GDP, investment and consumption (all experiments)

Legend (left): Free entry

Legend (right):
- GDP
- Investment
- Consumption

Y-axis: Logs

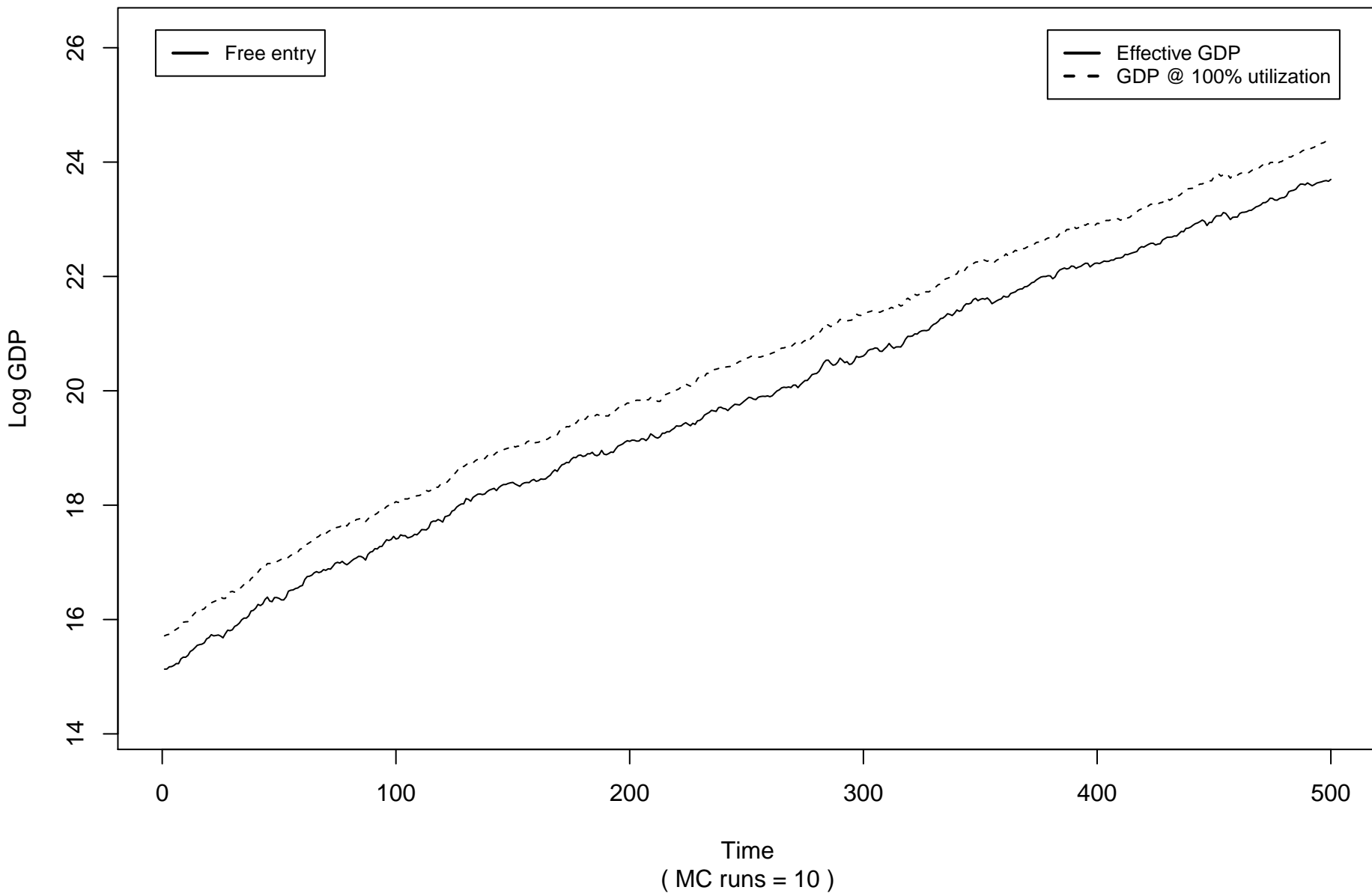X-axis: Time
(MC runs = 10)
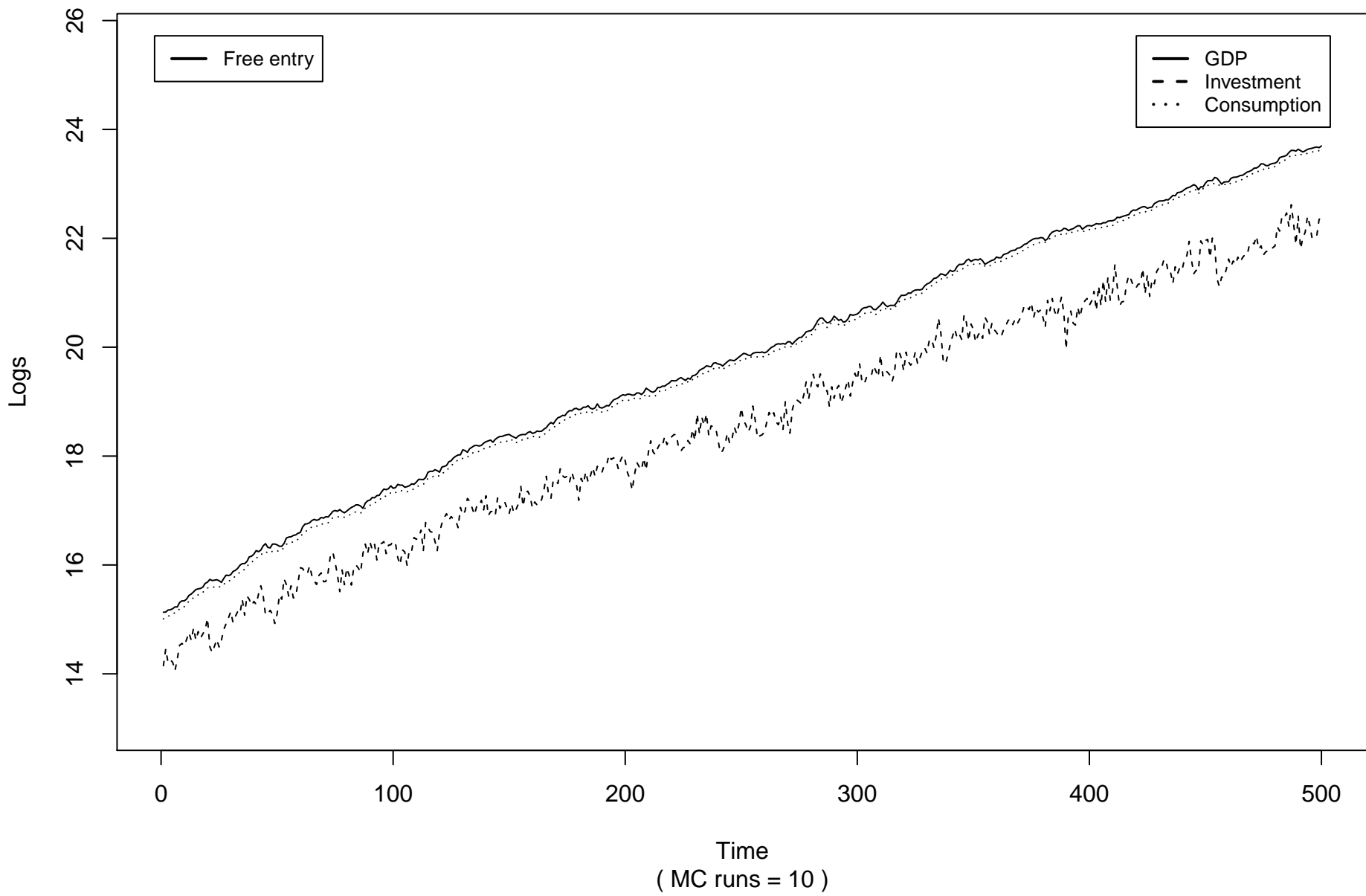
GDP, investment and consumption (Free entry)

Logs

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

Legend:
- GDP
- Investment
- Consumption

GDP (all experiments)

Log GDP

Time
(MC runs = 10)

GDP (Free entry)

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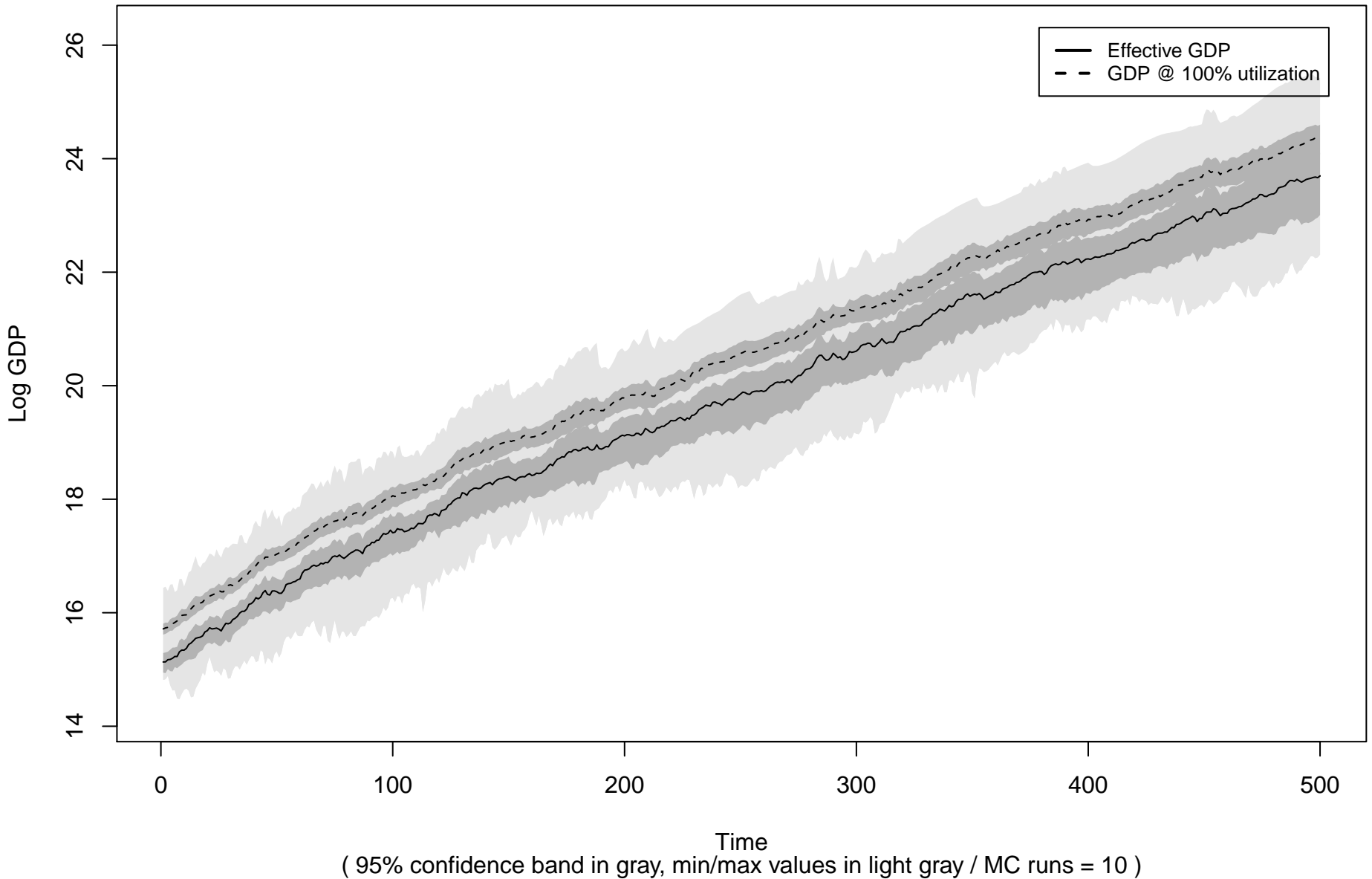
Government income and expenditure on GDP (all experiments)

Legend: Free entry · Tax · Total expenditure

Log government tax income and expenditure over GDP

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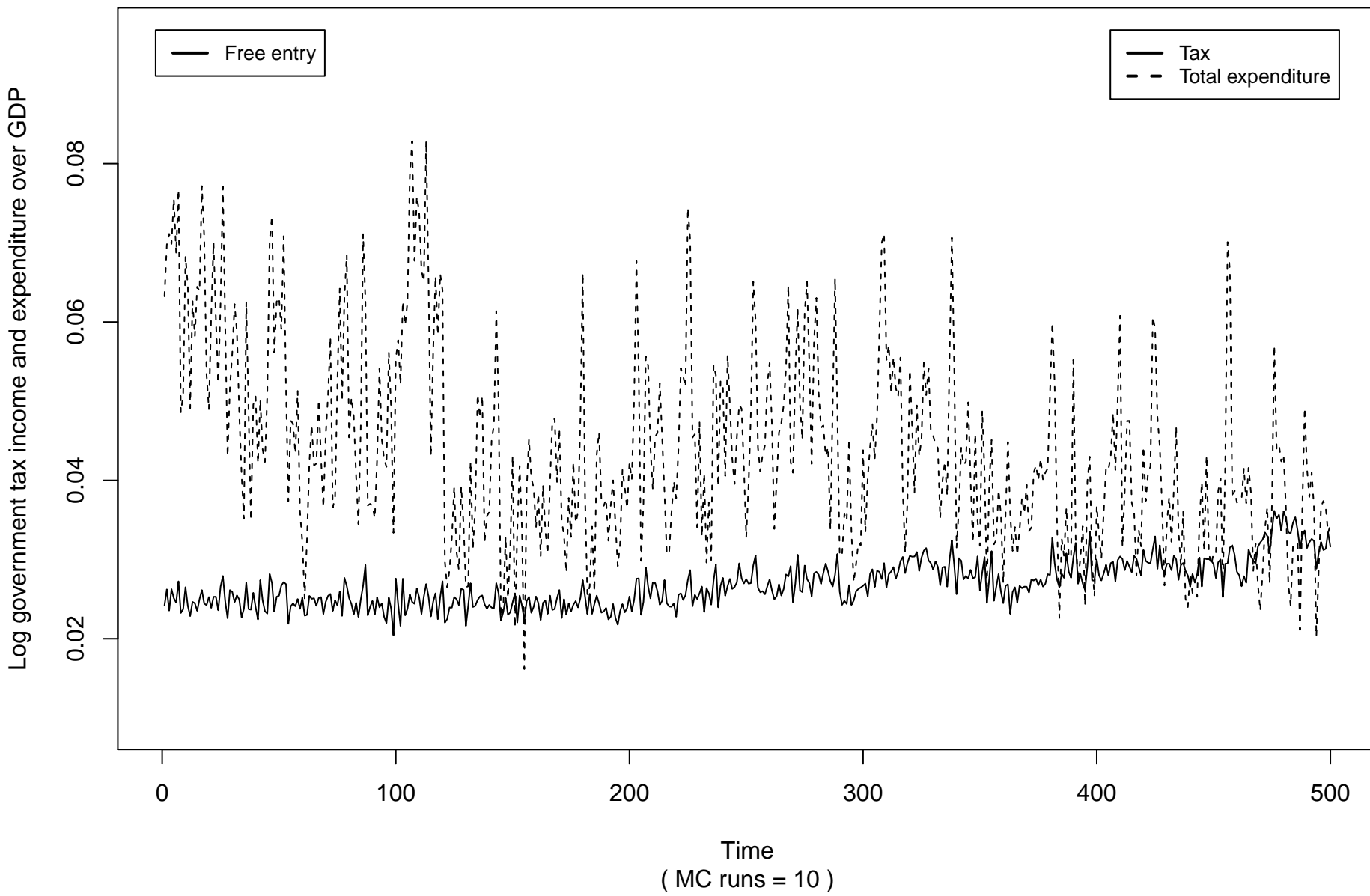
Government income and expenditure on GDP (Free entry)

Log government tax income and expenditure over GDP

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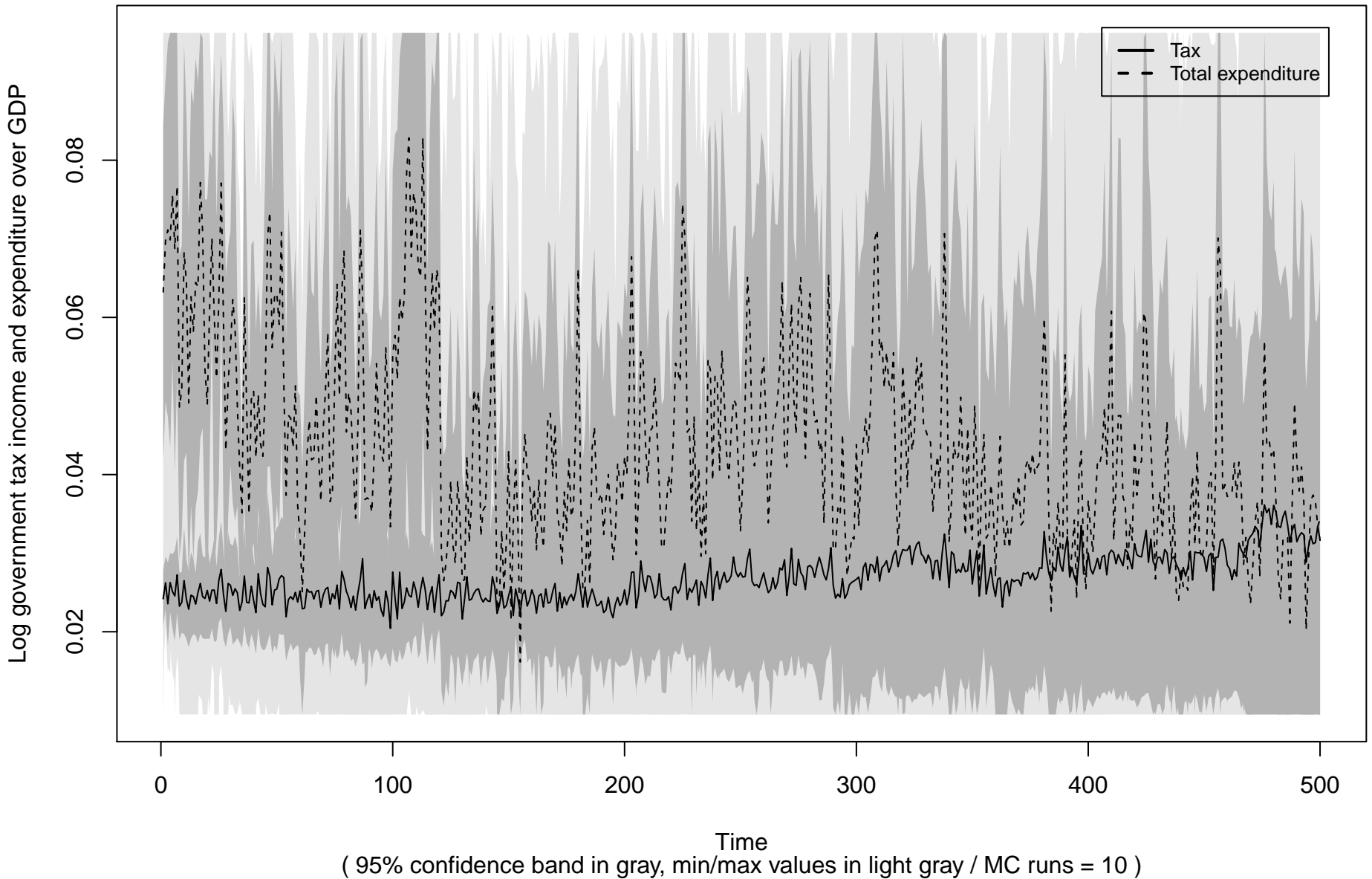
Government deficit on GDP (all experiments)

