GDP, investment and consumption (all experiments)

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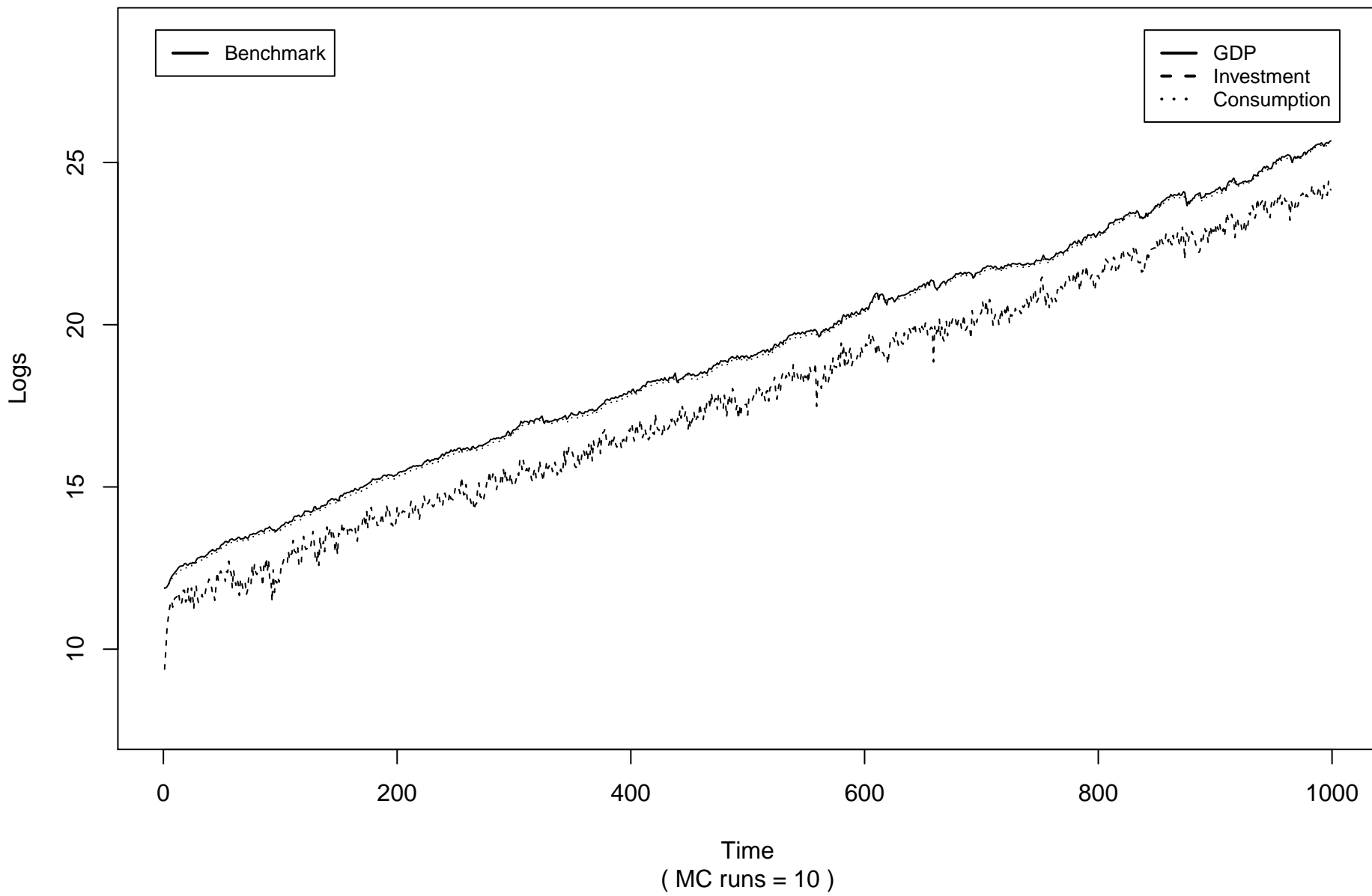
GDP, investment and consumption (Benchmark)

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

GDP (all experiments)

Benchmark

Effective GDP
GDP @ 100% utilization

Log GDP

Time
(MC runs = 10)

GDP (Benchmark)

Log GDP

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

Legend:
- Effective GDP
- GDP @ 100% utilization
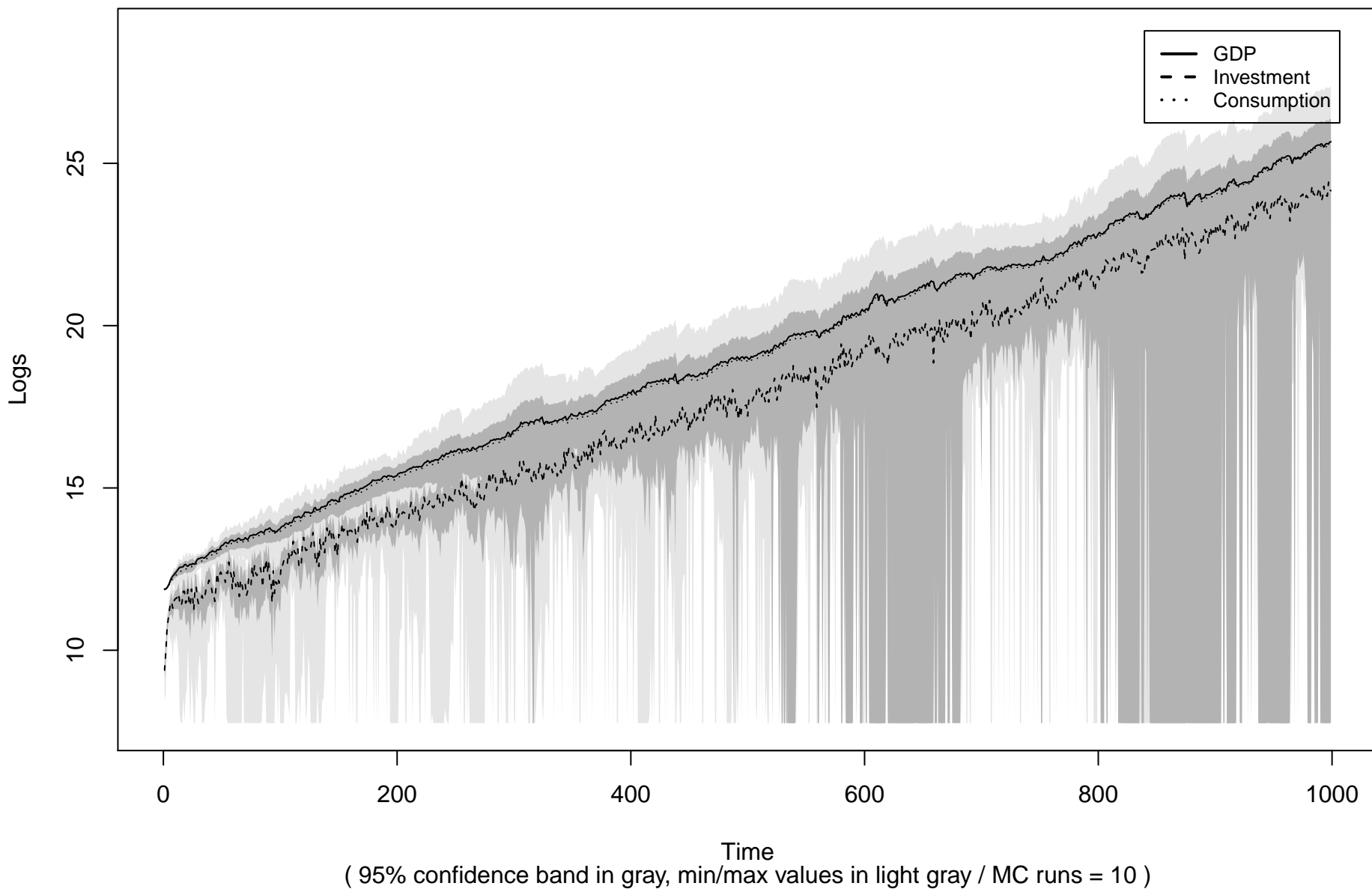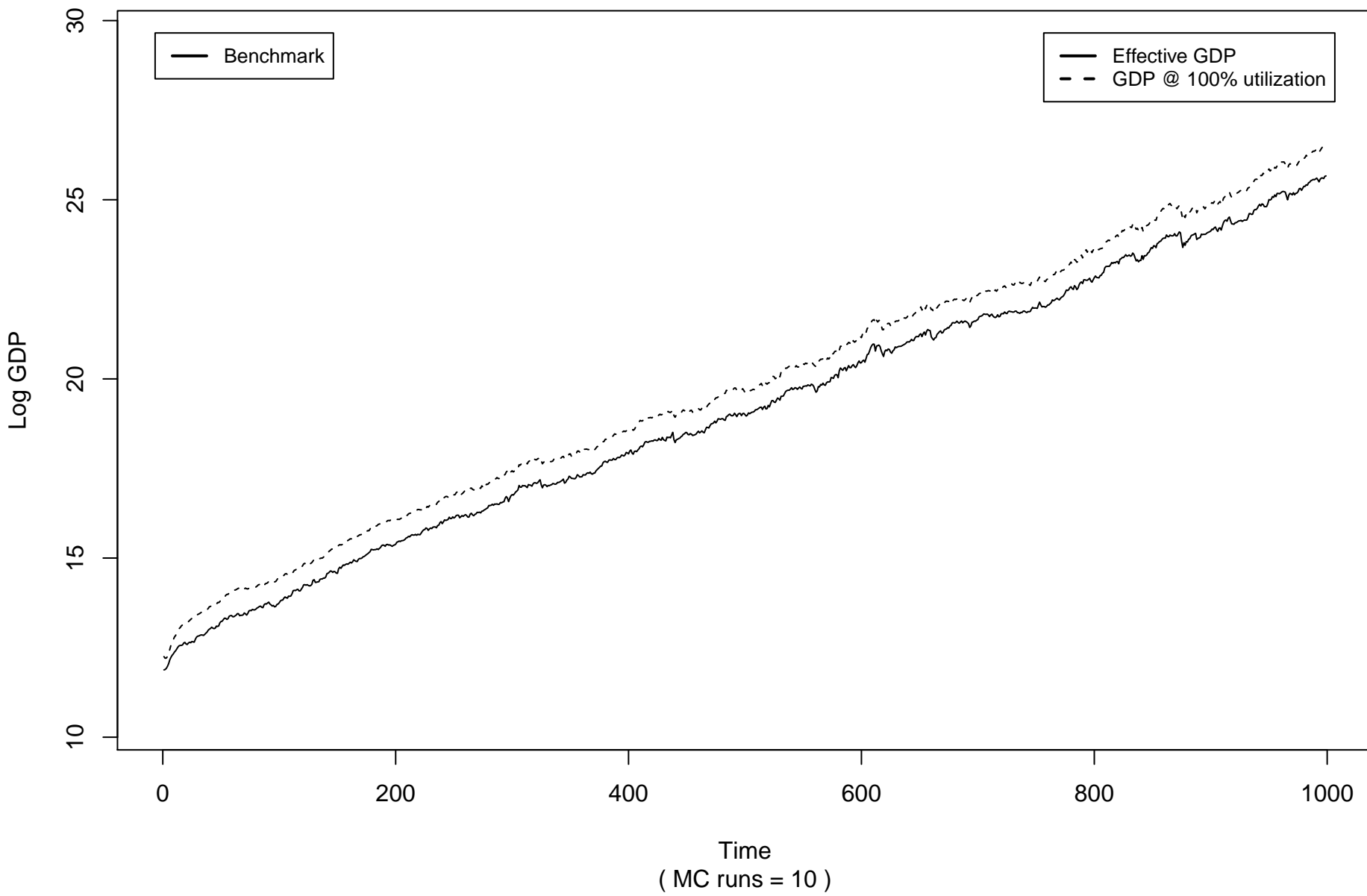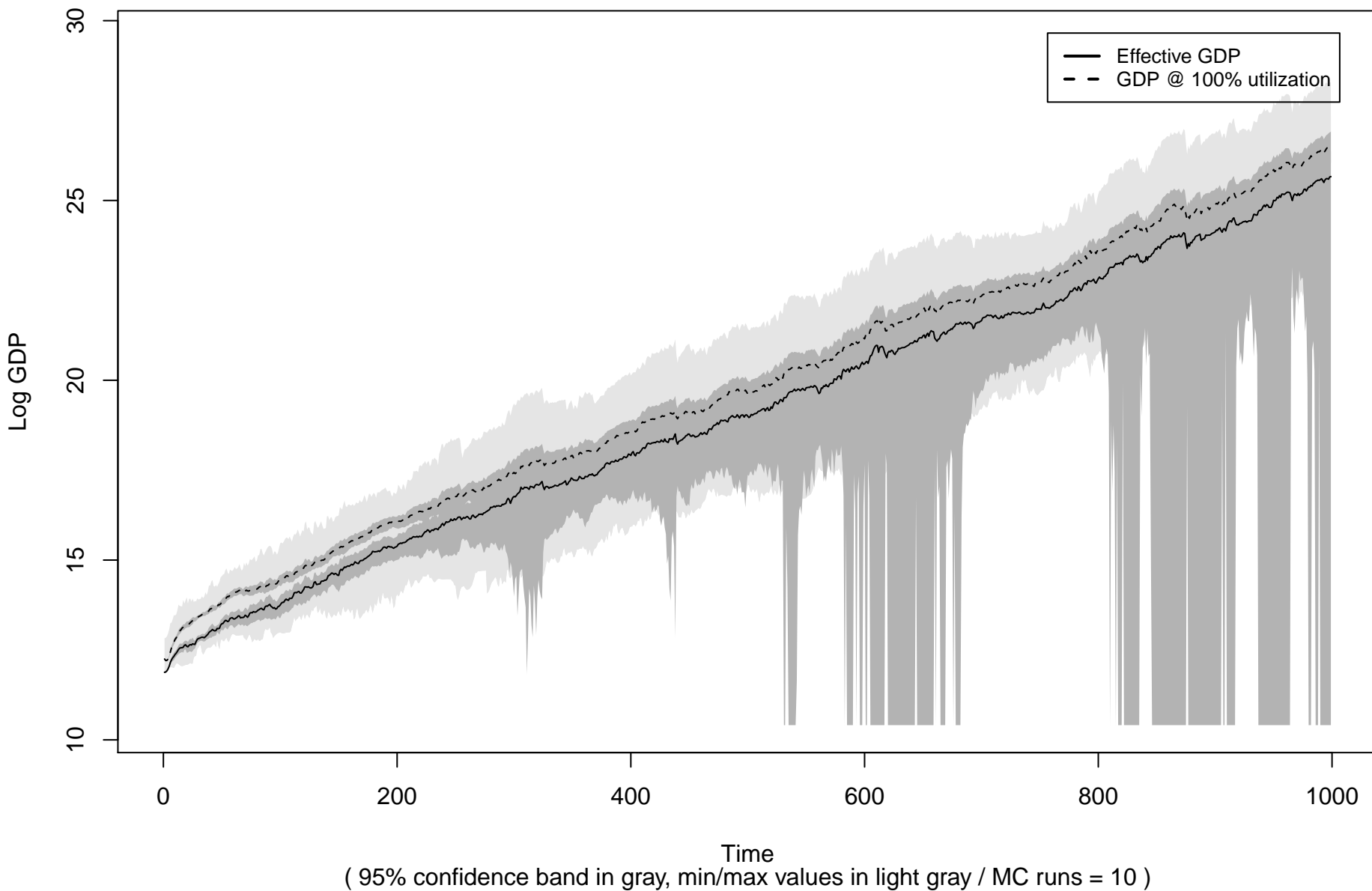
Government income and expenditure on GDP (all experiments)

Legend (upper left): Benchmark

Legend (upper right): Tax — Total expenditure

Y-axis: Log government tax income and expenditure over GDP

X-axis: Time
(MC runs = 10)
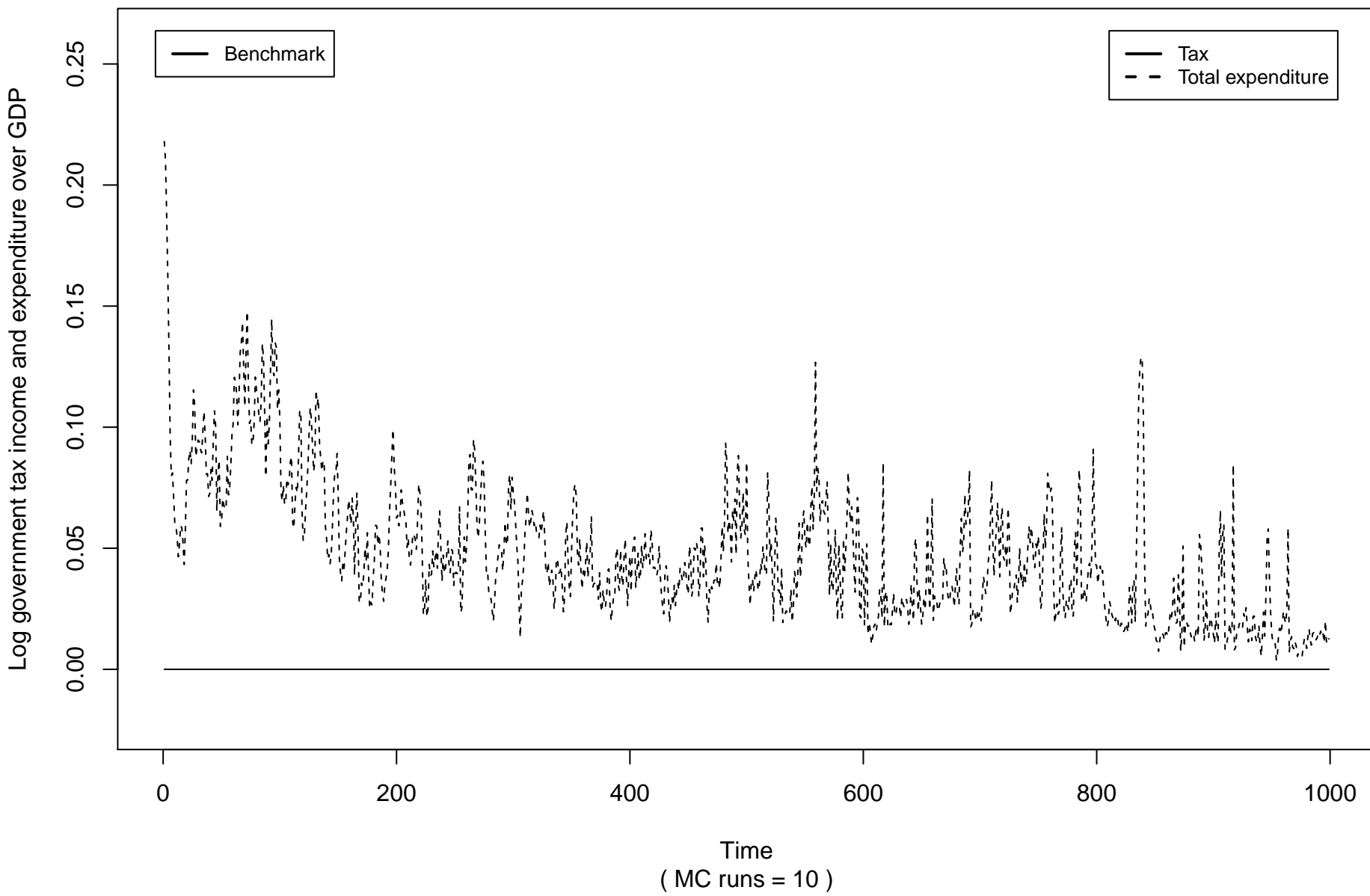
Government income and expenditure on GDP (Benchmark)

Log government tax income and expenditure over GDP

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

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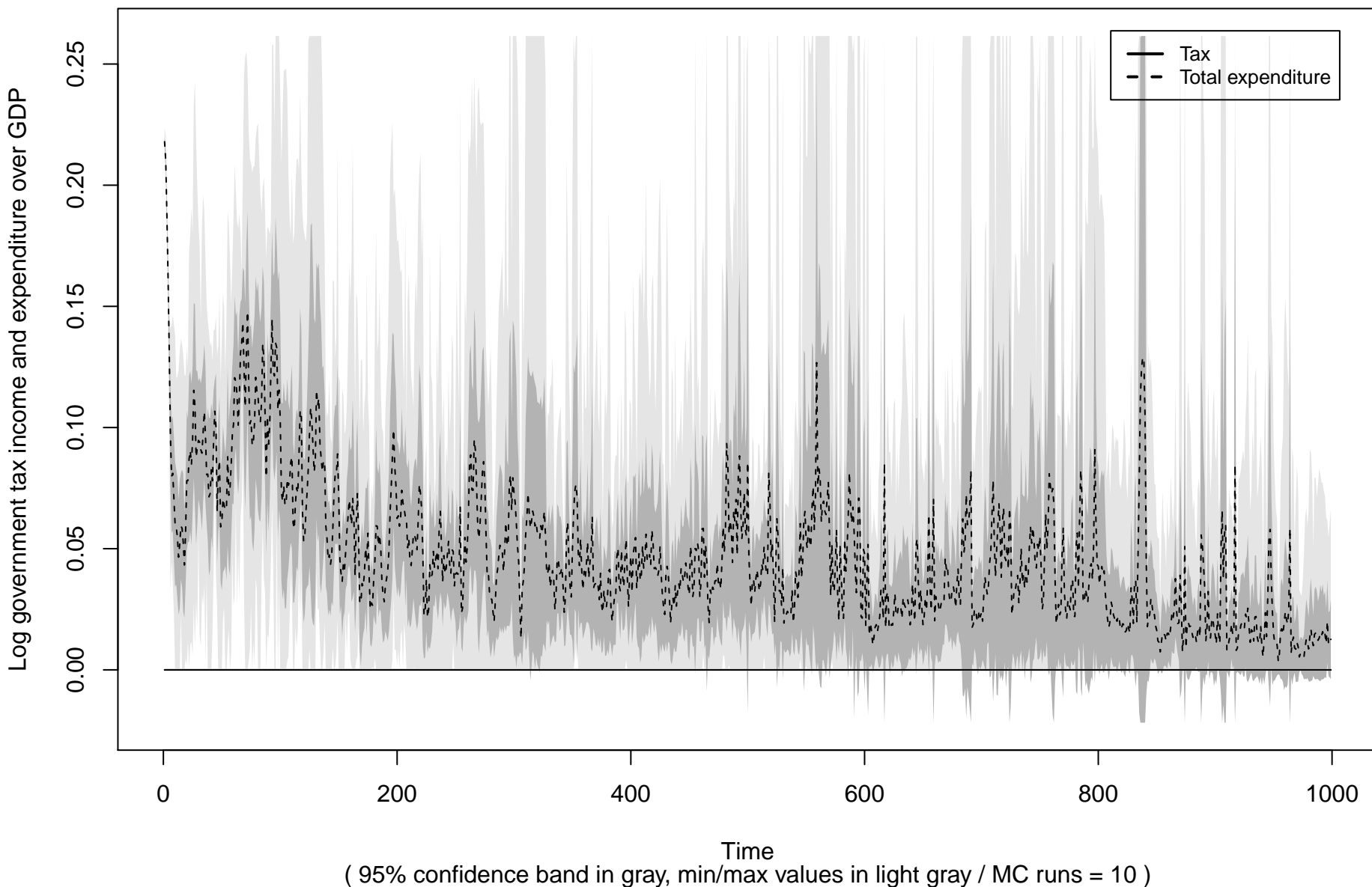
Government deficit on GDP (all experiments)

