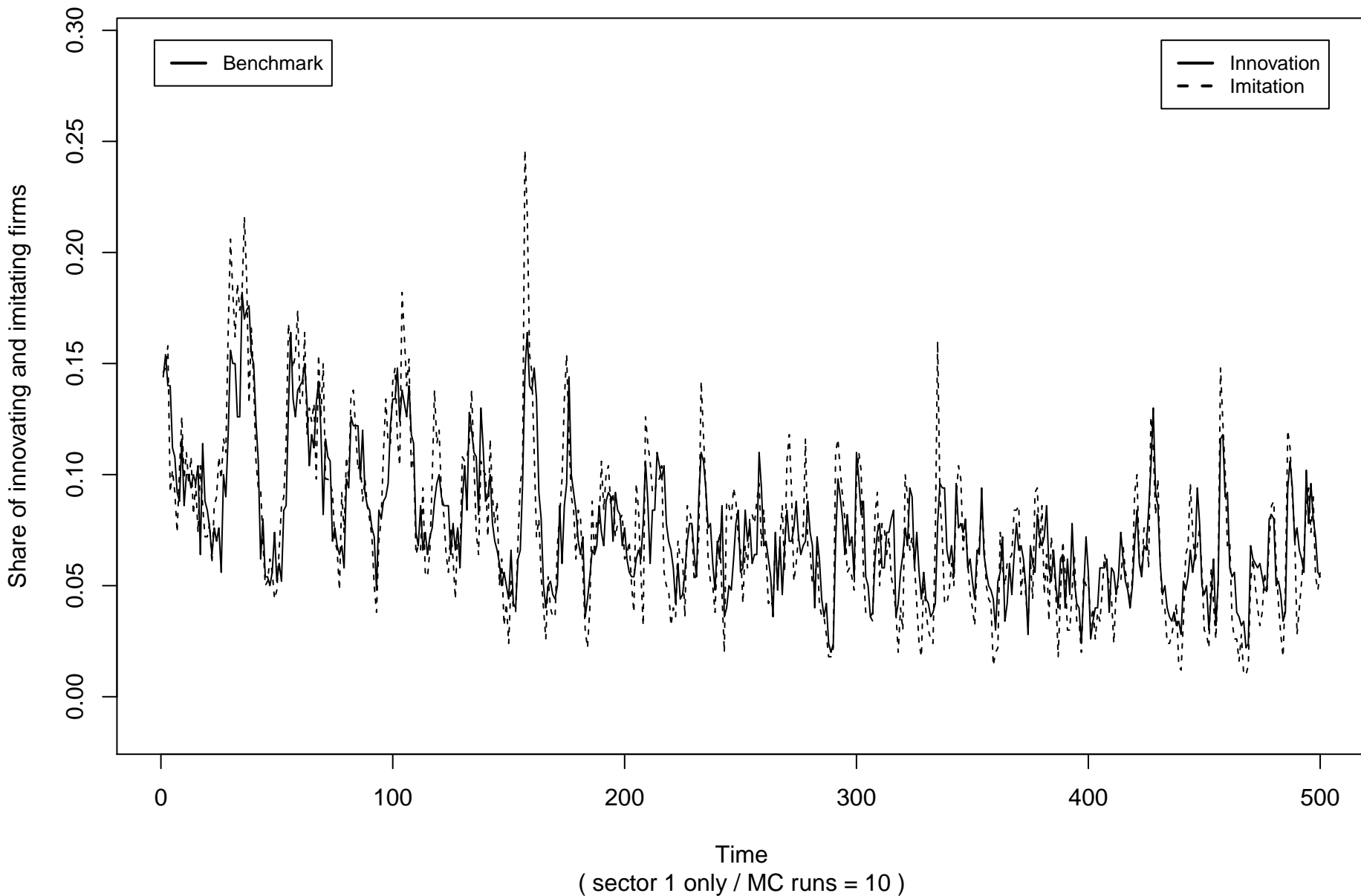
Innovation and imitation (Benchmark)

Share of innovating and imitating firms

Time
(95% confidence band in gray, min/max values in light gray / sector 1 only / MC runs = 10)
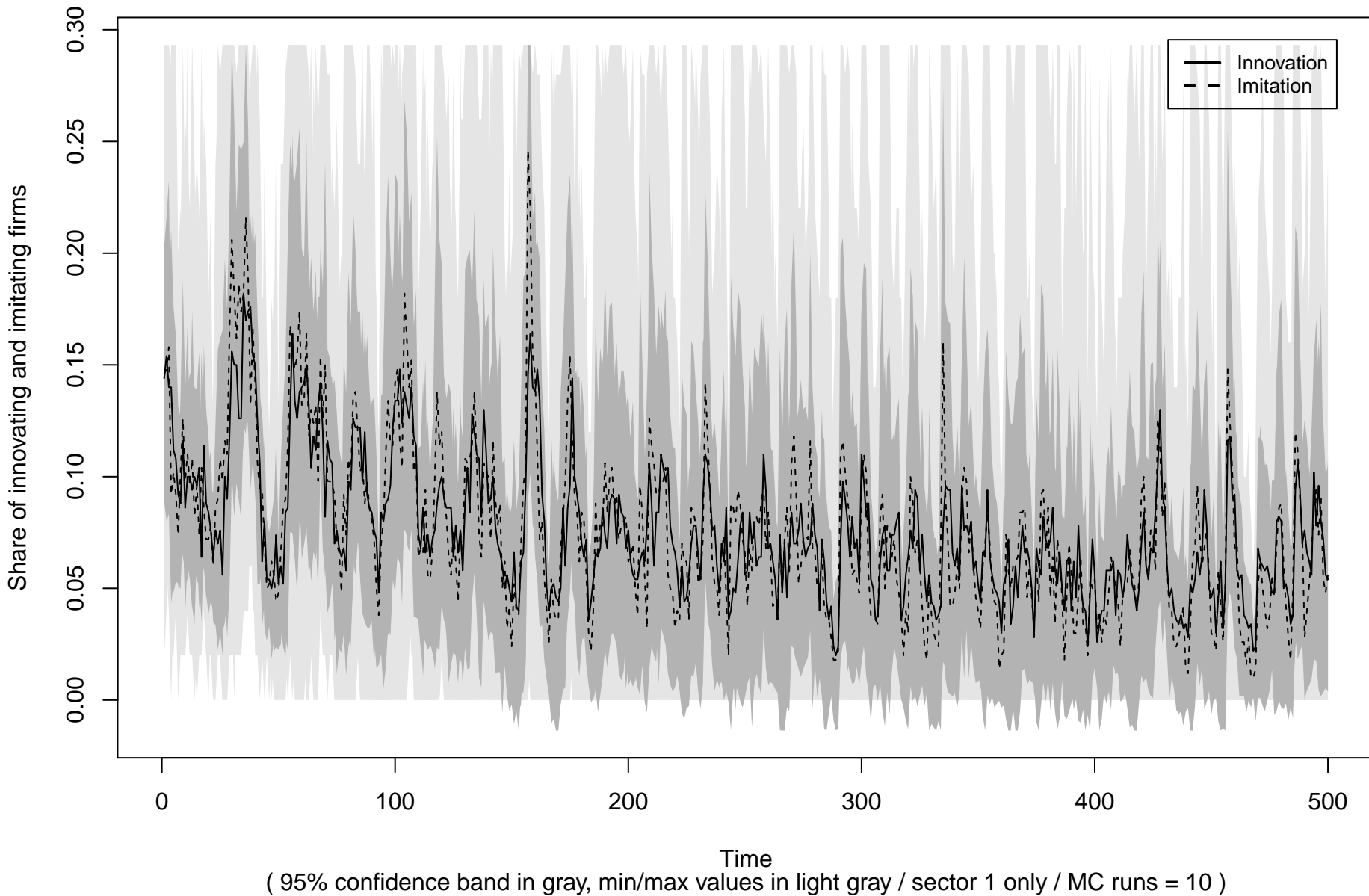
Market concentration (all experiments)

Time
(Sector 2 only / MC runs = 10)
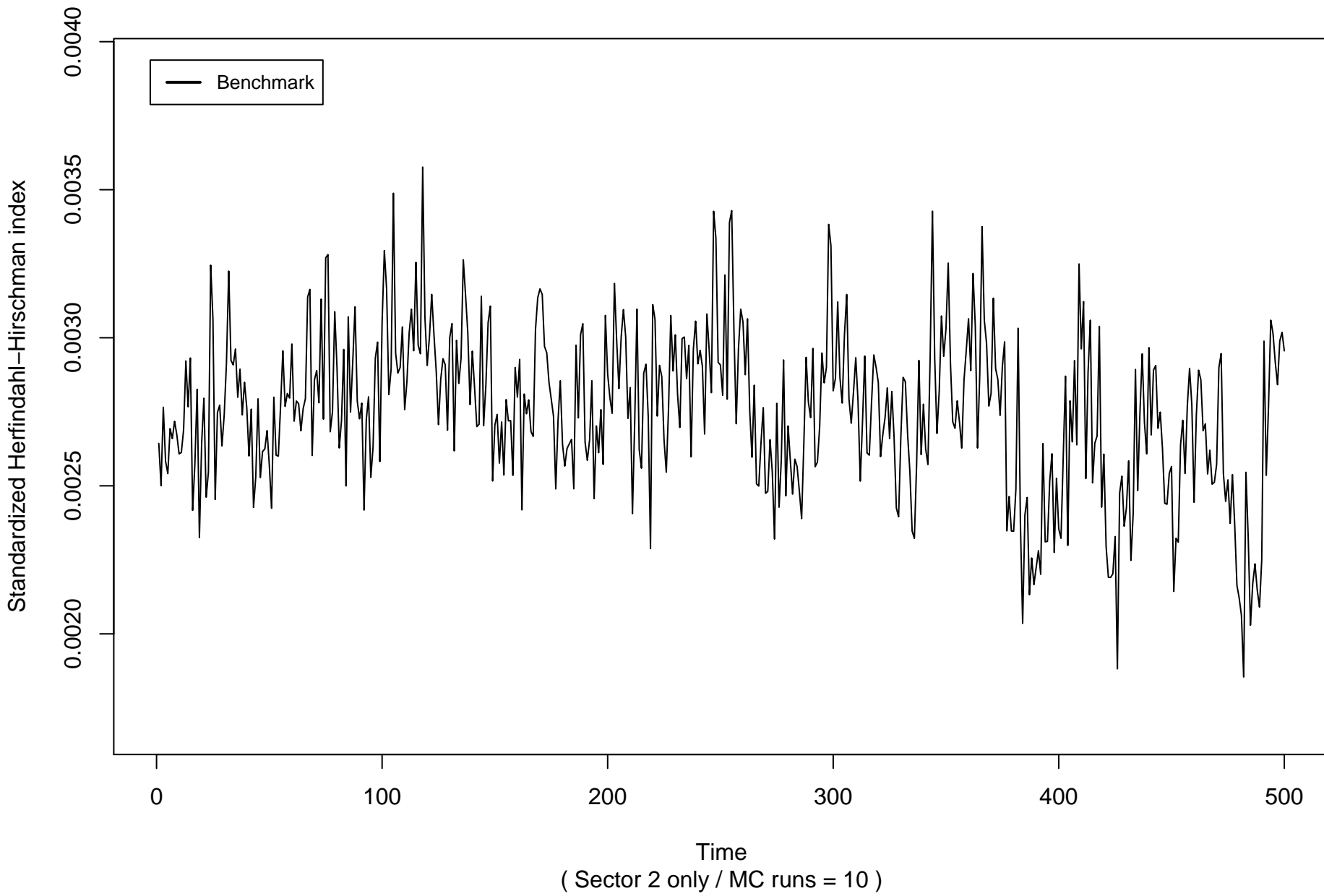
Market concentration (Benchmark)

Standardized Herfindahl–Hirschman index

Time
(95% confidence band in gray, min/max values in light gray / Sector 2 only / MC runs = 10)
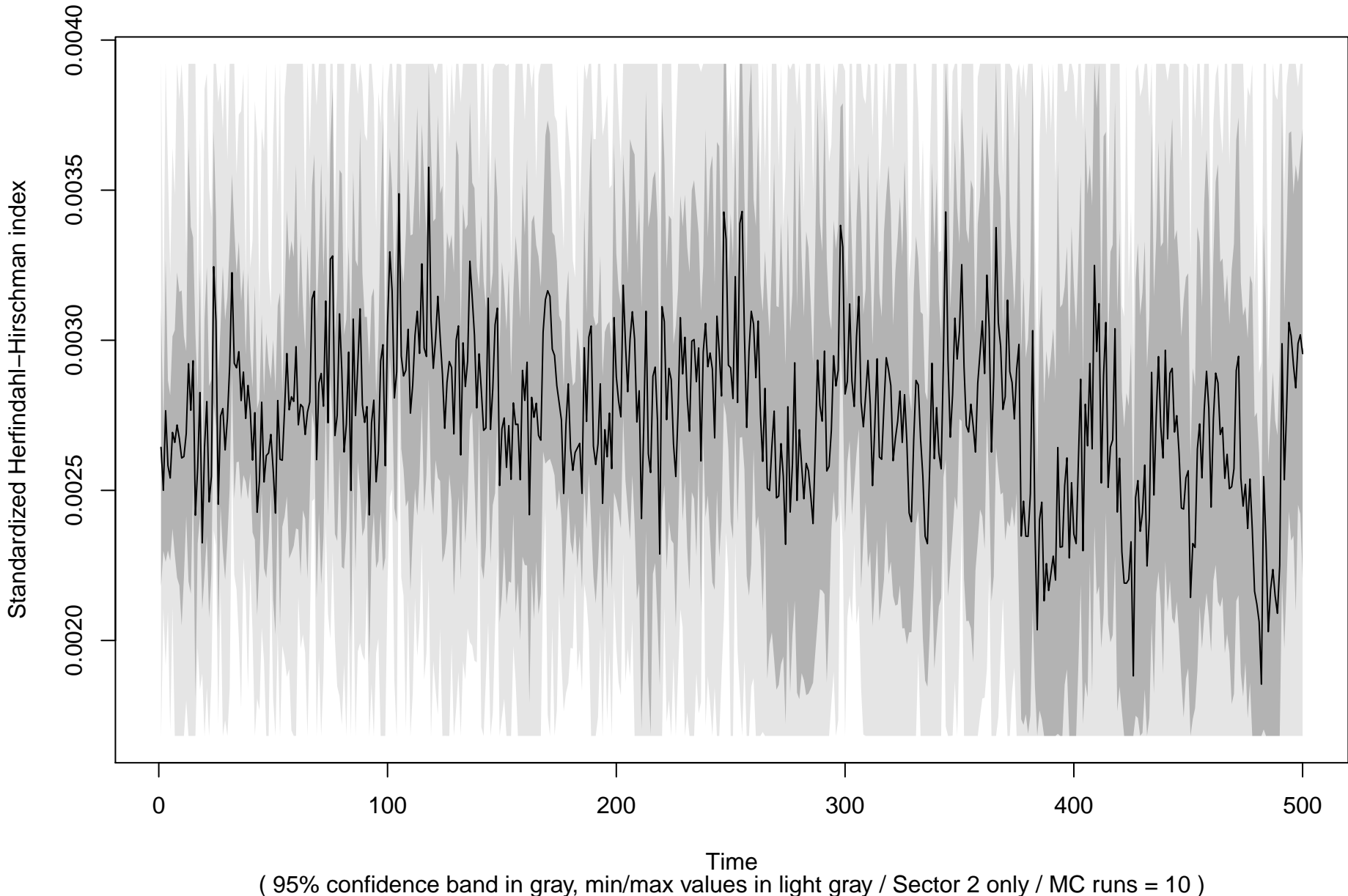
Mark−up average (all experiments)