Government deficit over GDP

Free entry

Time
(MC runs = 10)
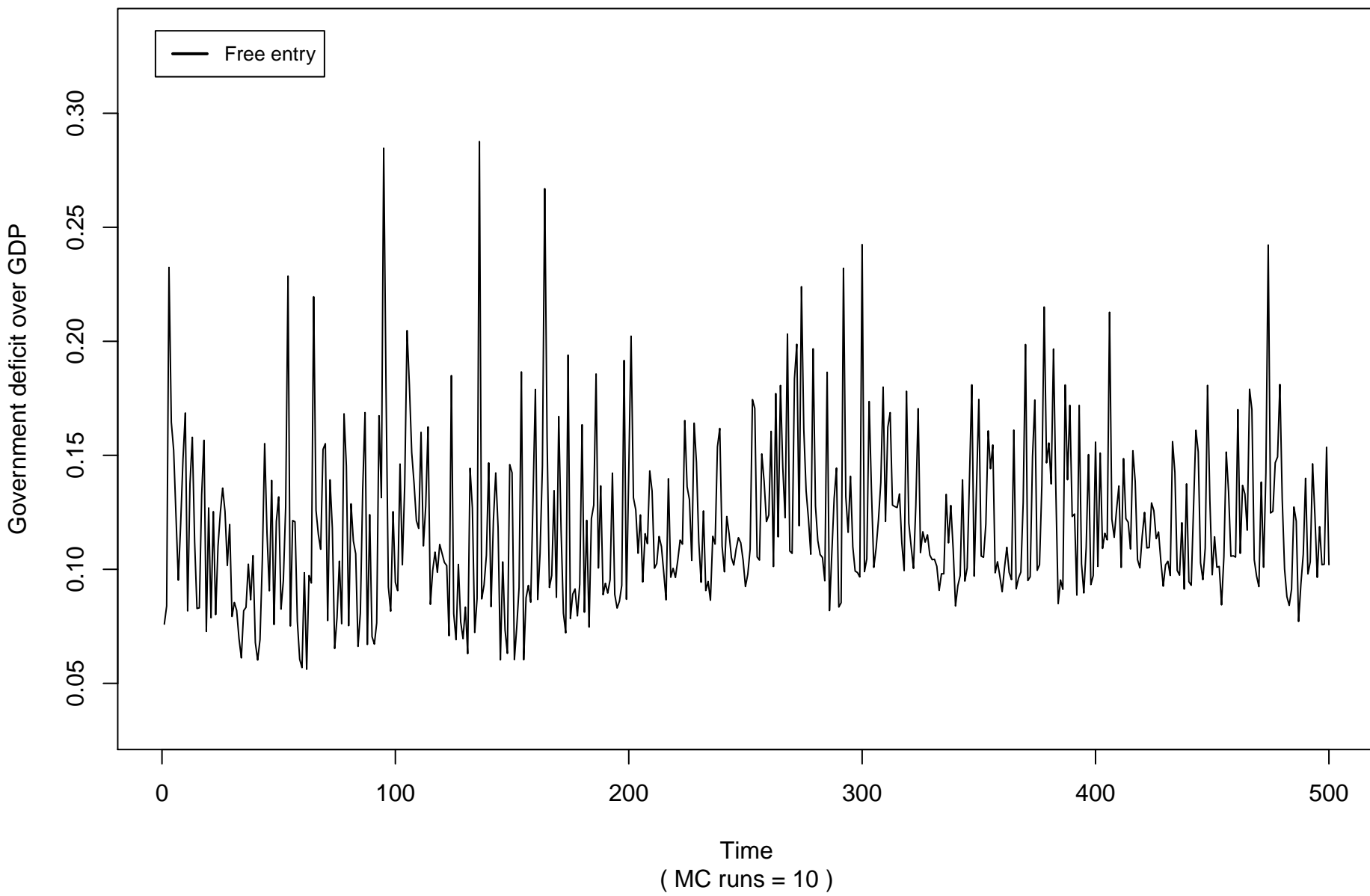
Government deficit on GDP (Free entry)

Government deficit over GDP

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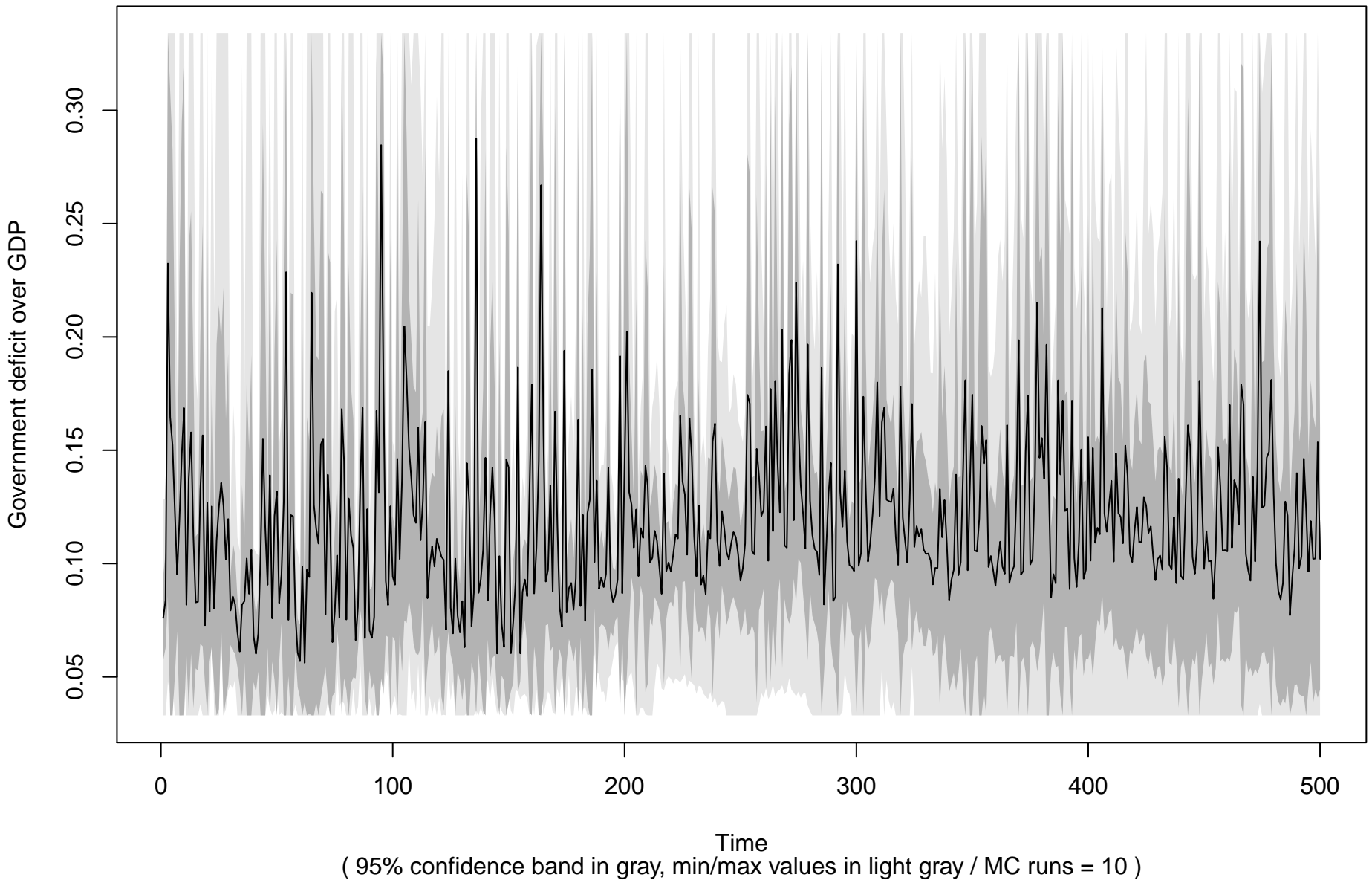
Government debt on GDP (all experiments)

Government debt over GDP

Free entry

Time
(MC runs = 10)
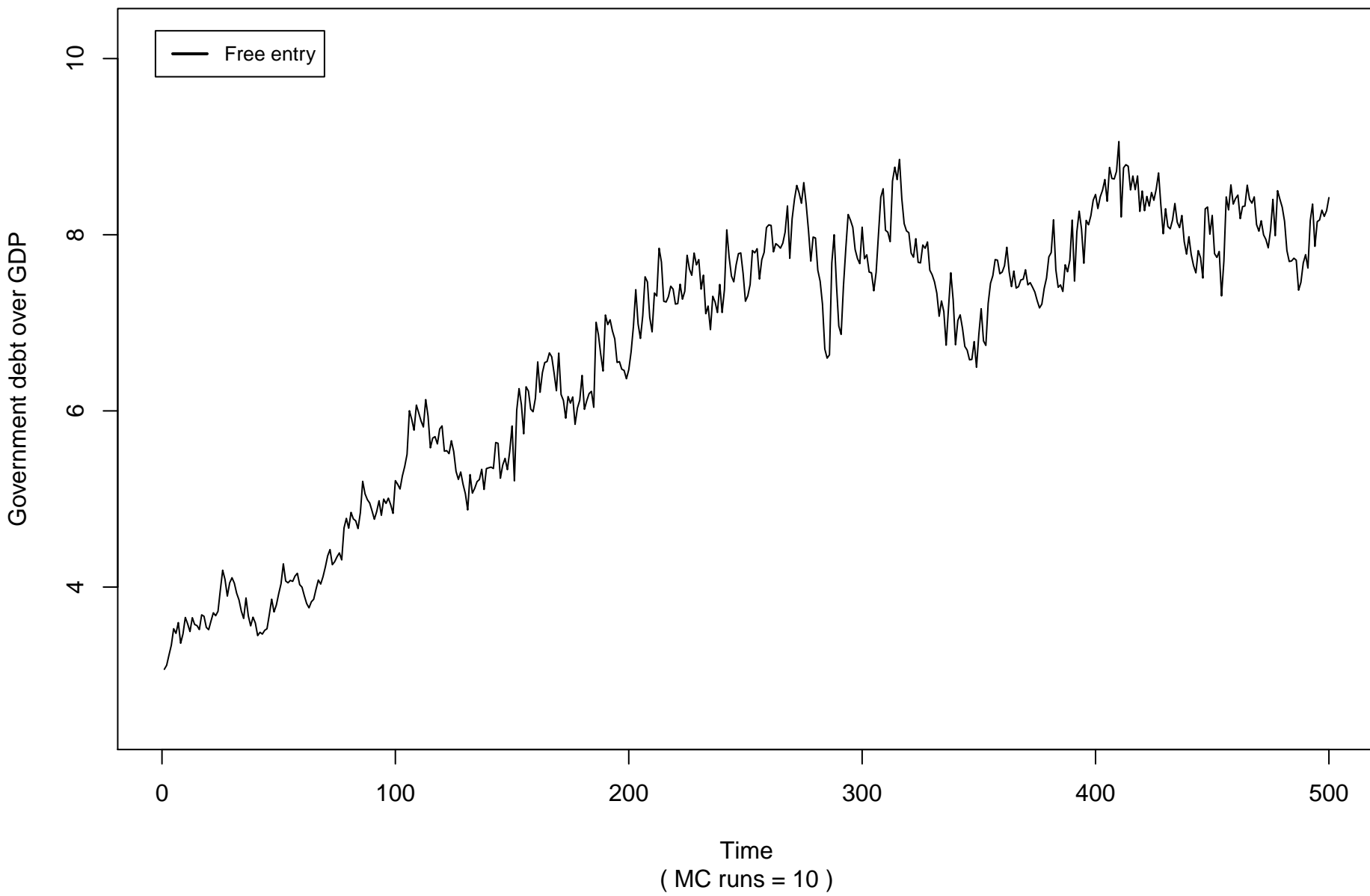
Government debt on GDP (Free entry)

Time
(95% confidence band in gray, min/max values in light gray / MC runs = 10)
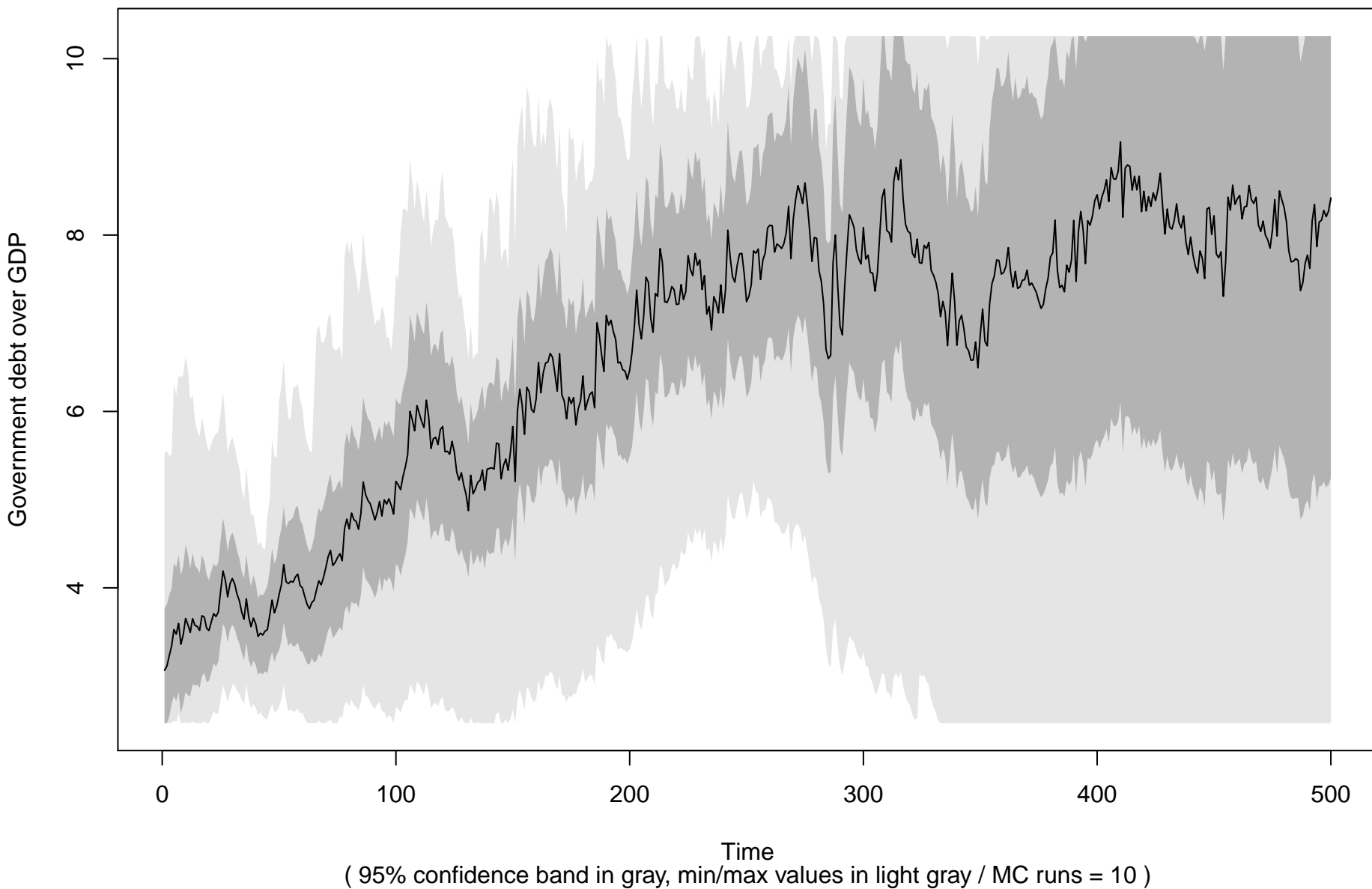
Total credit supply and loans on GDP (all experiments)

Free entry

Total credit
Loans

Total banks credit supply and firms loans debt over GDP

Time
(MC runs = 10)
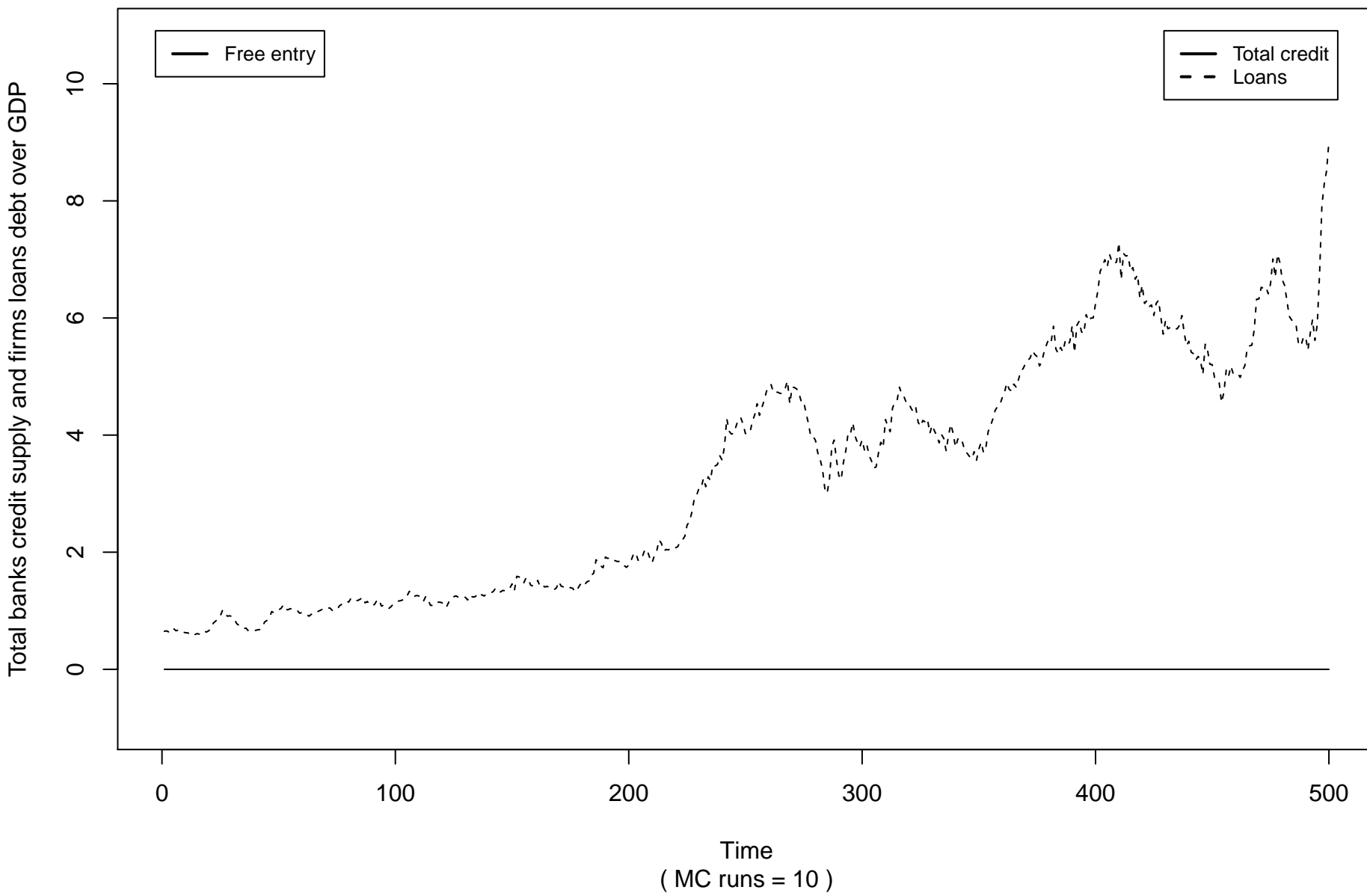
Total credit supply and loans on GDP (Free entry)