Government deficit over GDP

Time
(MC runs = 10)
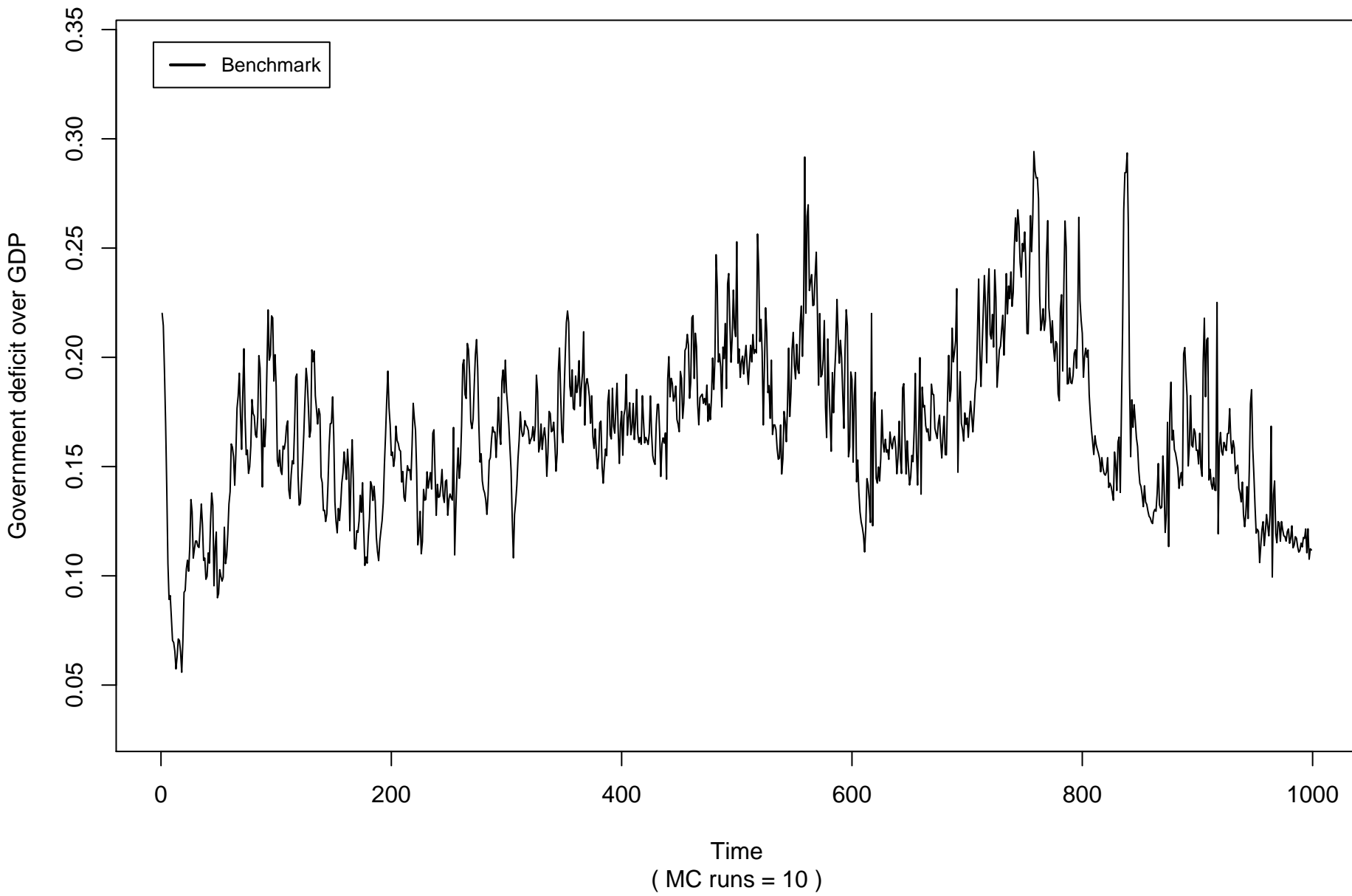
Benchmark

Government deficit on GDP (Benchmark)

Government deficit over GDP

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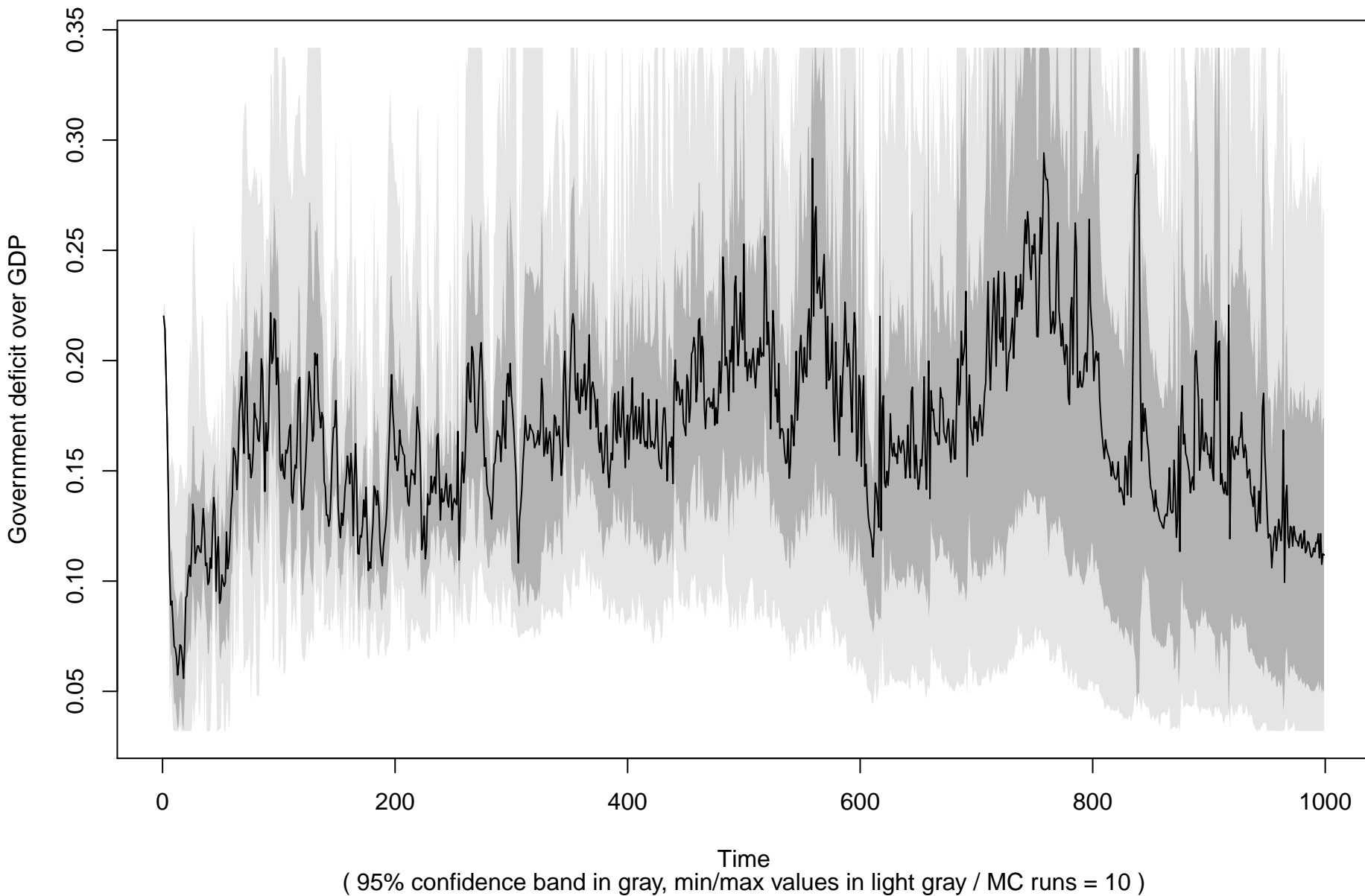
Government debt on GDP (all experiments)

Government debt over GDP

Benchmark
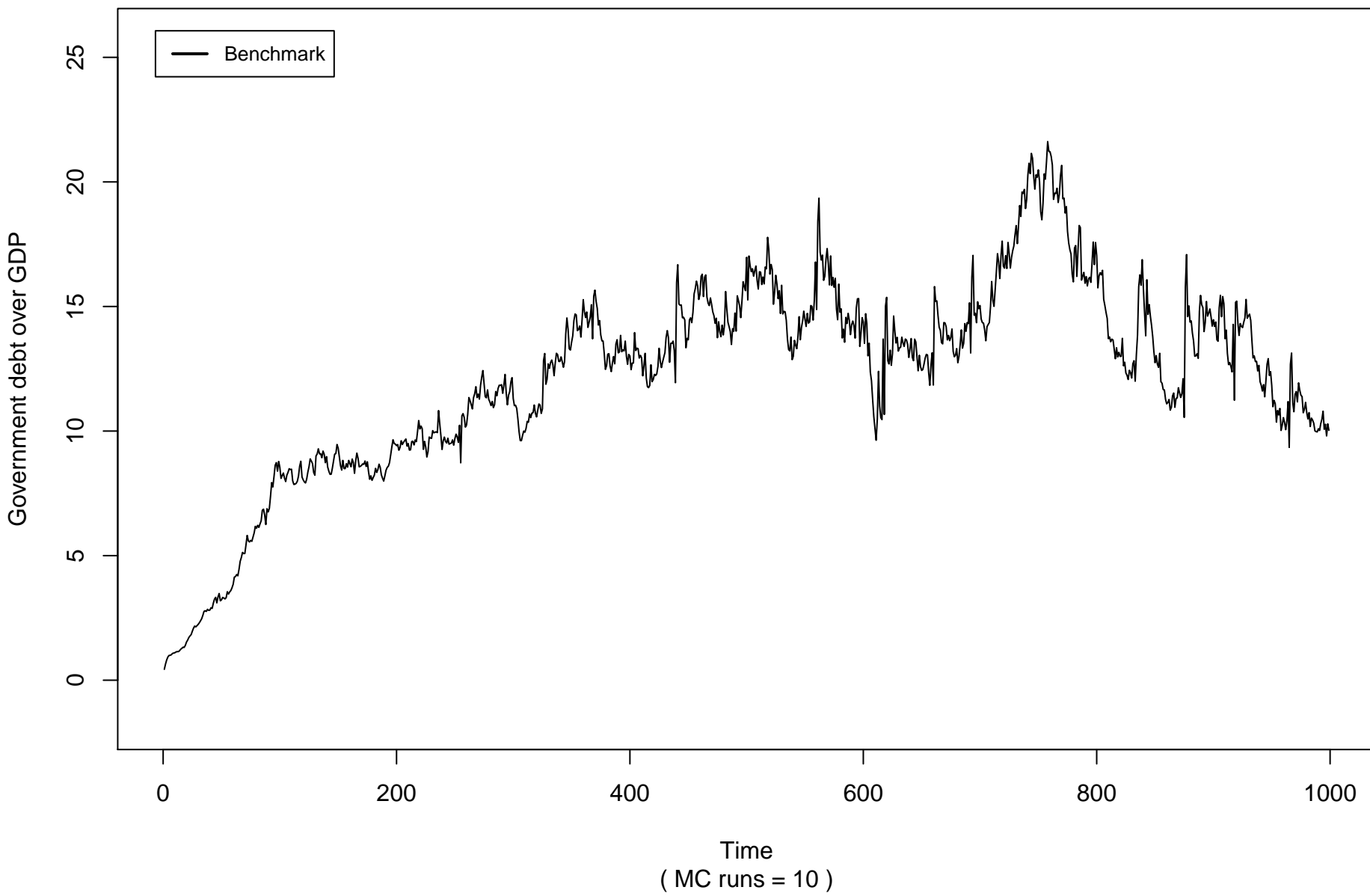
Time
(MC runs = 10)

Government debt on GDP (Benchmark)

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

Government debt over GDP
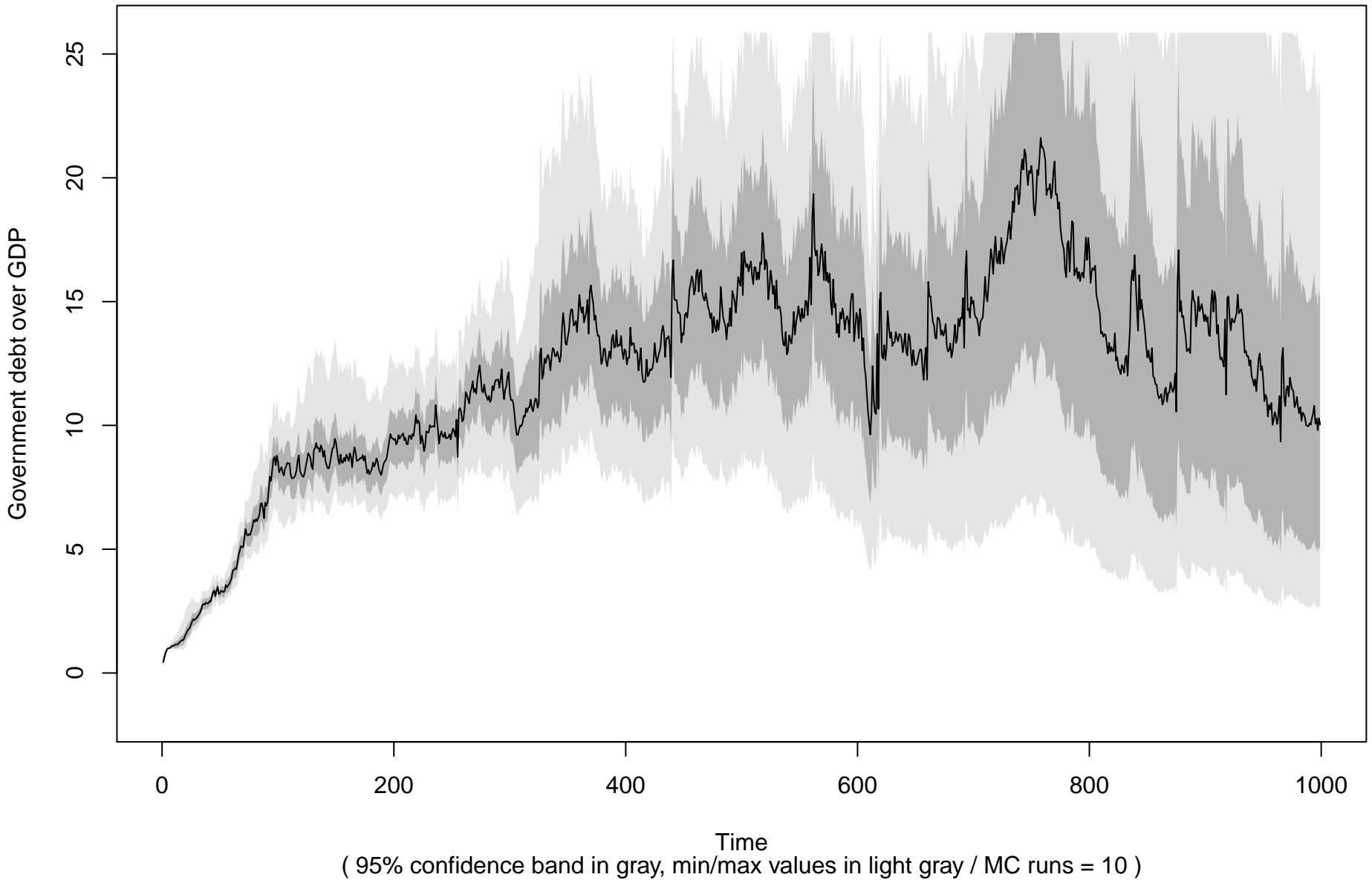
Unemployment and vacancy rates (all experiments)

Rate

Benchmark

Unemployment
Vacancy
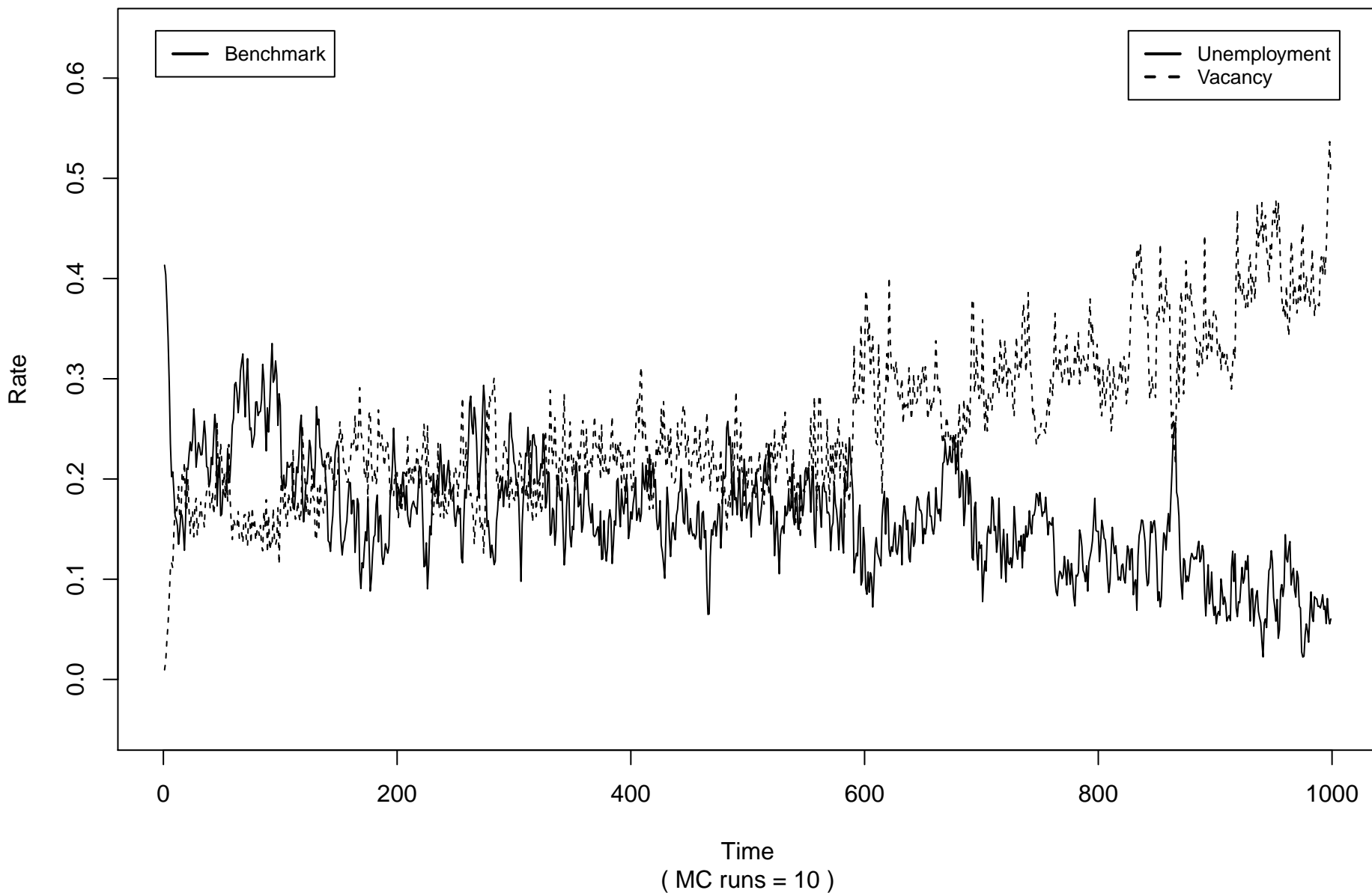
Time
(MC runs = 10)

Unemployment and vacancy rates (Benchmark)