Weighted average mark−up rate

Time
(Sector 2 only / MC runs = 10)
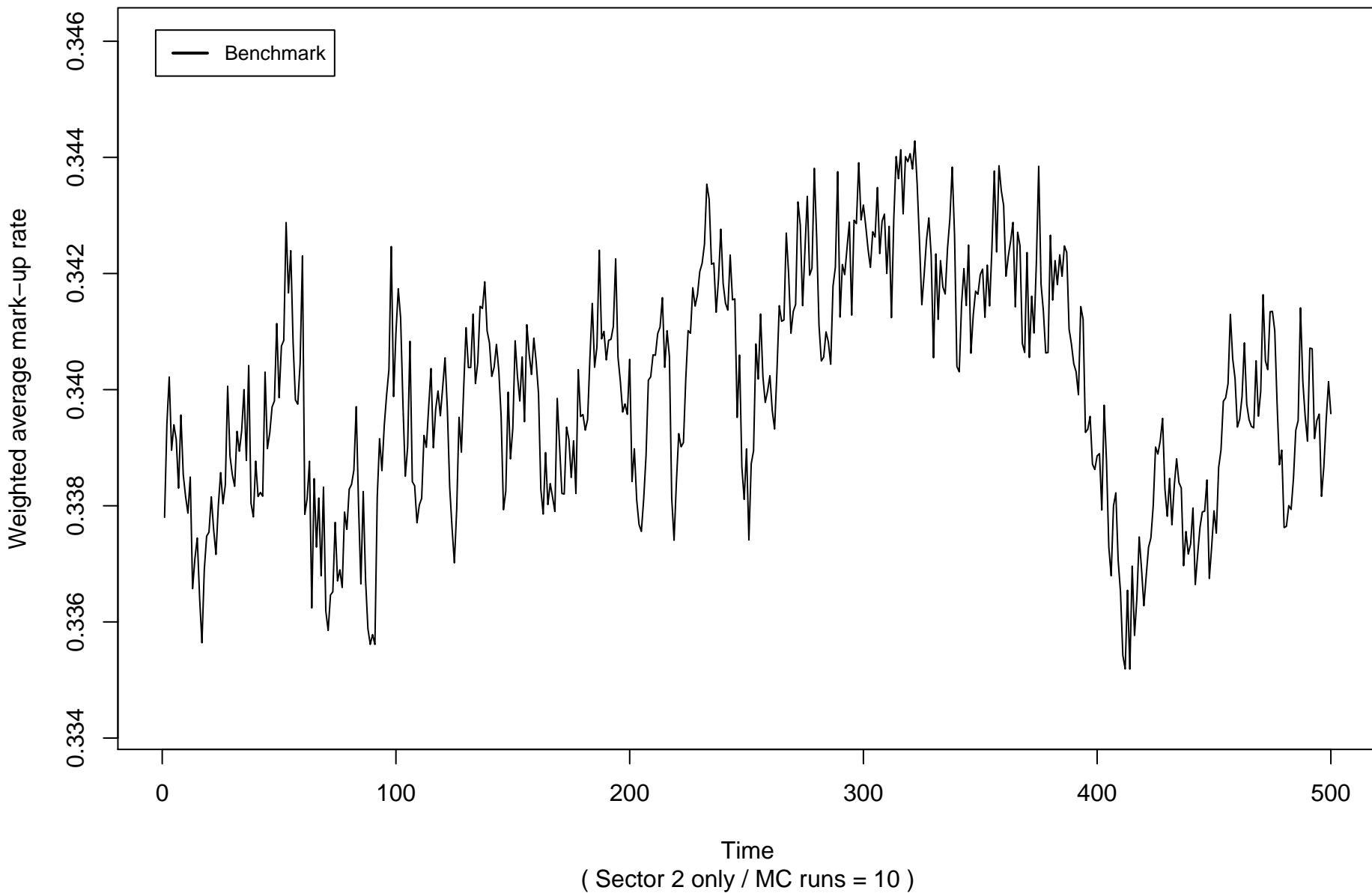
Benchmark

Mark−up average (Benchmark)

Weighted average mark−up rate

Time
(95% confidence band in gray, min/max values in light gray / Sector 2 only / MC runs = 10)

GDP cycles (Benchmark)

Filtered series

Time

(Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10)

Legend:
- GDP
- Consumption
- Investment
- Productivity
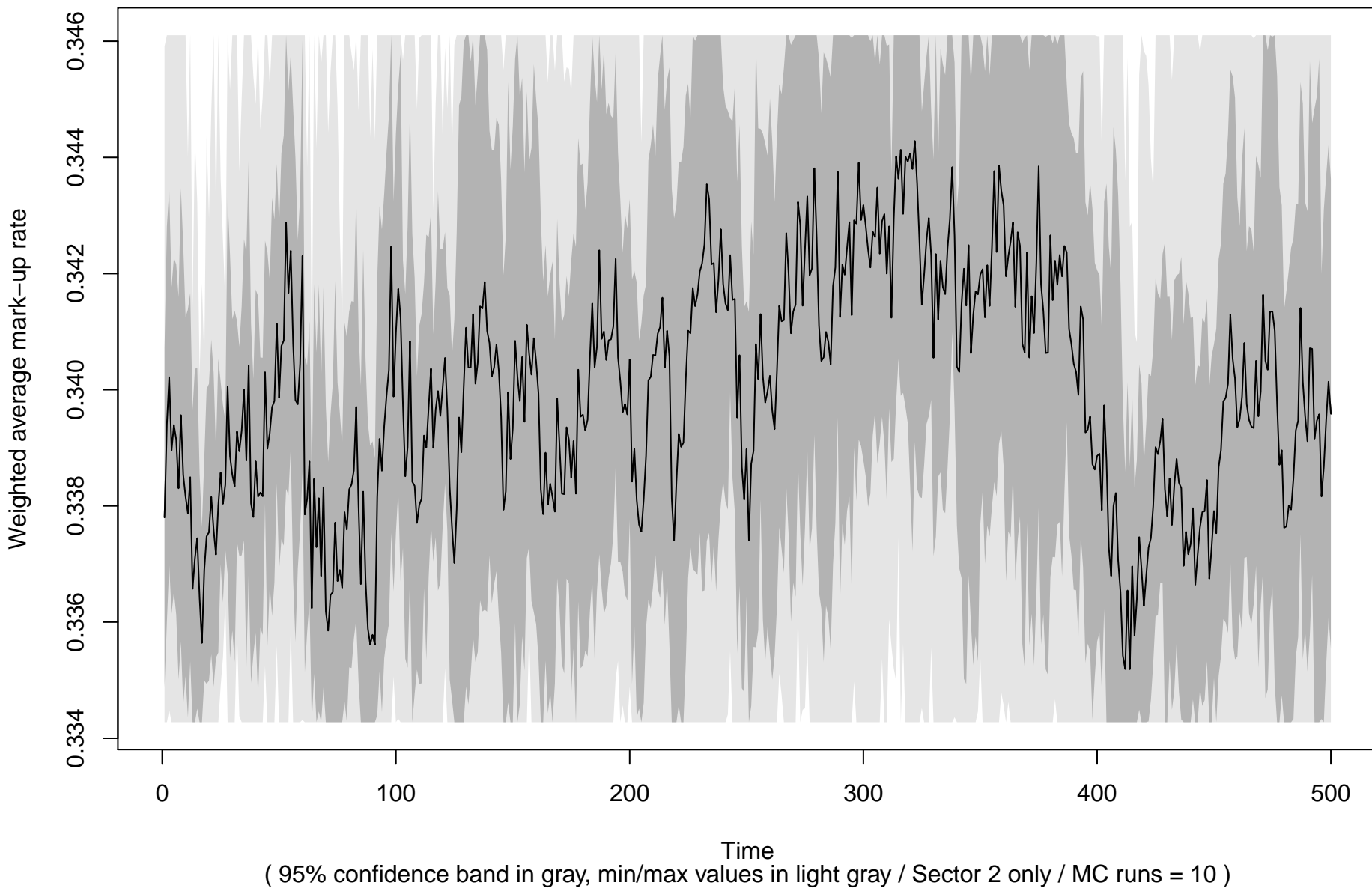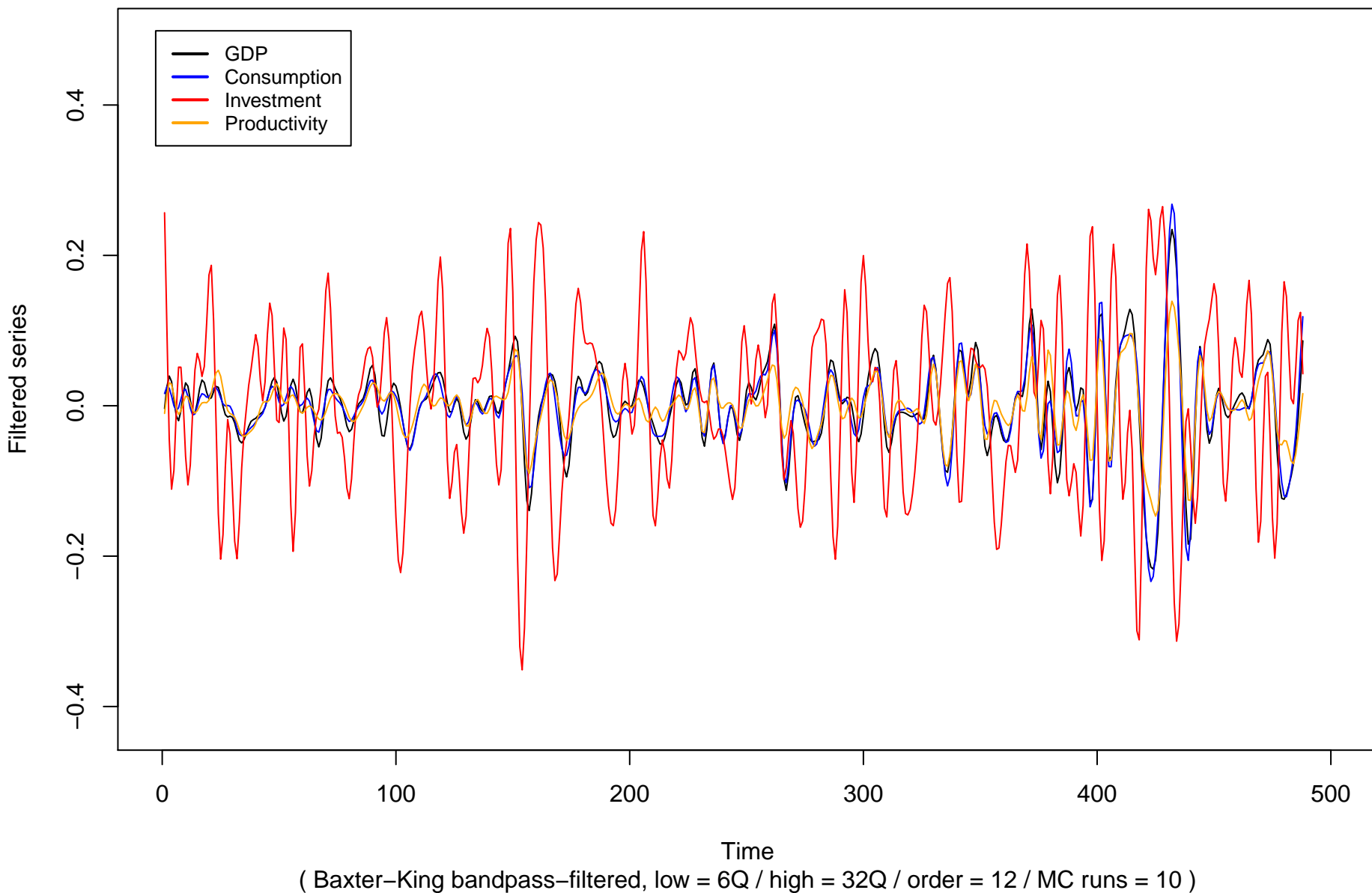
Shimer puzzle (Benchmark)

Filtered series

Time
(Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10)