Total banks credit supply and firms loans debt over GDP

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

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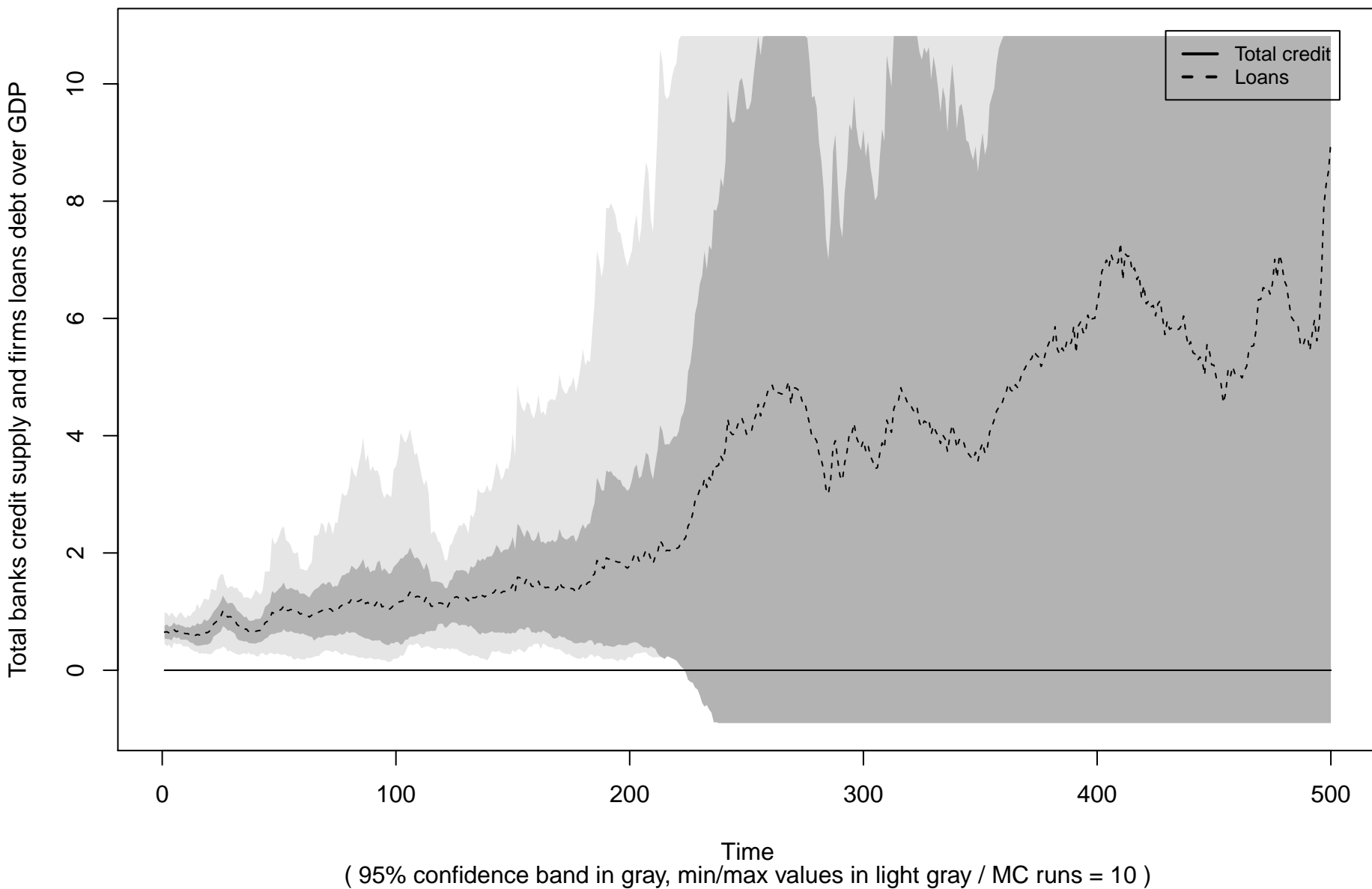
Unemployment and vacancy rates (all experiments)

Free entry

Unemployment
Vacancy

Rate

Time
(MC runs = 10)
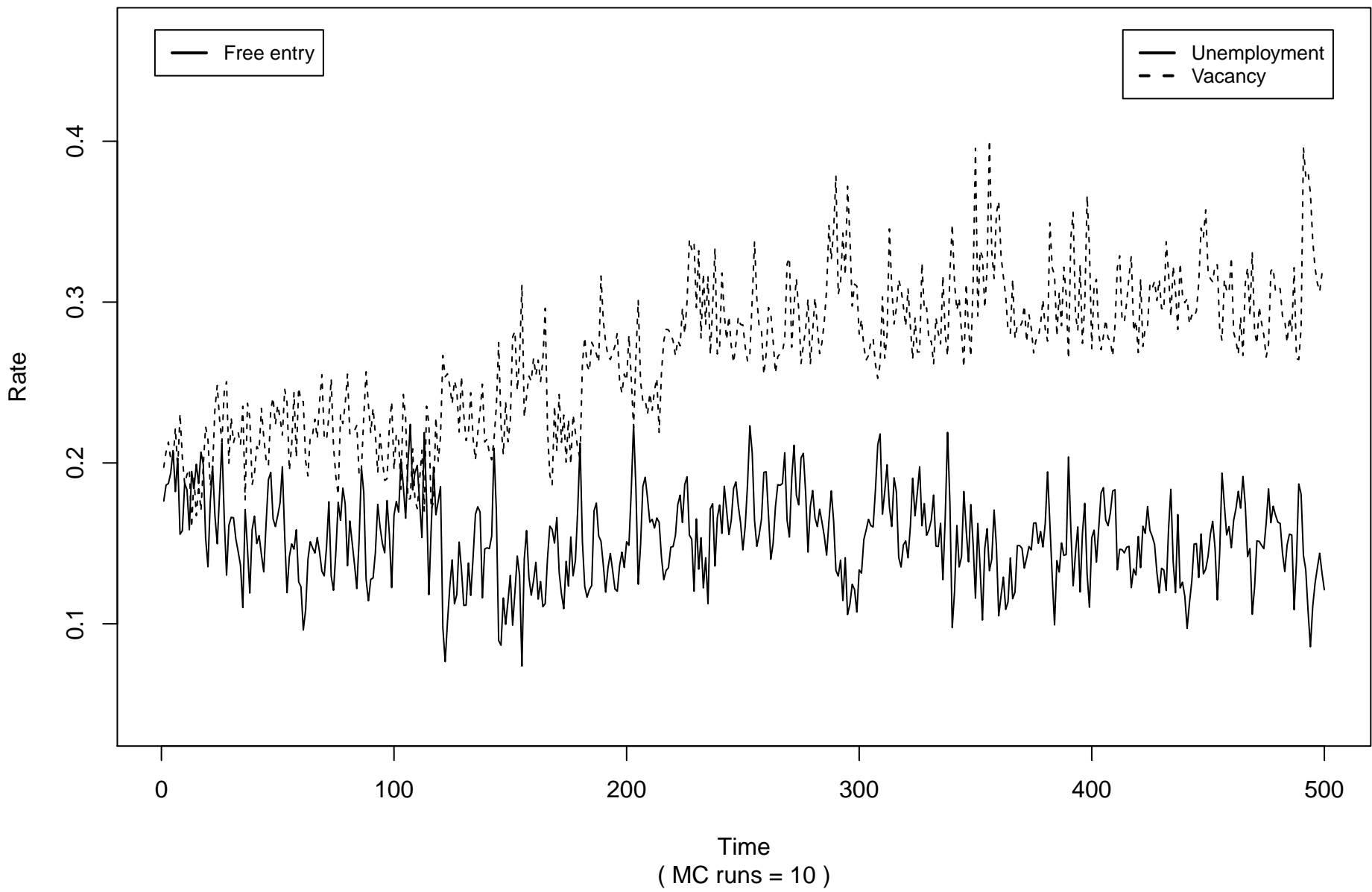
Unemployment and vacancy rates (Free entry)

Rate

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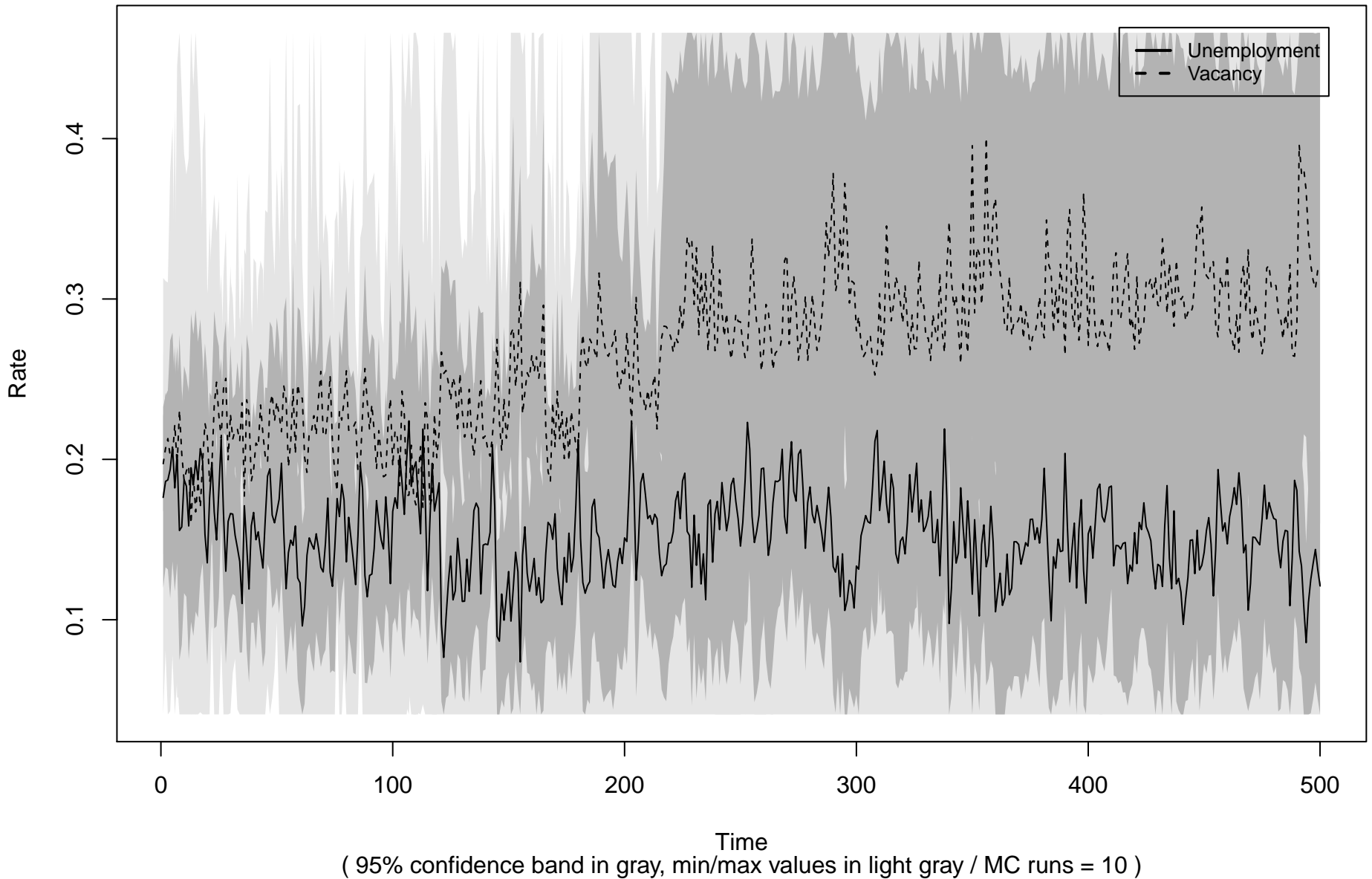
Real wages average (all experiments)

Log wages

Time
(MC runs = 10)
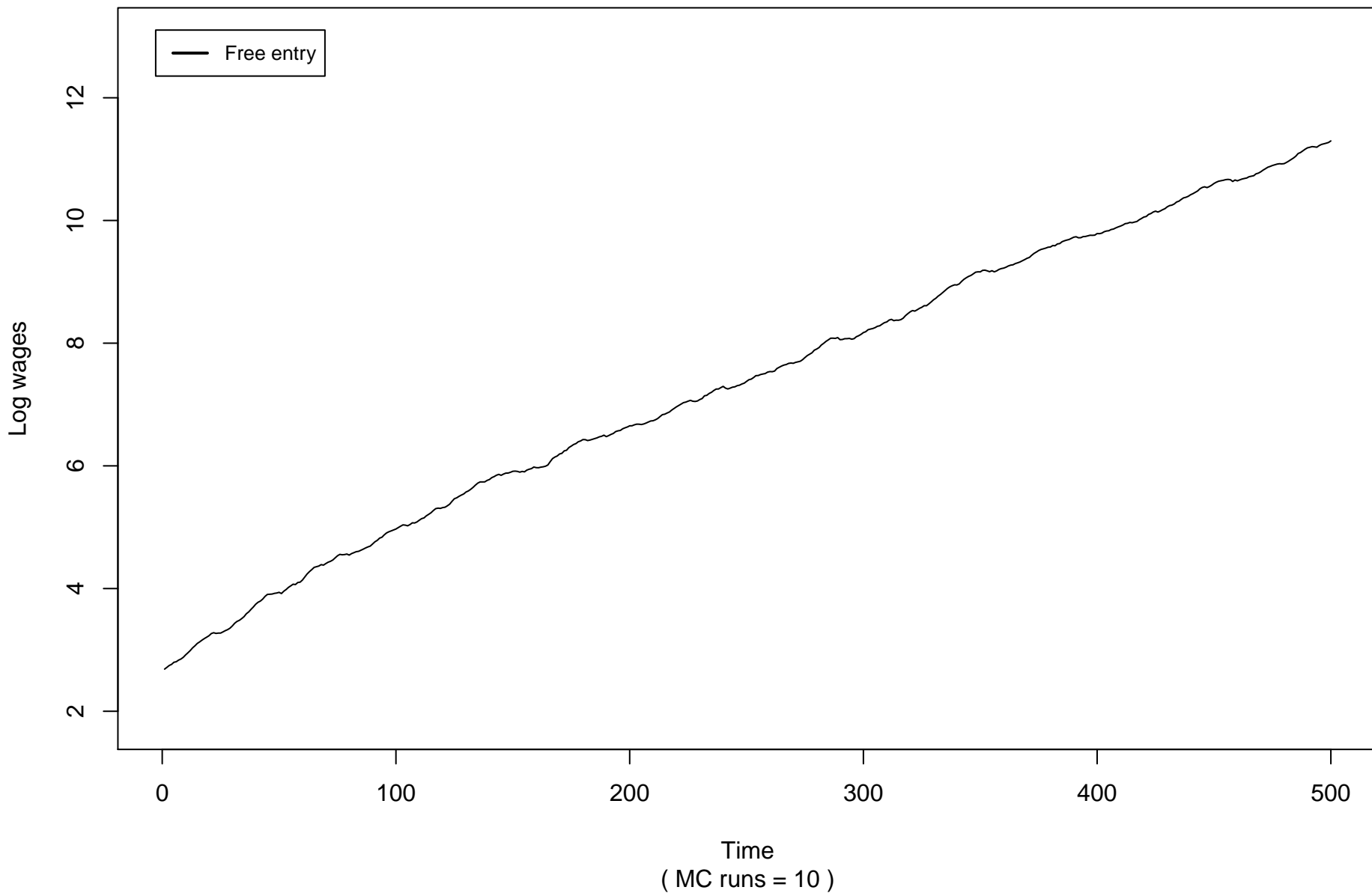
Free entry

Real wages average (Free entry)

Log wages

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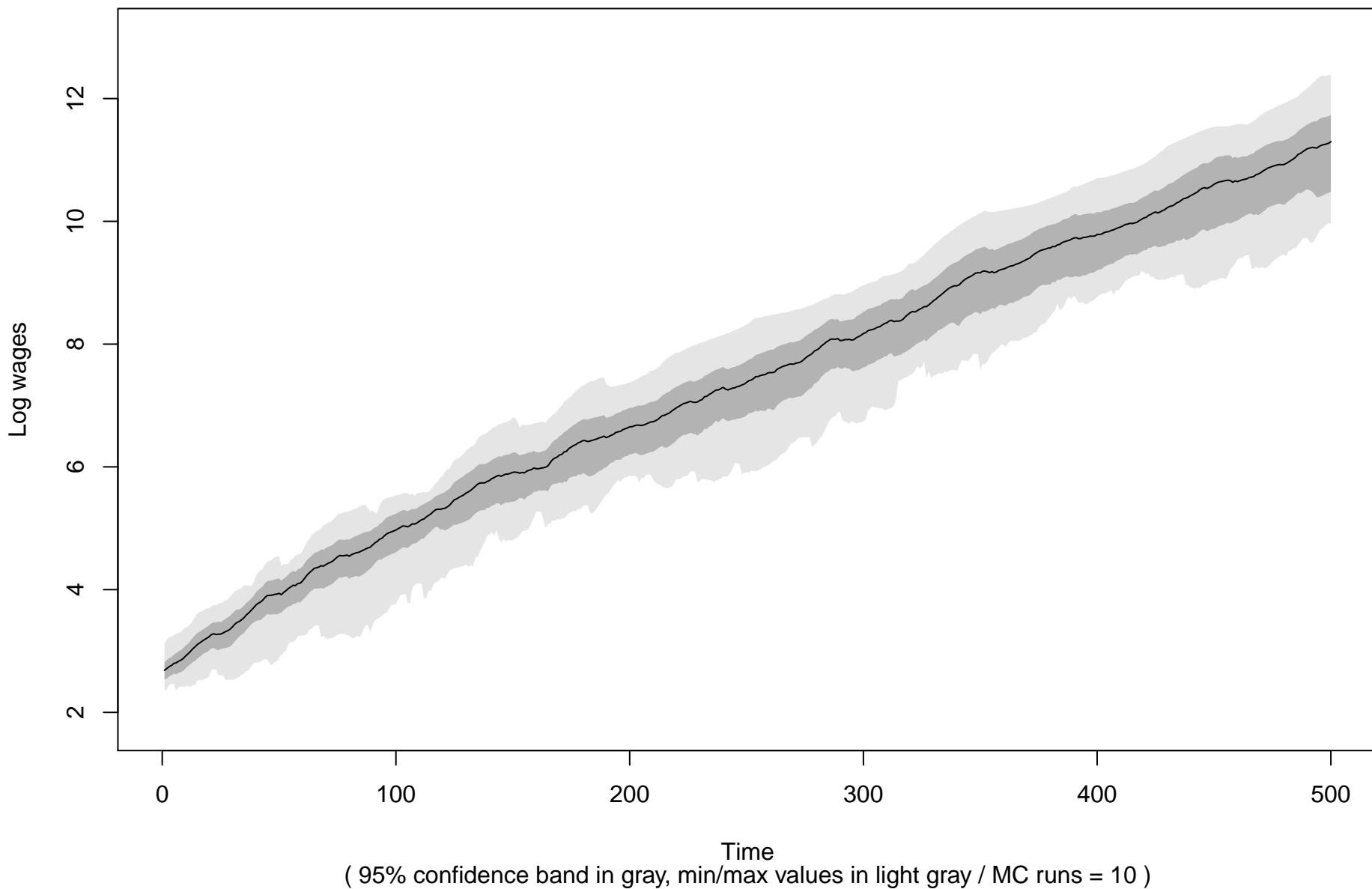
Wage share (all experiments)

Total real wages on GDP

Time
(MC runs = 10)

Wage share (Free entry)