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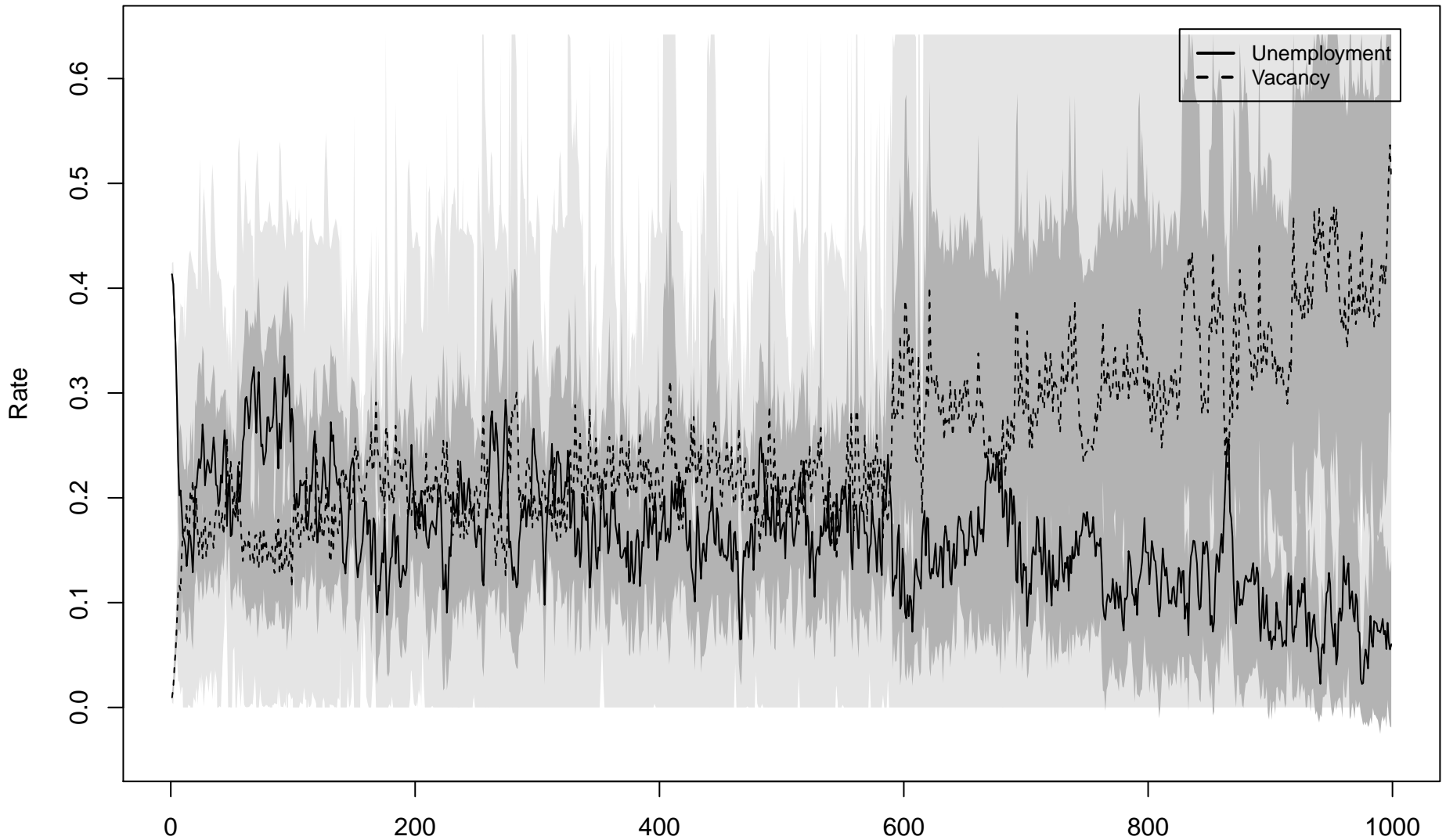
Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)

Real wages average (all experiments)

Log wages

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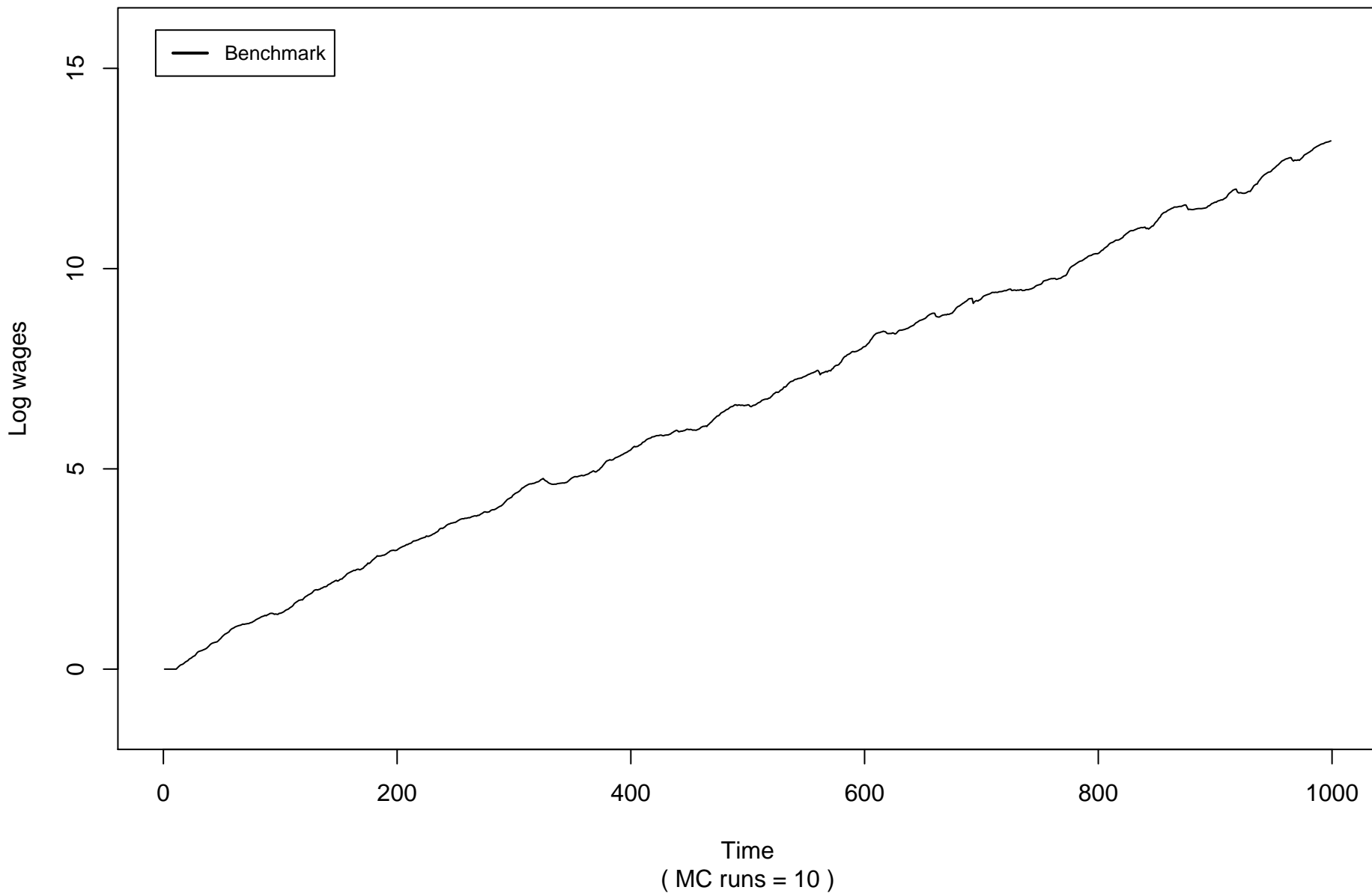
Real wages average (Benchmark)

Log wages

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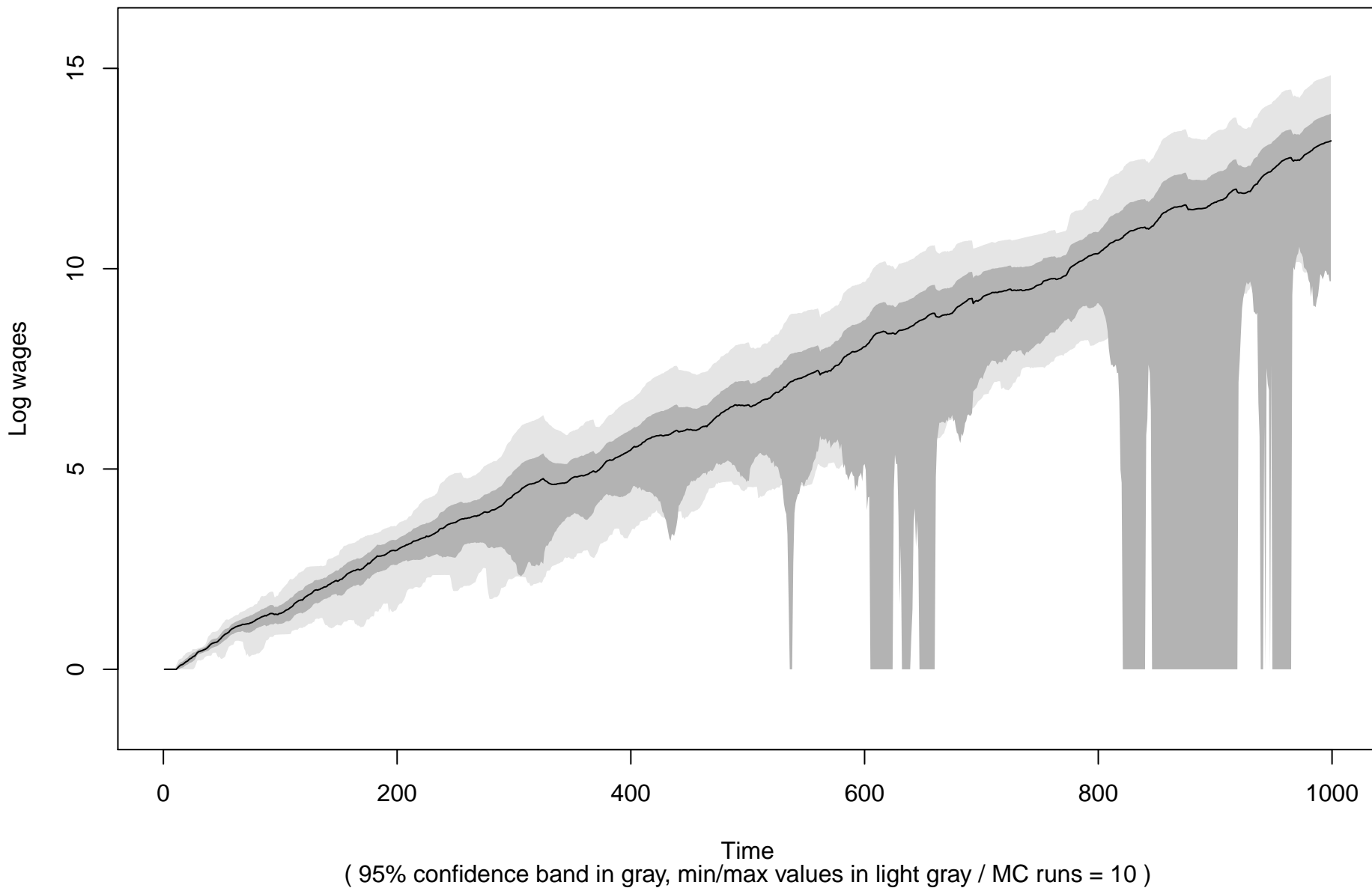
Wage share (all experiments)

Total real wages on GDP (y-axis)

Benchmark

Time
(MC runs = 10)

Wage share (Benchmark)

Total real wages on GDP

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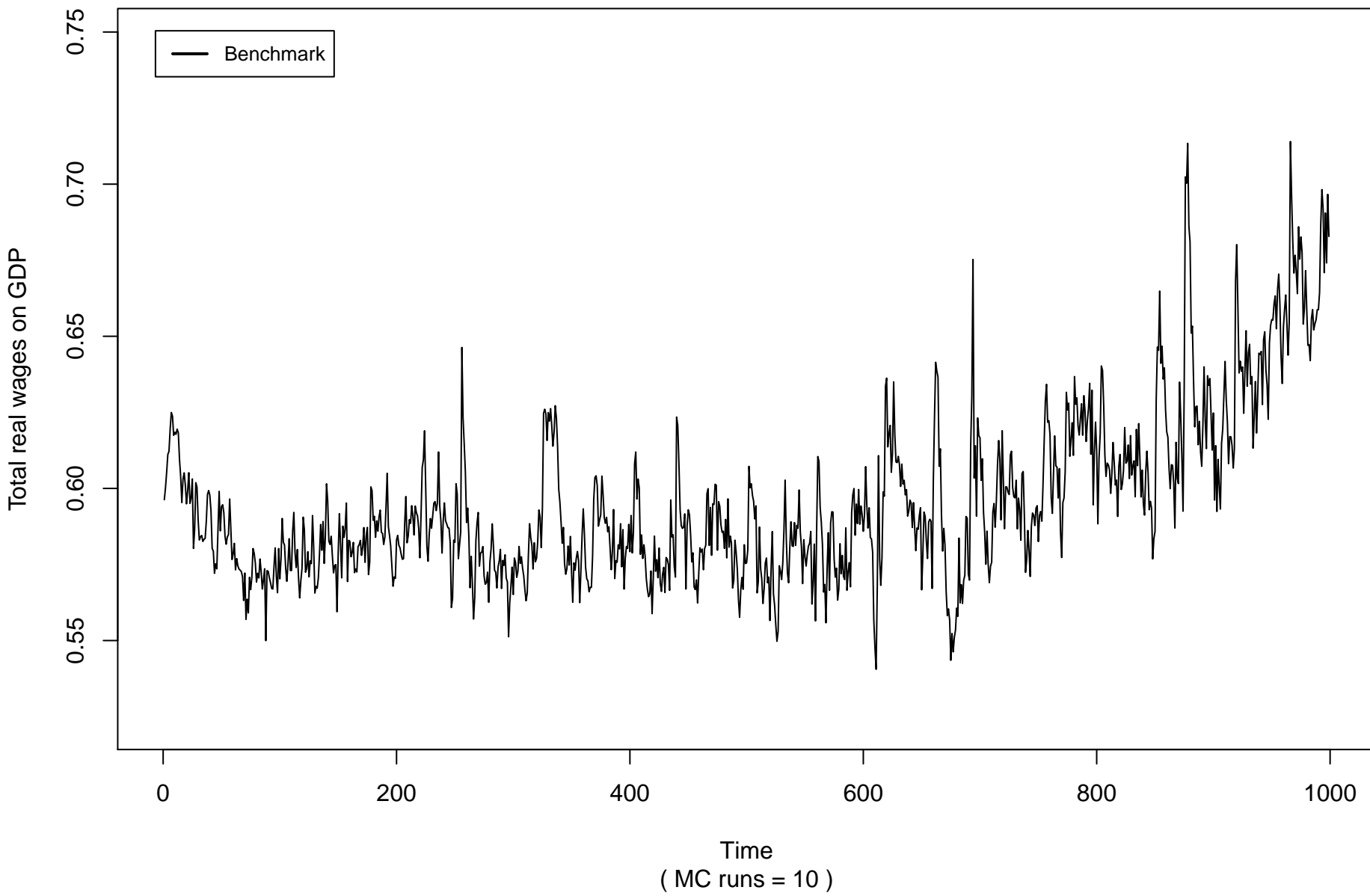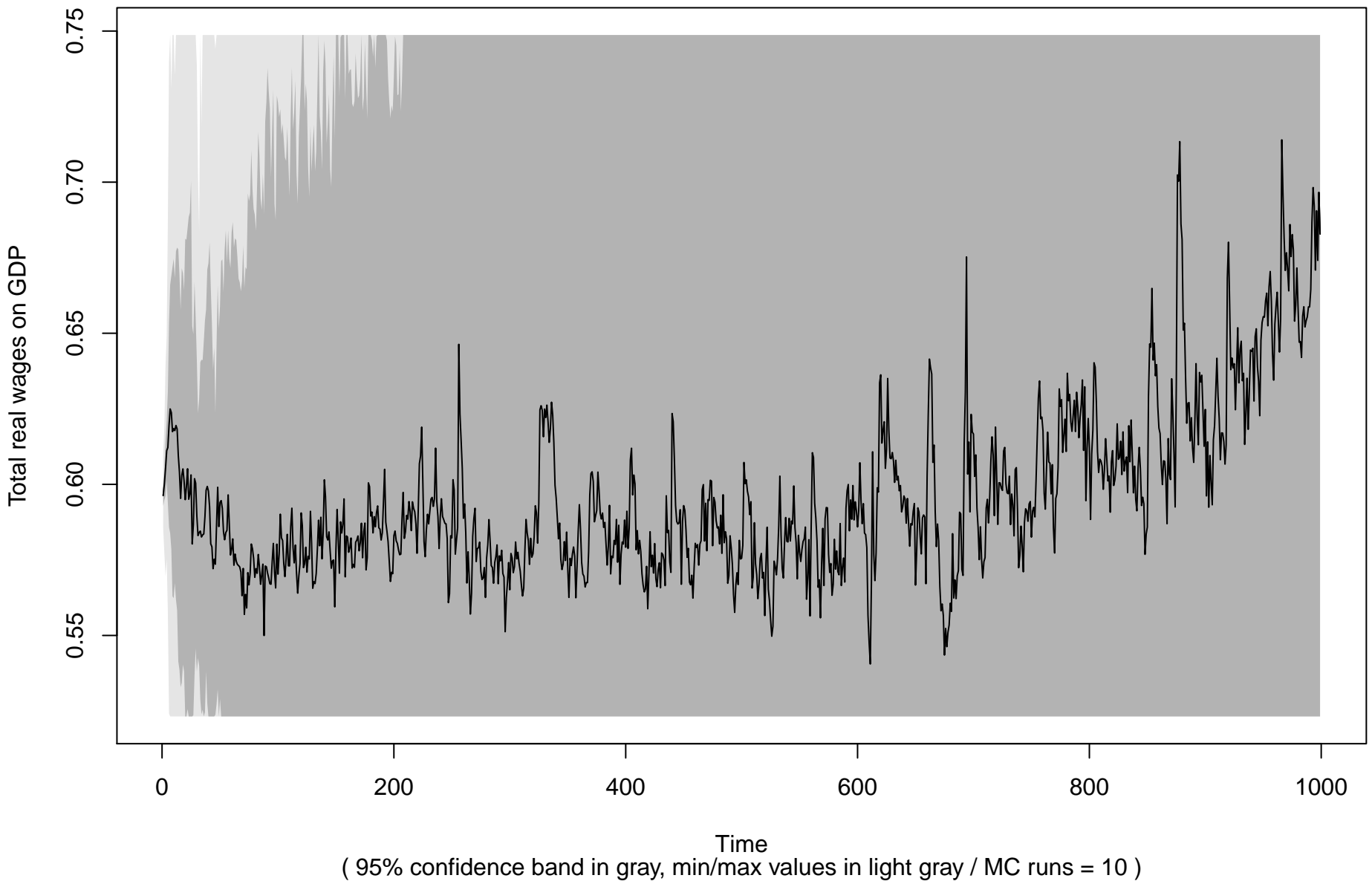
Innovation and imitation (all experiments)

Legend: Benchmark — Innovation — Imitation (dashed)

Y-axis: Share of innovating and imitating firms

X-axis: Time
(sector 1 only / MC runs = 10)
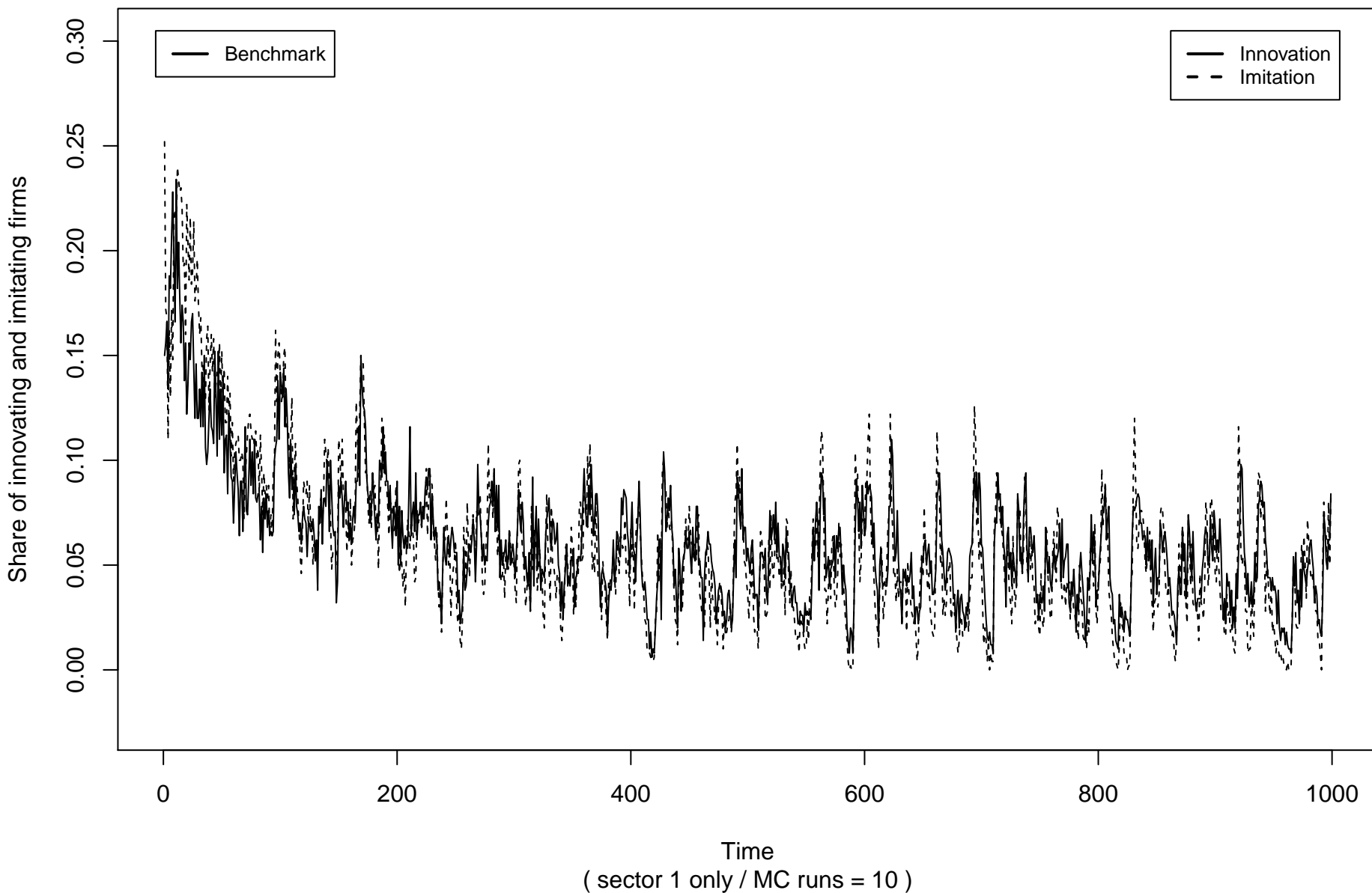
Innovation and imitation (Benchmark)