Legend:
— Productivity
— Unemployment
— Vacancy
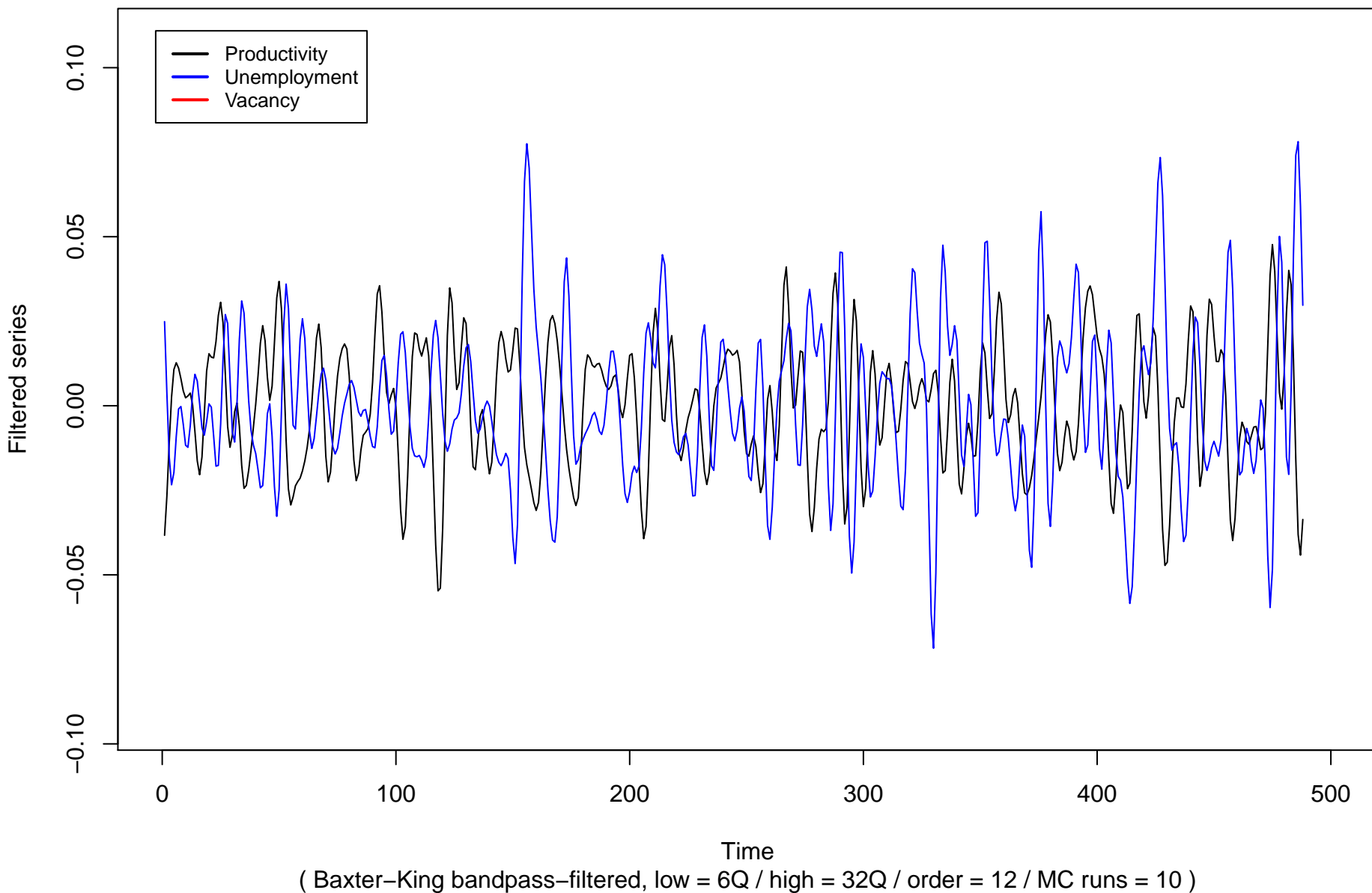
Key statistics and unit roots tests for cycles (Benchmark)

	GDP (output)	Consumption	Investment	Product.	Real wage
avg. growth rate	0.01066	0.01068	0.01181	0.01049	0.01088
(s.e.)	0.000765	0.0007565	0.0008619	0.0007307	0.0006453
ADF test (logs)	−3.197	−3.055	−6.53	−3.029	−2.682
(s.e.)	0.3801	0.3735	0.271	0.3333	0.2322
(p−val.)	0.2728	0.2956	0.01	0.2837	0.3244
(s.e.)	0.08206	0.09526	0	0.08541	0.08146
ADF test (bpf)	−6.507	−6.431	−6.684	−6.444	−5.997
(s.e.)	0.3814	0.3462	0.1913	0.3773	0.1999
(p−val.)	0.01	0.01	0.01	0.01	0.01
(s.e.)	0	0	0	0	0
s.d. (bpf)	0.1345	0.1203	1.619	0.09438	0.06778
(s.e.)	0.02486	0.02726	0.1079	0.01993	0.004232
relative s.d. (GDP)	1	0.8946	12.04	0.7018	0.504

(bpf: Baxter−King bandpass−filtered series, low = 6Q / high = 32Q / order = 12 / MC runs = 10 / period = 301 − 600)
(ADF test H0: there are unit roots / non−stationary at 5% level)

Correlation structure for GDP (Benchmark)

	−4	−3	−2	−1	0	1	2	3	4
GDP (output)	−0.01297	0.2737	0.6115	0.8902	1	0.8902	0.6115	0.2737	−0.01297
(s.e.)	0.04384	0.03747	0.02243	0.006749	1.17e−17	0.006749	0.02243	0.03747	0.04384
(p−val.)	0.09318	0.0002937	1.014e−09	4.905e−16	NA	4.905e−16	1.014e−09	0.0002937	0.09318
Consumption	0.0671	0.3246	0.6154	0.8538	0.9523	0.8653	0.6256	0.3175	0.03383
(s.e.)	0.0541	0.04295	0.02584	0.01267	0.008718	0.008019	0.02266	0.03879	0.04661
(p−val.)	0.02807	0.000148	3.322e−09	2.138e−13	2.523e−15	3.064e−15	8.802e−10	8.721e−05	0.06069
Investment	−0.2632	−0.3527	−0.3699	−0.2739	−0.07692	0.1538	0.3321	0.4014	0.3614
(s.e.)	0.0472	0.04878	0.05316	0.06624	0.07643	0.07237	0.05457	0.0366	0.03271
(p−val.)	0.0001269	0.0001694	0.0002022	0.00239	0.005558	0.004925	0.0002799	5.213e−06	6.168e−06
Net investment	−0.2241	−0.3118	−0.3332	−0.2499	−0.07301	0.1358	0.2969	0.3582	0.3199
(s.e.)	0.04735	0.05055	0.0588	0.07412	0.08264	0.07455	0.05326	0.03669	0.03803
(p−val.)	0.0005144	0.0006589	0.0009296	0.00265	0.002893	0.004319	0.0005846	1.697e−05	6.979e−05
Change in inventories	−0.247	−0.1727	0.01218	0.2282	0.3665	0.3611	0.2334	0.06709	−0.04863
(s.e.)	0.04595	0.03802	0.02322	0.0355	0.05127	0.04828	0.03183	0.02356	0.0294
(p−val.)	0.002726	0.01443	0.9347	0.0012	0.0001697	0.0001261	0.0004747	0.2665	0.6444
Unemployment rate	0.2106	0.224	0.1629	0.03306	−0.1193	−0.2296	−0.257	−0.2038	−0.1094
(s.e.)	0.04983	0.04395	0.03908	0.04386	0.05625	0.06553	0.06634	0.06011	0.04843
(p−val.)	0.000266	4.433e−06	0.004031	0.1883	0.02769	0.001353	0.000834	0.001588	0.0247
Productivity	0.1419	0.3486	0.5715	0.7446	0.8022	0.7111	0.5027	0.2438	0.006517
(s.e.)	0.06438	0.04832	0.03224	0.03354	0.04409	0.05041	0.05178	0.05176	0.05027
(p−val.)	0.005079	0.0001762	4.9e−08	4.922e−09	2.621e−08	2.678e−07	9.404e−06	0.005739	0.1032
Mark−up (sector 2)	0.2447	0.2062	0.1227	0.01357	−0.09005	−0.1608	−0.1852	−0.1714	−0.1386
(s.e.)	0.03981	0.04006	0.04731	0.05196	0.05155	0.04762	0.04194	0.03763	0.03687
(p−val.)	0.001264	0.000872	0.03588	0.03258	0.04133	0.00964	0.003298	0.0009549	0.005389
Total firm debt	0.03934	−0.03067	−0.09481	−0.134	−0.1398	−0.1203	−0.09474	−0.07888	−0.07688
(s.e.)	0.07907	0.07984	0.07661	0.0677	0.05444	0.04393	0.04548	0.05655	0.06757
(p−val.)	0.01023	0.007029	0.01172	0.02797	0.1043	0.1013	0.08964	0.1588	0.0563
Liquidity−to−sales ratio	0.02203	−0.2039	−0.4482	−0.6454	−0.7352	−0.6901	−0.5347	−0.325	−0.1215
(s.e.)	0.04772	0.05771	0.06637	0.06391	0.05131	0.04002	0.04172	0.05037	0.05634
(p−val.)	0.1047	0.0006842	0.0001787	4.909e−06	2.264e−07	4.901e−08	8.7e−07	0.0002854	0.003095
Bankruptcy rate	0.3063	0.3349	0.2766	0.1475	0.002164	−0.09765	−0.1286	−0.1112	−0.08759
(s.e.)	0.06551	0.05959	0.05359	0.05437	0.05629	0.05261	0.04527	0.03943	0.0362
(p−val.)	0.003517	0.001029	0.002583	0.008794	0.1127	0.04624	0.03704	0.06593	0.1097

(non−rate/ratio series are Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10 / period = 301 − 600)
(test H0: lag coefficient is not significant at 5% level)

Correlation structure for GDP (Benchmark)

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GDP (output)	−0.01297	0.2737	0.6115	0.8902	1	0.8902	0.6115	0.2737	−0.01297
(s.e.)	0.04384	0.03747	0.02243	0.006749	1.17e−17	0.006749	0.02243	0.03747	0.04384
(p−val.)	0.09318	0.0002937	1.014e−09	4.905e−16	NA	4.905e−16	1.014e−09	0.0002937	0.09318
Consumption	0.0671	0.3246	0.6154	0.8538	0.9523	0.8653	0.6256	0.3175	0.03383
(s.e.)	0.0541	0.04295	0.02584	0.01267	0.008718	0.008019	0.02266	0.03879	0.04661
(p−val.)	0.02807	0.000148	3.322e−09	2.138e−13	2.523e−15	3.064e−15	8.802e−10	8.721e−05	0.06069
Investment	−0.2632	−0.3527	−0.3699	−0.2739	−0.07692	0.1538	0.3321	0.4014	0.3614
(s.e.)	0.0472	0.04878	0.05316	0.06624	0.07643	0.07237	0.05457	0.0366	0.03271
(p−val.)	0.0001269	0.0001694	0.0002022	0.00239	0.005558	0.004925	0.0002799	5.213e−06	6.168e−06
Productivity	0.1419	0.3486	0.5715	0.7446	0.8022	0.7111	0.5027	0.2438	0.006517
(s.e.)	0.06438	0.04832	0.03224	0.03354	0.04409	0.05041	0.05178	0.05176	0.05027
(p−val.)	0.005079	0.0001762	4.9e−08	4.922e−09	2.621e−08	2.678e−07	9.404e−06	0.005739	0.1032
Entry	−0.1404	0.03564	0.243	0.4203	0.5126	0.496	0.395	0.2569	0.1275
(s.e.)	0.03911	0.0405	0.03719	0.0325	0.03237	0.03493	0.03427	0.03163	0.03281
(p−val.)	0.07846	0.1014	0.0008841	1.218e−06	1.532e−07	4.108e−07	3.598e−06	0.000169	0.002357
Wage	0.2914	0.4622	0.5975	0.6537	0.6084	0.4712	0.2862	0.1023	−0.04474
(s.e.)	0.03623	0.03565	0.04061	0.04972	0.05625	0.05557	0.04885	0.03943	0.03016
(p−val.)	0.0001243	9.993e−07	2.302e−07	5.38e−07	3.006e−06	3.026e−05	0.0008574	0.04964	0.5462
Unemployment rate	0.2106	0.224	0.1629	0.03306	−0.1193	−0.2296	−0.257	−0.2038	−0.1094
(s.e.)	0.04983	0.04395	0.03908	0.04386	0.05625	0.06553	0.06634	0.06011	0.04843
(p−val.)	0.000266	4.433e−06	0.004031	0.1883	0.02769	0.001353	0.000834	0.001588	0.0247
Vacancy rate	0.1105	−0.09374	−0.3128	−0.4579	−0.4703	−0.3547	−0.1784	−0.02151	0.067
(s.e.)	0.06312	0.0547	0.05086	0.05394	0.05618	0.05249	0.04084	0.02663	0.02606
(p−val.)	0.003123	0.1208	0.0006676	3.145e−05	3.351e−05	0.0002702	0.001034	0.7792	0.3423

(non−rate/ratio series are Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10 / period = 301 − 600)
(test H0: lag coefficient is not significant at 5% level)

	avg.ADF	rej.ADF	avg.PP	rej.PP	avg.KPSS	rej.KPSS	avg.BDS	rej.BDS	avg.KS	rej.KS	AD	W
dGDP	0.01	1.00	0.01	1.00	0.10	0.00	0.07	0.70	0.38	0.18	0.00	0
dA	0.01	1.00	0.01	1.00	0.09	0.10	0.01	0.90	0.17	0.64	0.00	0
dw	0.01	1.00	0.01	1.00	0.10	0.00	0.02	0.90	0.17	0.60	0.00	0
V	0.04	0.90	0.01	1.00	0.07	0.30	0.01	0.90	0.06	0.84	0.00	0
U	0.01	1.00	0.01	1.00	0.05	0.60	0.00	1.00	0.02	0.93	0.00	0
mu2avg	0.03	0.80	0.01	1.00	0.06	0.50	0.00	1.00	0.04	0.93	0.00	0
HH1	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.19	0.53	0.00	0
HH2	0.04	0.90	0.01	1.00	0.07	0.30	0.01	0.90	0.06	0.80	0.00	0