Total real wages on GDP

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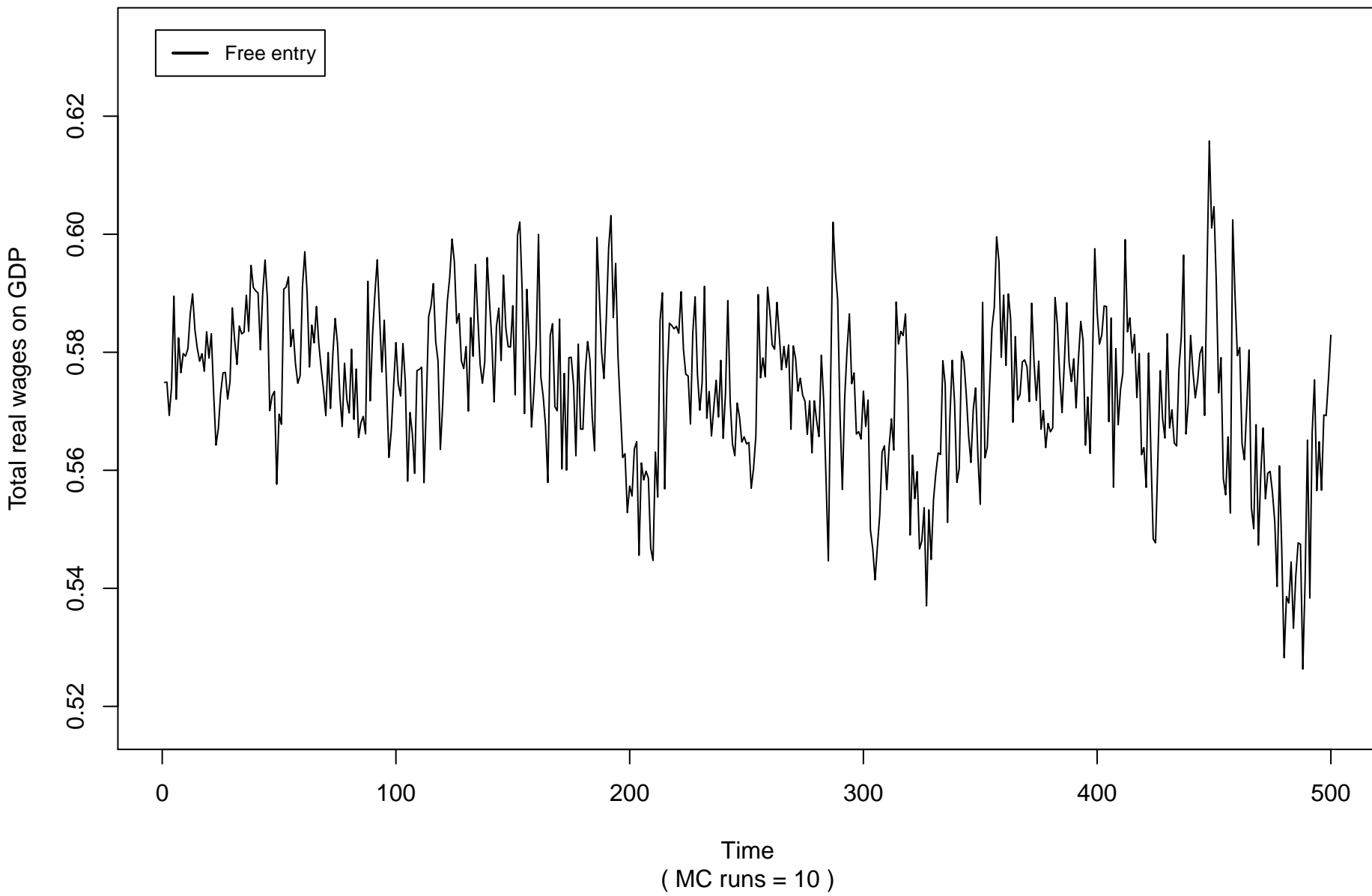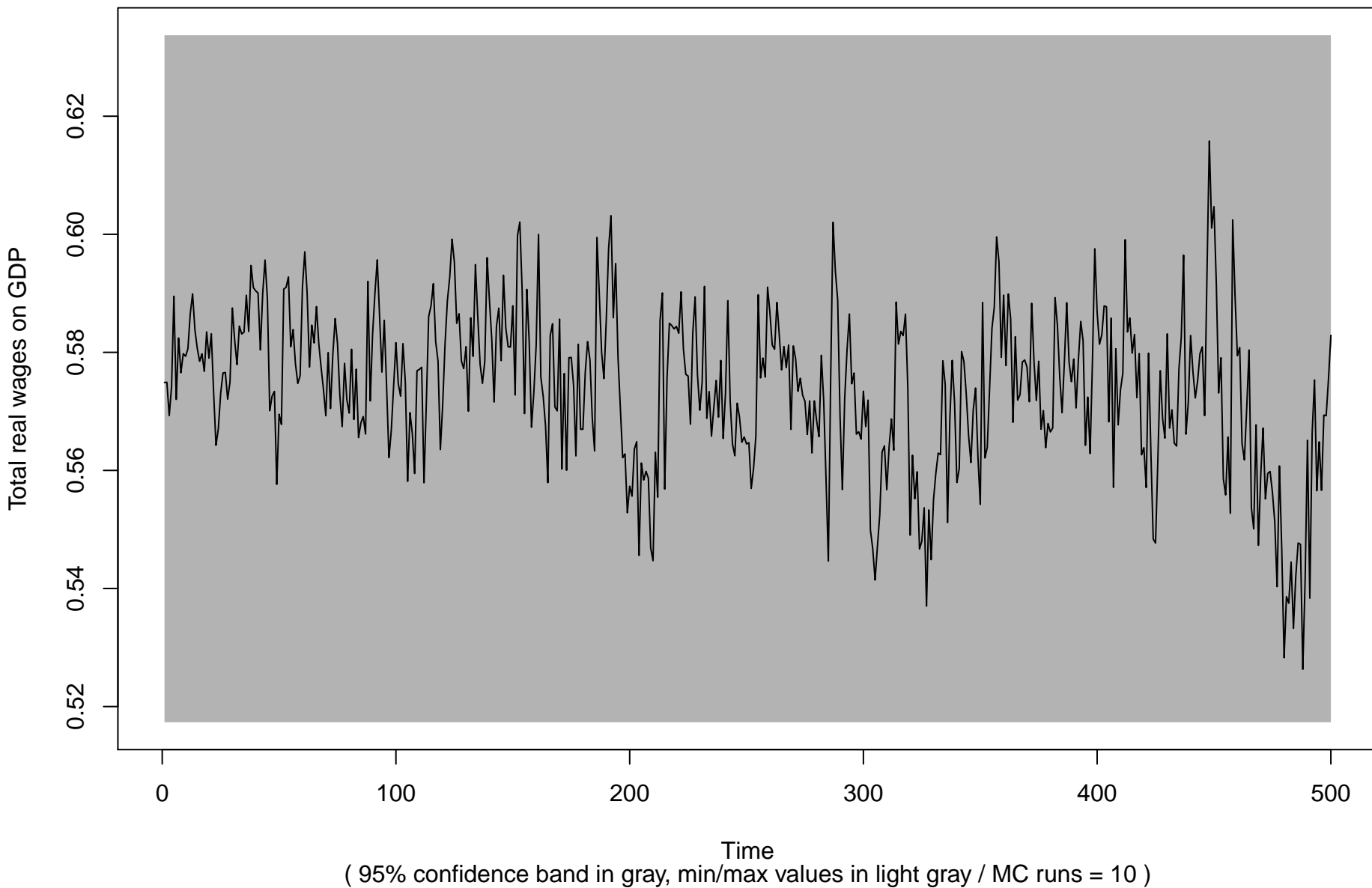
Innovation and imitation (all experiments)

Free entry

Innovation
Imitation

Share of innovating and imitating firms

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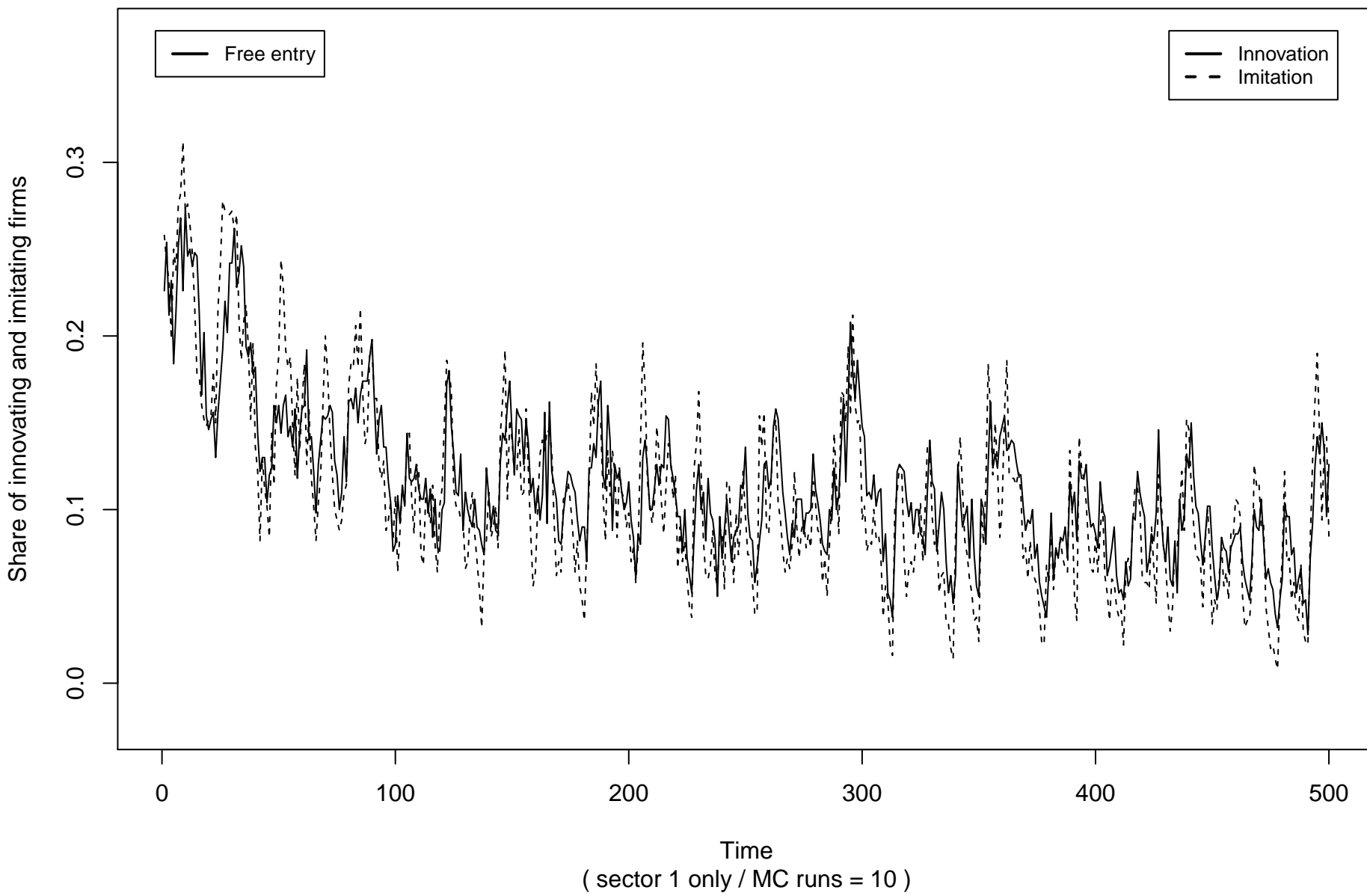
Innovation and imitation (Free entry)

Share of innovating and imitating firms

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

Legend:
- Innovation
- Imitation
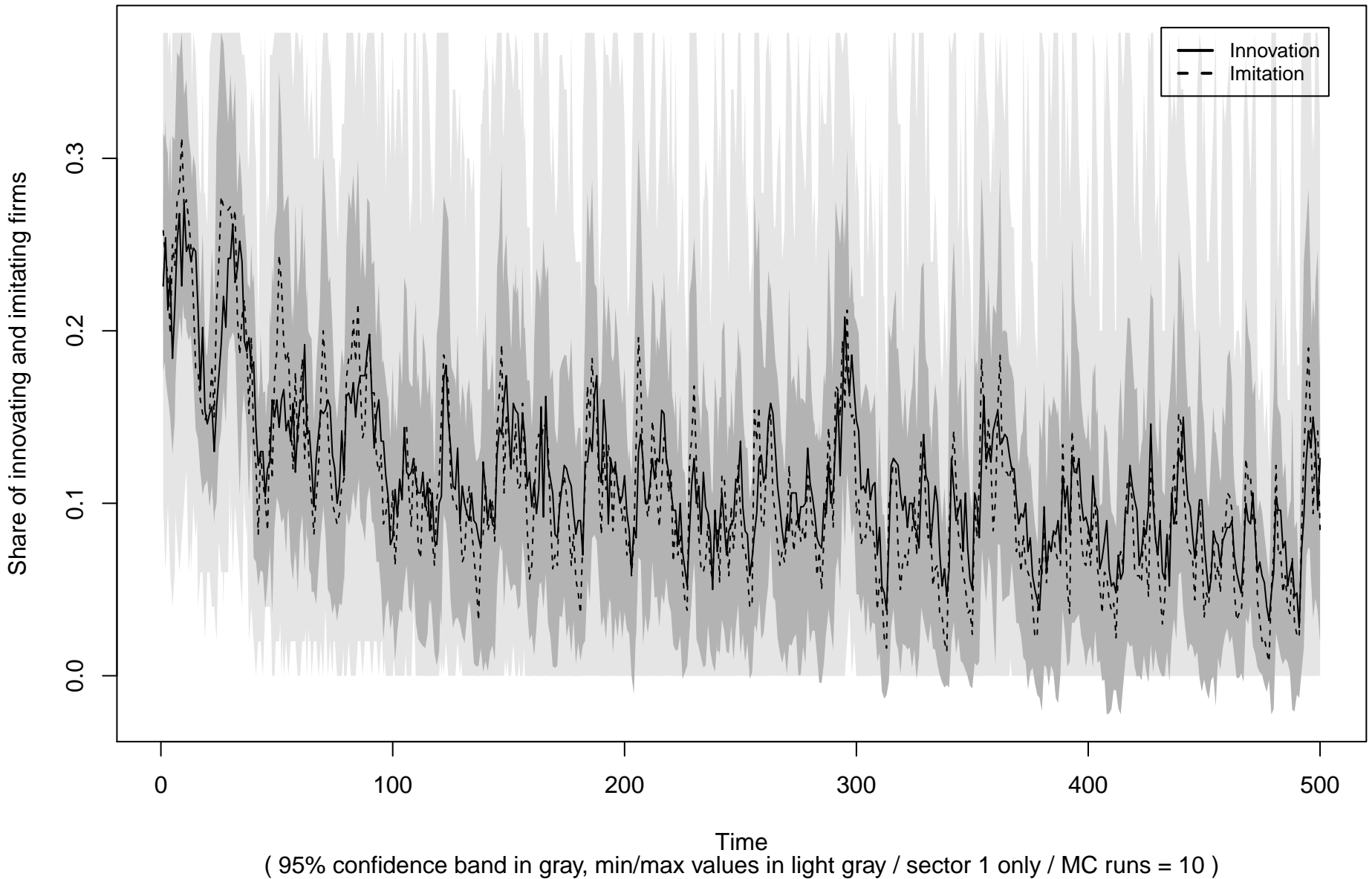
Net entry of firms trend (all experiments)

Number of net entrant firms (HP−filtered)

Free entry

Consumption−good sector
Capital−good sector

Time
(MC runs = 10)
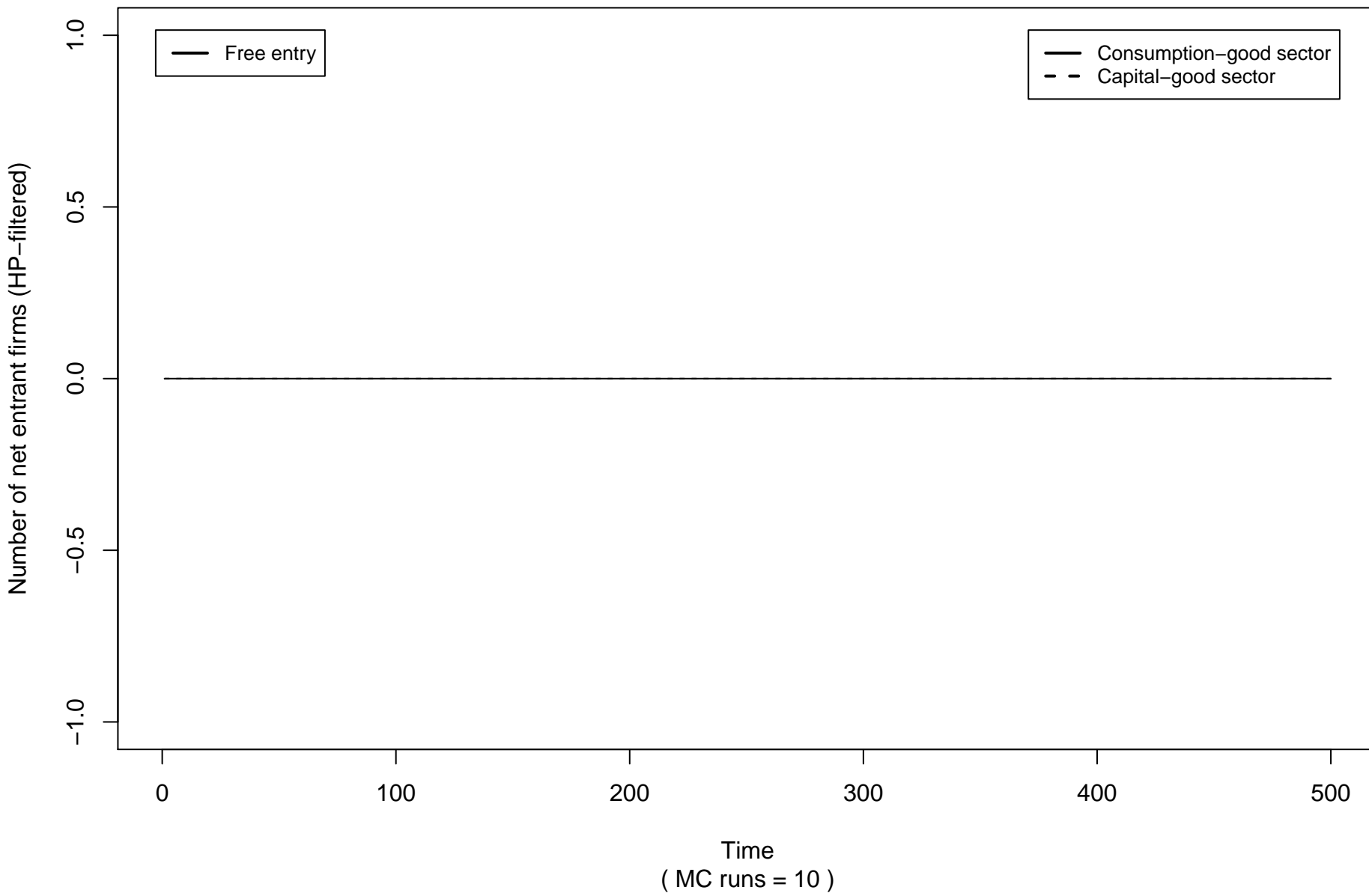
Net entry of firms trend (Free entry)

Number of net entrant firms (HP–filtered)

Consumption–good sector
Capital–good sector

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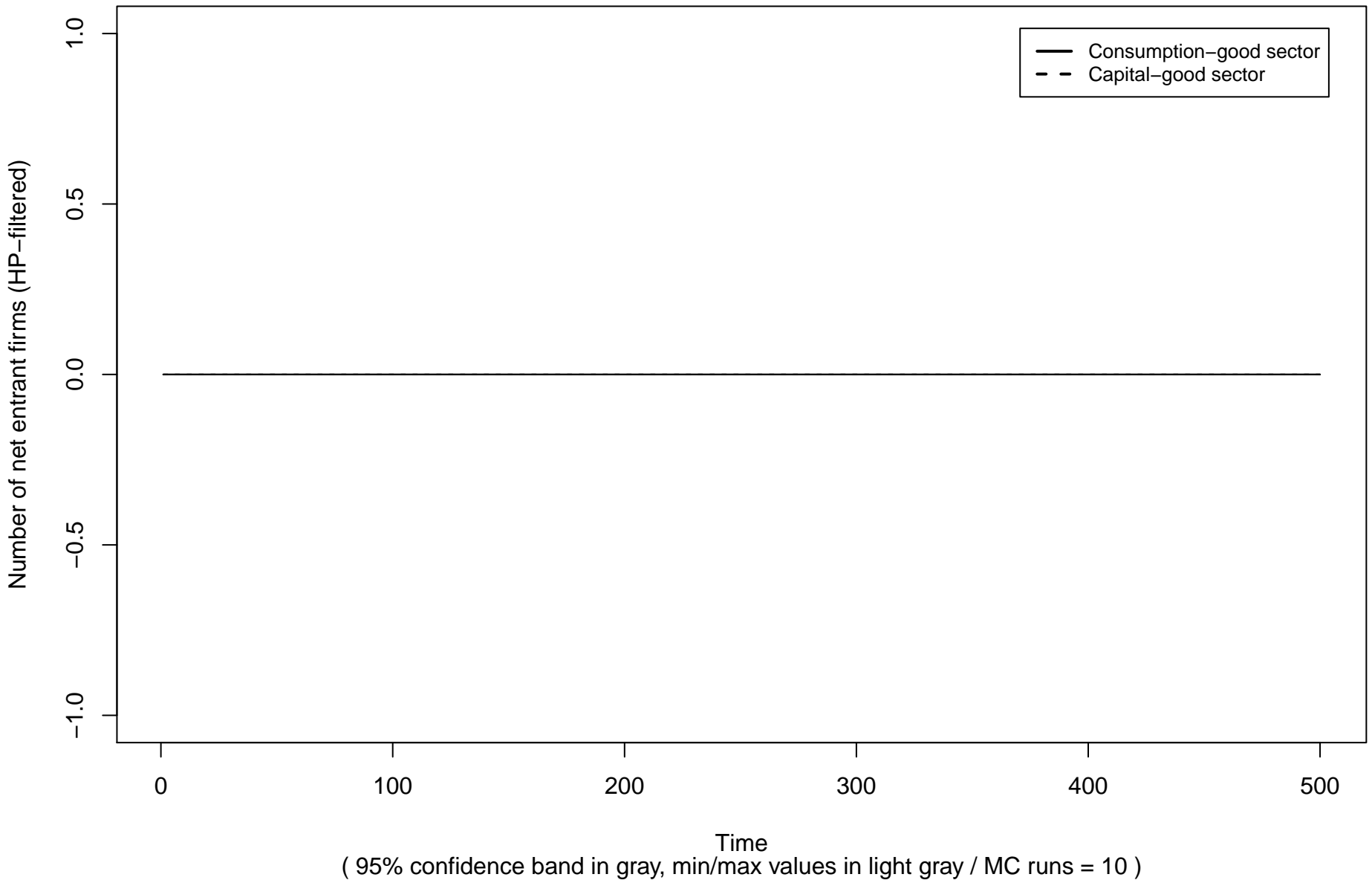
Market concentration (all experiments)