Share of innovating and imitating firms

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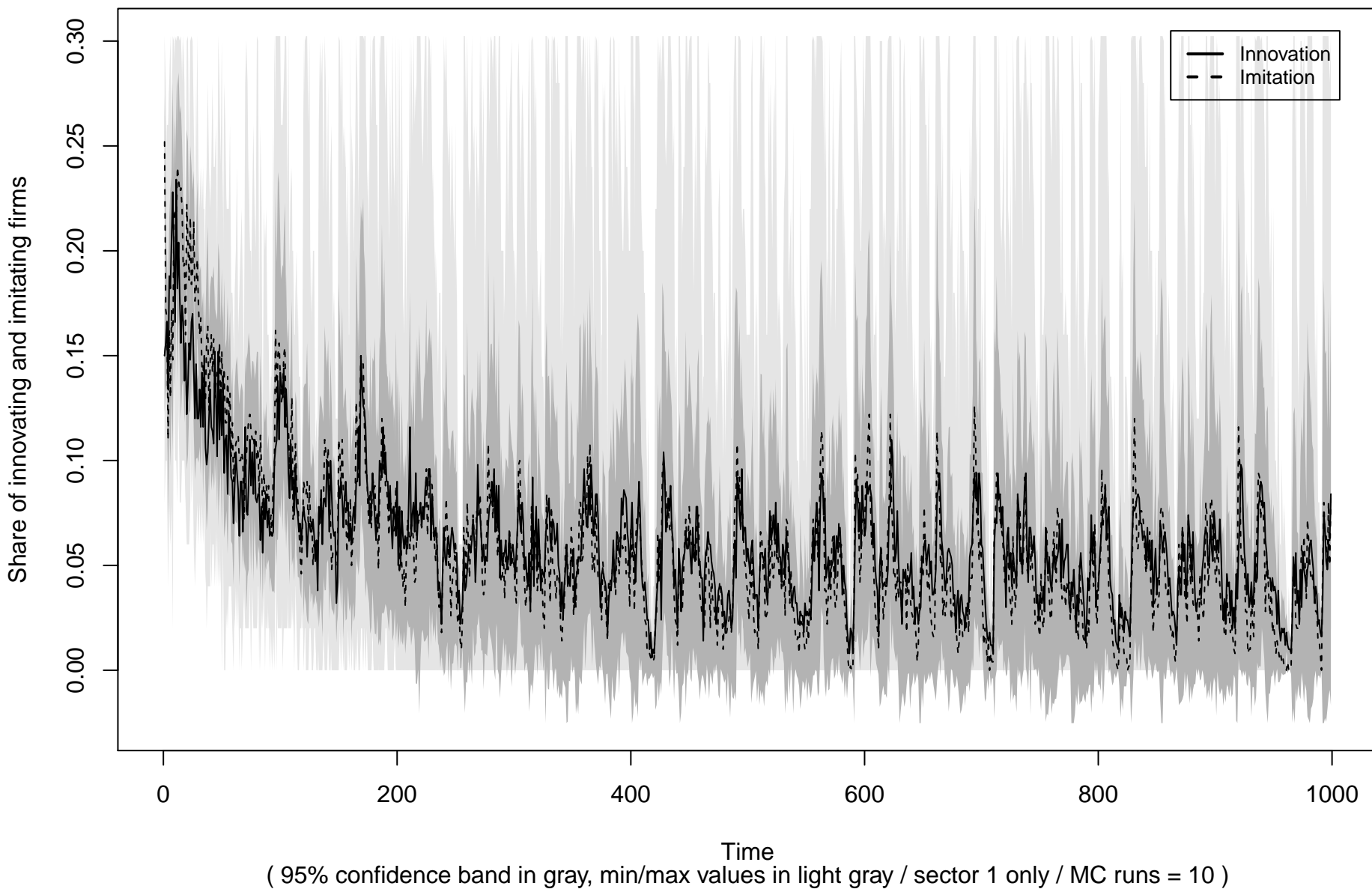
Market concentration (all experiments)

Benchmark

Standardized Herfindahl–Hirschman index

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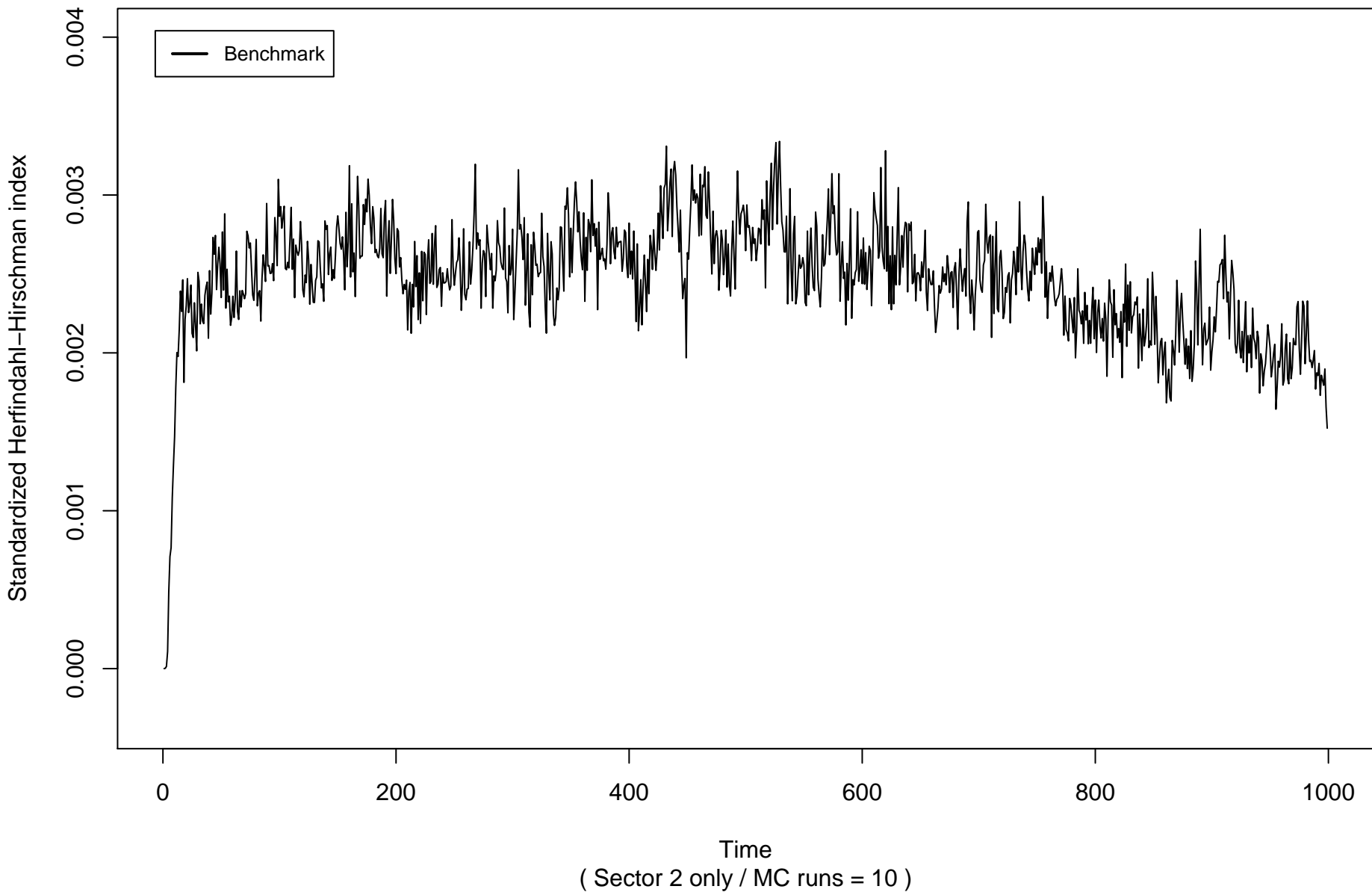
Market concentration (Benchmark)

Standardized Herfindahl–Hirschman index

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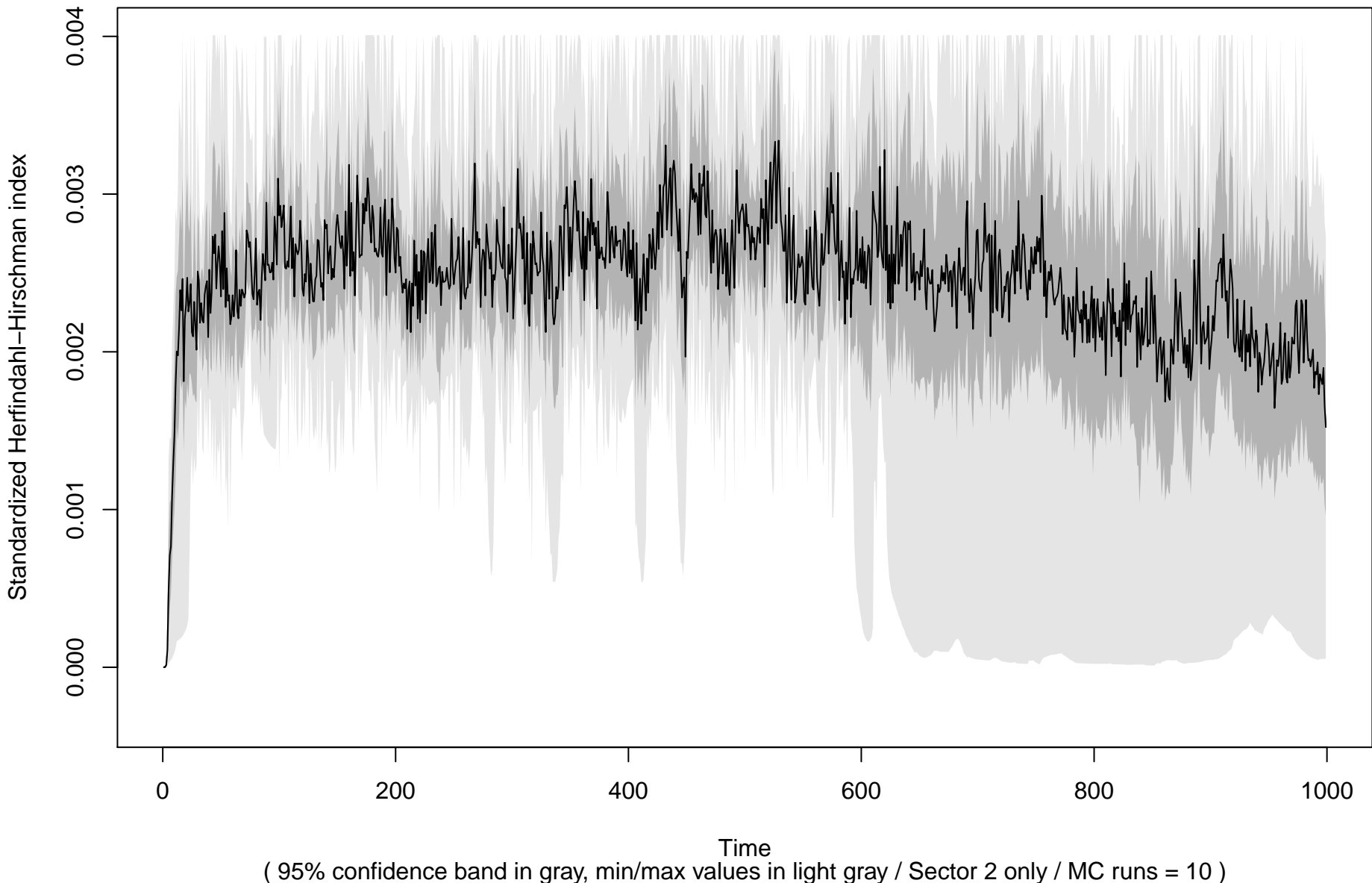
Mark−up average (all experiments)

Weighted average mark−up rate

Time
(Sector 2 only / MC runs = 10)
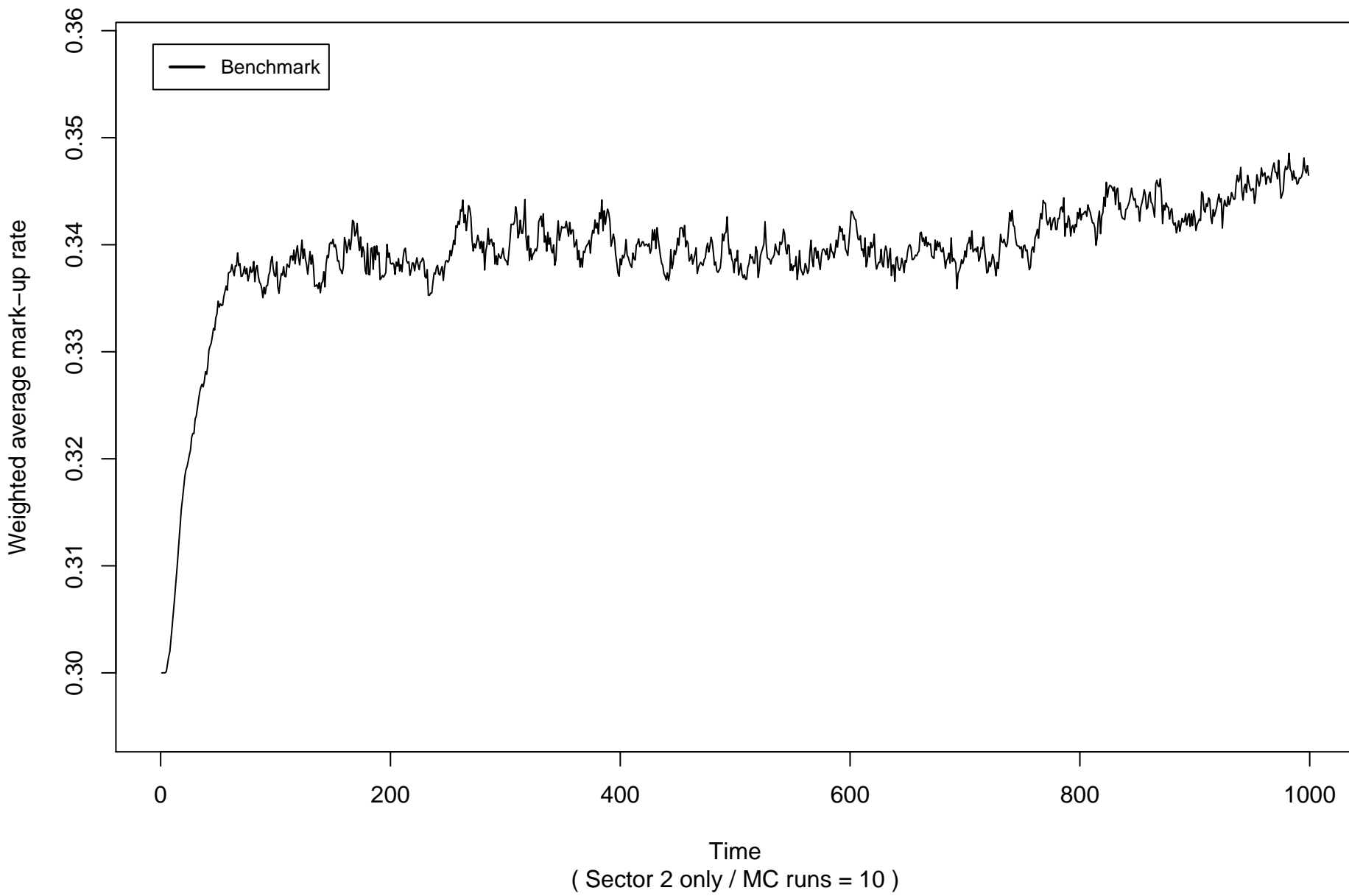
Mark−up average (Benchmark)

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

GDP cycles (Benchmark)

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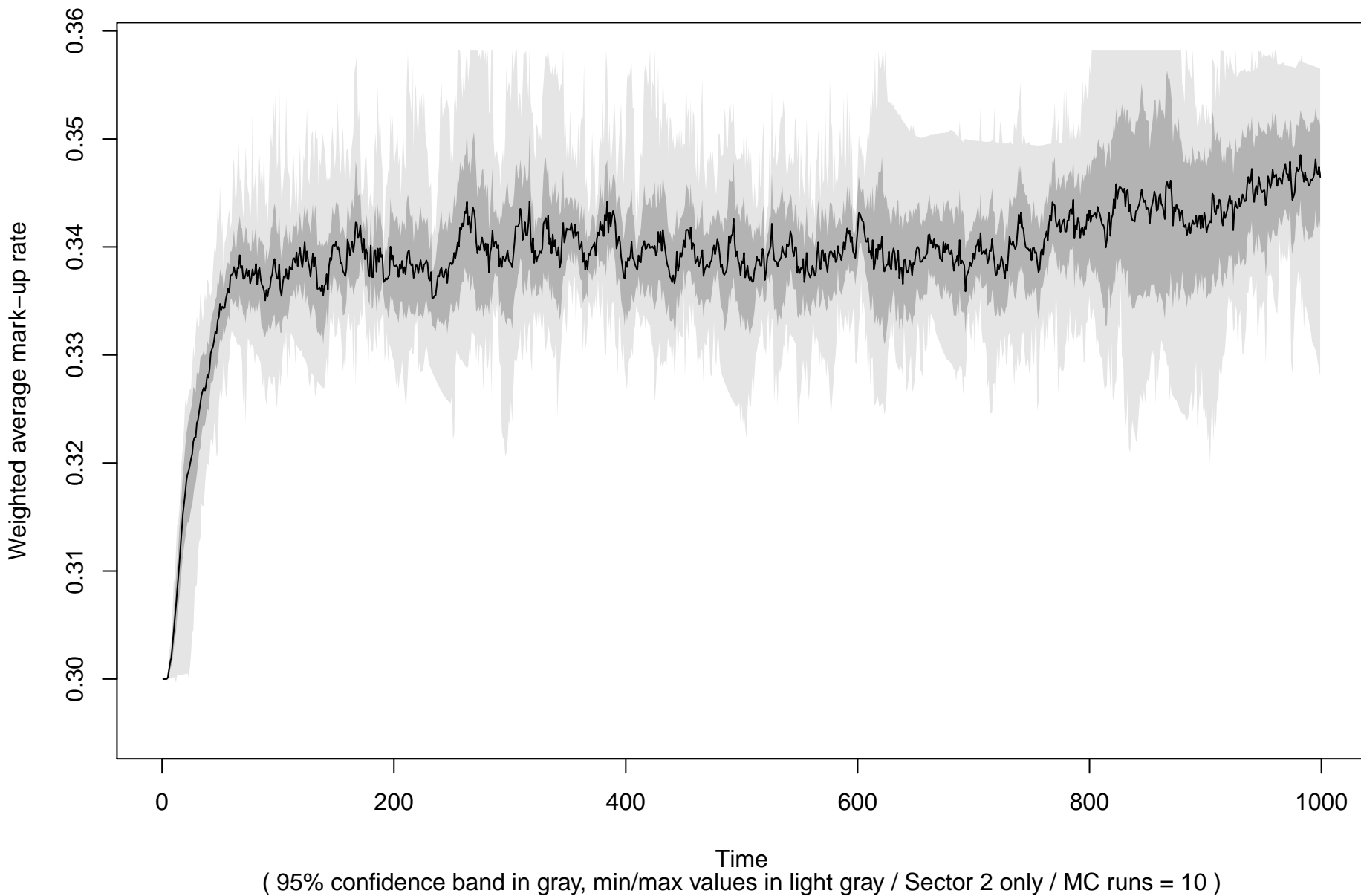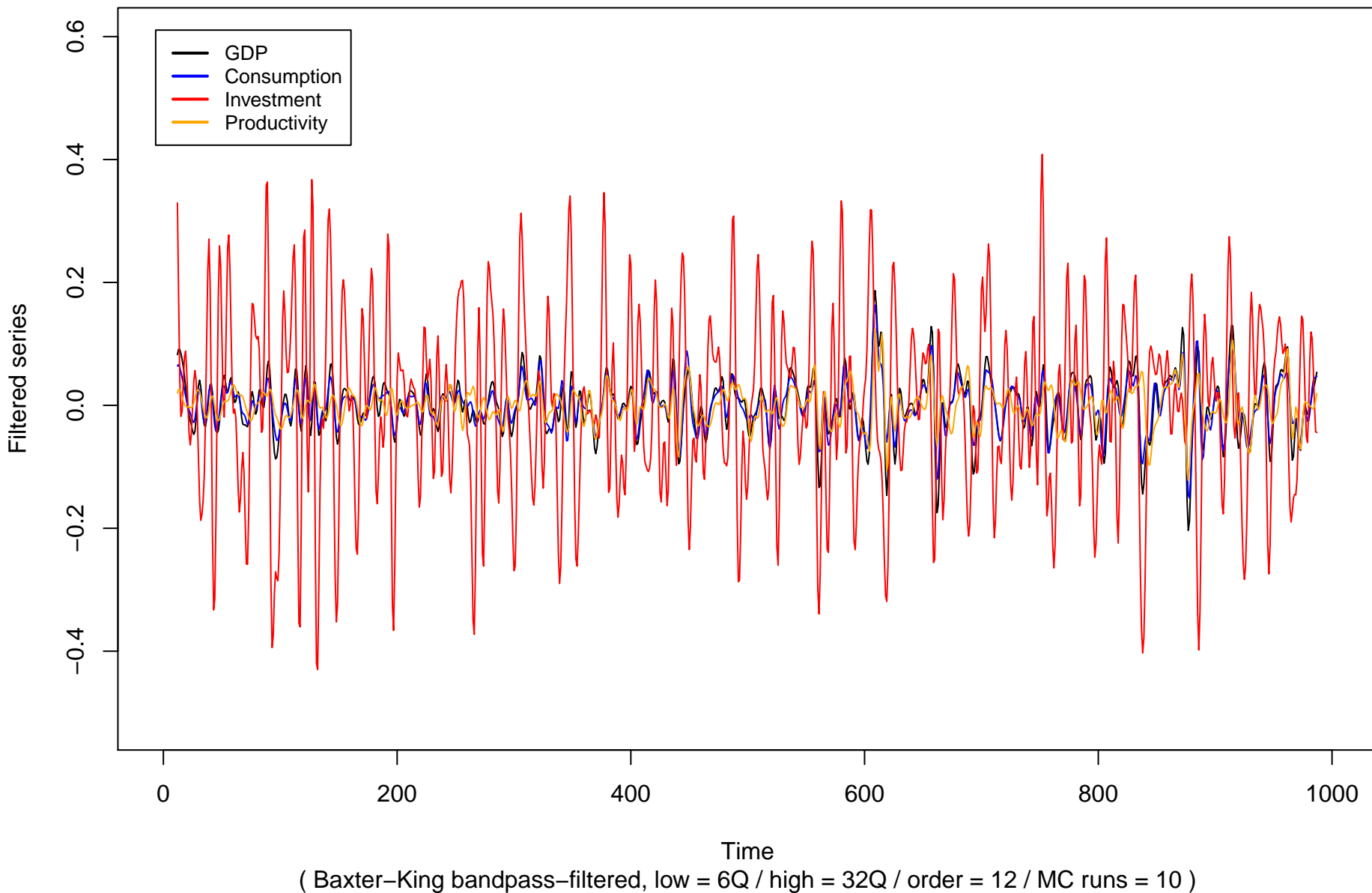
Shimer puzzle (Benchmark)