(average p−values for testing H0 and rate of rejection of H0 / MC runs = 10 / 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
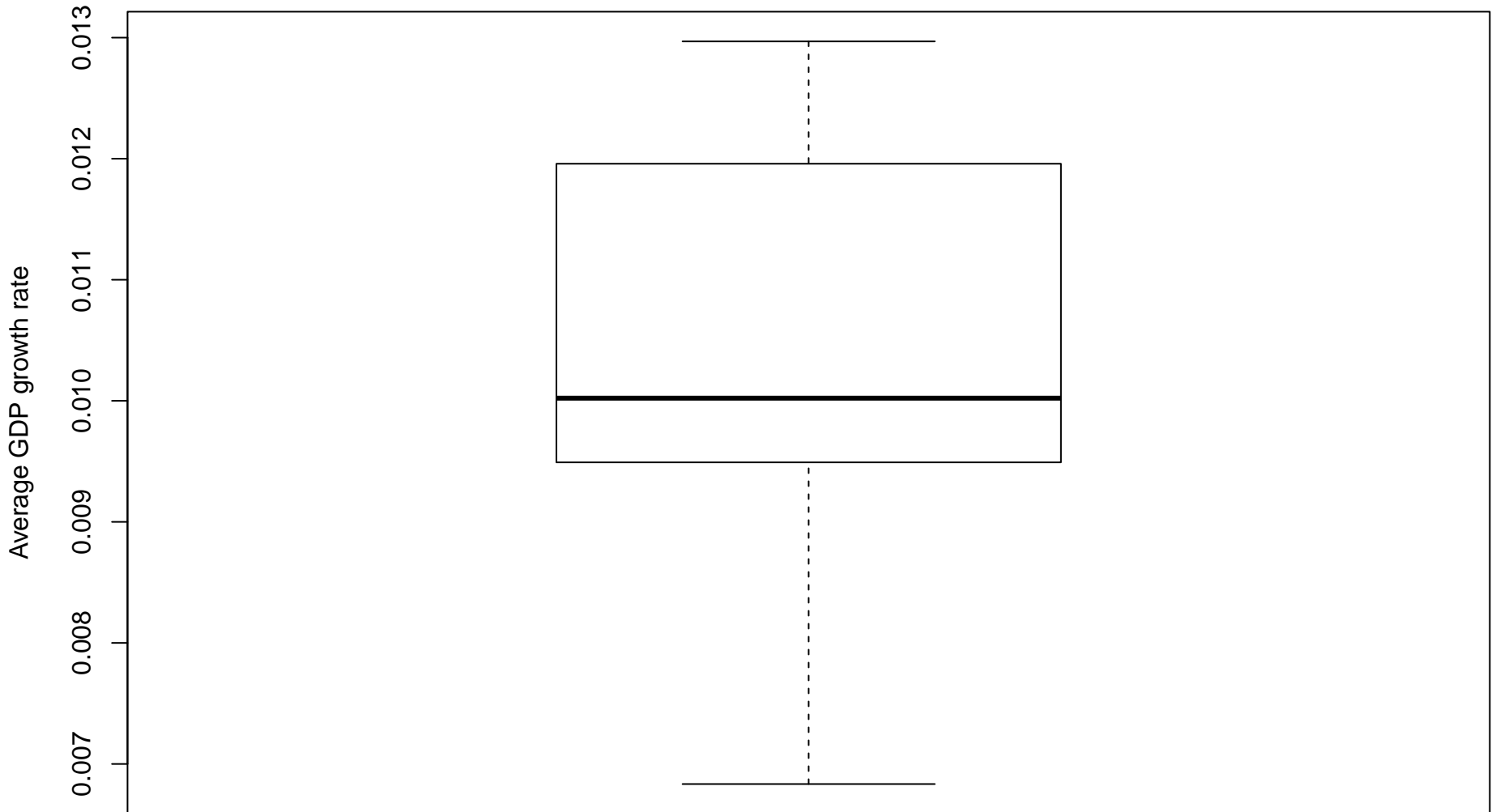
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Volatility of GDP growth
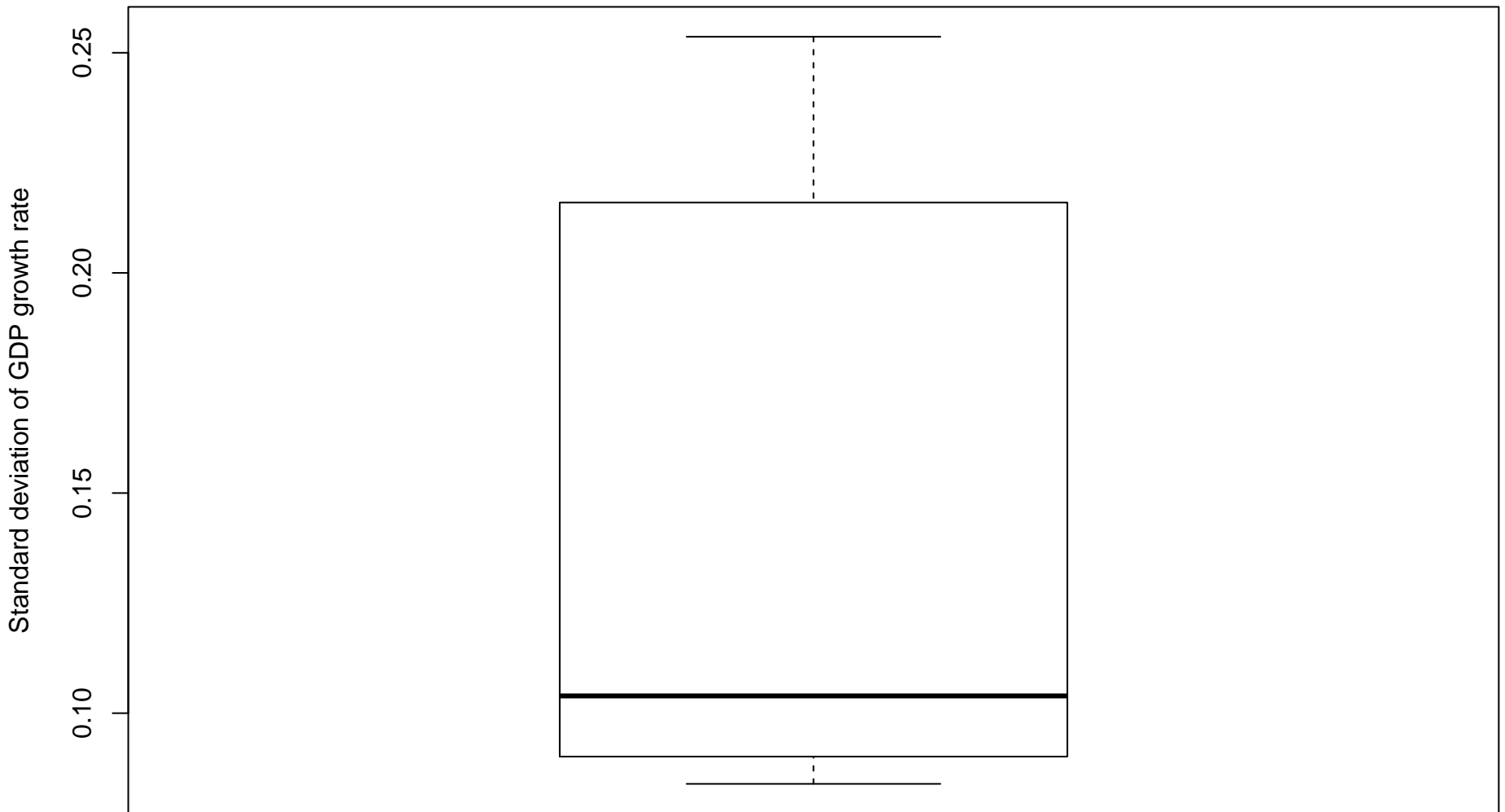
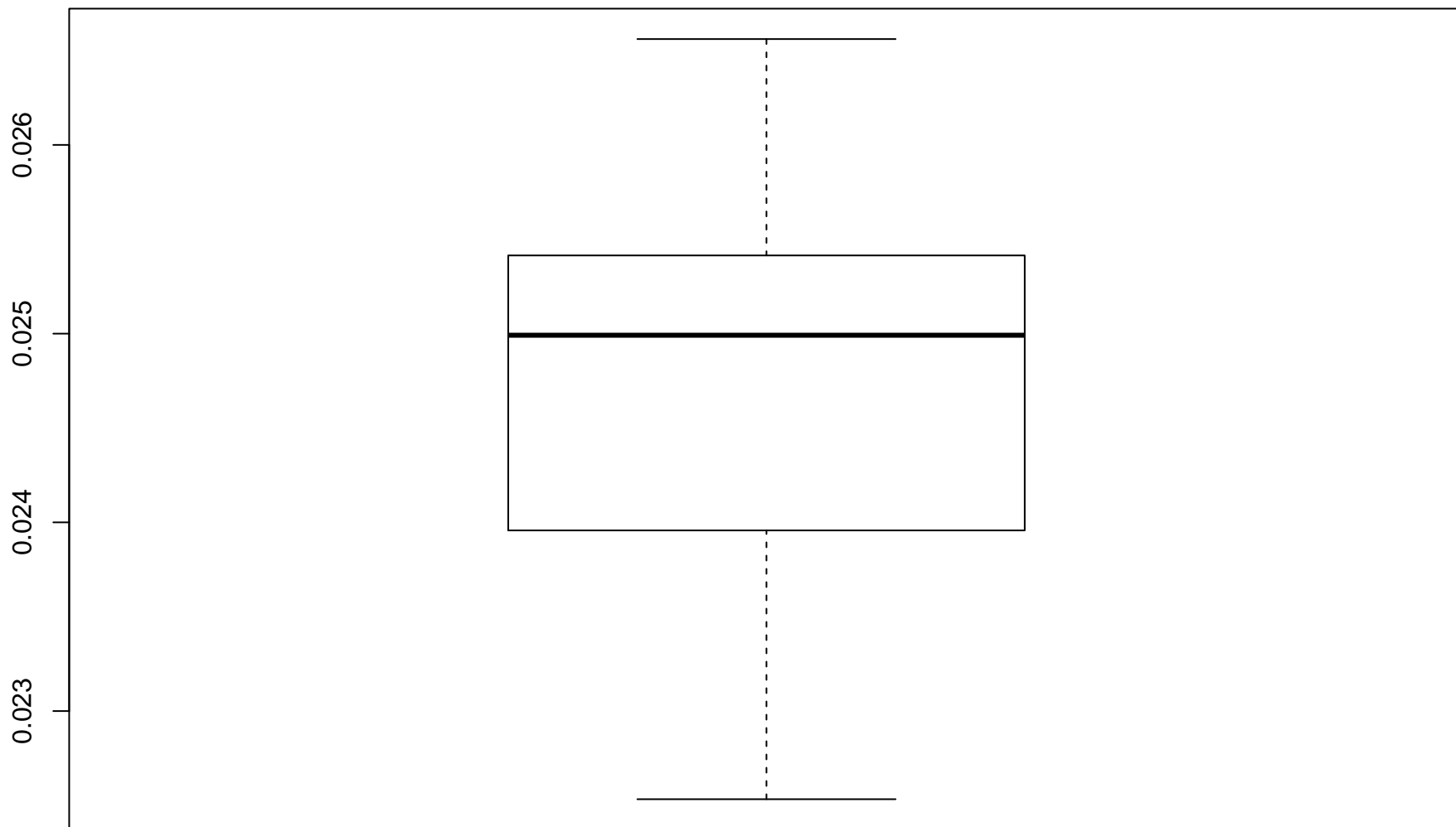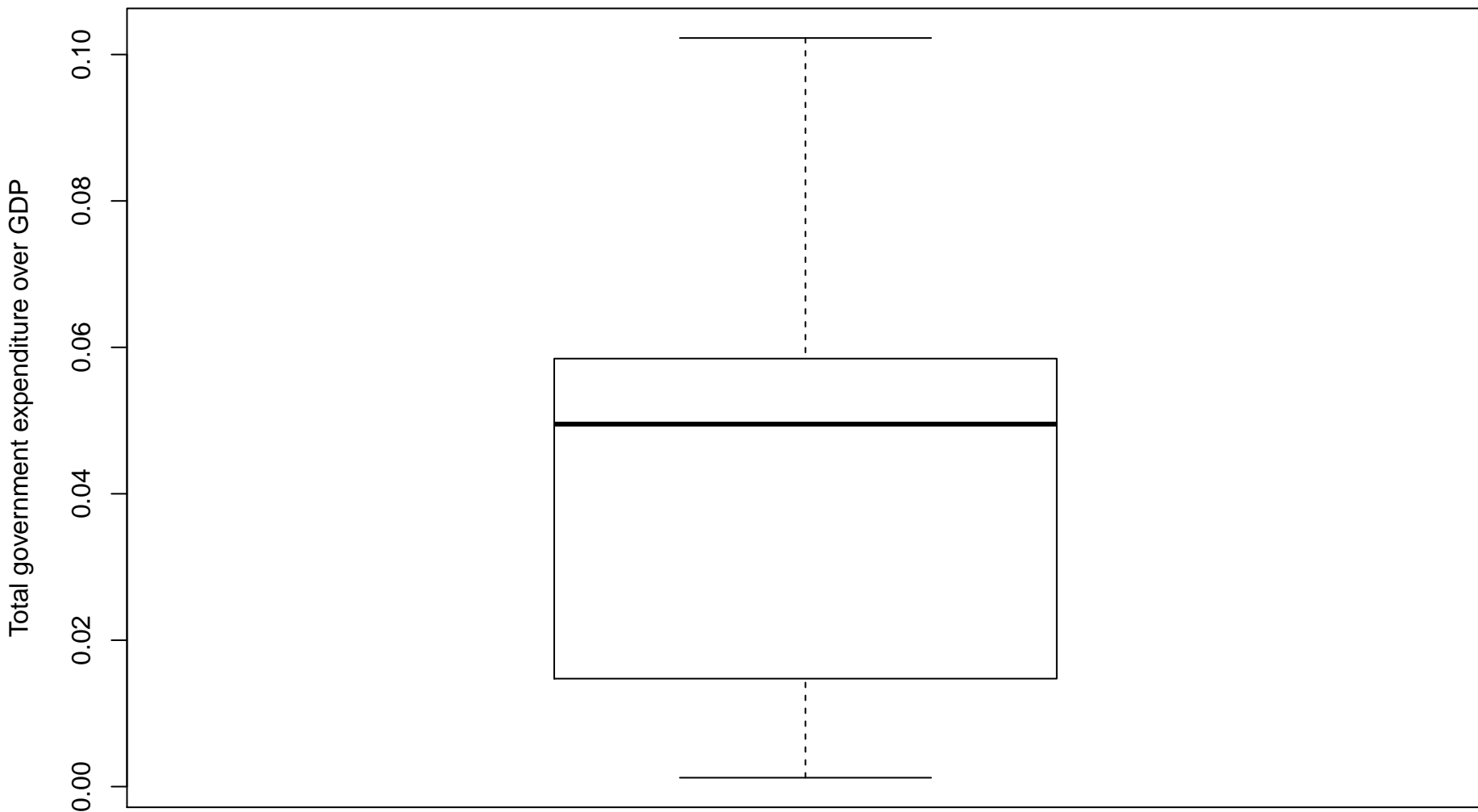(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)