Standardized Herfindahl–Hirschman index

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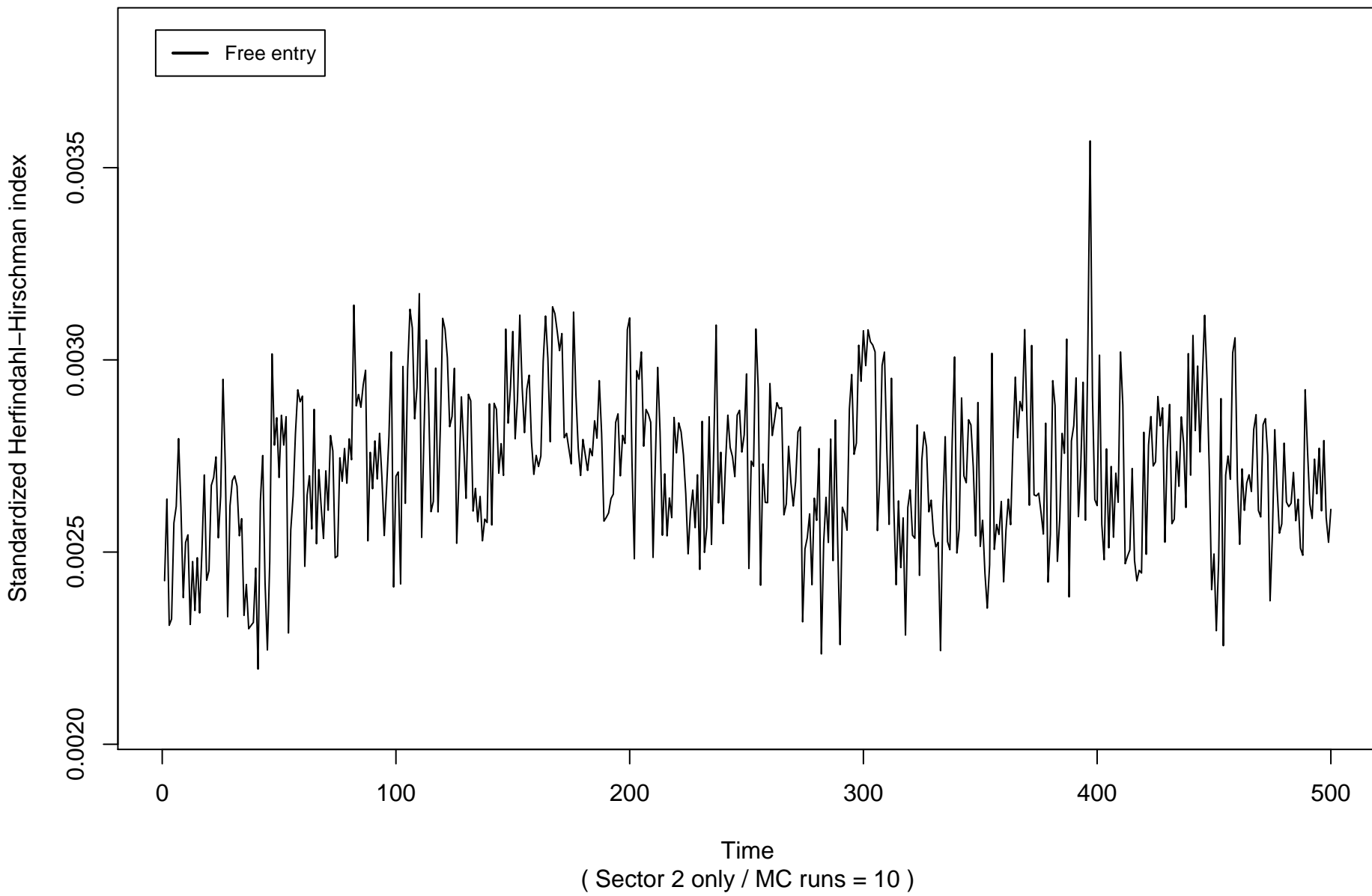
Market concentration (Free entry)

Standardized Herfindahl–Hirschman index

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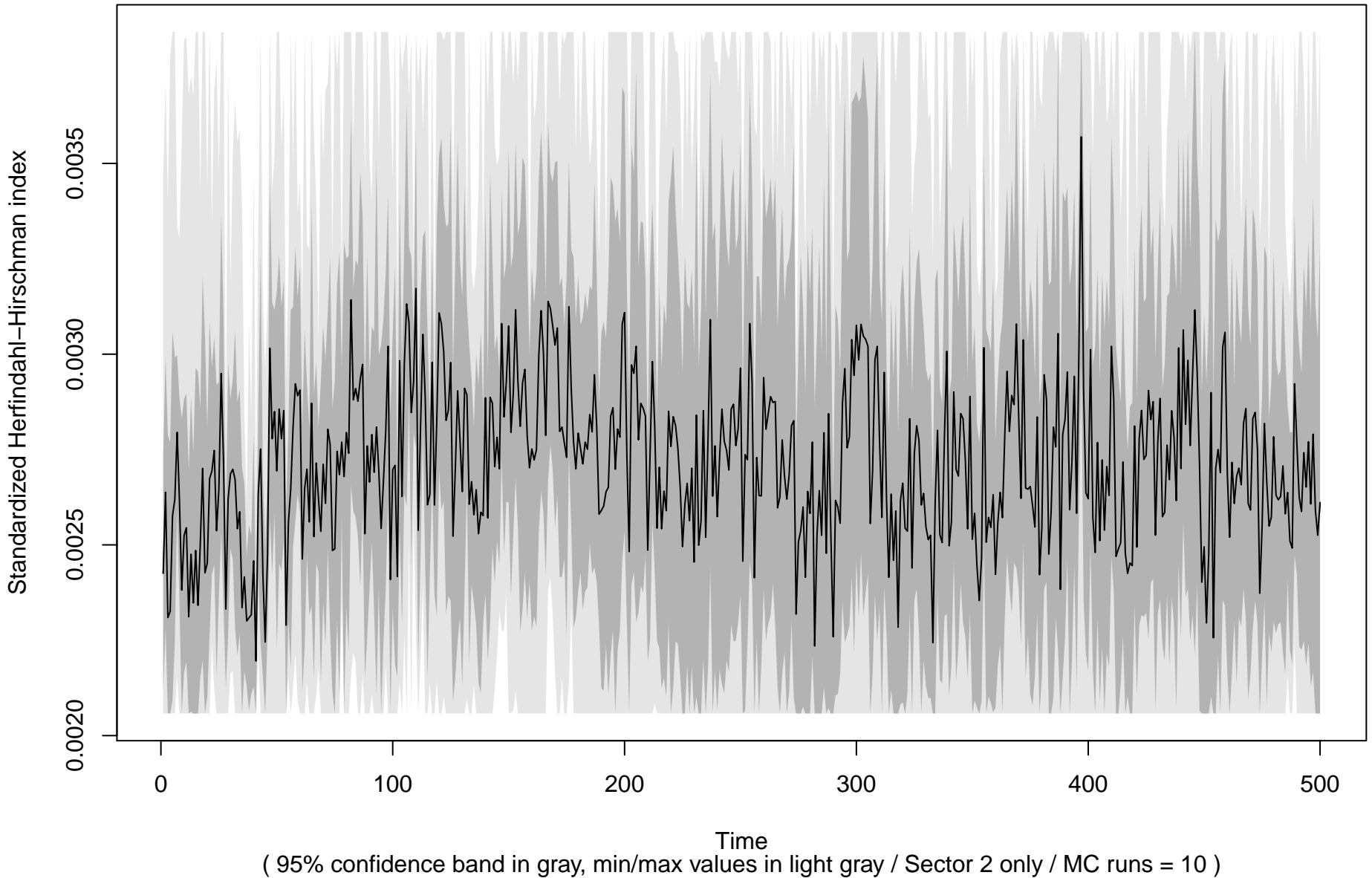
Mark−up average (all experiments)

Weighted average mark−up rate

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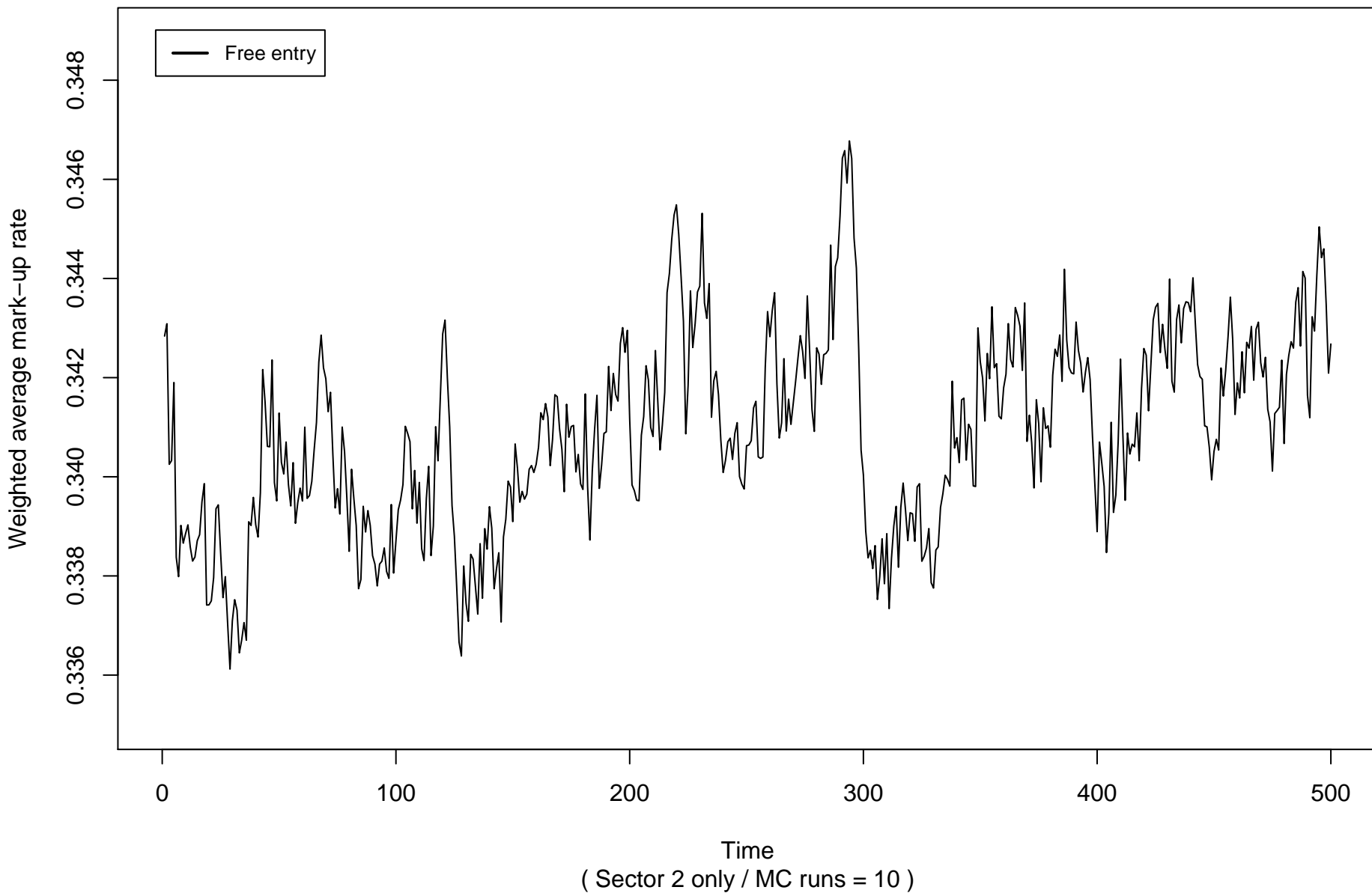
Mark−up average (Free entry)

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

GDP cycles (Free entry)

Legend:
- GDP
- Consumption
- Investment
- Productivity

Filtered series

Time

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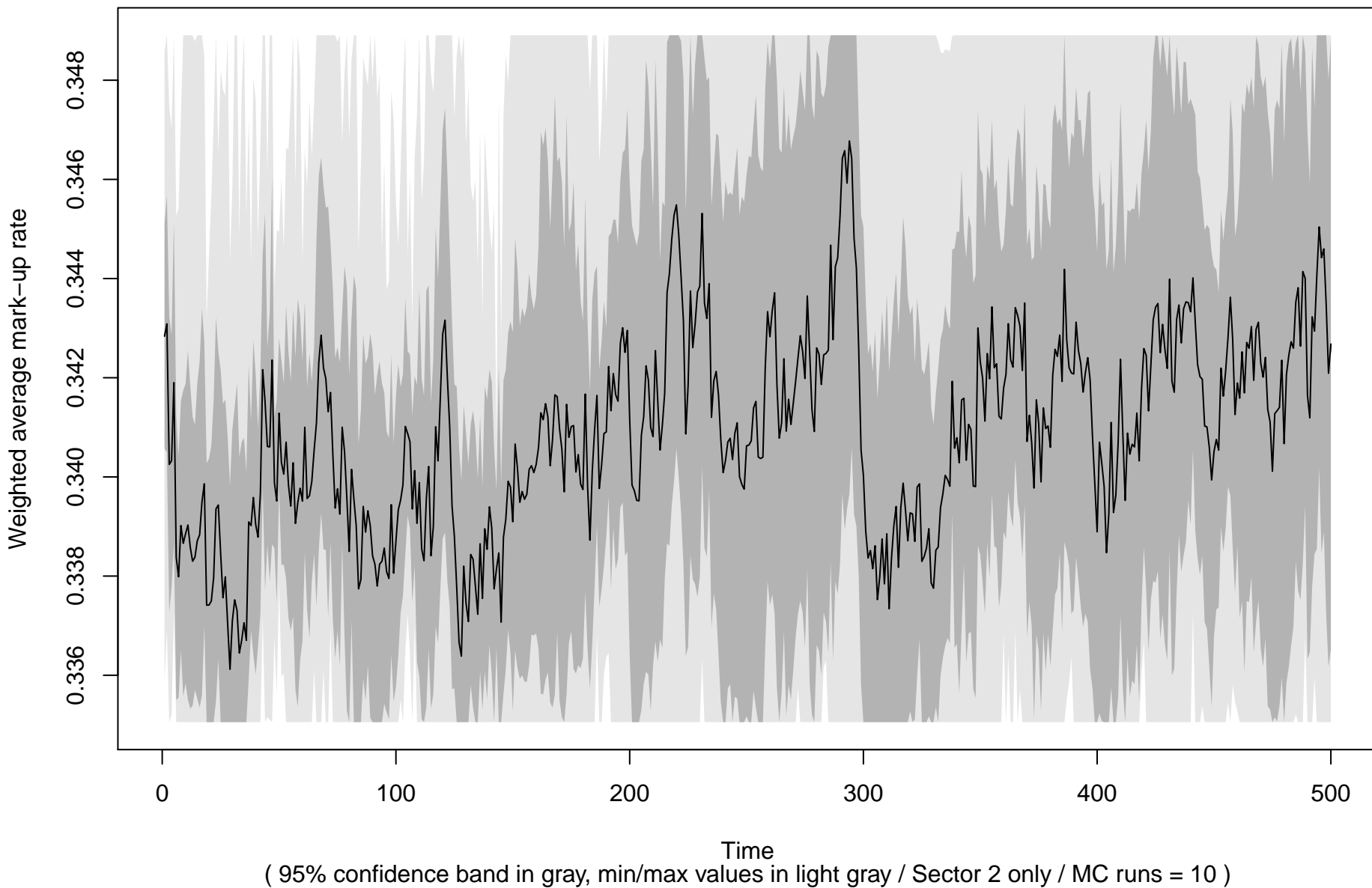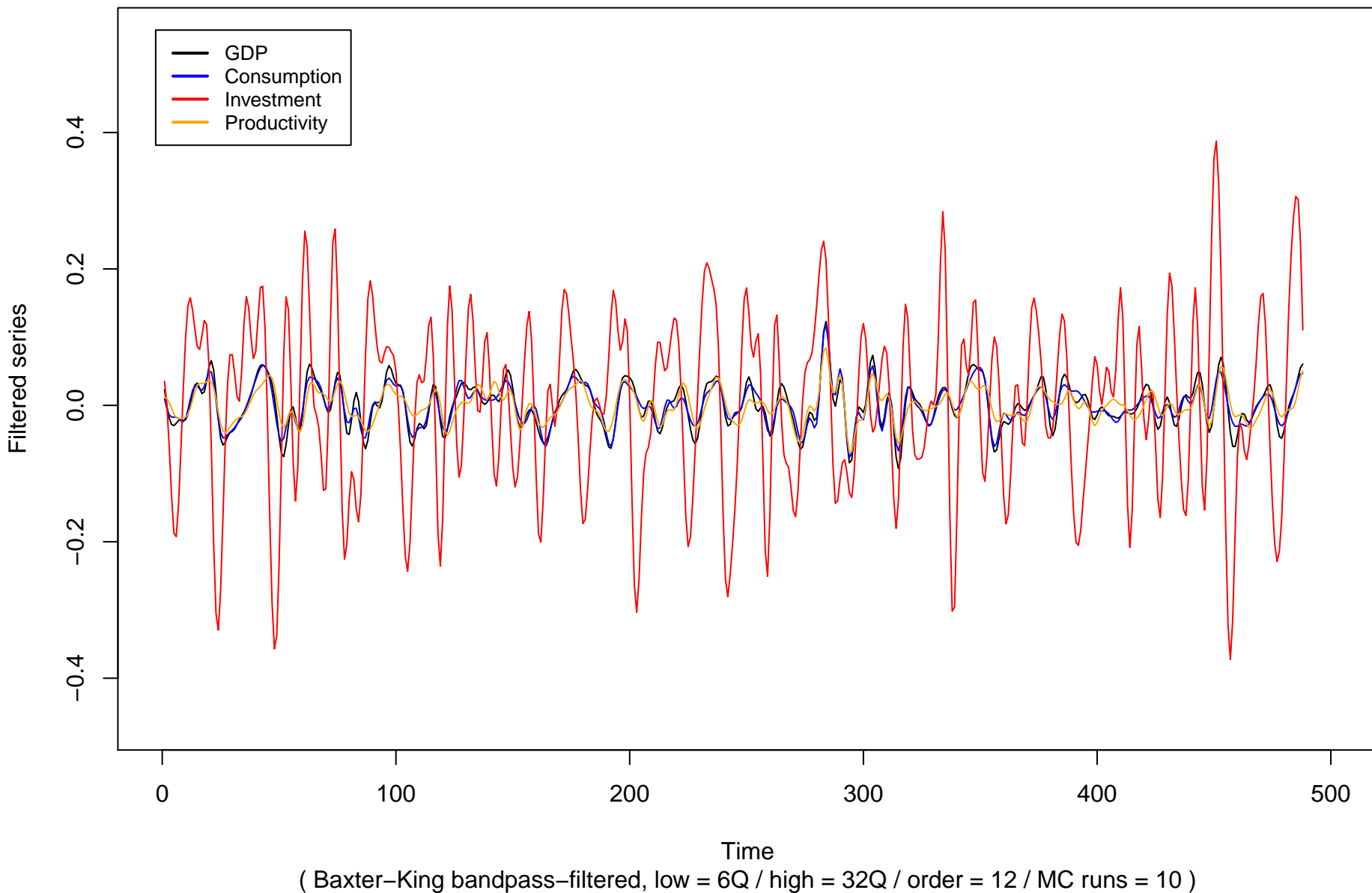
Shimer puzzle (Free entry)