Legend:
- Productivity (black)
- Unemployment (blue)
- Vacancy (red)

Filtered series

Time

(Baxter–King bandpass–filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10)
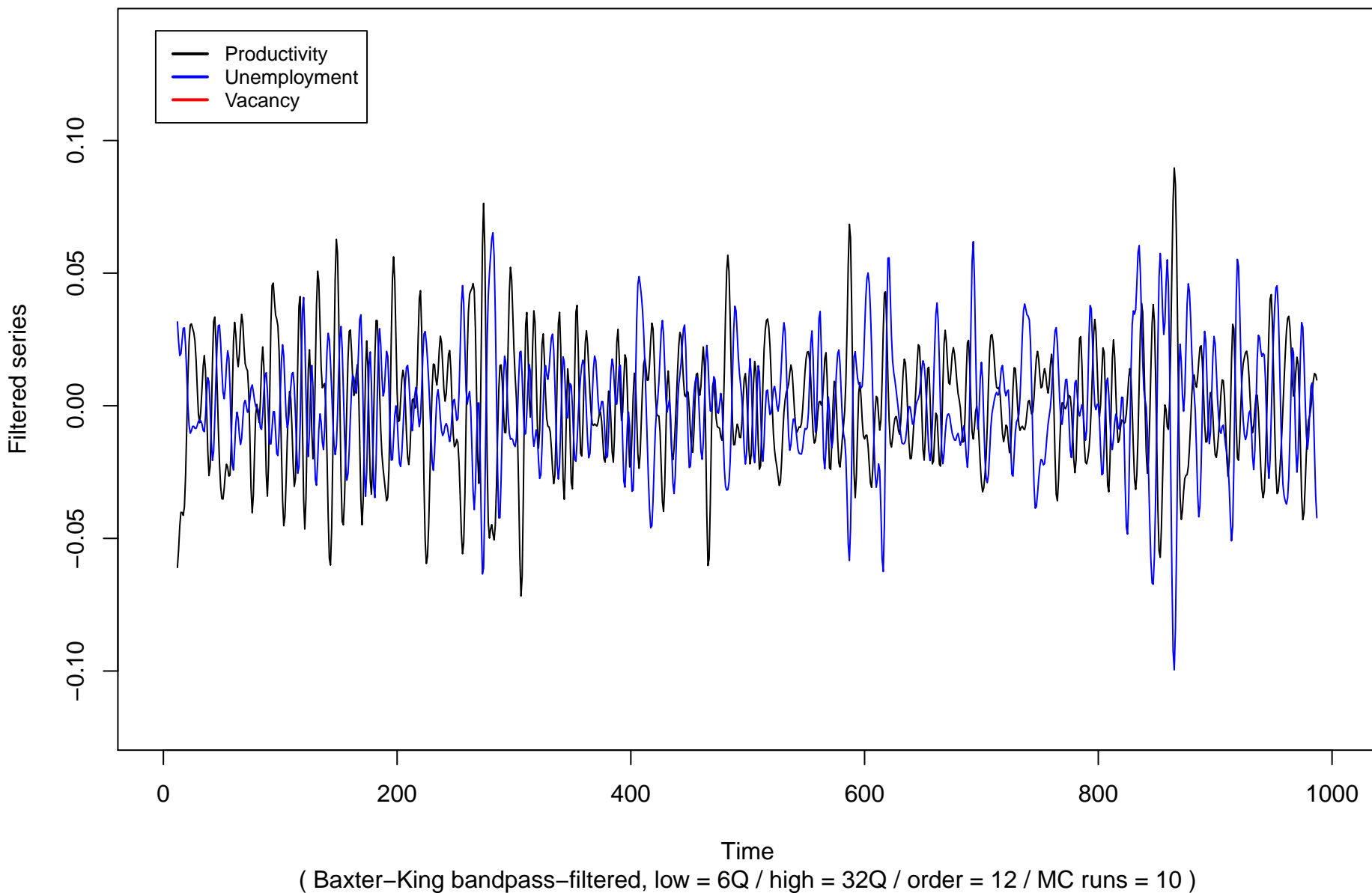
Key statistics and unit roots tests for cycles (Benchmark)

	GDP (output)	Consumption	Investment	Product.	Real wage
avg. growth rate	0.01294	0.01288	0.01405	0.01251	0.01242
(s.e.)	0.0004097	0.000413	0.0004339	0.0003871	0.0003963
ADF test (logs)	−3.127	−2.861	−8.762	−3.189	−2.961
(s.e.)	0.1893	0.1832	0.2248	0.2444	0.2029
(p−val.)	0.161	0.2376	0.01	0.1704	0.2063
(s.e.)	0.06475	0.06948	0	0.06864	0.07546
ADF test (bpf)	−11.38	−10.56	−13.75	−10.62	−10.02
(s.e.)	0.2611	0.2052	0.2378	0.286	0.2164
(p−val.)	0.01	0.01	0.01	0.01	0.01
(s.e.)	0	0	0	0	0
s.d. (bpf)	0.09642	0.07666	1.753	0.05929	0.06426
(s.e.)	0.002428	0.00257	0.103	0.00107	0.002503
relative s.d. (GDP)	1	0.795	18.18	0.615	0.6665

(bpf: Baxter−King bandpass−filtered series, low = 6Q / high = 32Q / order = 12 / MC runs = 10 / period = 2 − 1000)
(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)	−0.001036	0.2795	0.6142	0.8914	1	0.8914	0.6142	0.2795	−0.001036
(s.e.)	0.02046	0.0172	0.01035	0.003159	4.054e−17	0.003159	0.01035	0.0172	0.02046
(p−val.)	0.7981	2.459e−07	7.175e−13	4.288e−19	NA	4.288e−19	7.175e−13	2.459e−07	0.7981
Consumption	0.05403	0.2881	0.5723	0.8224	0.9444	0.8833	0.661	0.3586	0.07292
(s.e.)	0.02317	0.01956	0.01413	0.007834	0.003083	0.003909	0.008327	0.01353	0.01783
(p−val.)	0.2526	5.284e−07	2.371e−11	3.314e−15	1.974e−19	3.189e−18	4.898e−14	2.019e−09	0.2581
Investment	−0.2396	−0.2167	−0.129	0.02349	0.2027	0.3467	0.4045	0.3648	0.2614
(s.e.)	0.02549	0.02994	0.03074	0.02863	0.02361	0.01747	0.01524	0.01735	0.01836
(p−val.)	3.273e−05	0.0002945	0.0286	0.2214	0.0001065	2.748e−08	1.621e−09	1.501e−08	8.931e−07
Net investment	−0.1704	−0.1195	−0.01825	0.1219	0.2626	0.3542	0.3651	0.2989	0.1922
(s.e.)	0.02043	0.02616	0.0312	0.03168	0.02542	0.01637	0.01548	0.02017	0.02087
(p−val.)	0.0002458	0.02769	0.2751	0.009114	1.233e−05	1.236e−08	5.473e−09	4.625e−07	7.572e−05
Change in inventories	−0.1497	−0.06031	0.07646	0.2055	0.2673	0.2325	0.1304	0.01998	−0.04789
(s.e.)	0.01864	0.02074	0.02111	0.0204	0.01754	0.01499	0.01264	0.01305	0.01452
(p−val.)	0.0005563	0.1587	0.2169	3.043e−05	4.762e−07	6.041e−07	0.000213	0.9945	0.7332
Unemployment rate	0.3041	0.1888	−0.02085	−0.2654	−0.4558	−0.5199	−0.4463	−0.2841	−0.1114
(s.e.)	0.01658	0.01823	0.01944	0.02142	0.0234	0.02364	0.02247	0.02168	0.02149
(p−val.)	7.118e−08	3.315e−05	0.8613	2.746e−06	2.068e−08	6.004e−09	1.792e−08	1.46e−06	0.017
Productivity	0.2663	0.4068	0.5422	0.6293	0.6296	0.5299	0.3567	0.1596	−0.01289
(s.e.)	0.01464	0.008389	0.009044	0.01806	0.02609	0.03217	0.03635	0.03716	0.03325
(p−val.)	1.056e−07	7.432e−12	7.491e−13	8.234e−11	2.157e−09	7.372e−08	9.929e−06	0.01375	0.202
Mark−up (sector 2)	0.2216	0.2032	0.1356	0.03696	−0.0597	−0.1245	−0.1467	−0.1361	−0.1121
(s.e.)	0.01404	0.02078	0.02691	0.02987	0.02919	0.02526	0.01915	0.01415	0.01541
(p−val.)	6.111e−07	3.974e−05	0.005936	0.2993	0.09574	0.005162	0.0008268	0.0002676	0.004957
Total firm debt	0.1941	0.1334	0.06035	−0.01805	−0.09313	−0.1562	−0.1995	−0.2178	−0.2104
(s.e.)	0.03224	0.03874	0.04387	0.04542	0.04235	0.03522	0.02716	0.02213	0.02111
(p−val.)	0.001342	0.03474	0.02917	0.04551	0.07402	0.0127	0.0003385	3.029e−05	3.053e−05
Liquidity−to−sales ratio	−0.005113	−0.182	−0.3952	−0.588	−0.695	−0.6721	−0.5297	−0.3186	−0.1061
(s.e.)	0.01892	0.01061	0.01204	0.02054	0.02533	0.02365	0.01709	0.01139	0.01429
(p−val.)	0.9112	6.368e−07	2.558e−10	5.071e−10	6.319e−10	4.754e−10	2.819e−10	1.577e−09	0.006513
Bankruptcy rate	0.2309	0.2876	0.2837	0.2293	0.1564	0.09406	0.04996	0.009385	−0.04288
(s.e.)	0.03325	0.03398	0.03247	0.02911	0.03023	0.03749	0.04094	0.03443	0.02089
(p−val.)	0.0003306	4.731e−05	3.827e−05	0.0001383	0.00393	0.005697	0.03368	0.2112	0.605

(non−rate/ratio series are Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10 / period = 2 − 1000)
(test H0: lag coefficient is not significant at 5% level)

Correlation structure for GDP (Benchmark)

	−4	−3	−2	−1	0	1	2	3	4
GDP (output)	−0.001036	0.2795	0.6142	0.8914	1	0.8914	0.6142	0.2795	−0.001036
(s.e.)	0.02046	0.0172	0.01035	0.003159	4.054e−17	0.003159	0.01035	0.0172	0.02046
(p−val.)	0.7981	2.459e−07	7.175e−13	4.288e−19	NA	4.288e−19	7.175e−13	2.459e−07	0.7981
Consumption	0.05403	0.2881	0.5723	0.8224	0.9444	0.8833	0.661	0.3586	0.07292
(s.e.)	0.02317	0.01956	0.01413	0.007834	0.003083	0.003909	0.008327	0.01353	0.01783
(p−val.)	0.2526	5.284e−07	2.371e−11	3.314e−15	1.974e−19	3.189e−18	4.898e−14	2.019e−09	0.2581
Investment	−0.2396	−0.2167	−0.129	0.02349	0.2027	0.3467	0.4045	0.3648	0.2614
(s.e.)	0.02549	0.02994	0.03074	0.02863	0.02361	0.01747	0.01524	0.01735	0.01836
(p−val.)	3.273e−05	0.0002945	0.0286	0.2214	0.0001065	2.748e−08	1.621e−09	1.501e−08	8.931e−07
Productivity	0.2663	0.4068	0.5422	0.6293	0.6296	0.5299	0.3567	0.1596	−0.01289
(s.e.)	0.01464	0.008389	0.009044	0.01806	0.02609	0.03217	0.03635	0.03716	0.03325
(p−val.)	1.056e−07	7.432e−12	7.491e−13	8.234e−11	2.157e−09	7.372e−08	9.929e−06	0.01375	0.202
Entry	0.06736	0.2035	0.3254	0.4055	0.4249	0.3812	0.293	0.1883	0.09454
(s.e.)	0.02353	0.02538	0.02351	0.01881	0.0171	0.02393	0.03188	0.03449	0.03034
(p−val.)	0.05144	0.0001727	6.889e−07	1.01e−08	2.685e−09	1.552e−07	2.42e−05	0.002605	0.0779
Wage	0.3337	0.4639	0.5691	0.6165	0.5844	0.4746	0.3149	0.1449	−0.001939
(s.e.)	0.00982	0.009945	0.01372	0.01779	0.02024	0.02067	0.01945	0.01744	0.01529
(p−val.)	2.551e−10	8.654e−12	1.928e−11	8.813e−11	4.745e−10	4.628e−09	1.933e−07	0.0005202	0.9883
Unemployment rate	0.3041	0.1888	−0.02085	−0.2654	−0.4558	−0.5199	−0.4463	−0.2841	−0.1114
(s.e.)	0.01658	0.01823	0.01944	0.02142	0.0234	0.02364	0.02247	0.02168	0.02149
(p−val.)	7.118e−08	3.315e−05	0.8613	2.746e−06	2.068e−08	6.004e−09	1.792e−08	1.46e−06	0.017
Vacancy rate	−0.0258	−0.1285	−0.2056	−0.2145	−0.1462	−0.03316	0.06824	0.1141	0.09688
(s.e.)	0.03214	0.02731	0.03257	0.04562	0.05463	0.05309	0.0415	0.02788	0.02512
(p−val.)	0.2471	0.01725	0.0008509	0.0042	0.02098	0.06637	0.07378	0.0473	0.04946

(non−rate/ratio series are Baxter−King bandpass−filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10 / period = 2 − 1000)
(test H0: lag coefficient is not significant at 5% level)

Stationarity, i.i.d. and ergodicity tests (Benchmark)

	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	0.02	0.90	0.33	0.33	0.00	
dA	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.08	0.80	0.00	
dw	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.09	0.80	0.00	
V	0.07	0.90	0.01	1.00	0.03	0.90	0.00	1.00	0.02	0.91	0.00	
U	0.01	1.00	0.01	1.00	0.03	0.80	0.00	1.00	0.00	1.00	0.00	
mu2avg	0.01	1.00	0.01	1.00	0.02	0.90	0.00	1.00	0.05	0.87	0.00	
HH1	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.16	0.60	0.00	
HH2	0.01	1.00	0.01	1.00	0.04	0.70	0.00	1.00	0.06	0.82	0.00	

(average p−values for testing H0 and rate of rejection of H0 / MC runs = 10 / period = 2 − 1000)
(ADF/PP H0: non−stationary, KPSS H0: stationary, BDS H0: i.i.d., KS/AD/WW H0: ergodic)
(significance = 0.05)