Likelihood of GDP crises
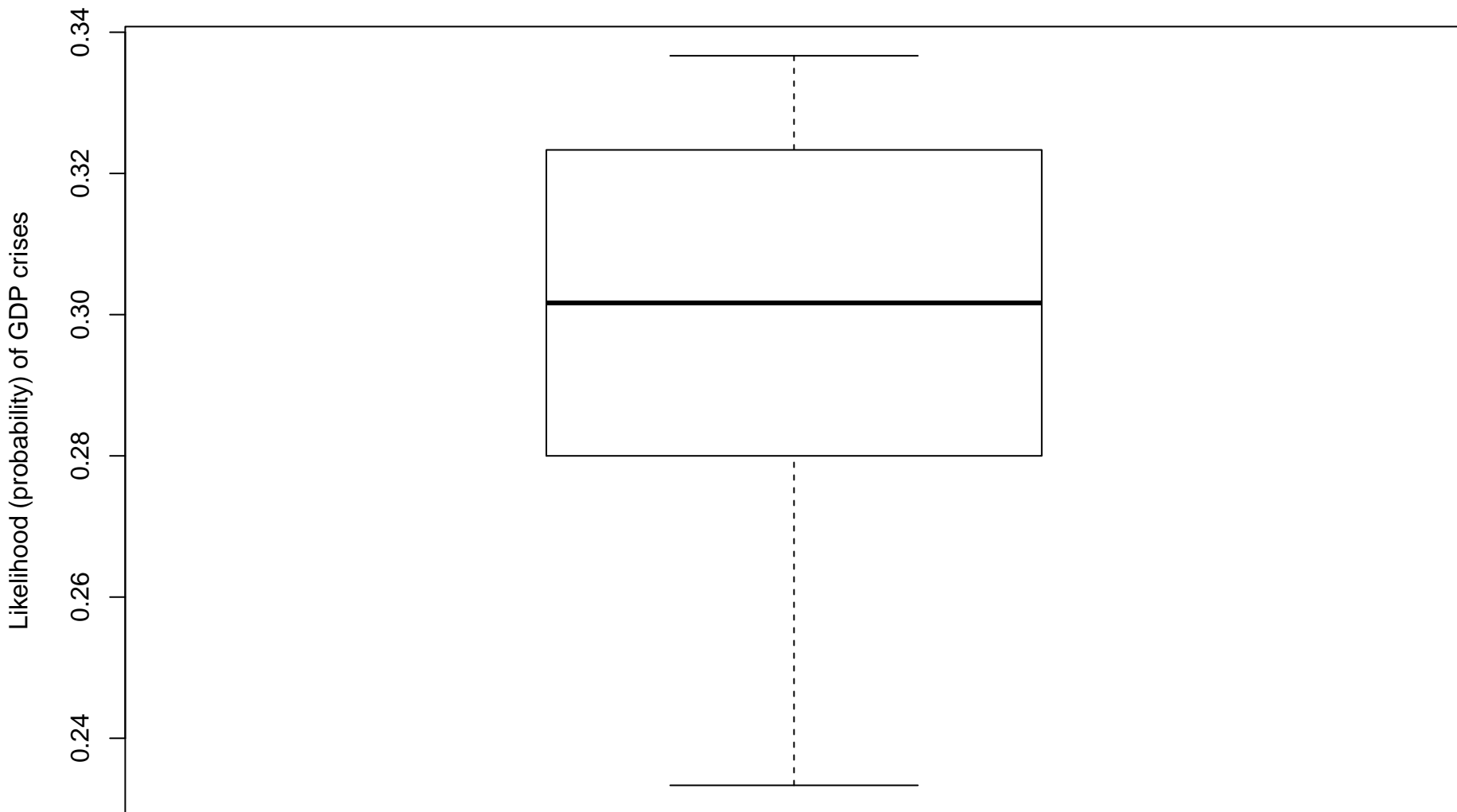
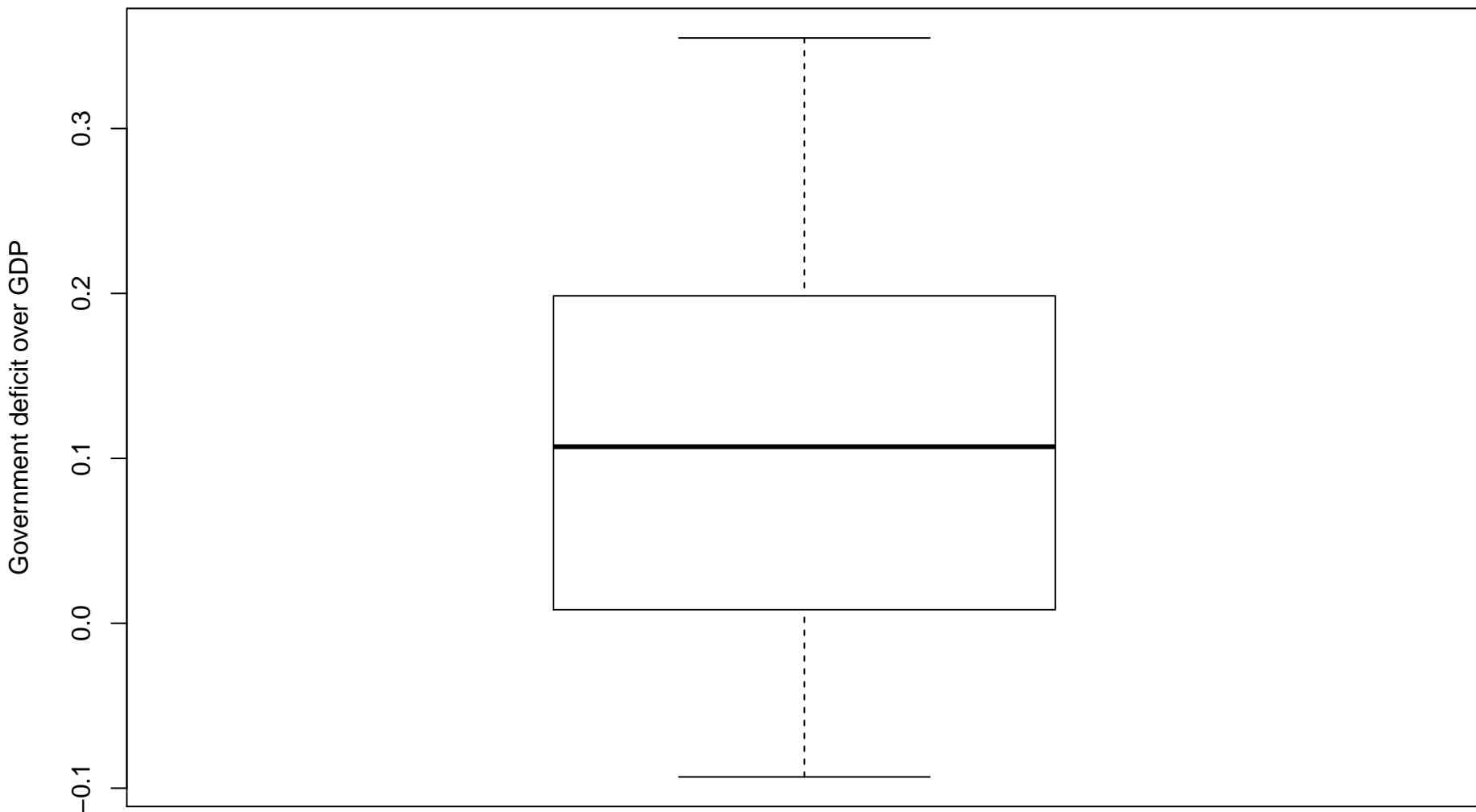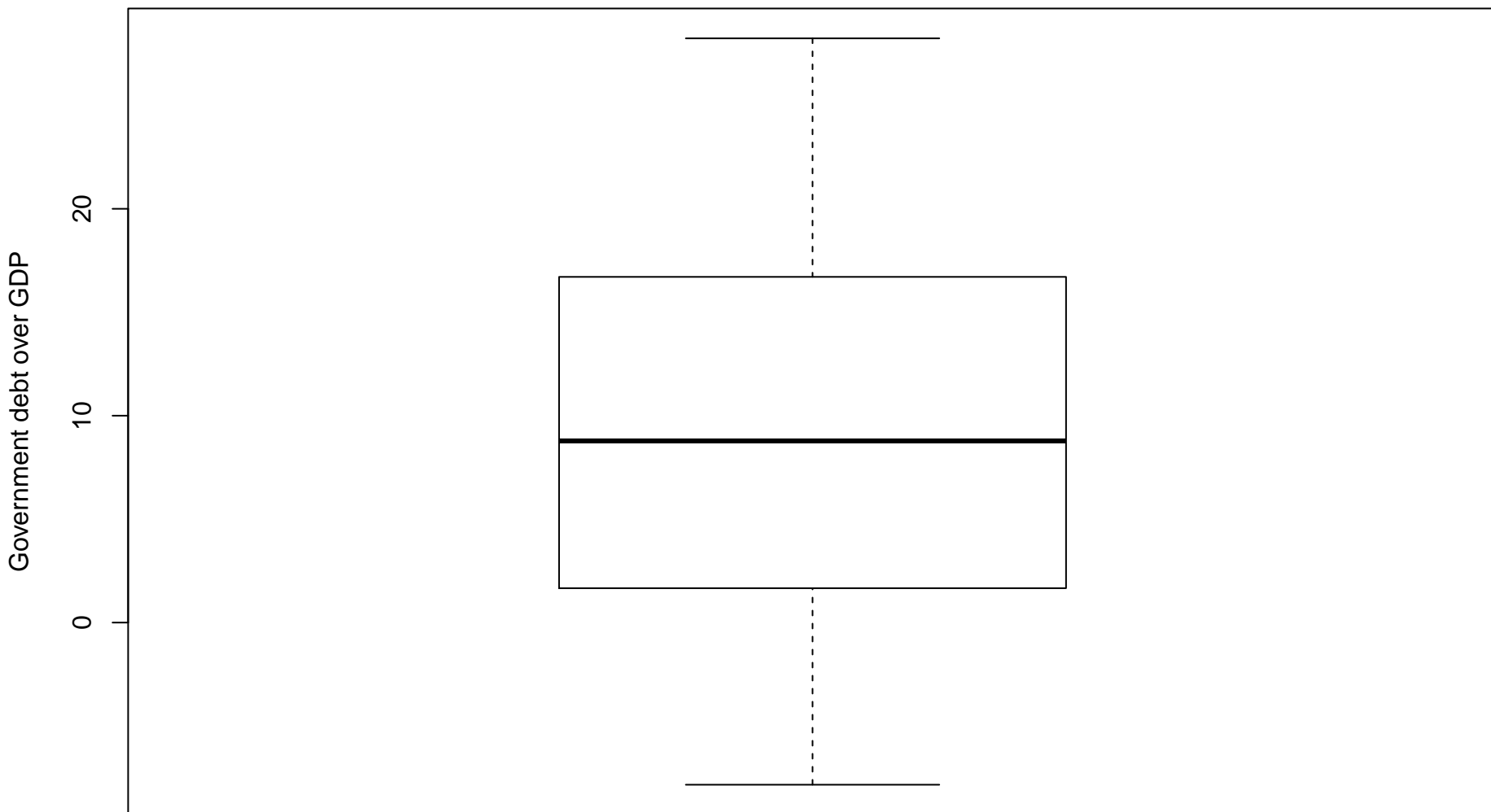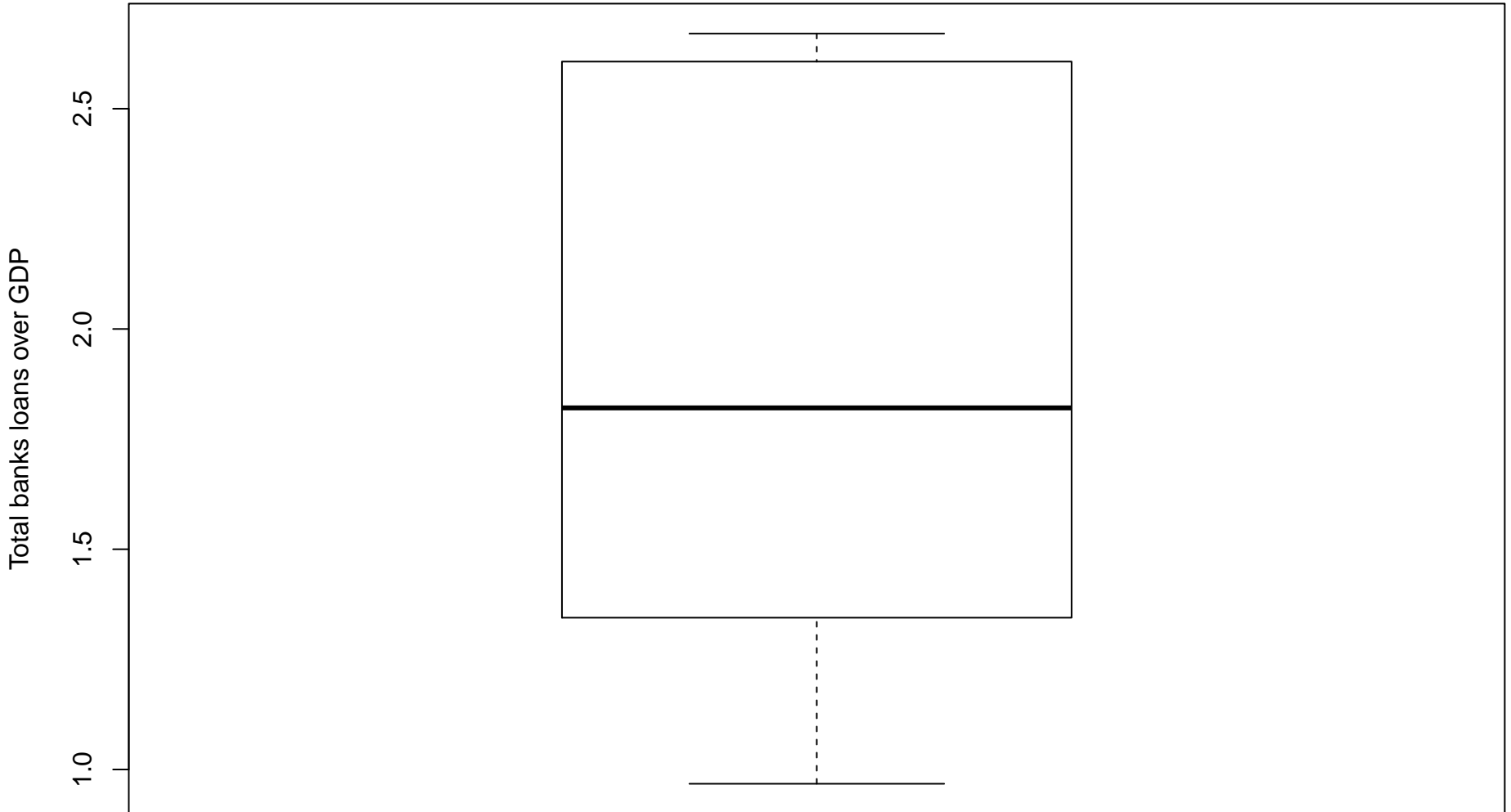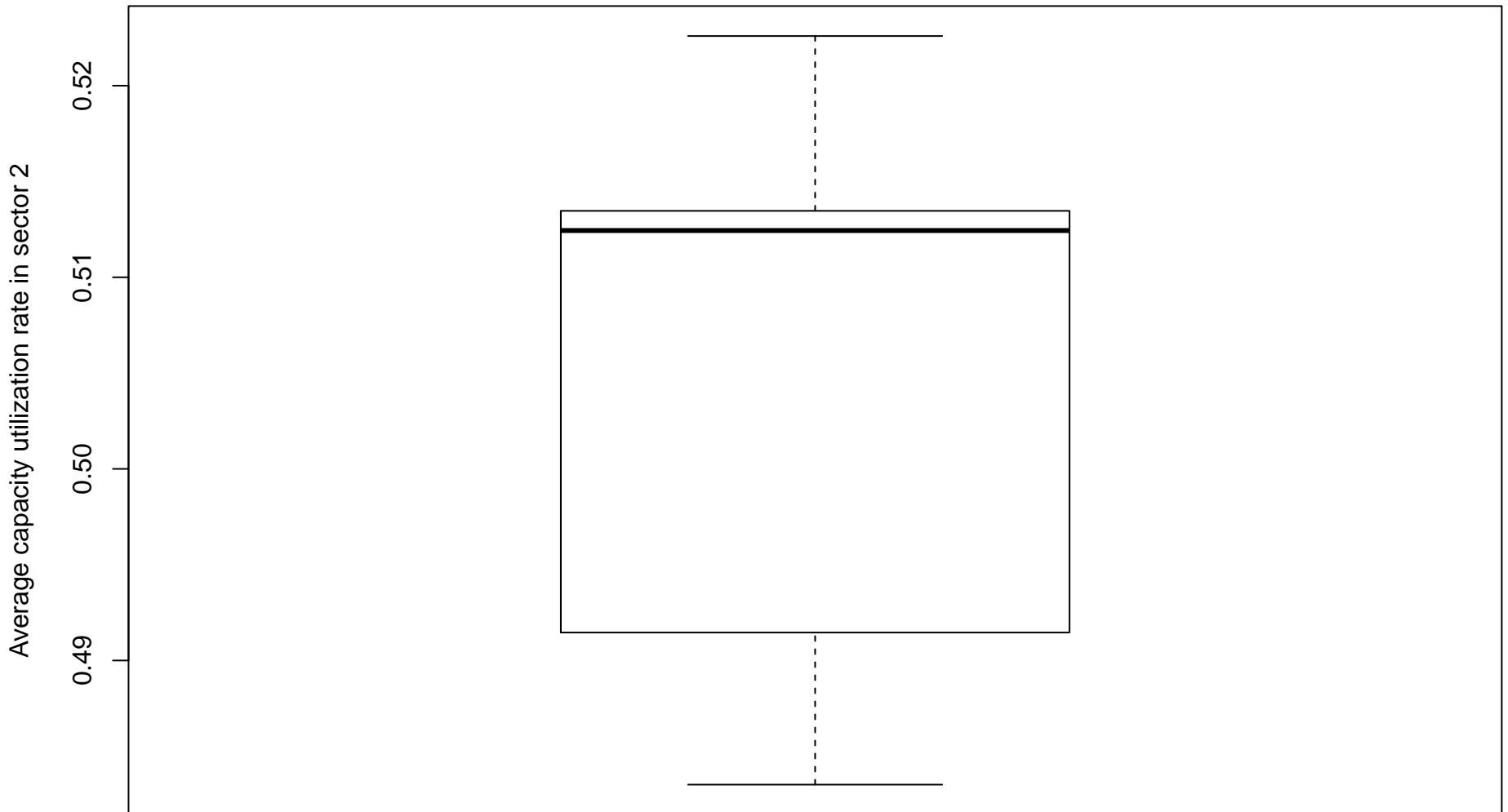