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

Filtered series

Time
(Baxter–King bandpass–filtered, low = 6Q / high = 32Q / order = 12 / MC runs = 10)
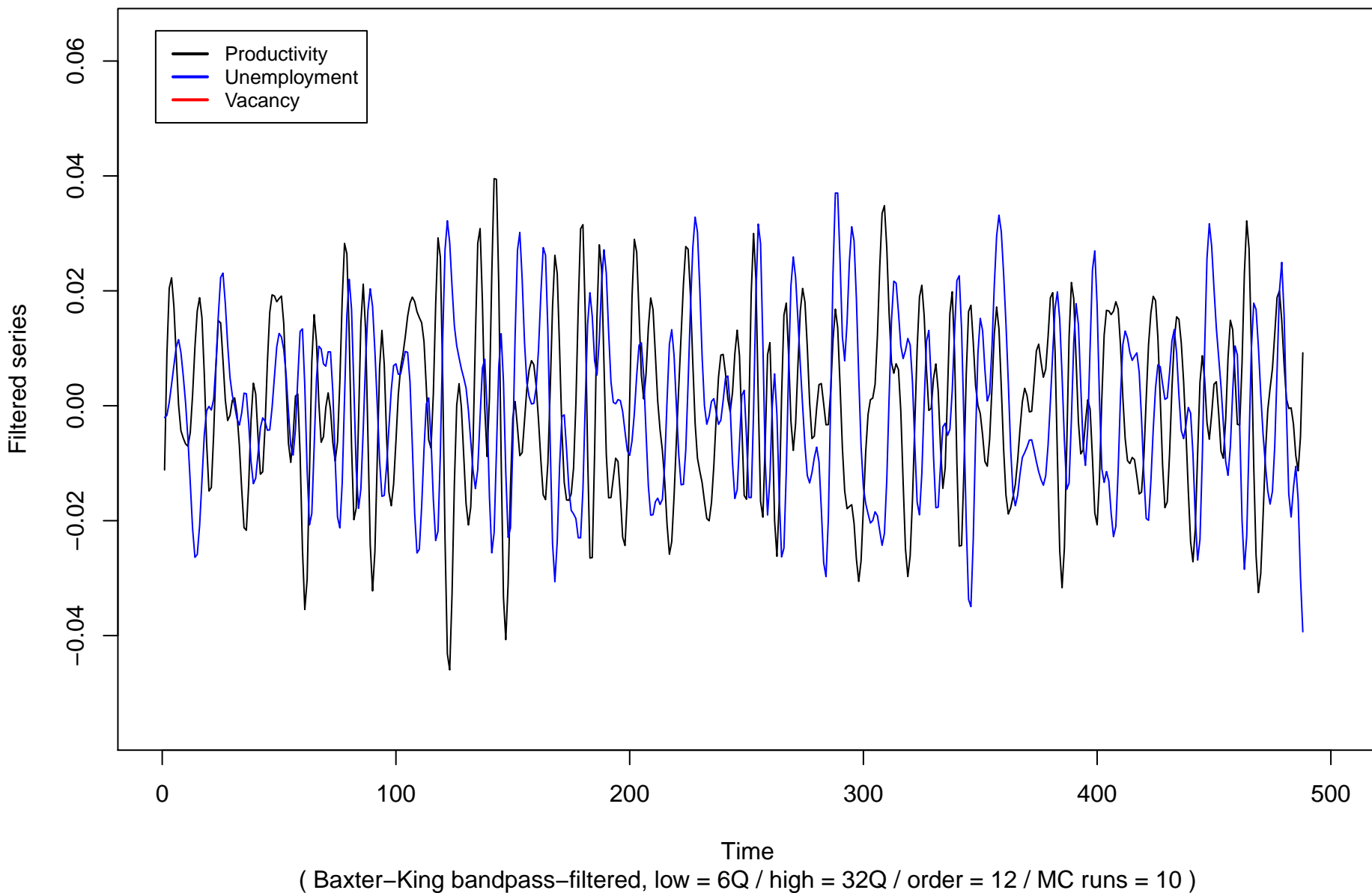
Net entry dynamics and business cycle (Free entry)

Time

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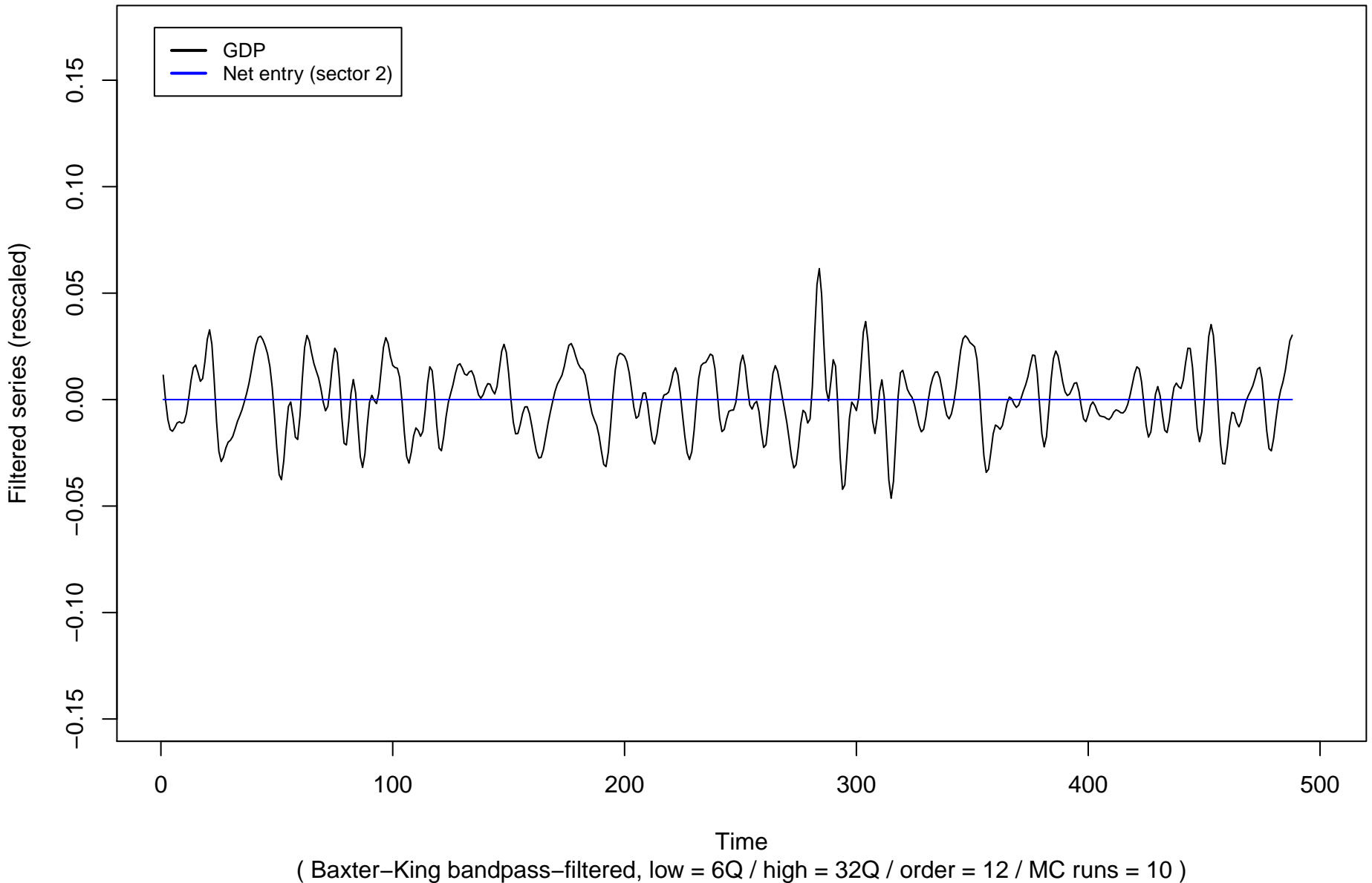
Key statistics and unit roots tests for cycles (Free entry)

	GDP (output)	Consumption	Investment	Product.	Real wage
avg. growth rate	0.01481	0.01491	0.01551	0.01486	0.0149
(s.e.)	0.0005809	0.0005782	0.001574	0.0005697	0.0005934
ADF test (logs)	−3.148	−3.006	−6.734	−3.194	−3.179
(s.e.)	0.1822	0.1693	0.2883	0.1557	0.1716
(p−val.)	0.1705	0.2036	0.01	0.1413	0.1486
(s.e.)	0.04488	0.04982	0	0.0418	0.04244
ADF test (bpf)	−5.626	−5.337	−6.928	−6.215	−6.194
(s.e.)	0.2397	0.2104	0.1206	0.2359	0.2731
(p−val.)	0.01	0.01	0.01	0.01	0.01
(s.e.)	0	0	0	0	0
s.d. (bpf)	0.08527	0.06903	1.639	0.06254	0.068
(s.e.)	0.004057	0.002601	0.1696	0.002465	0.006135
relative s.d. (GDP)	1	0.8095	19.22	0.7334	0.7975

(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 (Free entry)

	−4	−3	−2	−1	0	1	2	3	4
GDP (output)	−0.01821	0.2508	0.591	0.8826	1	0.8826	0.591	0.2508	−0.01821
(s.e.)	0.02477	0.02424	0.01669	0.005503	2.341e−17	0.005503	0.01669	0.02424	0.02477
(p−val.)	0.9013	3.011e−05	1.034e−10	8.51e−17	NA	8.51e−17	1.034e−10	3.011e−05	0.9013
Consumption	0.1066	0.3411	0.6216	0.8573	0.9506	0.849	0.5968	0.2909	0.02914
(s.e.)	0.02584	0.02993	0.02169	0.0103	0.007078	0.006193	0.01757	0.02597	0.0252
(p−val.)	0.1221	5.512e−06	6.367e−10	3.193e−14	3.943e−16	3.622e−16	1.484e−10	9.831e−06	0.8641
Investment	−0.3563	−0.4488	−0.4554	−0.328	−0.07977	0.2084	0.4248	0.4981	0.4313
(s.e.)	0.02607	0.02968	0.03154	0.03429	0.0398	0.04298	0.03826	0.02714	0.01969
(p−val.)	1.101e−06	2.861e−07	4.131e−07	2.458e−05	0.09843	0.007637	4.224e−06	4.483e−08	1.238e−08
Net investment	−0.3134	−0.4057	−0.4185	−0.3065	−0.08282	0.1766	0.3683	0.4285	0.364
(s.e.)	0.02975	0.03137	0.03312	0.03694	0.0447	0.05048	0.04734	0.03483	0.02236
(p−val.)	1.293e−05	1.311e−06	1.493e−06	8.623e−05	0.04363	0.03007	9.073e−05	1.785e−06	2.373e−07
Change in inventories	−0.2855	−0.178	0.03627	0.2657	0.3977	0.3652	0.2144	0.0435	−0.06139
(s.e.)	0.03514	0.03152	0.02917	0.03279	0.03635	0.04041	0.03637	0.02765	0.02497
(p−val.)	0.0001222	0.002661	0.6129	0.0001543	5.424e−06	2.97e−05	0.001264	0.6054	0.5246
Unemployment rate	0.3112	0.3417	0.246	0.05522	−0.1471	−0.2779	−0.294	−0.22	−0.1177
(s.e.)	0.04997	0.03663	0.02944	0.03376	0.04681	0.0626	0.07469	0.07673	0.06665
(p−val.)	0.003144	0.0005738	0.002069	0.4202	0.03056	0.005193	0.00852	0.02157	0.04669
Productivity	0.1701	0.3645	0.5779	0.7471	0.8057	0.7159	0.513	0.2671	0.05033
(s.e.)	0.05159	0.05741	0.04586	0.02535	0.01436	0.03233	0.05919	0.07586	0.0713
(p−val.)	0.01261	0.0003925	8.997e−07	3.99e−10	1.169e−12	5.262e−09	2.248e−05	0.01192	0.01032
Mark−up (sector 2)	0.2212	0.1318	0.01838	−0.09054	−0.1662	−0.1925	−0.1794	−0.1515	−0.1315
(s.e.)	0.02805	0.03222	0.0459	0.05198	0.04838	0.04095	0.03327	0.02368	0.01874
(p−val.)	0.000353	0.05462	0.2312	0.02795	0.01086	0.003639	0.001397	0.004441	0.01131
Total firm debt	0.1155	0.01673	−0.07411	−0.1411	−0.1779	−0.1876	−0.1842	−0.1777	−0.1701
(s.e.)	0.05914	0.05054	0.04671	0.05159	0.0601	0.06495	0.06271	0.05444	0.04614
(p−val.)	0.001433	0.08139	0.02489	0.03831	0.03271	0.03333	0.01304	0.006585	0.0007433
Liquidity−to−sales ratio	0.103	−0.109	−0.3532	−0.5669	−0.6862	−0.6765	−0.5578	−0.3837	−0.2115
(s.e.)	0.03524	0.02727	0.01568	0.01237	0.02823	0.04255	0.04868	0.04758	0.04373
(p−val.)	0.006201	0.158	1.524e−08	1.096e−11	2.425e−09	1.014e−07	2.09e−06	6.389e−05	0.004663
Bankruptcy rate	0.3126	0.2465	0.1005	−0.07322	−0.2017	−0.2335	−0.1833	−0.1093	−0.06791
(s.e.)	0.04477	0.05335	0.0648	0.06736	0.05544	0.03709	0.03048	0.03199	0.02858
(p−val.)	0.0002835	0.006157	0.3251	0.005569	0.001107	0.001265	0.003998	0.1528	0.3665

(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 (Free entry)

	−4	−3	−2	−1	0	1	2	3	4
GDP (output)	−0.01821	0.2508	0.591	0.8826	1	0.8826	0.591	0.2508	−0.01821
(s.e.)	0.02477	0.02424	0.01669	0.005503	2.341e−17	0.005503	0.01669	0.02424	0.02477
(p−val.)	0.9013	3.011e−05	1.034e−10	8.51e−17	NA	8.51e−17	1.034e−10	3.011e−05	0.9013
Consumption	0.1066	0.3411	0.6216	0.8573	0.9506	0.849	0.5968	0.2909	0.02914
(s.e.)	0.02584	0.02993	0.02169	0.0103	0.007078	0.006193	0.01757	0.02597	0.0252
(p−val.)	0.1221	5.512e−06	6.367e−10	3.193e−14	3.943e−16	3.622e−16	1.484e−10	9.831e−06	0.8641
Investment	−0.3563	−0.4488	−0.4554	−0.328	−0.07977	0.2084	0.4248	0.4981	0.4313
(s.e.)	0.02607	0.02968	0.03154	0.03429	0.0398	0.04298	0.03826	0.02714	0.01969
(p−val.)	1.101e−06	2.861e−07	4.131e−07	2.458e−05	0.09843	0.007637	4.224e−06	4.483e−08	1.238e−08
Productivity	0.1701	0.3645	0.5779	0.7471	0.8057	0.7159	0.513	0.2671	0.05033
(s.e.)	0.05159	0.05741	0.04586	0.02535	0.01436	0.03233	0.05919	0.07586	0.0713
(p−val.)	0.01261	0.0003925	8.997e−07	3.99e−10	1.169e−12	5.262e−09	2.248e−05	0.01192	0.01032
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	−0.1272	0.04552	0.2504	0.4338	0.539	0.5282	0.419	0.2591	0.1052
(s.e.)	0.04618	0.06255	0.06966	0.06637	0.05496	0.03997	0.0299	0.02787	0.02961
(p−val.)	0.07143	0.1202	5.96e−05	7.574e−05	7.845e−06	6.84e−07	6.238e−07	6.071e−05	0.06721
Wage	0.3154	0.5192	0.6858	0.7671	0.7347	0.5882	0.3762	0.1542	−0.03271
(s.e.)	0.03502	0.0366	0.04717	0.05486	0.05486	0.04902	0.04056	0.03142	0.02396
(p−val.)	4.319e−05	3.849e−07	2.155e−07	2.67e−07	4.031e−07	1.325e−06	2.277e−05	0.02122	0.8013
Unemployment rate	0.3112	0.3417	0.246	0.05522	−0.1471	−0.2779	−0.294	−0.22	−0.1177
(s.e.)	0.04997	0.03663	0.02944	0.03376	0.04681	0.0626	0.07469	0.07673	0.06665
(p−val.)	0.003144	0.0005738	0.002069	0.4202	0.03056	0.005193	0.00852	0.02157	0.04669
Vacancy rate	0.1665	−0.03413	−0.2425	−0.3824	−0.4087	−0.3289	−0.203	−0.09464	−0.03714
(s.e.)	0.03828	0.03219	0.04725	0.06441	0.07133	0.06418	0.04967	0.03988	0.03807
(p−val.)	0.004784	0.2504	0.003709	0.0005644	0.0006387	0.001873	0.01572	0.1301	0.1125

(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)

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	W
dGDP	0.01	1.00	0.01	1.00	0.10	0.00	0.19	0.30	0.33	0.27	0.00	0
dA	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.11	0.76	0.00	0
dw	0.01	1.00	0.01	1.00	0.10	0.00	0.01	0.80	0.11	0.71	0.00	0
V	0.02	0.90	0.02	0.90	0.06	0.40	0.05	0.80	0.05	0.84	0.00	0
U	0.01	1.00	0.01	1.00	0.03	0.78	0.00	1.00	0.01	0.96	0.00	0
mu2avg	0.07	0.90	0.08	0.90	0.06	0.40	0.00	1.00	0.02	0.93	0.00	0
HH1	0.01	1.00	0.01	1.00	0.10	0.00	0.00	1.00	0.17	0.64	0.00	0
HH2	0.01	1.00	0.01	1.00	0.06	0.40	0.07	0.70	0.21	0.42	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
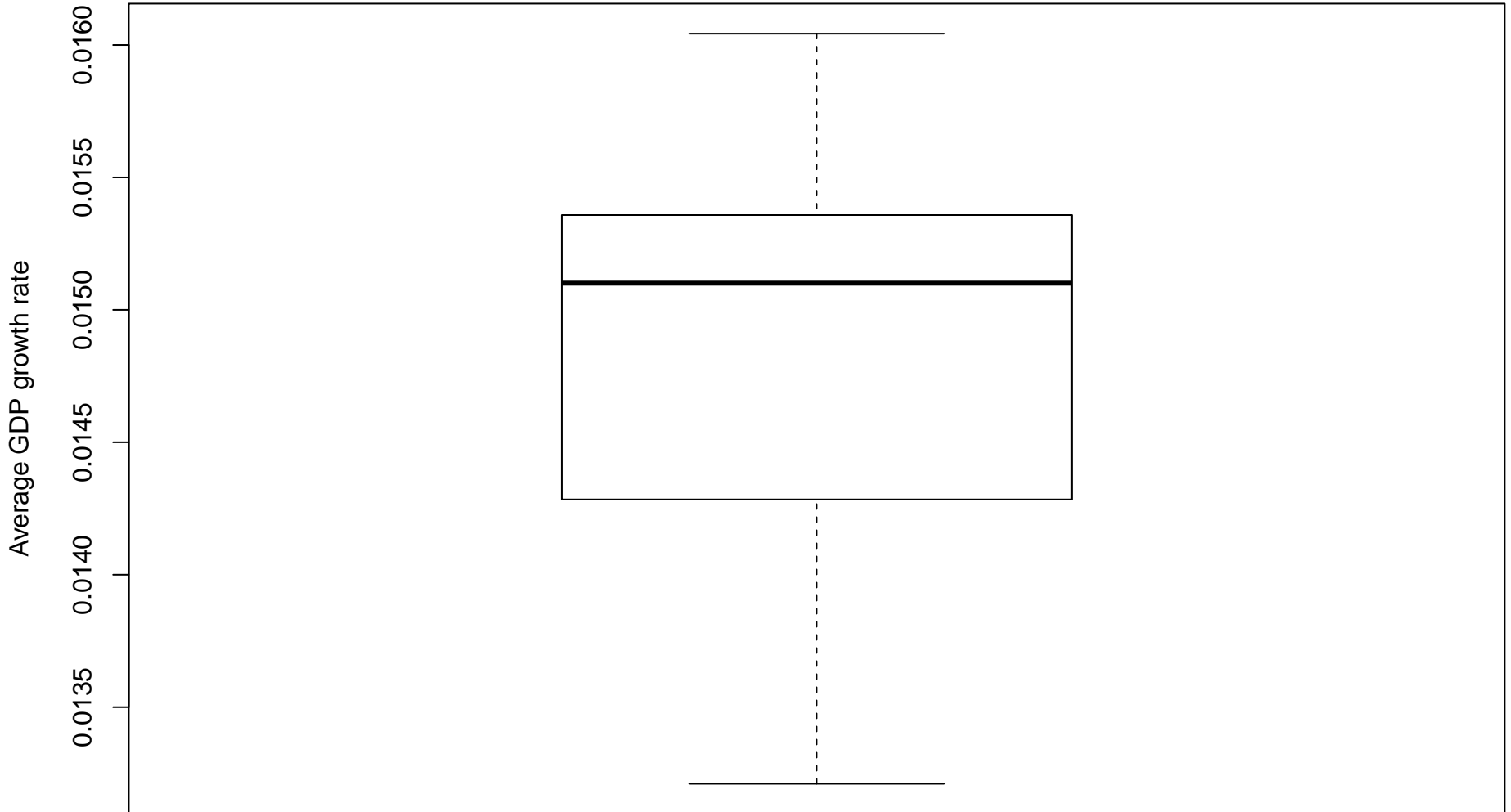
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Volatility of GDP growth