GDP growth

Average GDP growth rate
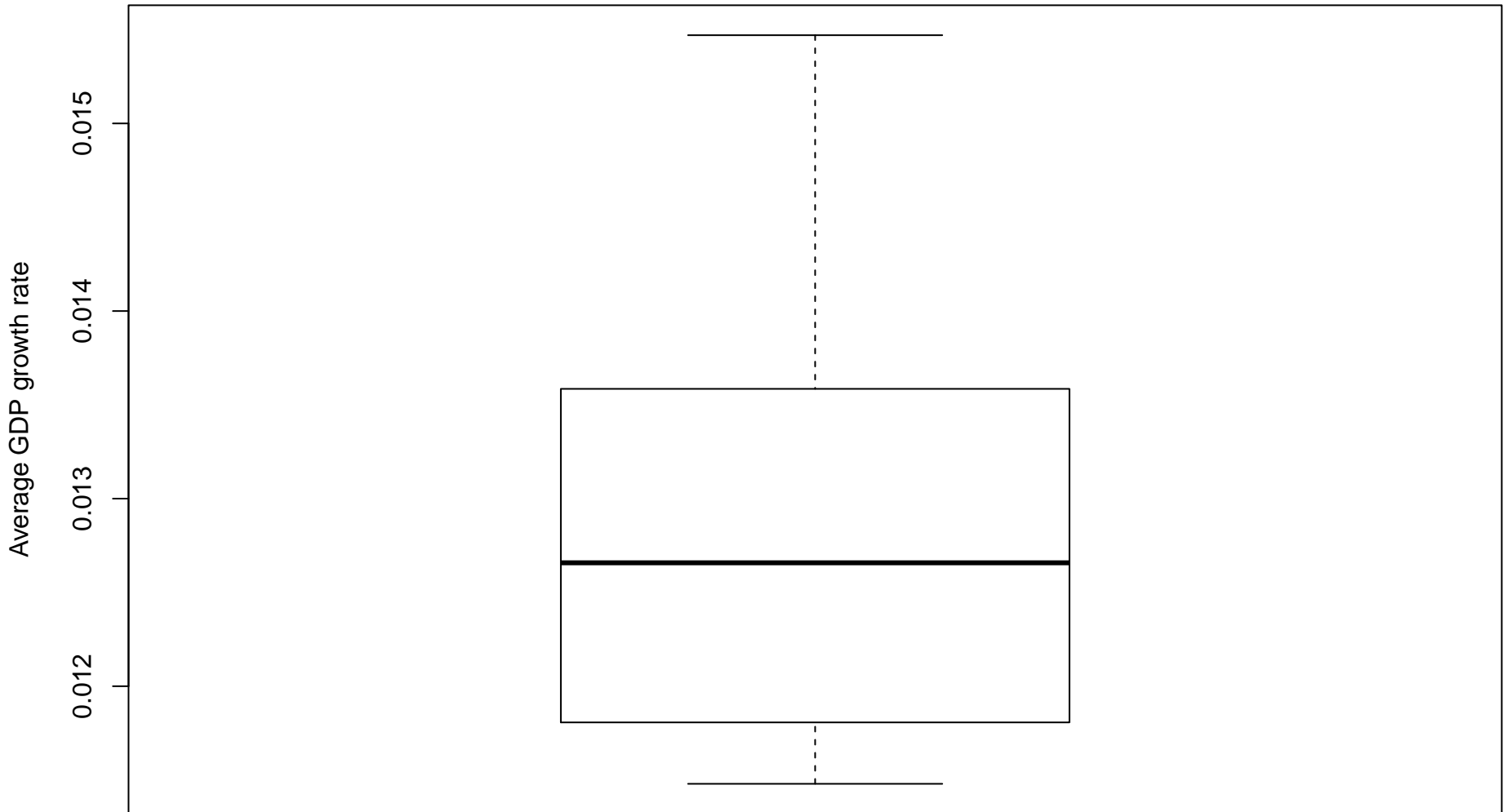
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)
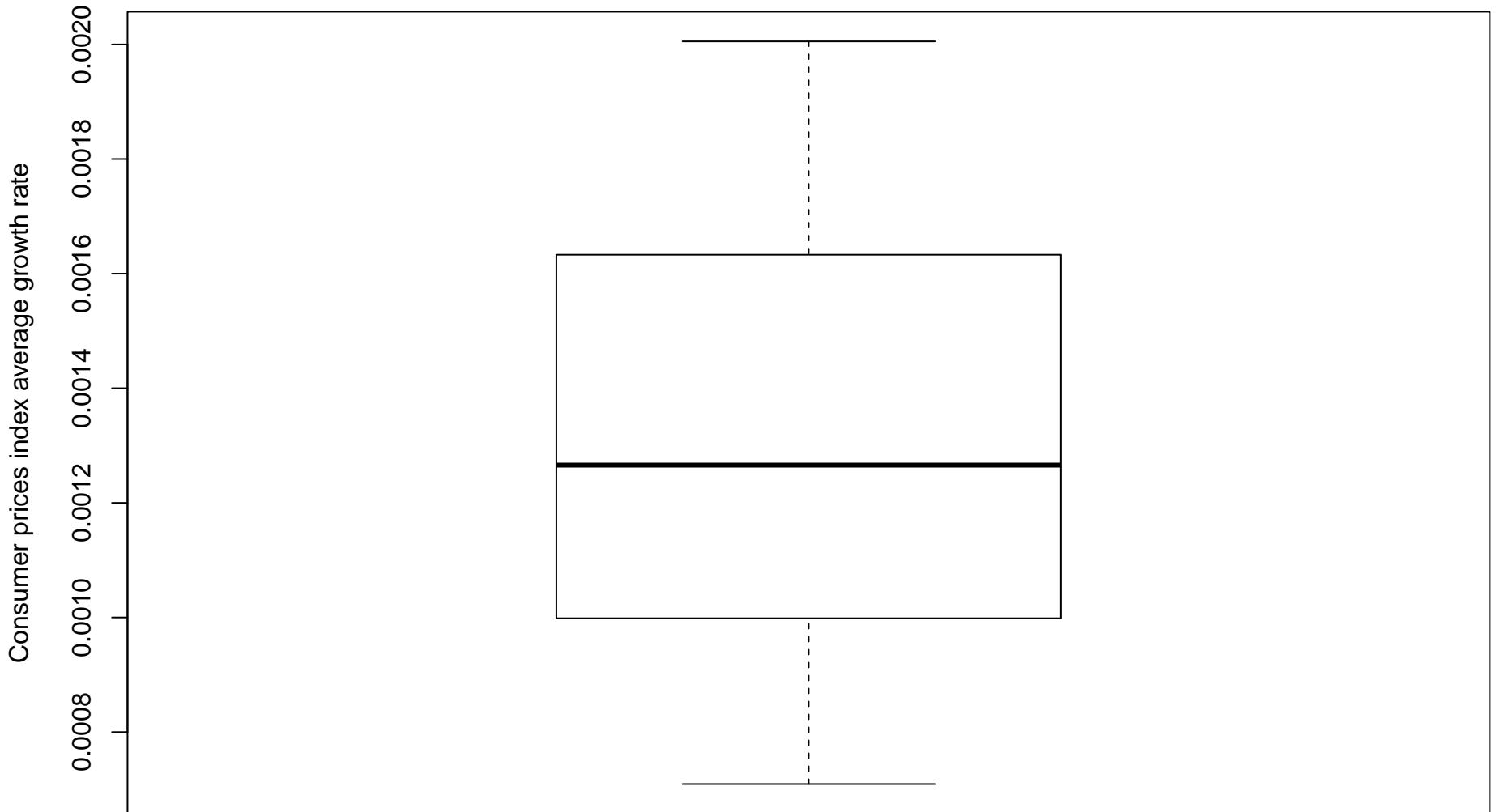
Volatility of GDP growth
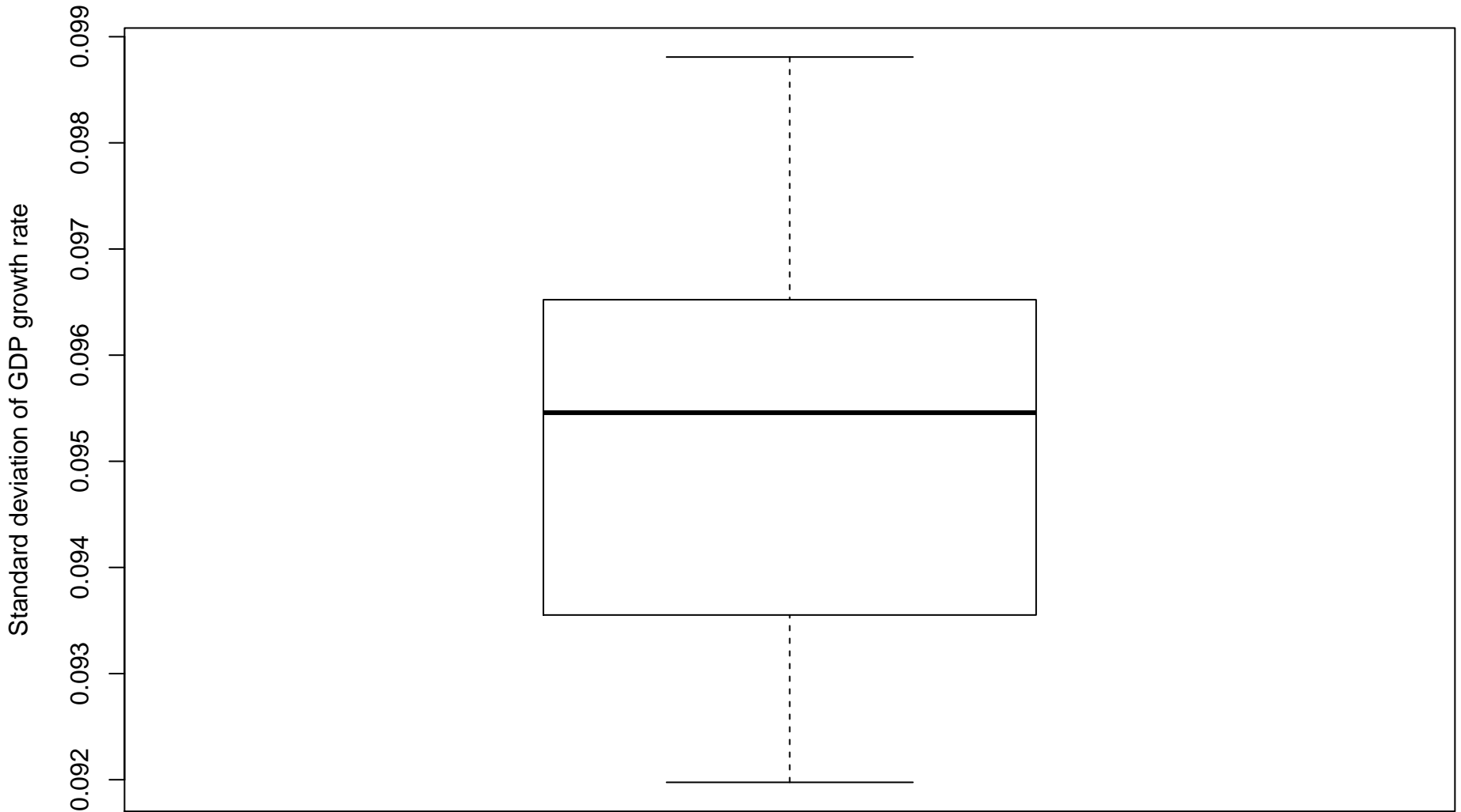
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)
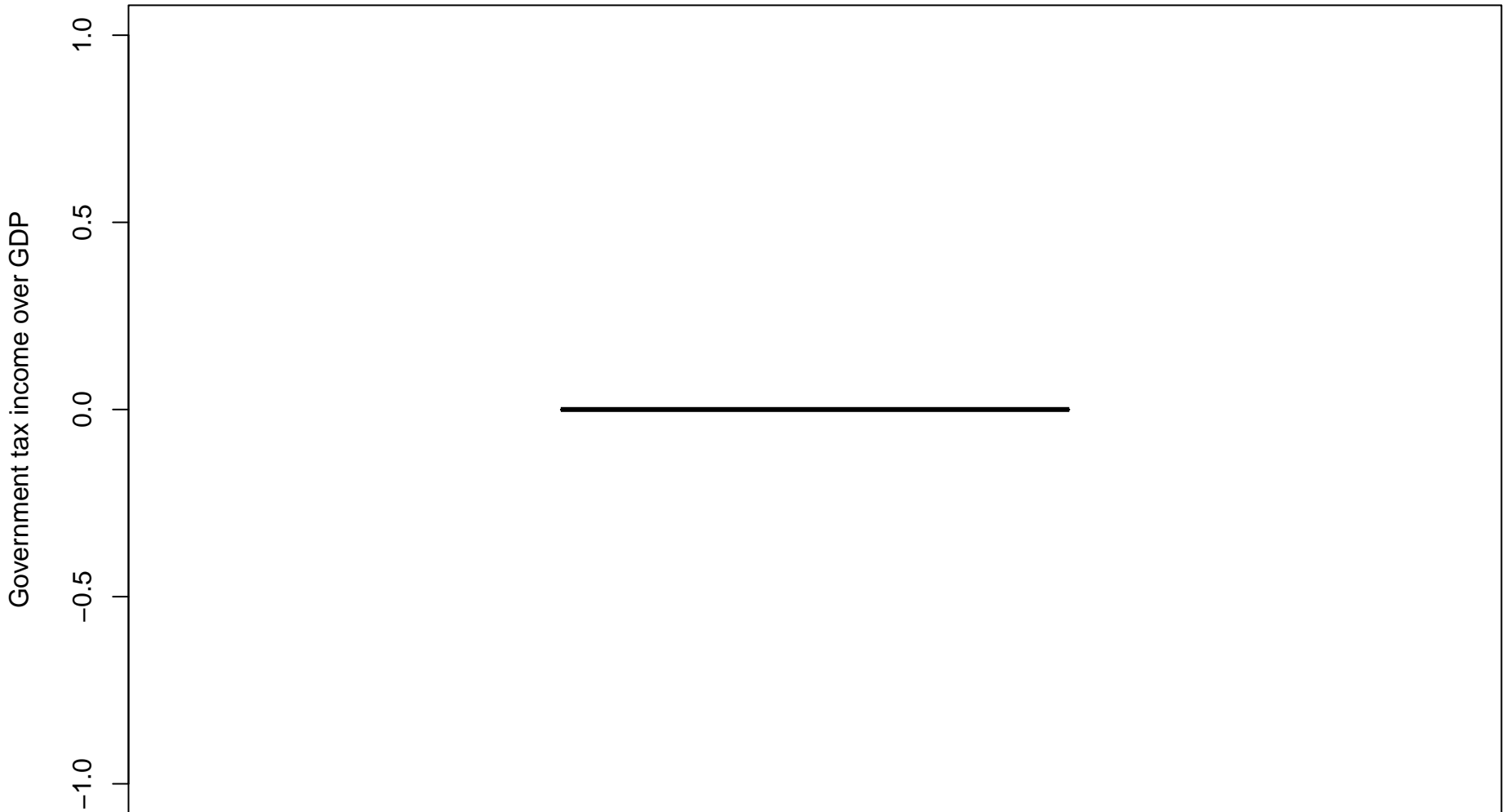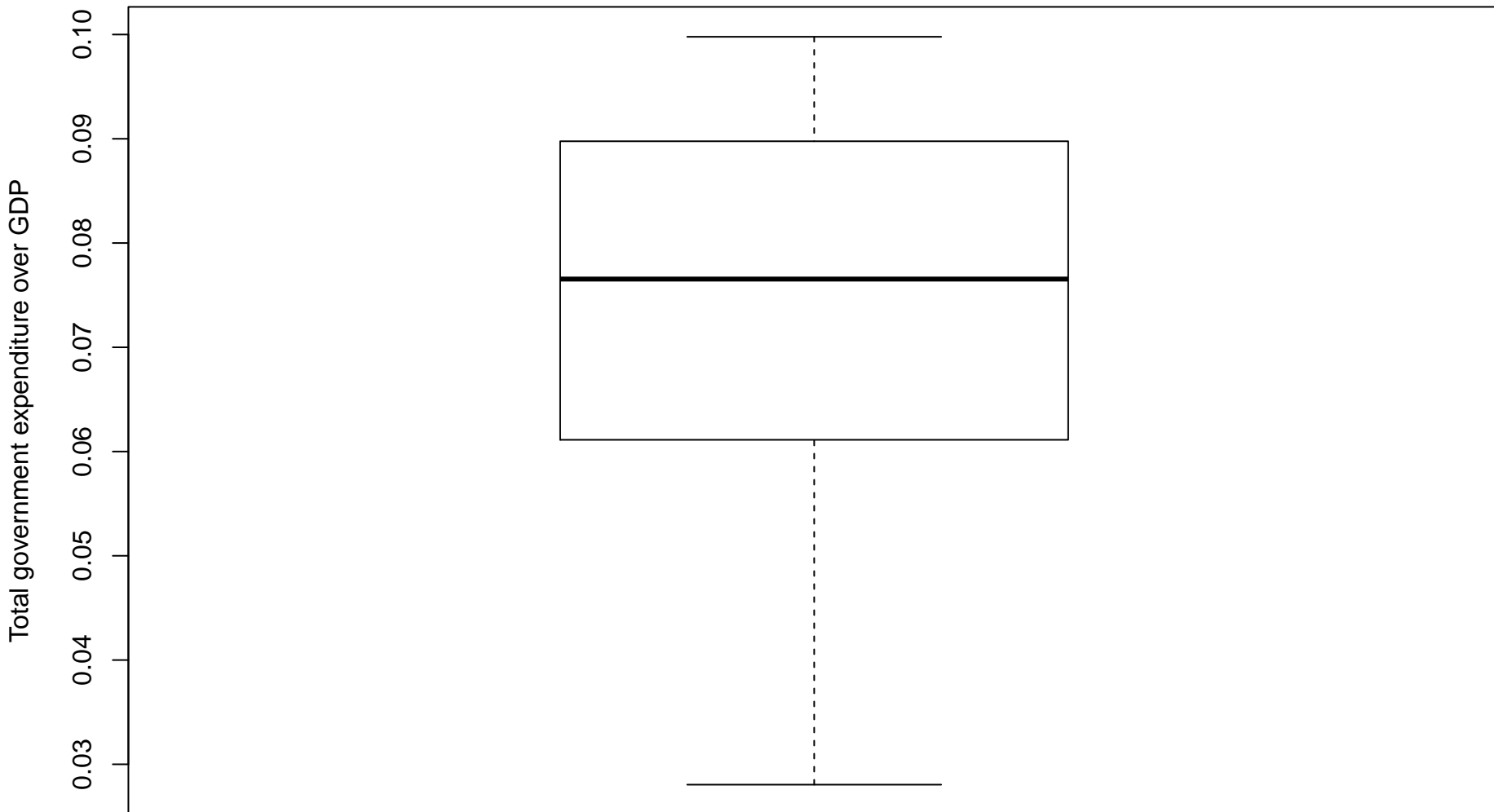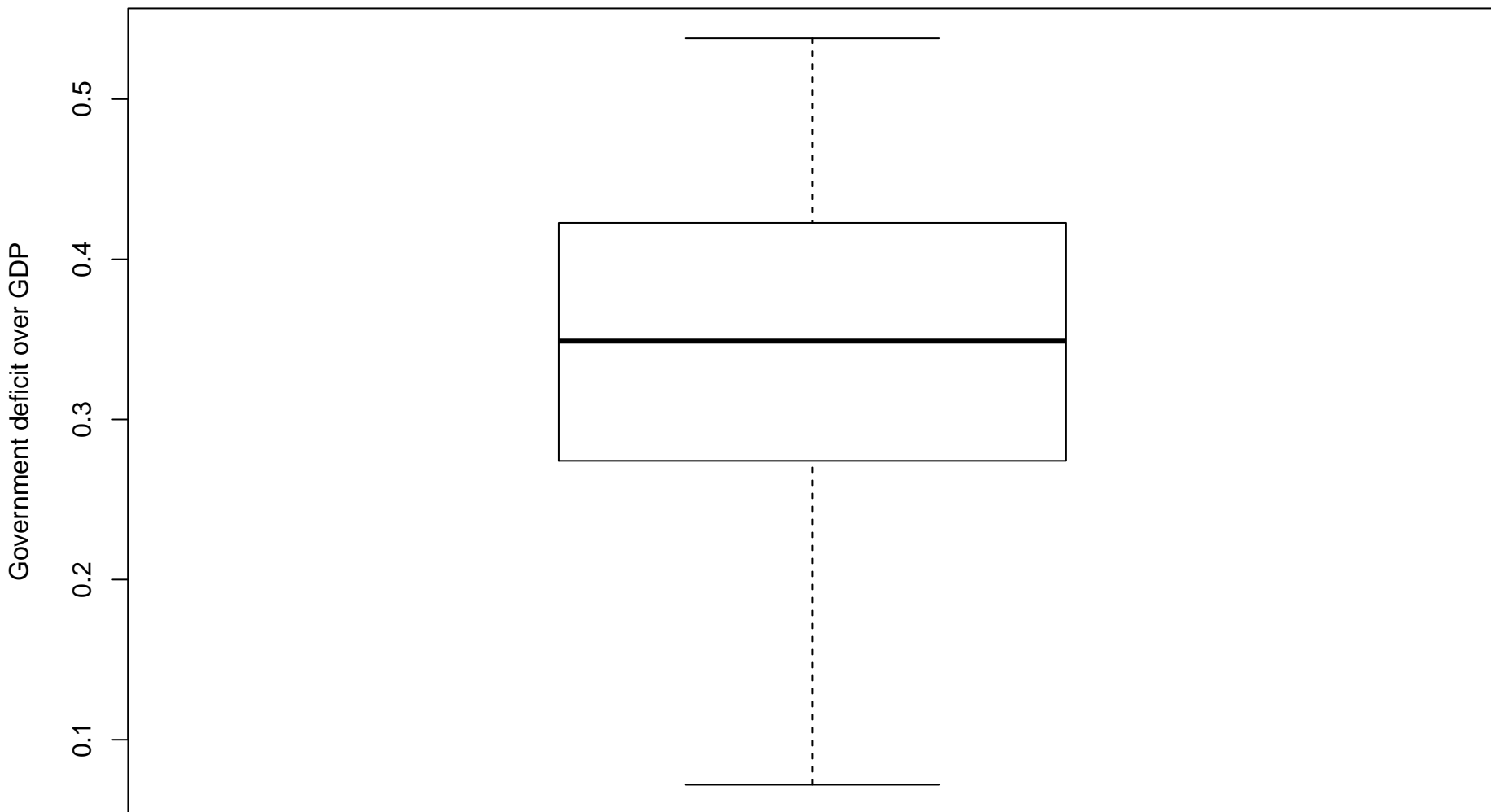
Likelihood of GDP crises