Likelihood (probability) of GDP crises

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Inflation
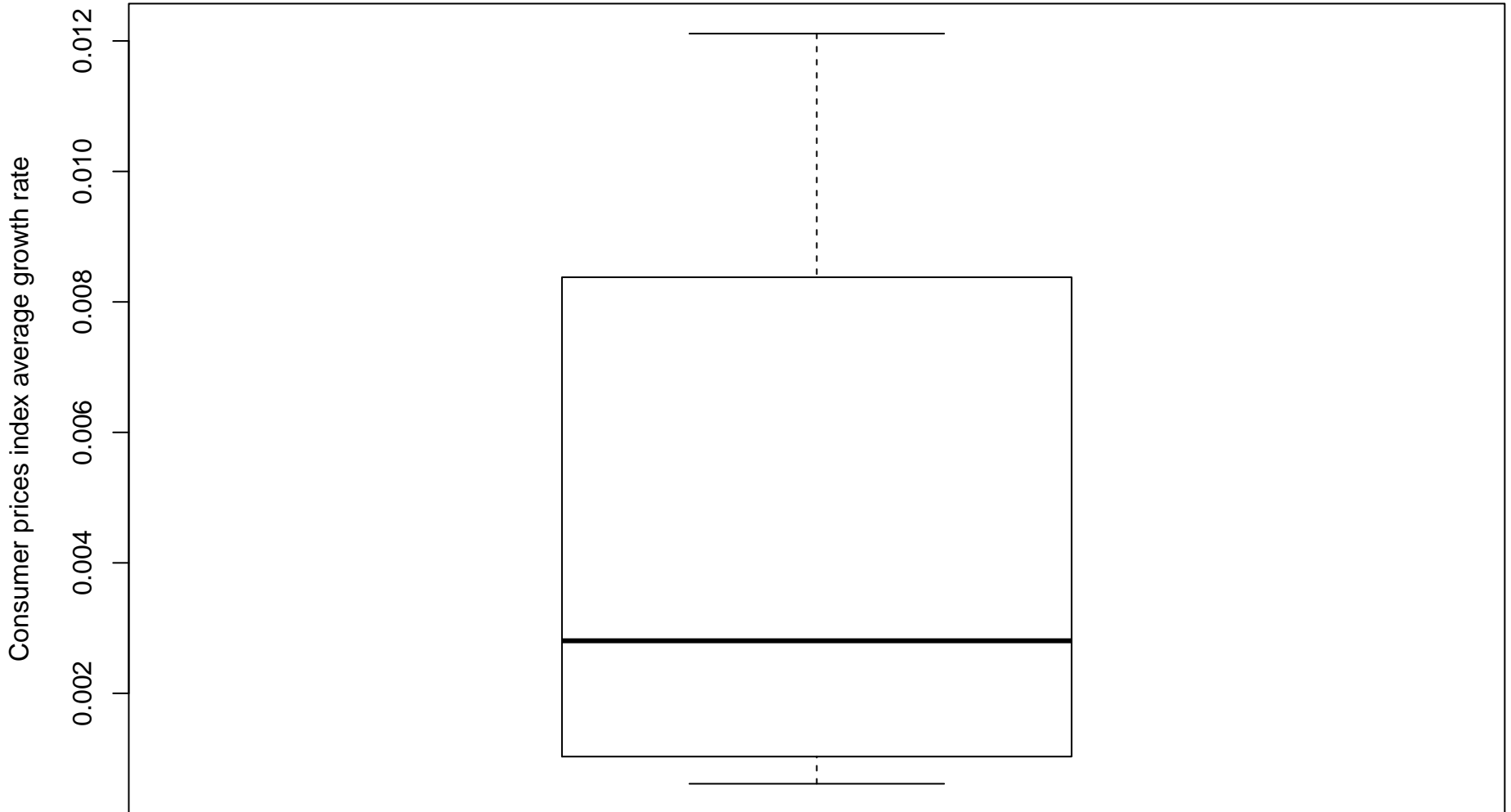
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Tax

Government tax income over GDP

0.026
0.025
0.024
0.023

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Government total expenditure

Total government expenditure over GDP

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Government deficit

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)
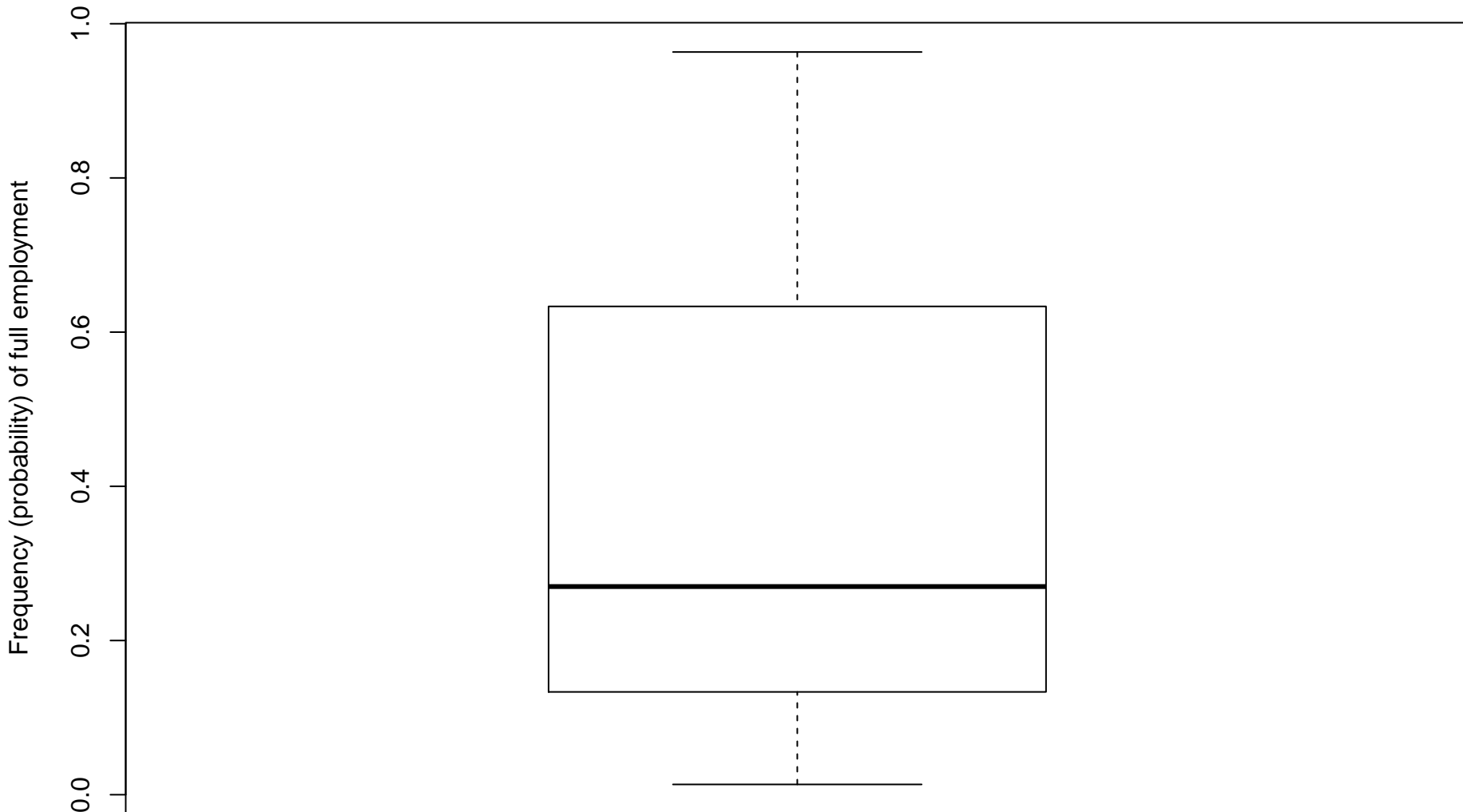
Government debt

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)

Loans

Total banks loans over GDP

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)