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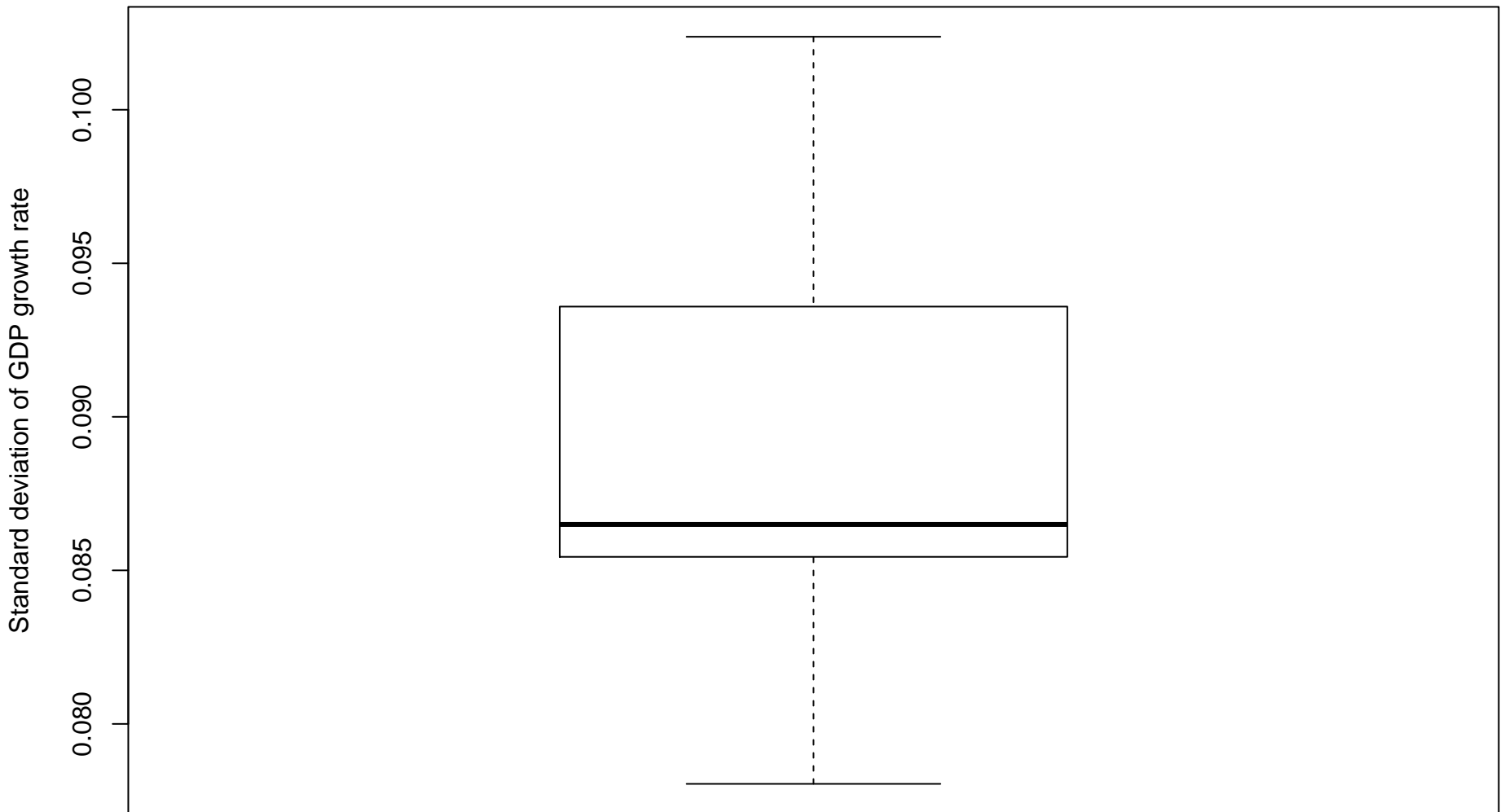
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 – 600)

Likelihood of GDP crises
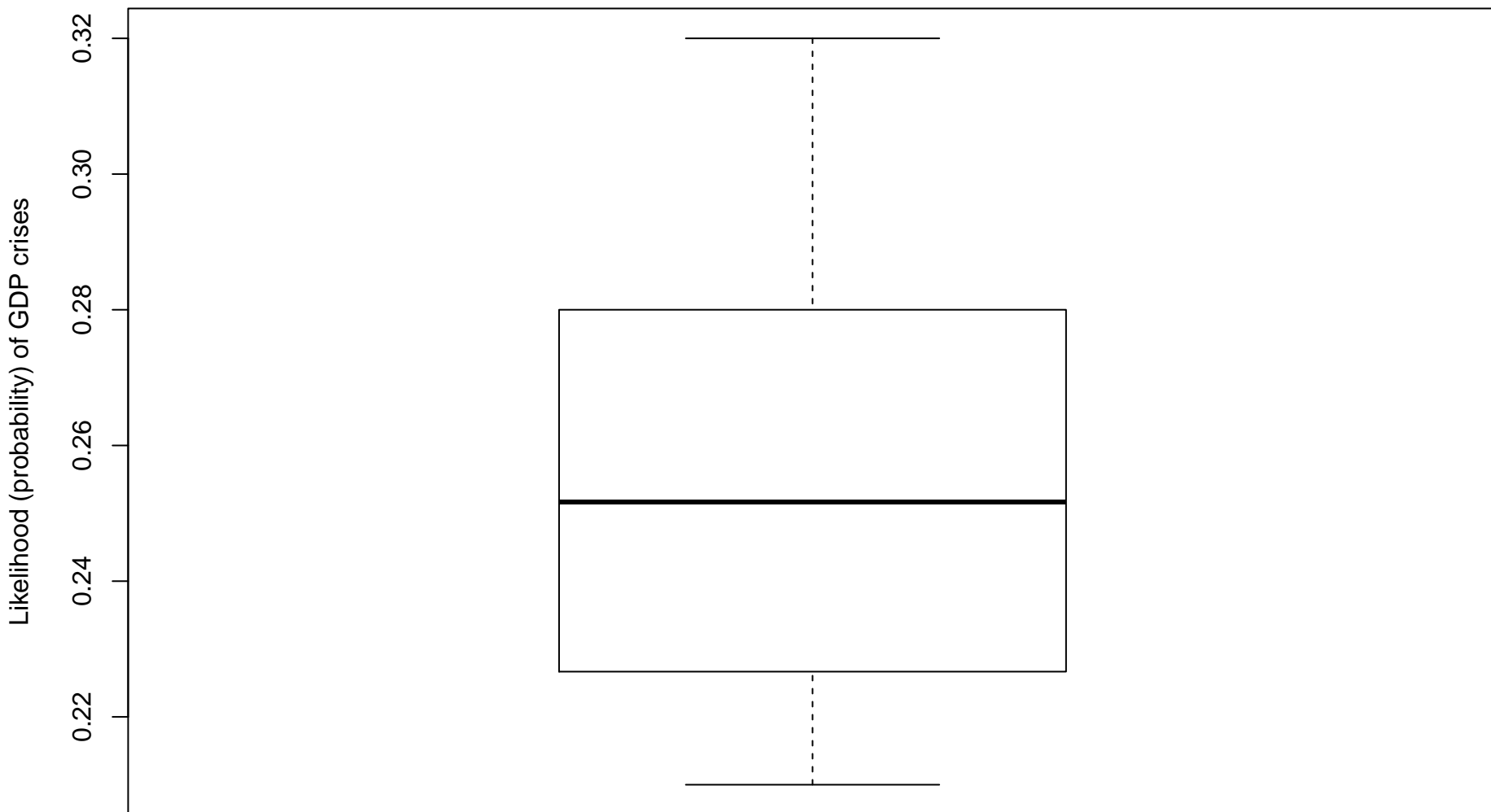
(bar: median / box: 2nd–3rd quartile / whiskers: max–min / points: outliers / MC runs = 10 / period = 301 − 600)
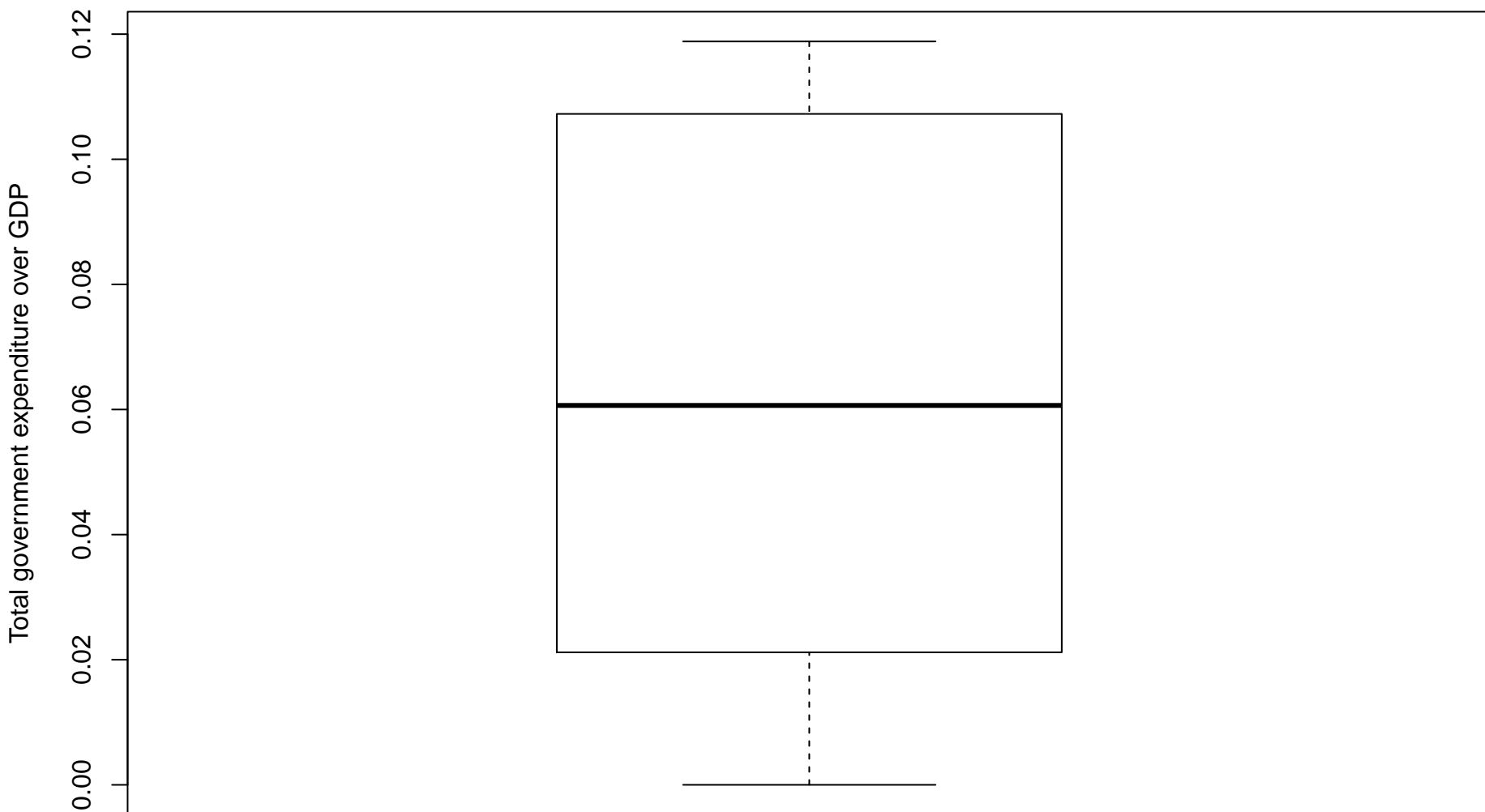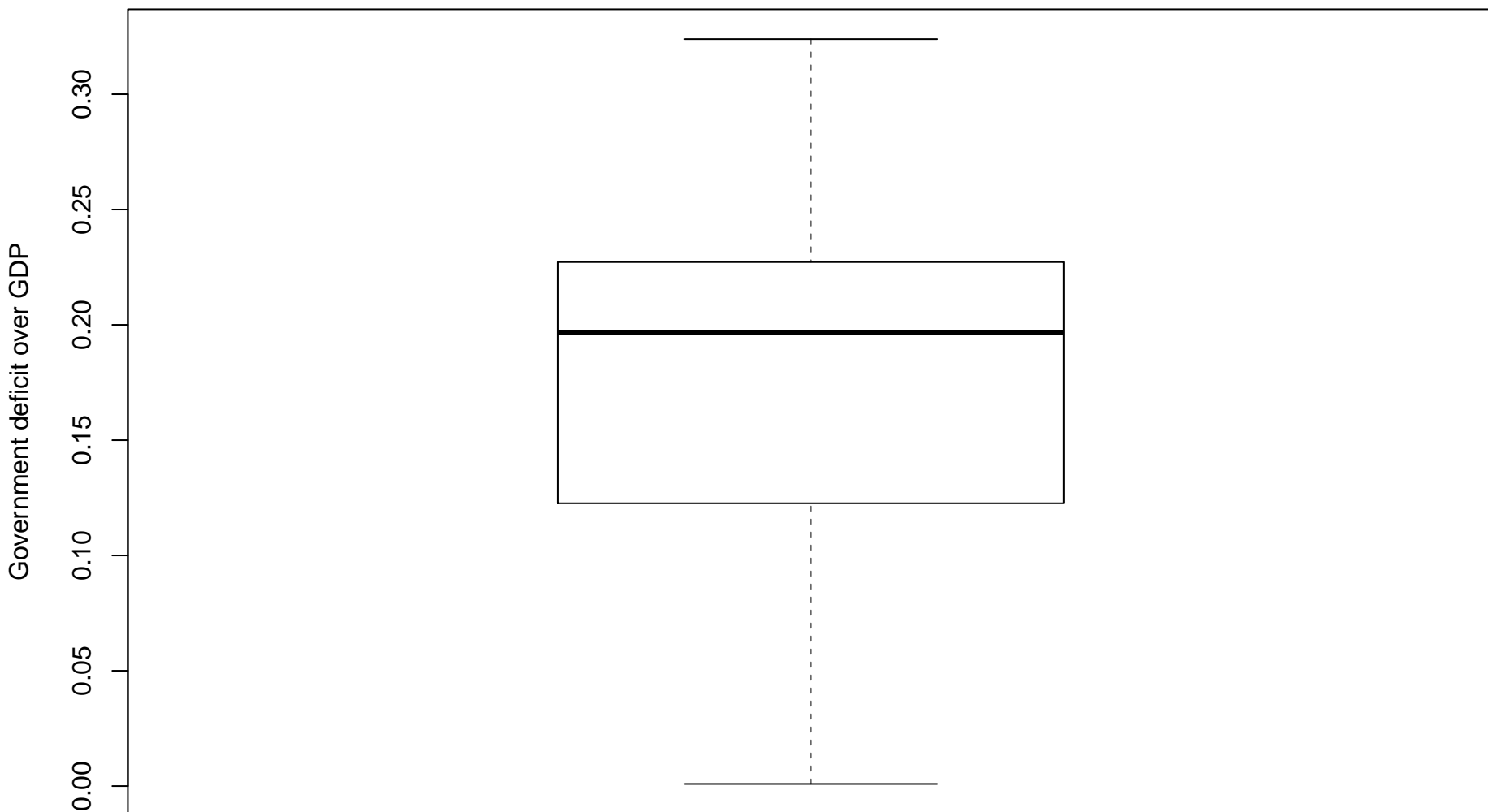
Inflation
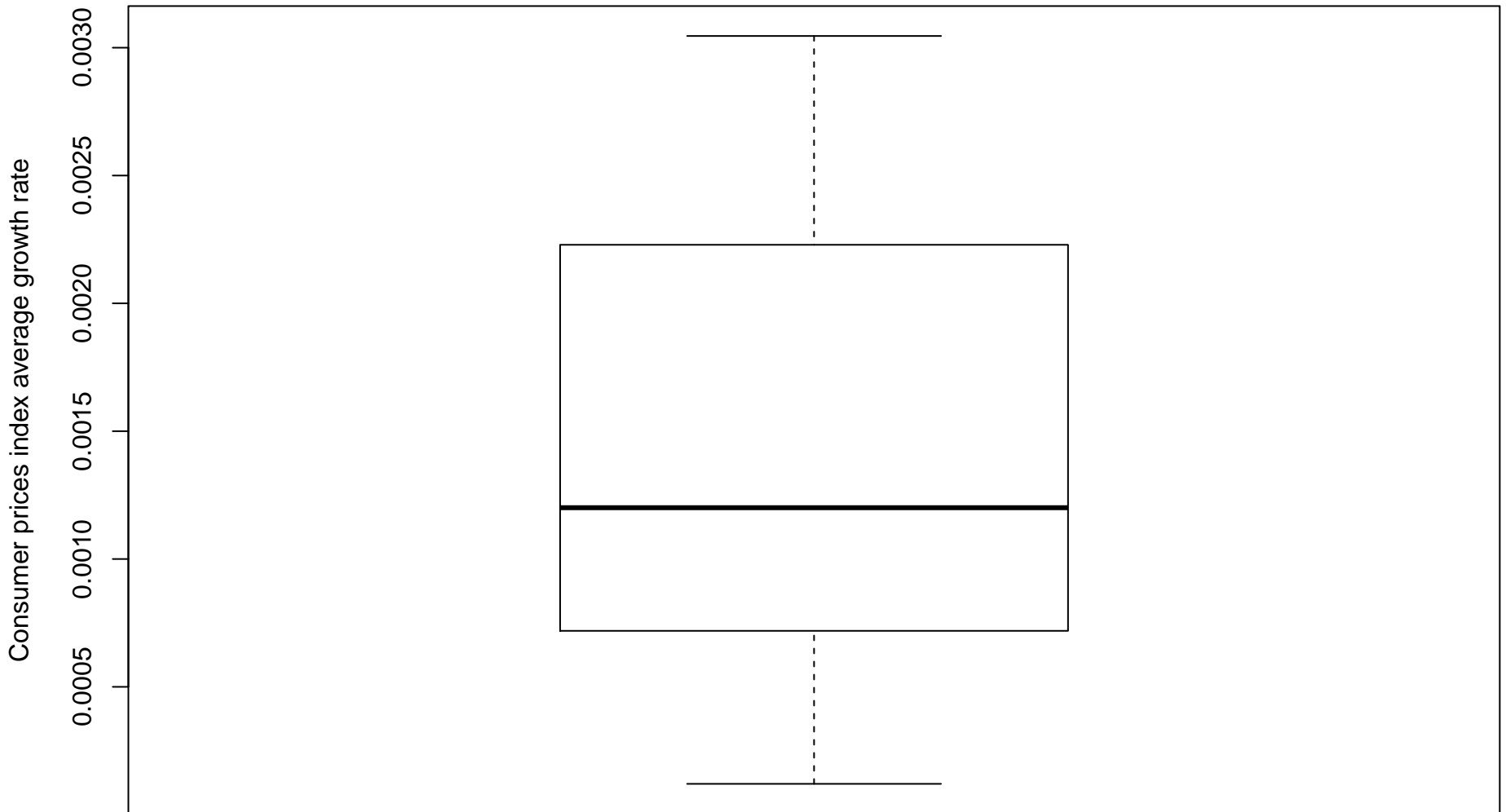
Consumer prices index average growth rate