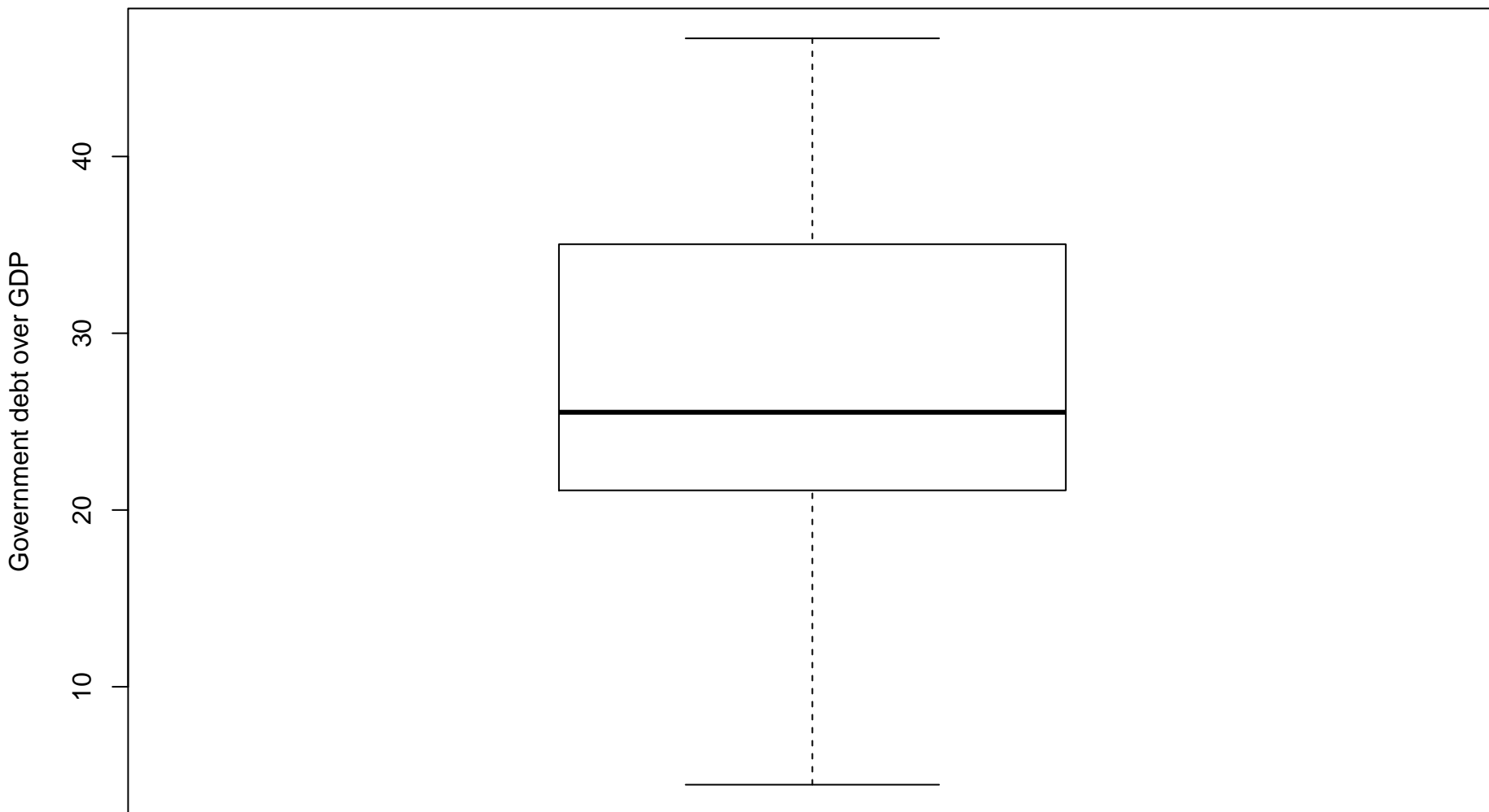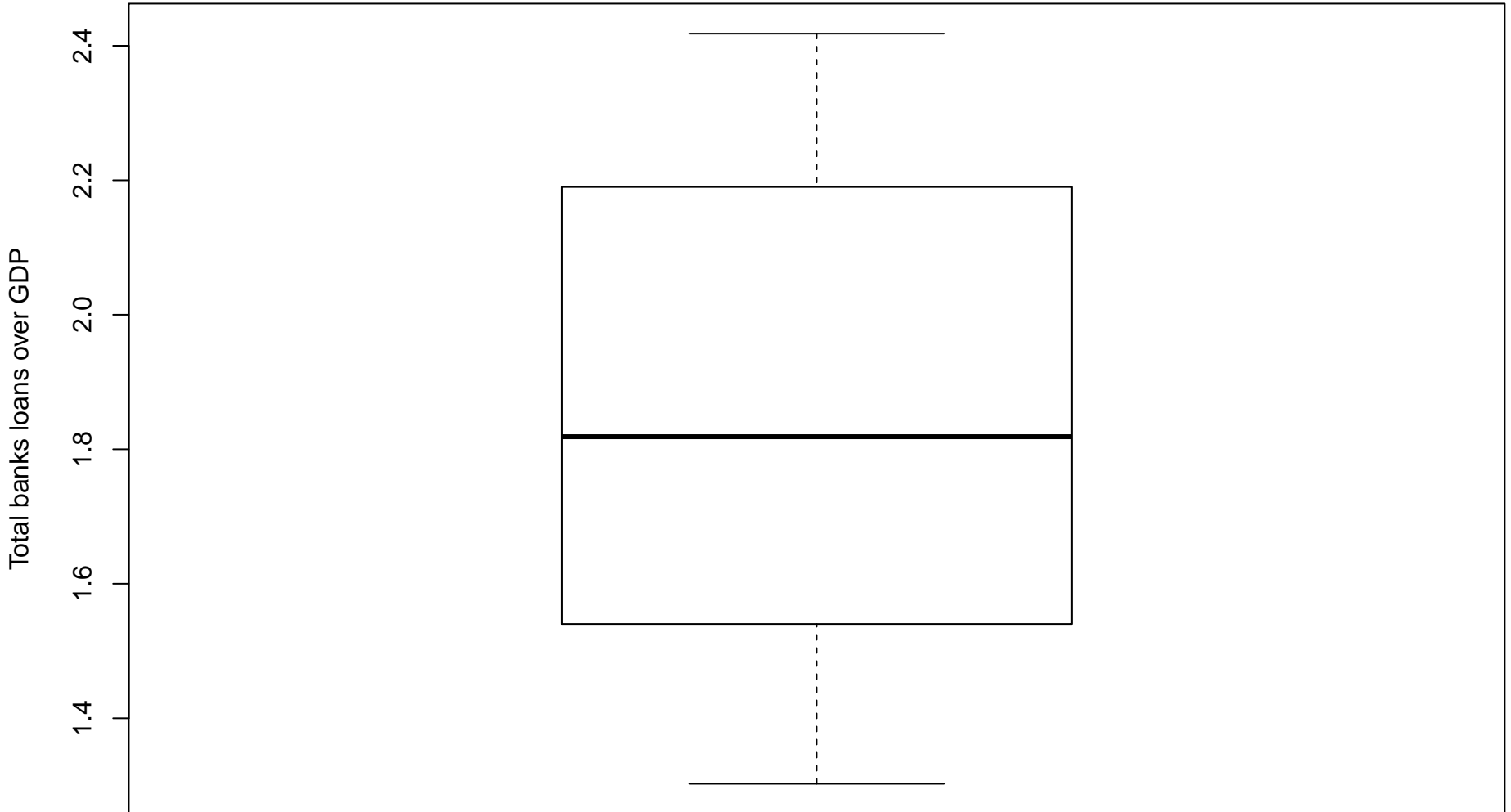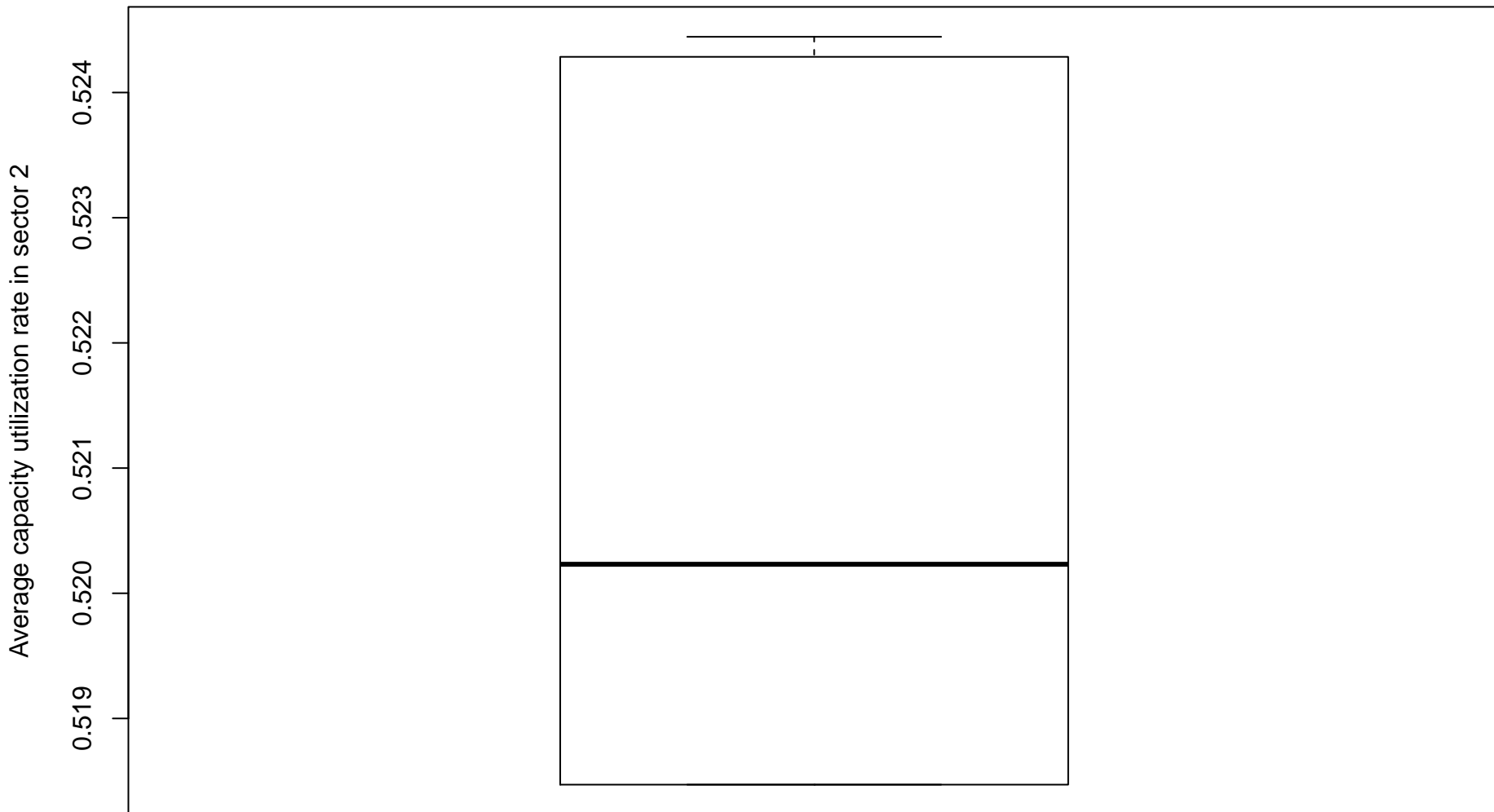Likelihood (probability) of GDP crises
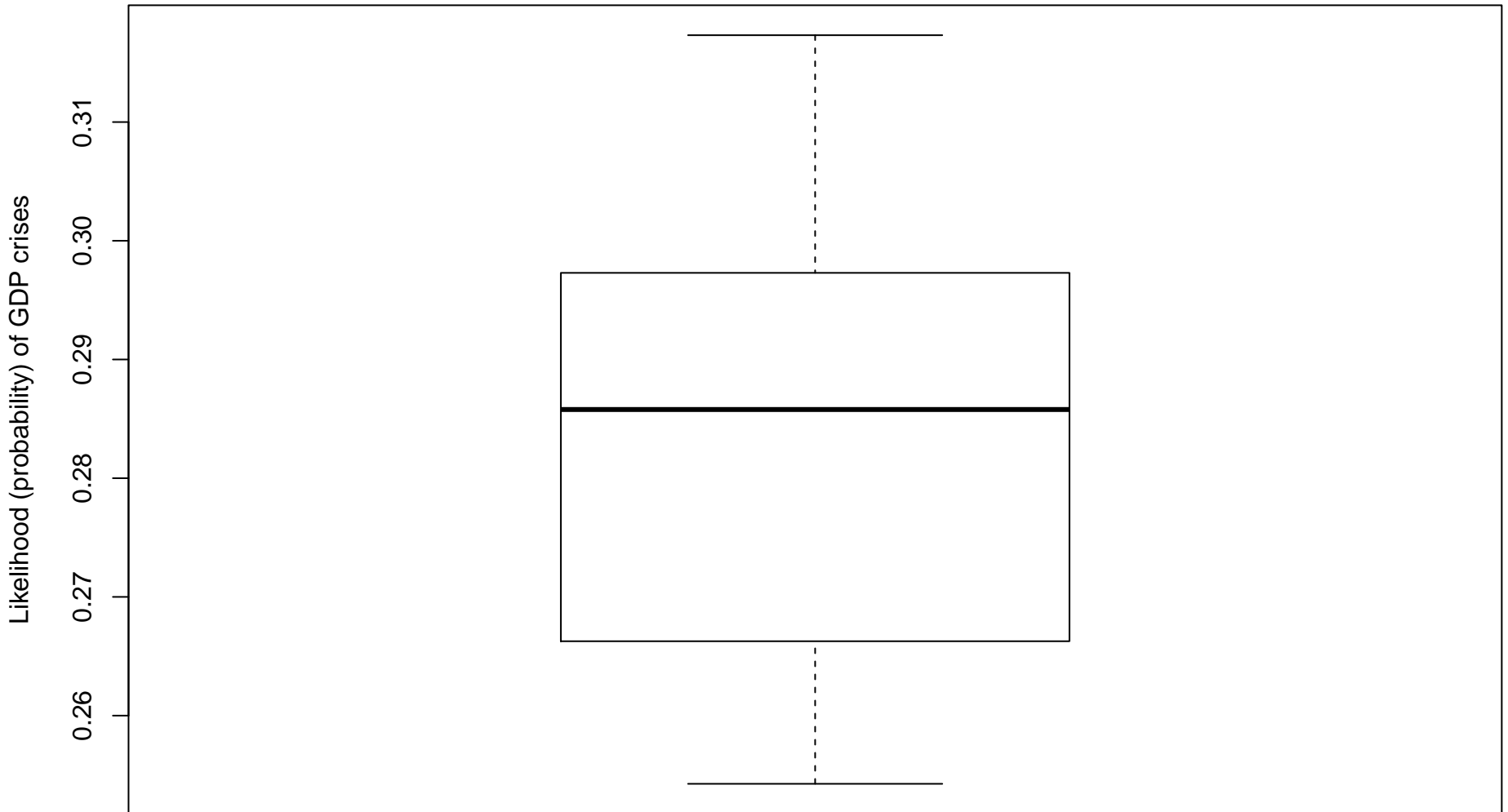
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)

Inflation

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)

Tax

Government tax income over GDP

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)

Government total expenditure

Total government expenditure over GDP

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)

Government deficit

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)

Government debt

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)
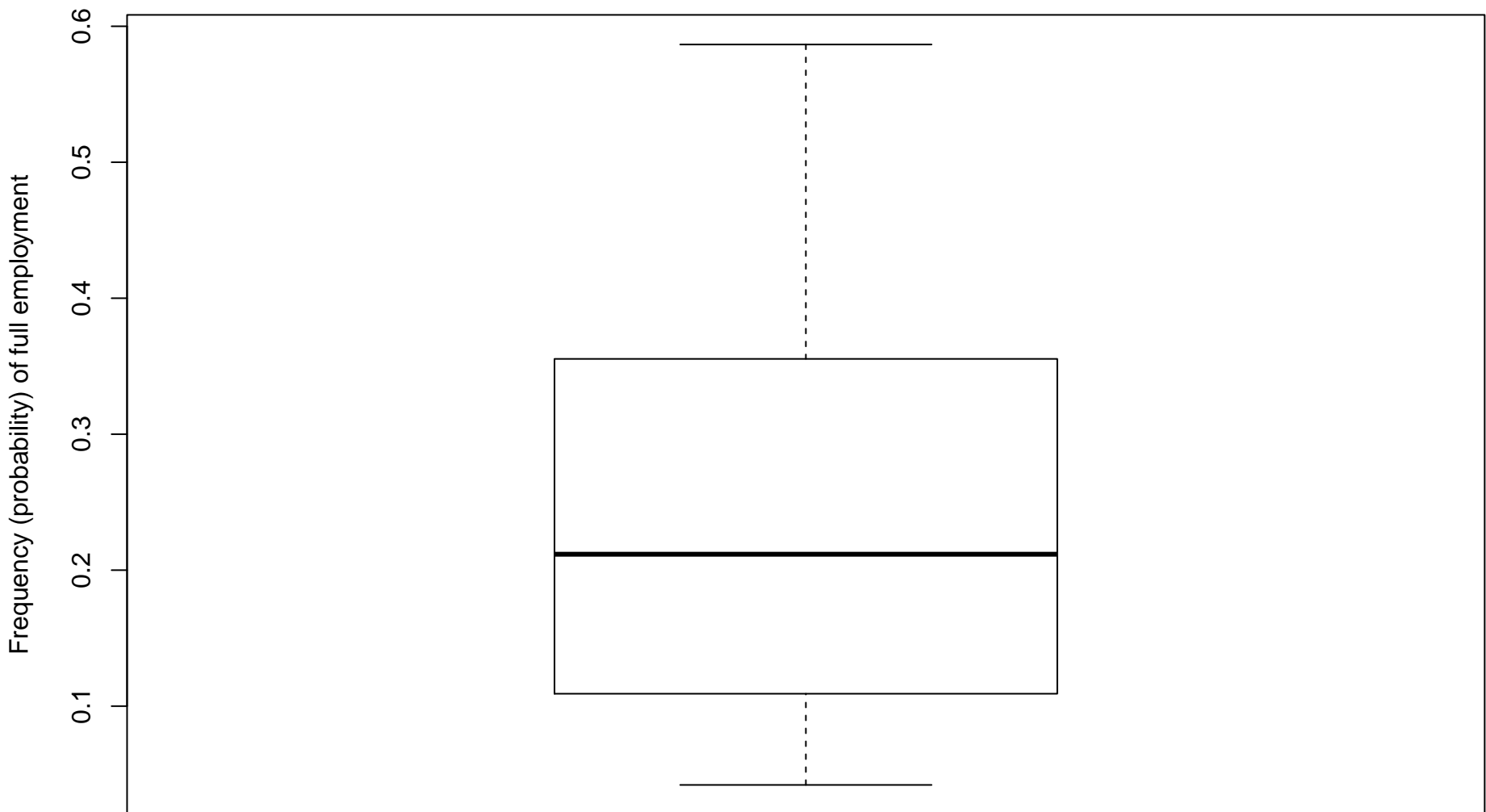
Loans

Total banks loans over GDP

(bar: median / box: 2nd–3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)
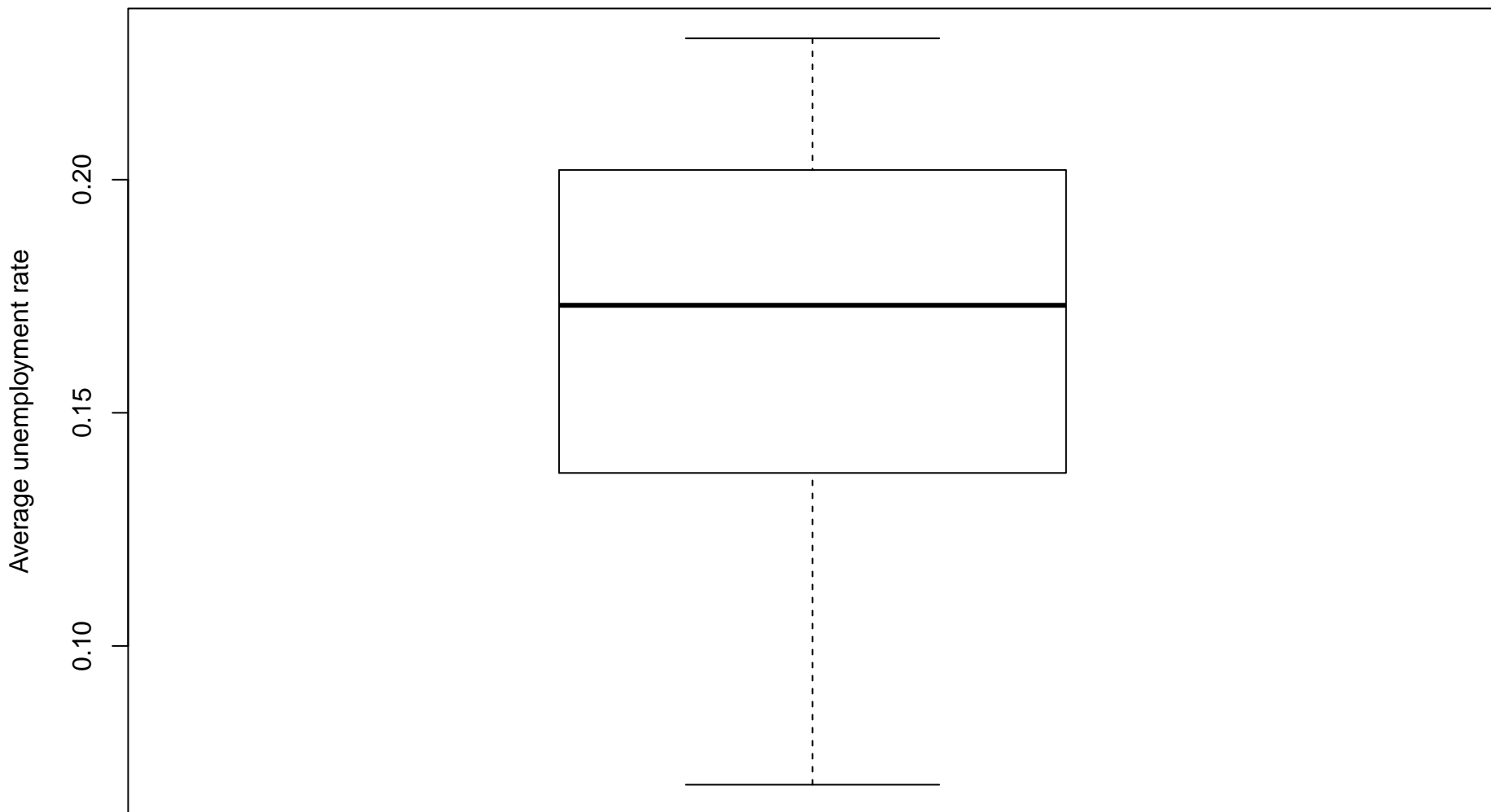
Capacity utilization

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)
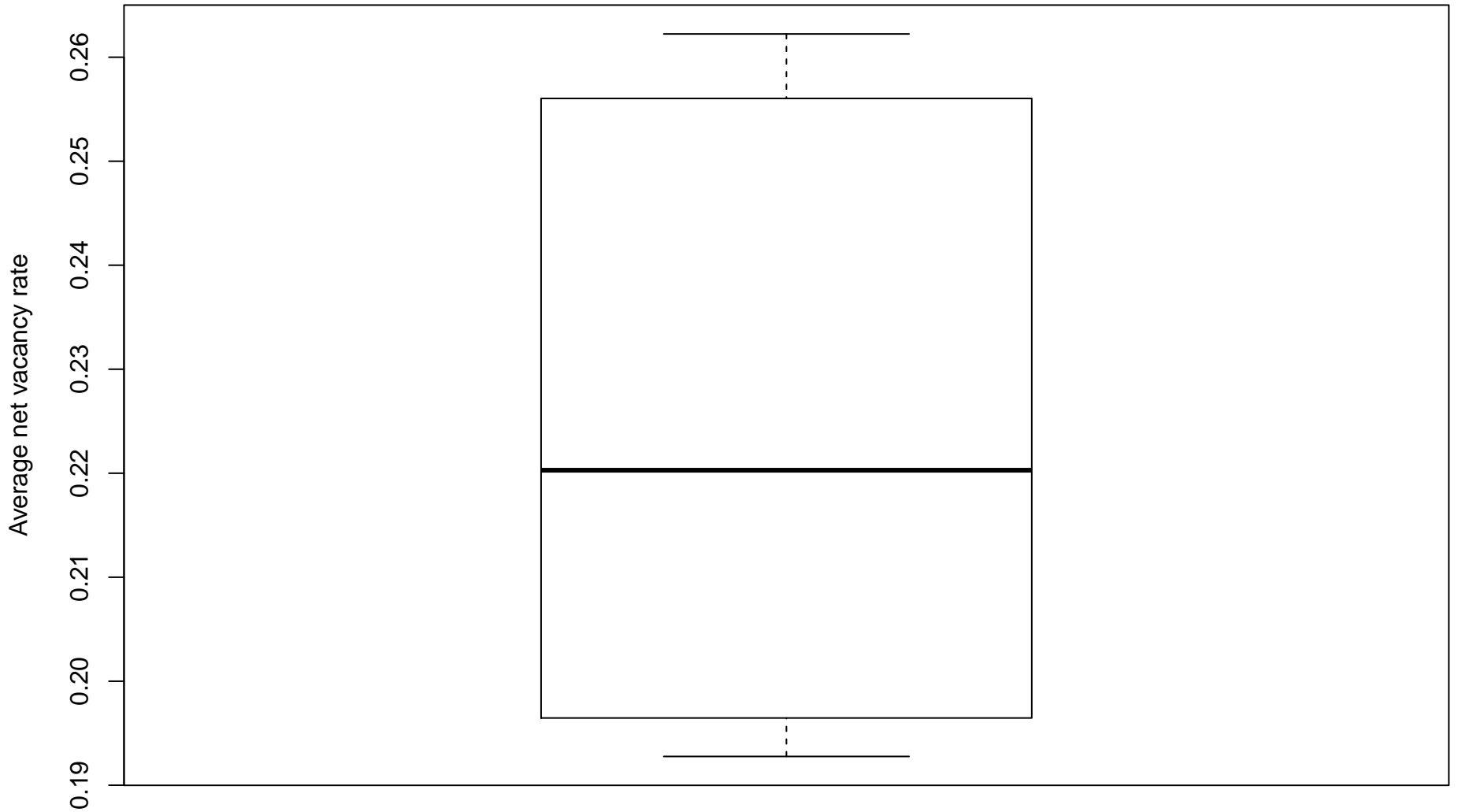
Full employment frequency