Capacity utilization

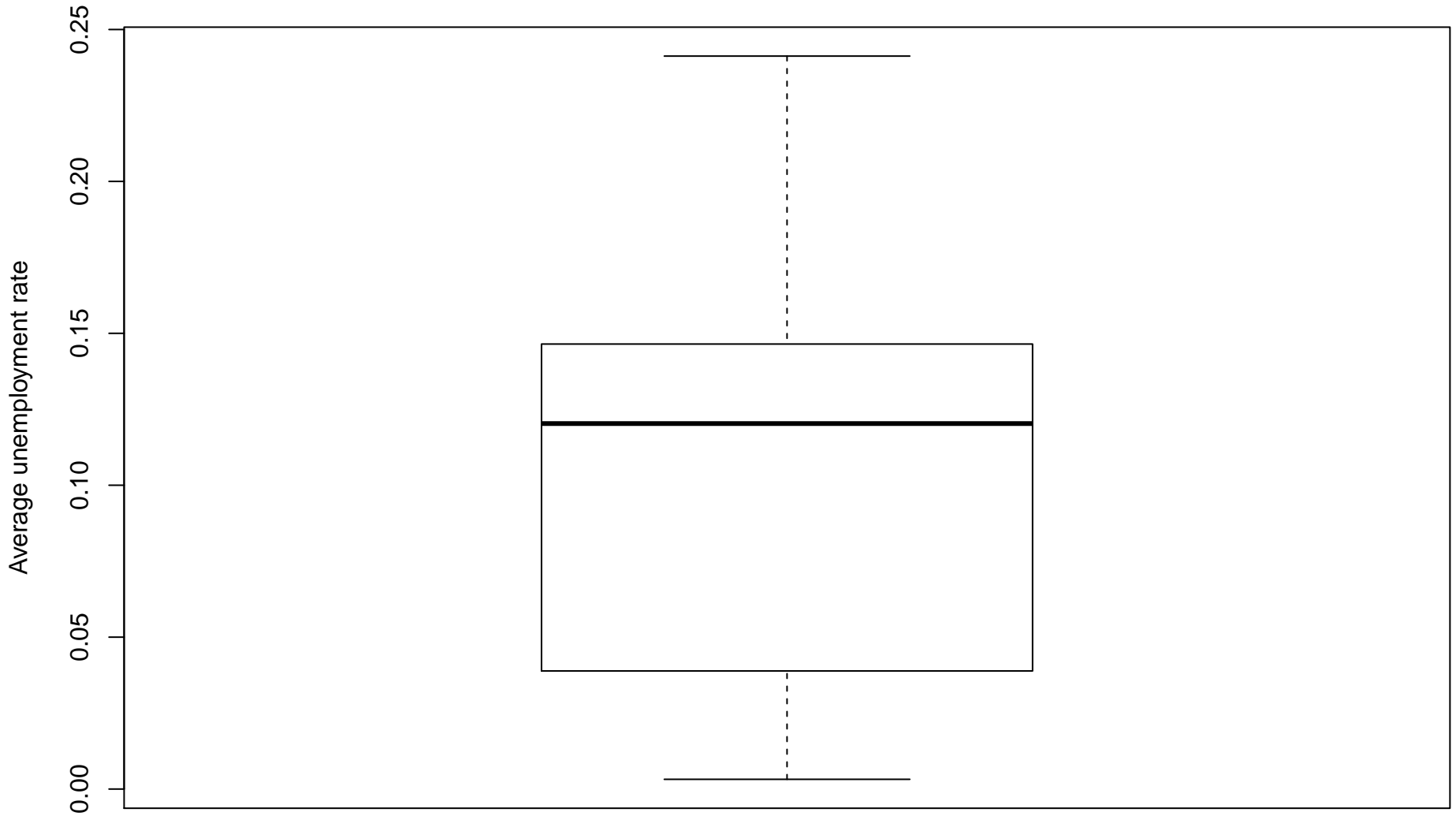Average capacity utilization rate in sector 2

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Full employment frequency
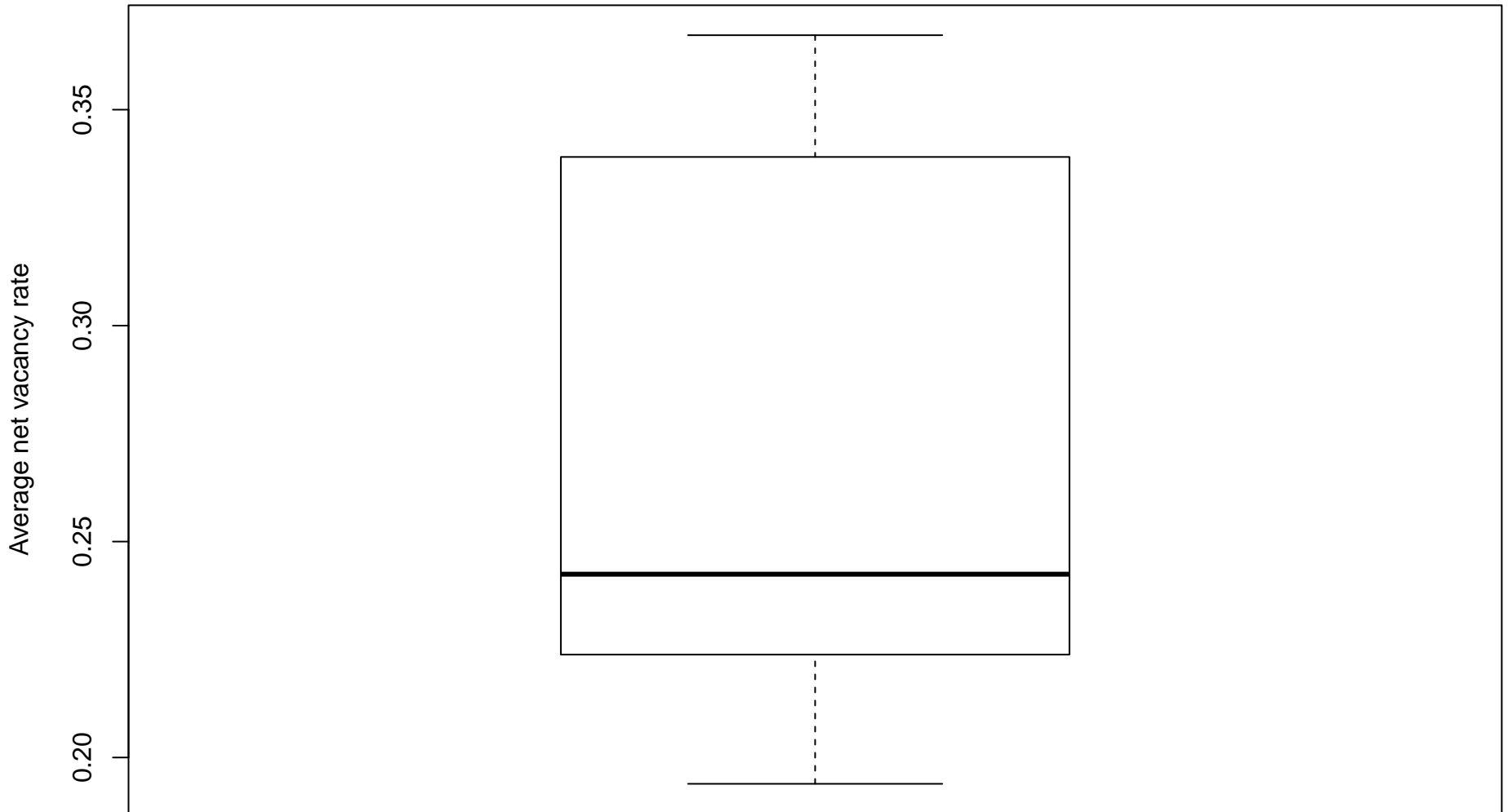

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Unemployment
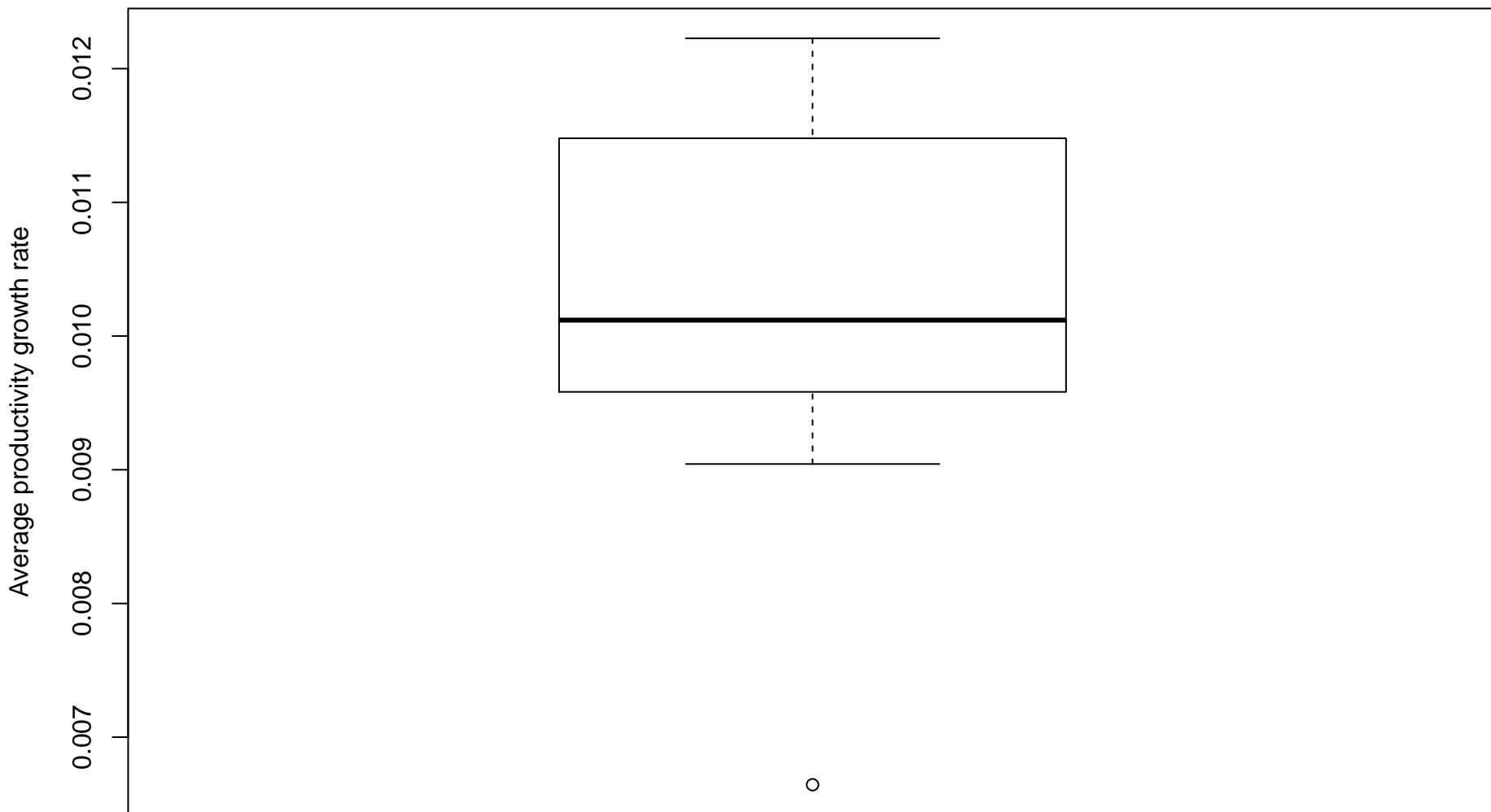

Average unemployment rate

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)
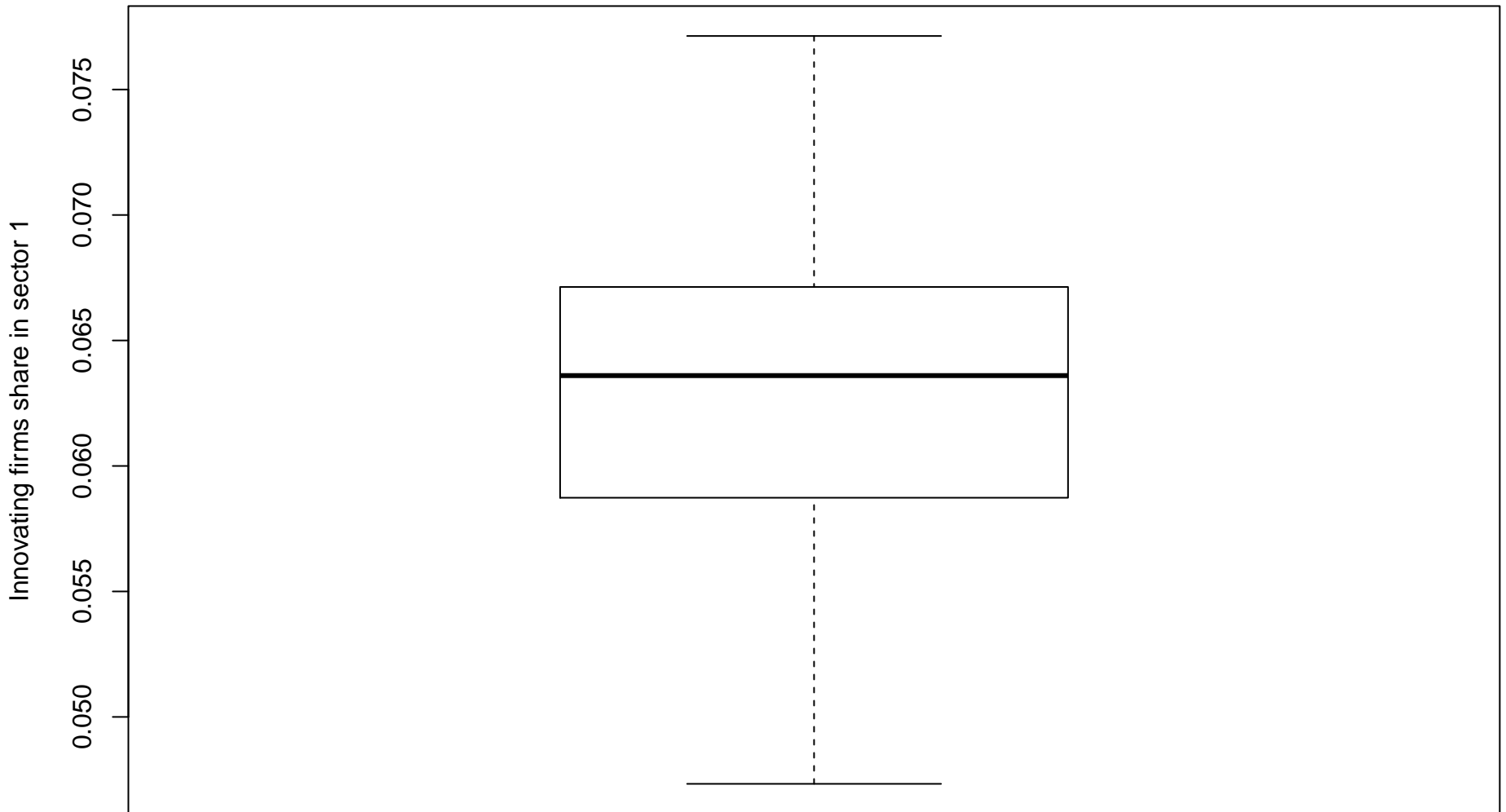
Vacancy

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)
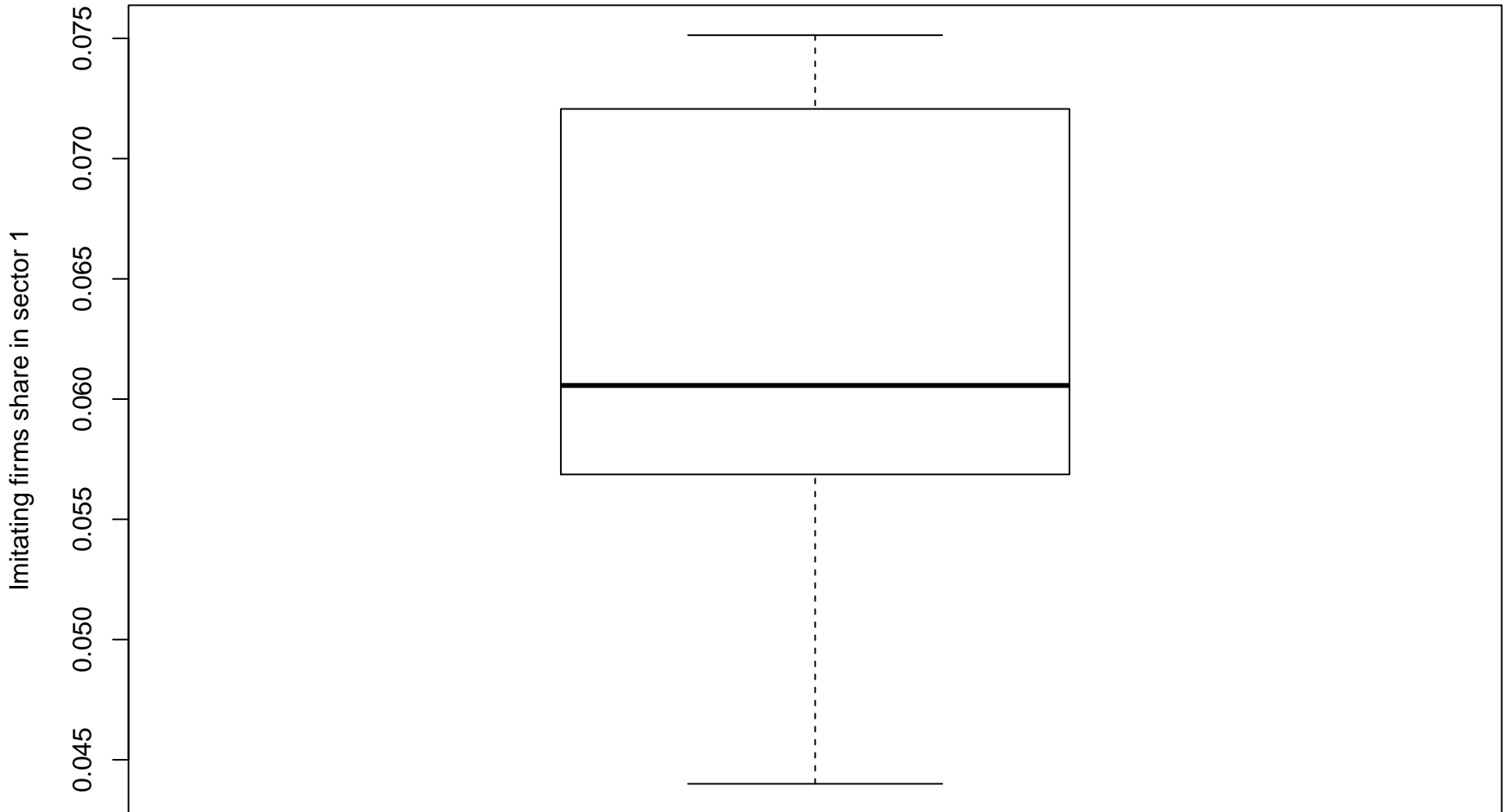
Productivity growth

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)
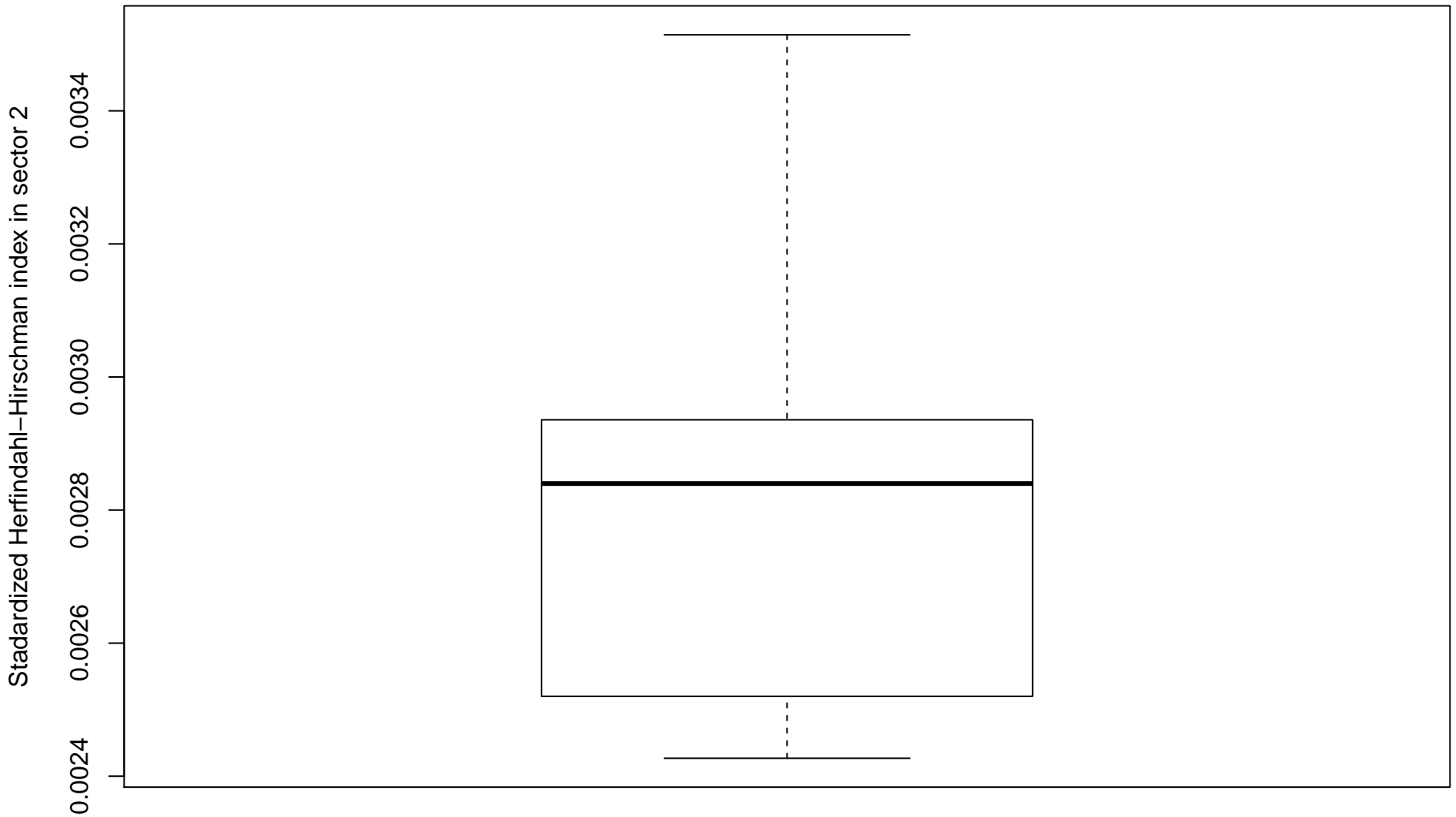
Innovation

Innovating firms share in sector 1

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)
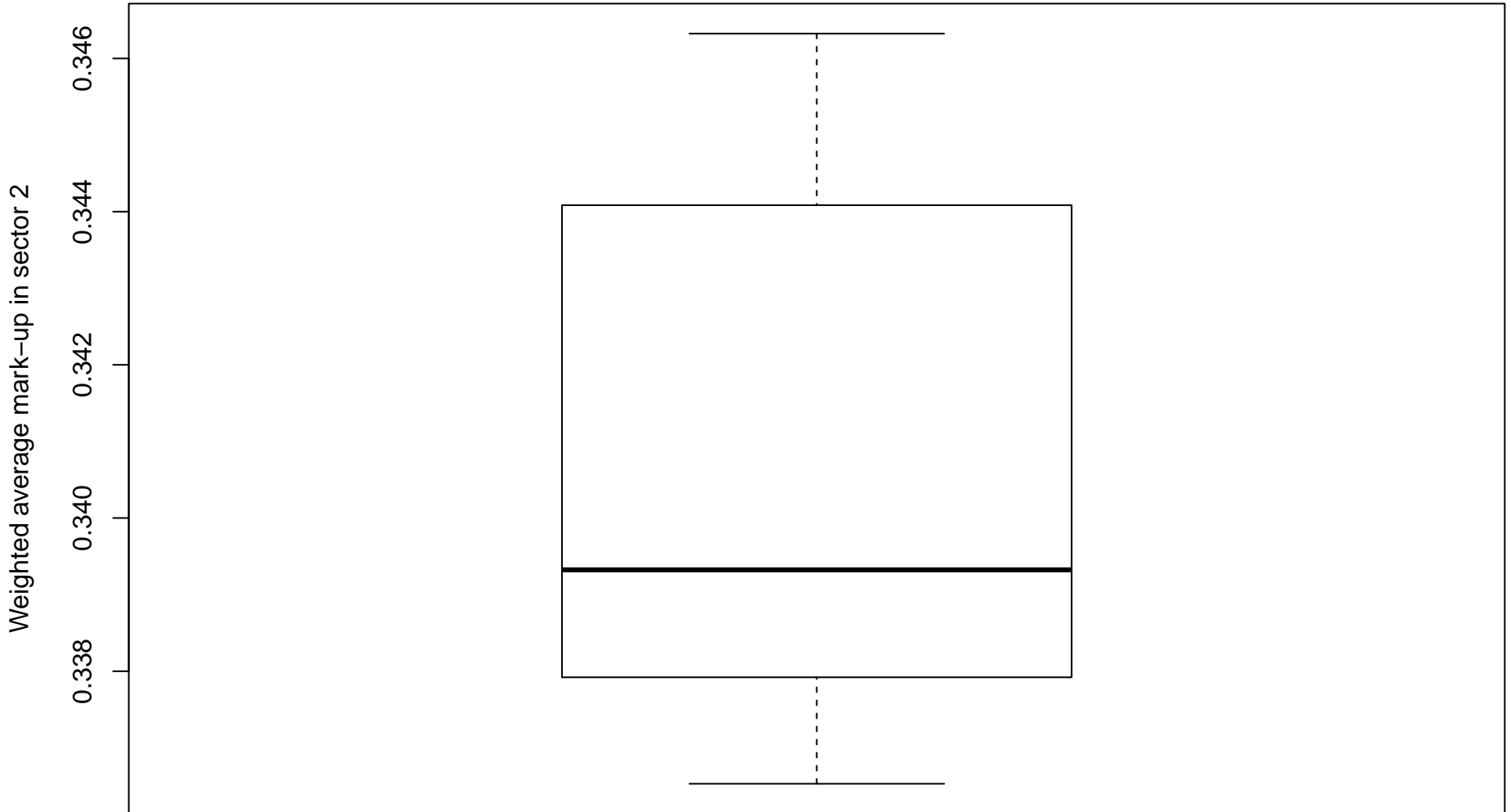
Imitation

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Market concentration

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)

Mark−ups

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Monte Carlo descriptive statistics (all experiments)

	Avg[1]	SD[1]	Min[1]	Max[1]
GDP growth	0.01072	0.002426	0.006834	0.01587
Volatility of GDP growth	0.1452	0.06716	0.08394	0.2536
Likelihood of GDP crises	0.294	0.03428	0.2333	0.3367
Inflation	0.00486	0.004557	0.000614	0.01211
Tax	0.0241	0.002819	0.0167	0.02656
Government total expenditure	0.04416	0.03186	0.001217	0.1023
Government deficit	0.1056	0.1341	−0.09317	0.3549
Government debt	8.647	10.66	−7.837	28.24
Loans	2.695	2.913	0.9676	10.83
Capacity utilization	0.4889	0.05806	0.328	0.5226
Full employment frequency	0.3773	0.3285	0.01333	0.9633
Unemployment	0.1083	0.07515	0.003204	0.2413
Vacancy	0.2988	0.1338	0.1939	0.6435
Productivity growth	0.01052	0.002345	0.006644	0.01568
Innovation	0.06326	0.009291	0.04733	0.07713
Imitation	0.06064	0.01077	0.044	0.07513
Market concentration	0.002709	0.0005452	0.001428	0.003514
Mark−ups	0.3405	0.003488	0.3365	0.3463

Experiments: [1] Benchmark
(numbers in brackets indicate the experiment number / MC runs = 10 / period = 301 − 600)