Frequency (probability) of full employment

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 − 1000)
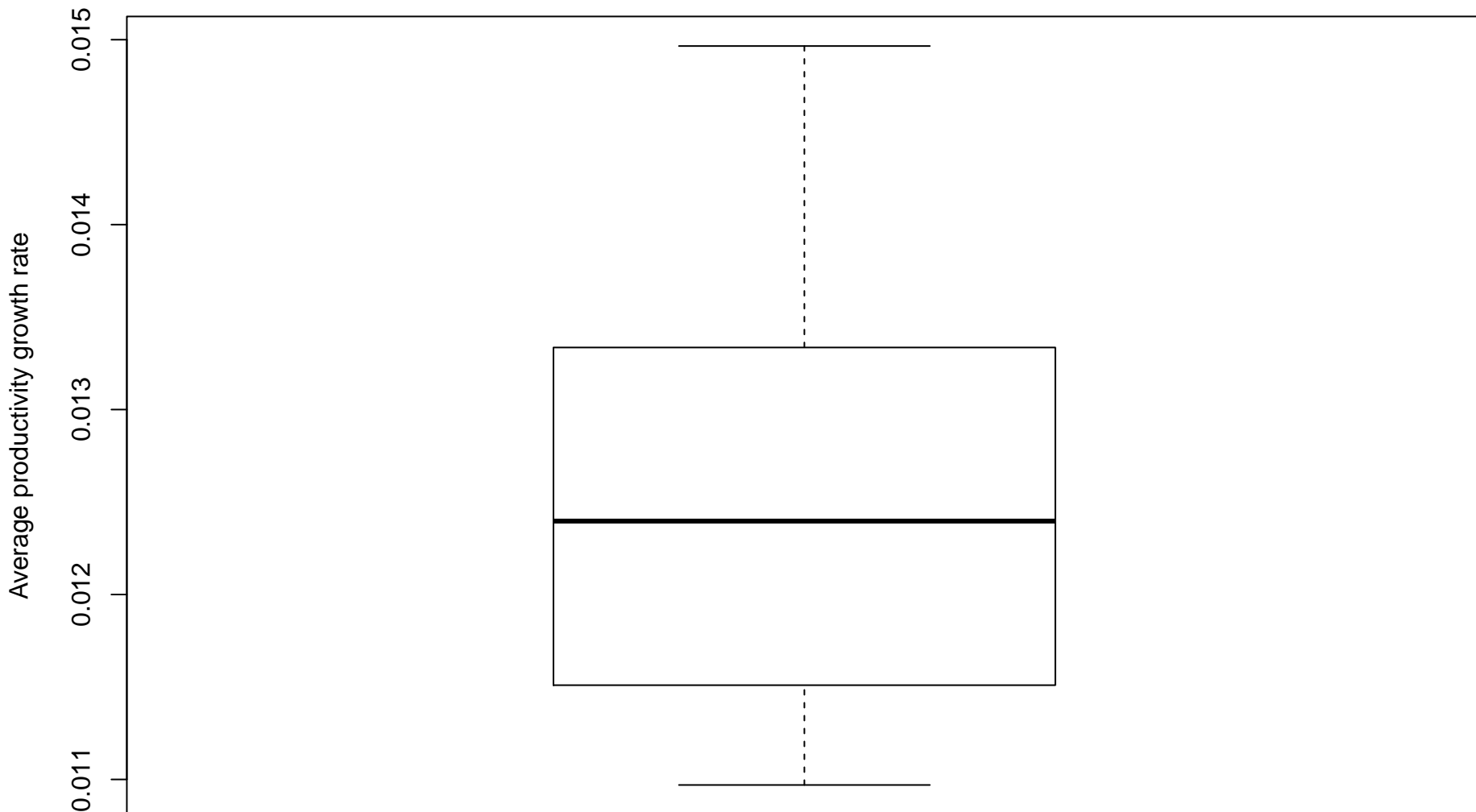
Unemployment

Average unemployment rate

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)

Vacancy
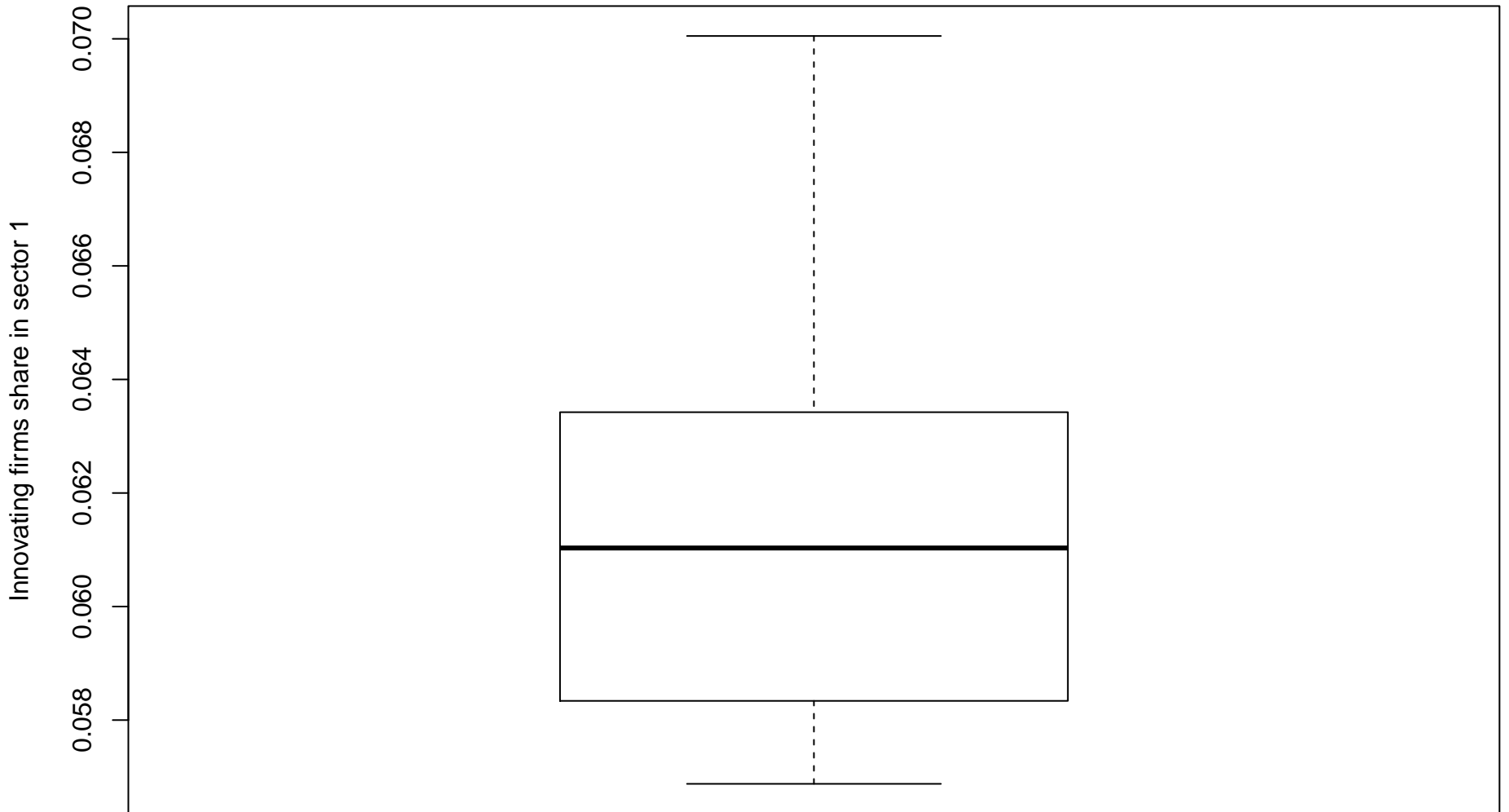
Average net vacancy rate

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)
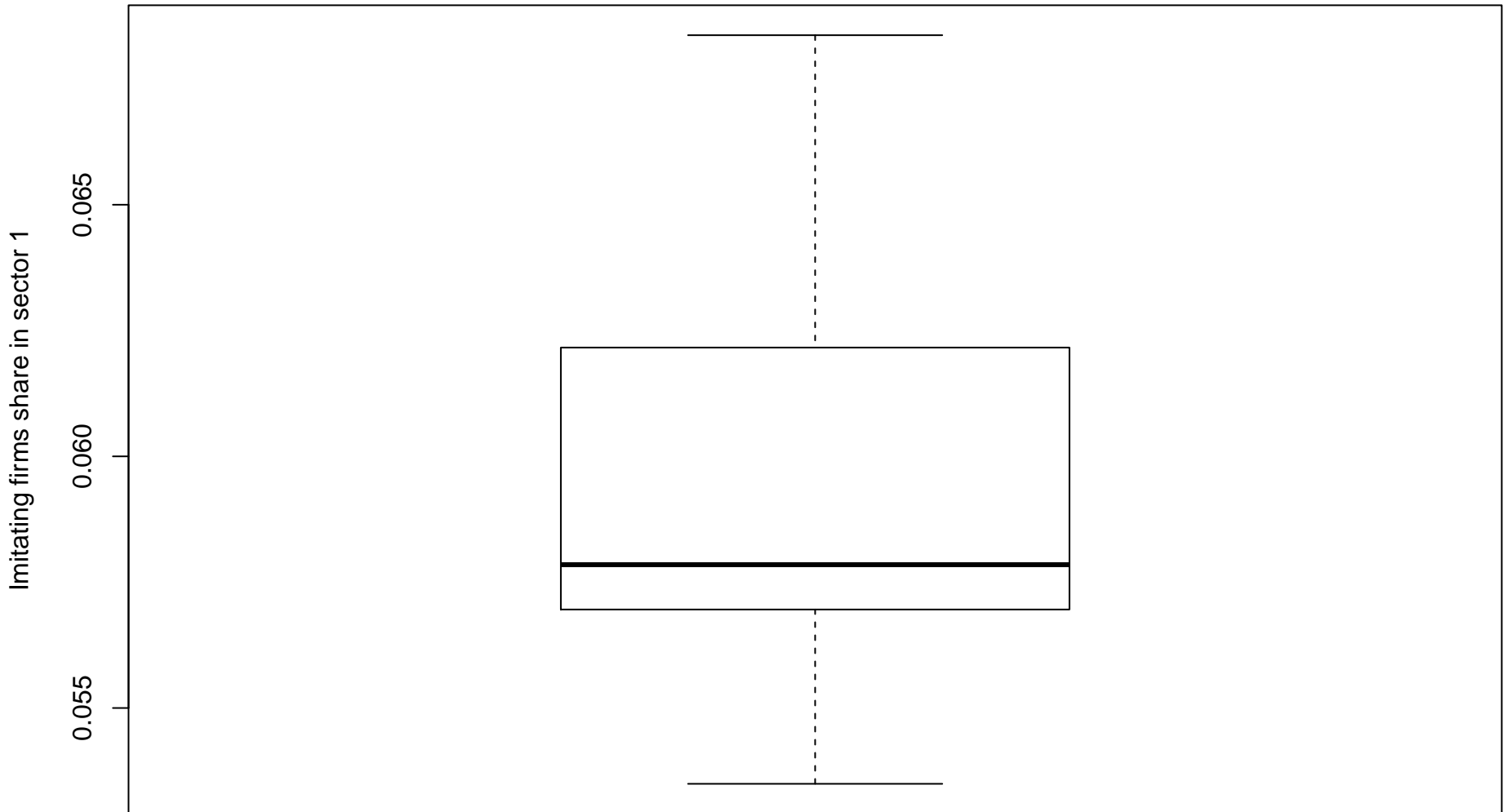
Productivity growth

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)
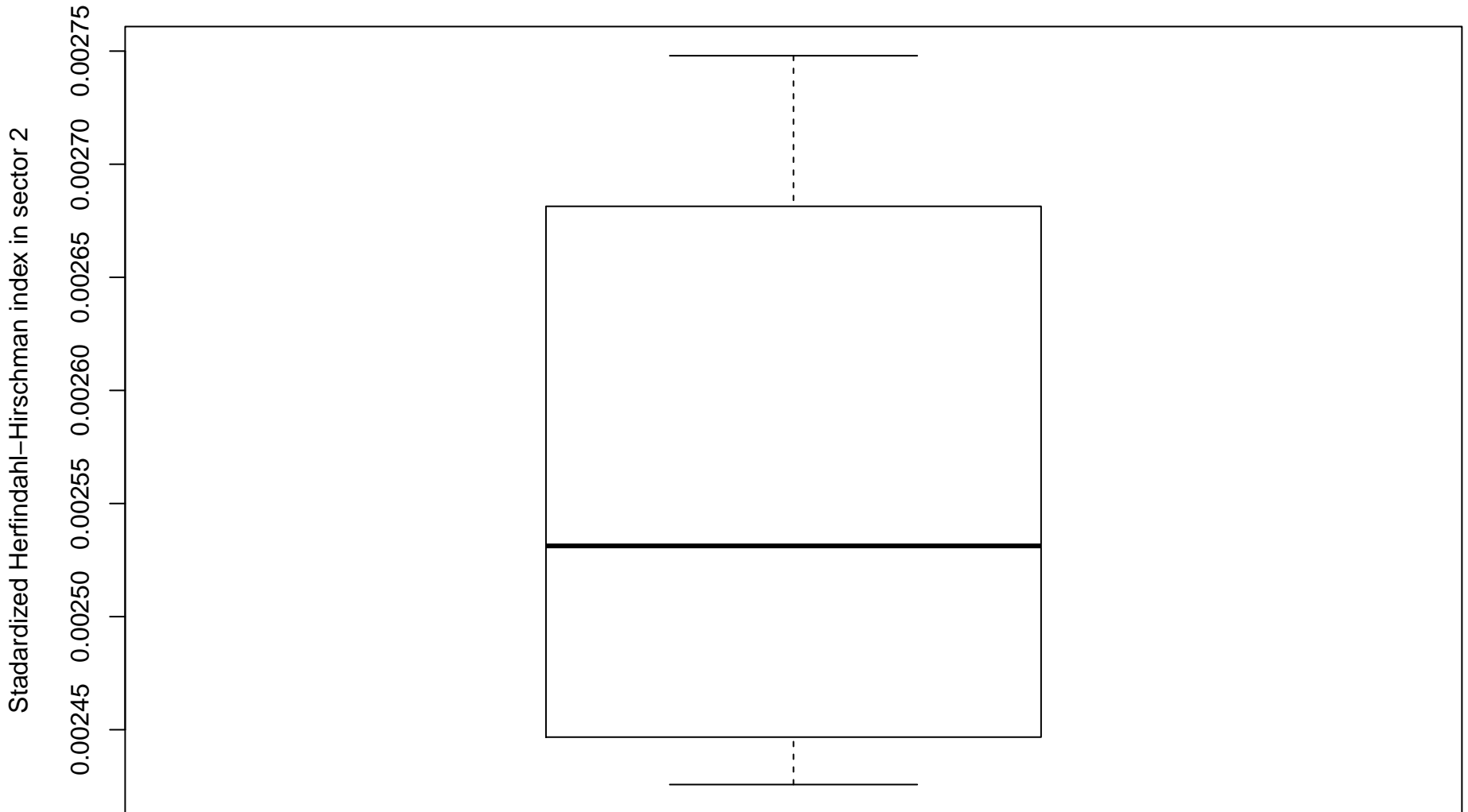
Innovation

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)

Imitation

Imitating firms share in sector 1
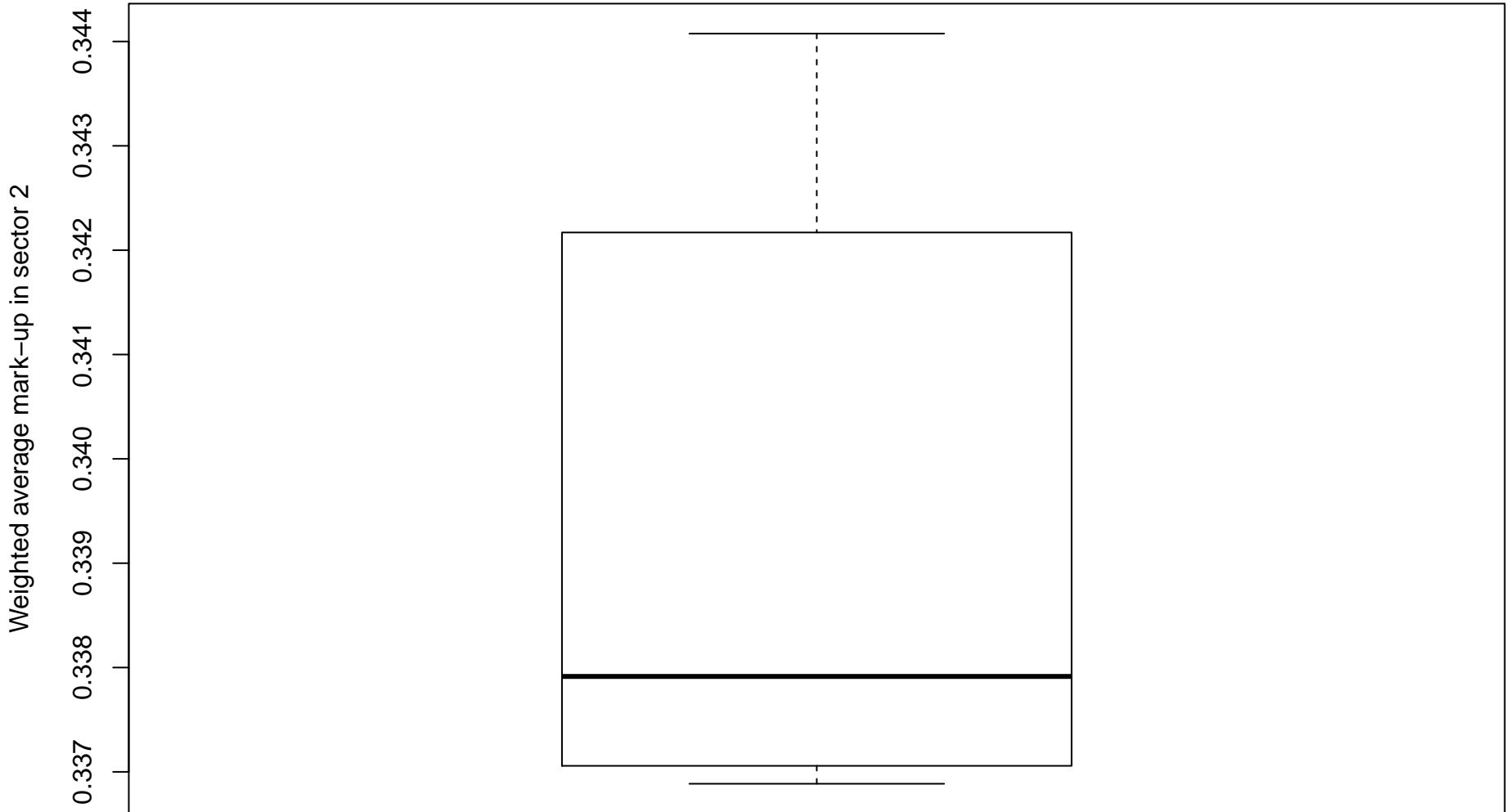
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)

Market concentration

Stadardized Herfindahl−Hirschman index in sector 2

(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 2 − 1000)

Mark–ups

Weighted average mark–up in sector 2

(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 2 – 1000)

Monte Carlo descriptive statistics (all experiments)

	Avg[1]	SD[1]	Min[1]	Max[1]
GDP growth	0.01293	0.001293	0.01148	0.01547
Volatility of GDP growth	0.09539	0.004292	0.08738	0.1039
Likelihood of GDP crises	0.2778	0.03697	0.1882	0.3173
Inflation	0.001286	0.0004124	0.0007093	0.002005
Tax	0	0	0	0
Government total expenditure	0.07118	0.02406	0.02805	0.09978
Government deficit	0.3256	0.1474	0.07193	0.5379
Government debt	25.76	13.08	4.46	46.68
Loans	2.87	3.372	1.303	12.41
Capacity utilization	0.5036	0.05003	0.3627	0.5244
Full employment frequency	0.2481	0.1816	0.04204	0.5866
Unemployment	0.1625	0.0544	0.07024	0.2303
Vacancy	0.2539	0.1032	0.1928	0.538
Productivity growth	0.01251	0.001224	0.01097	0.01497
Innovation	0.06187	0.003958	0.05688	0.07005
Imitation	0.05951	0.004379	0.05349	0.06837
Market concentration	0.002469	0.0003622	0.001497	0.002748
Mark−ups	0.3393	0.002917	0.3369	0.3441

Experiments: [1] Benchmark
(numbers in brackets indicate the experiment number / MC runs = 10 / period = 2 – 1000)