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

Tax

Government tax income over GDP
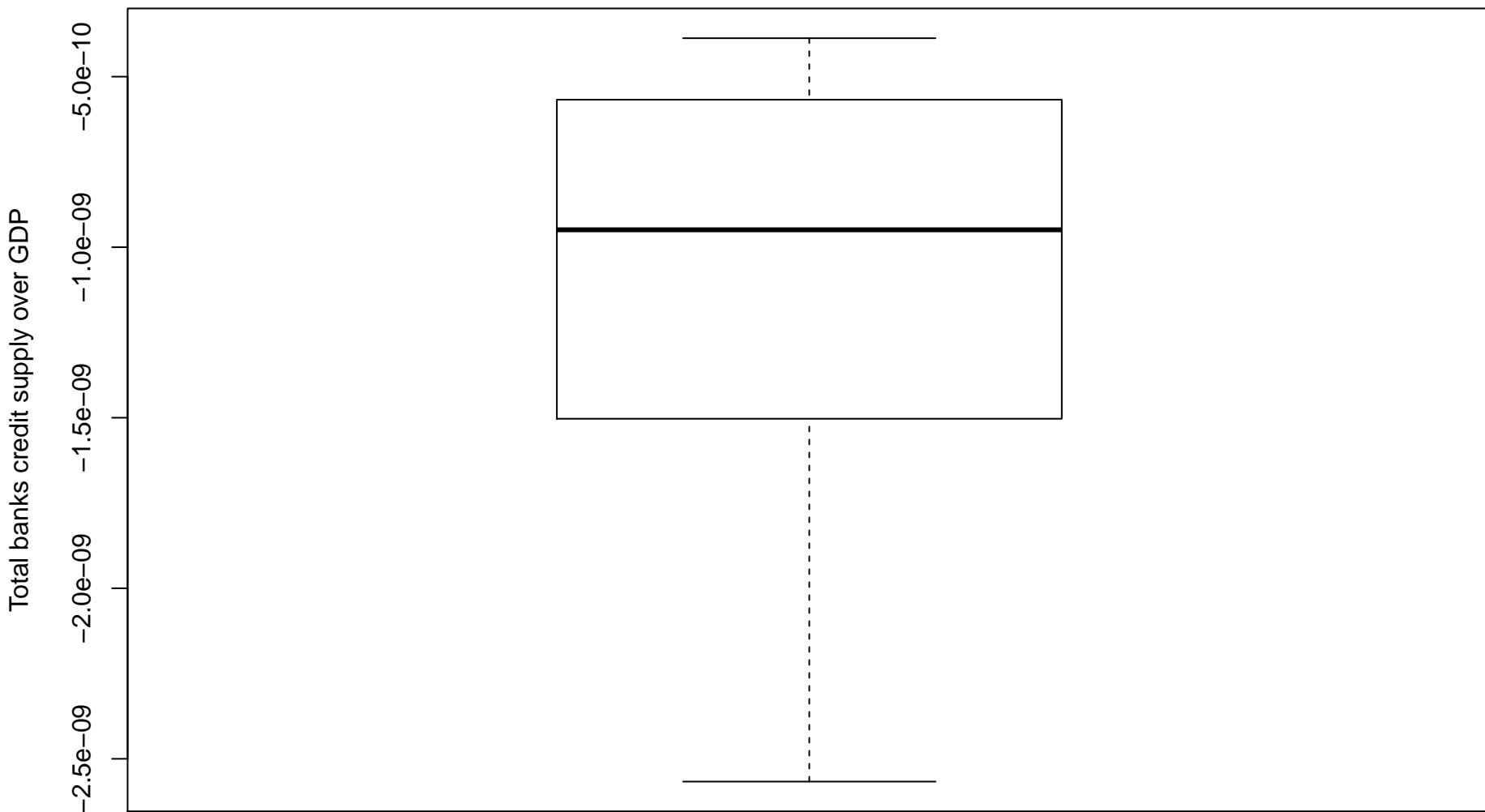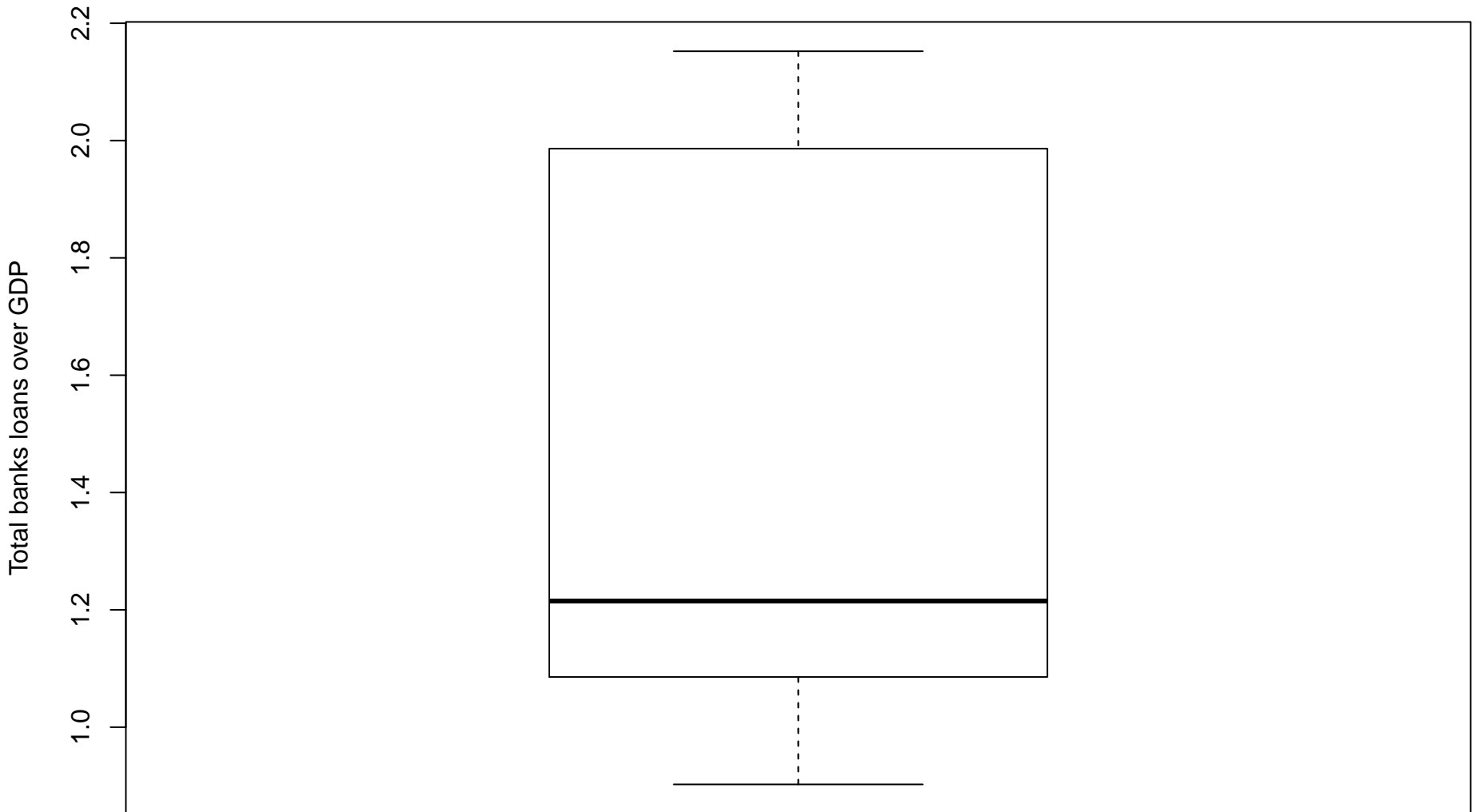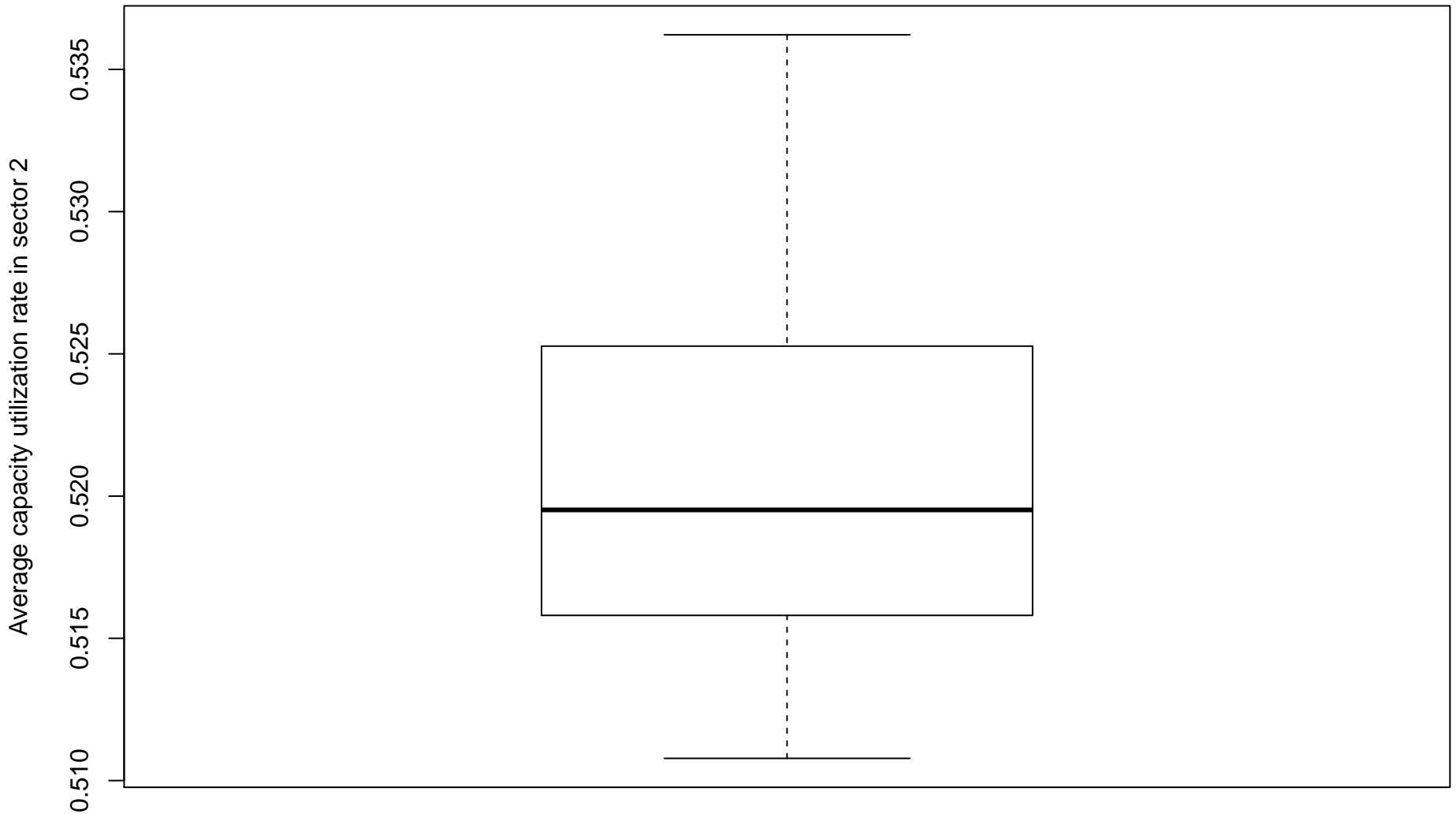
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)
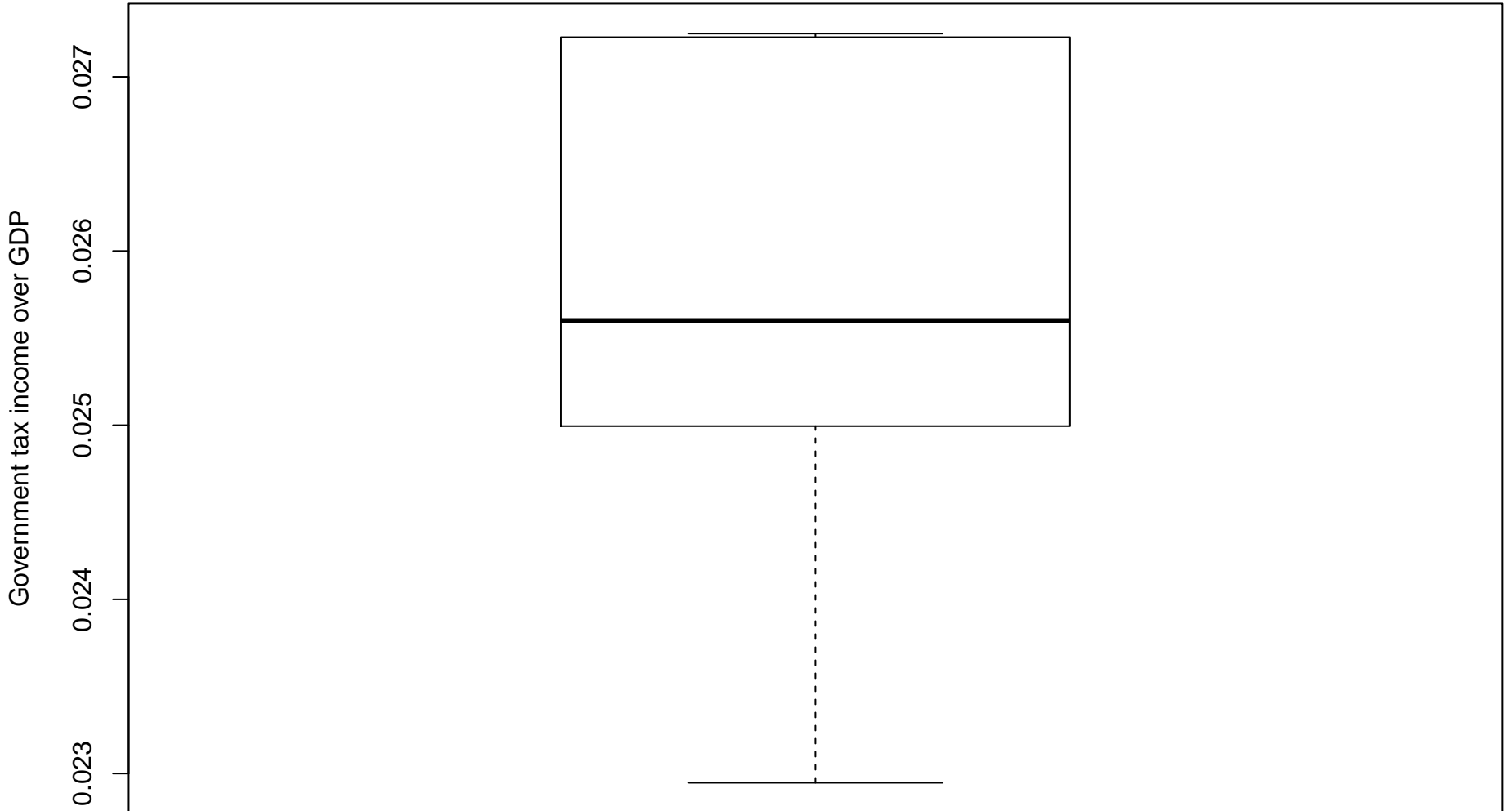
Government total expenditure
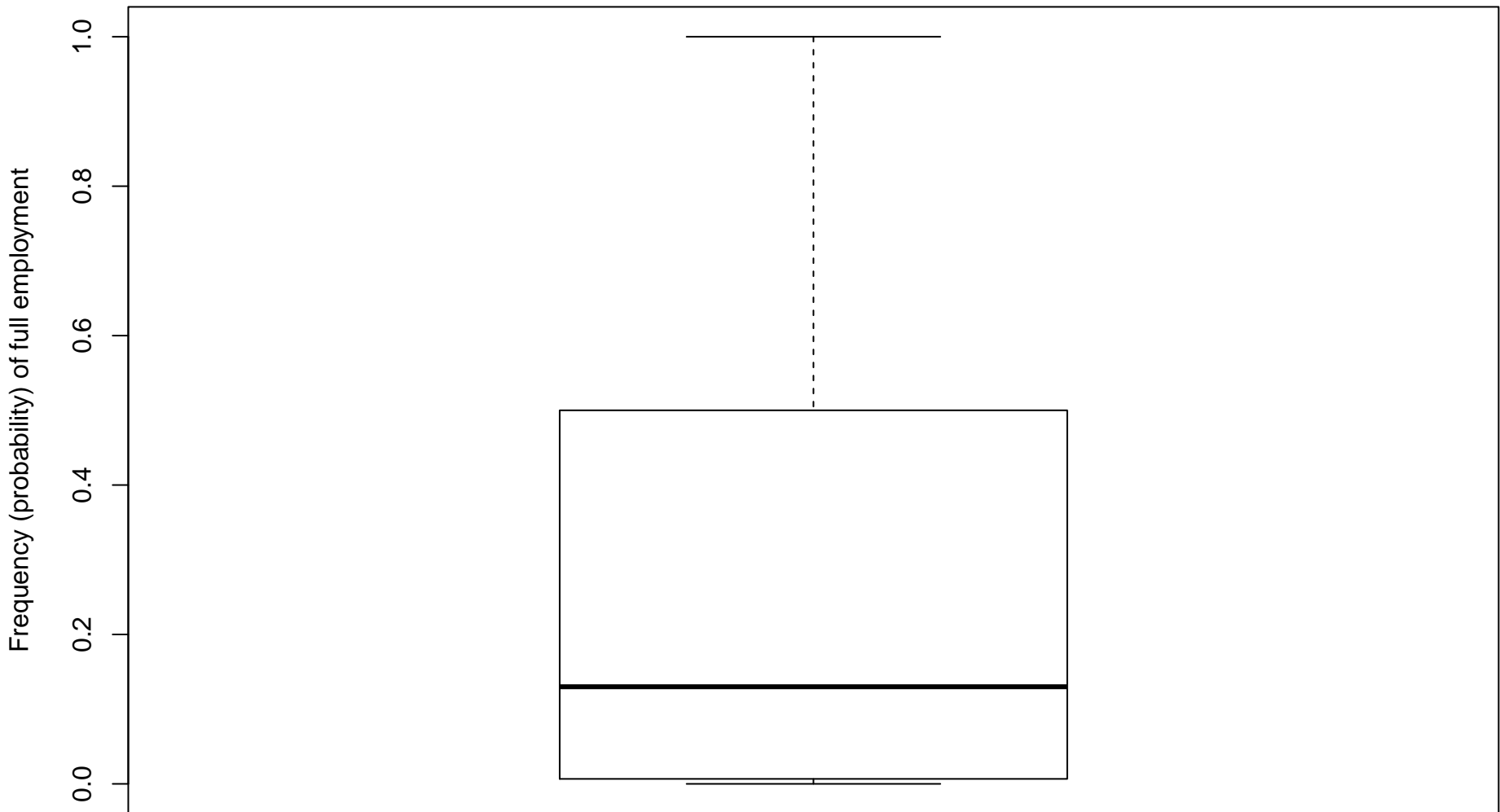

Total government expenditure over GDP

(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

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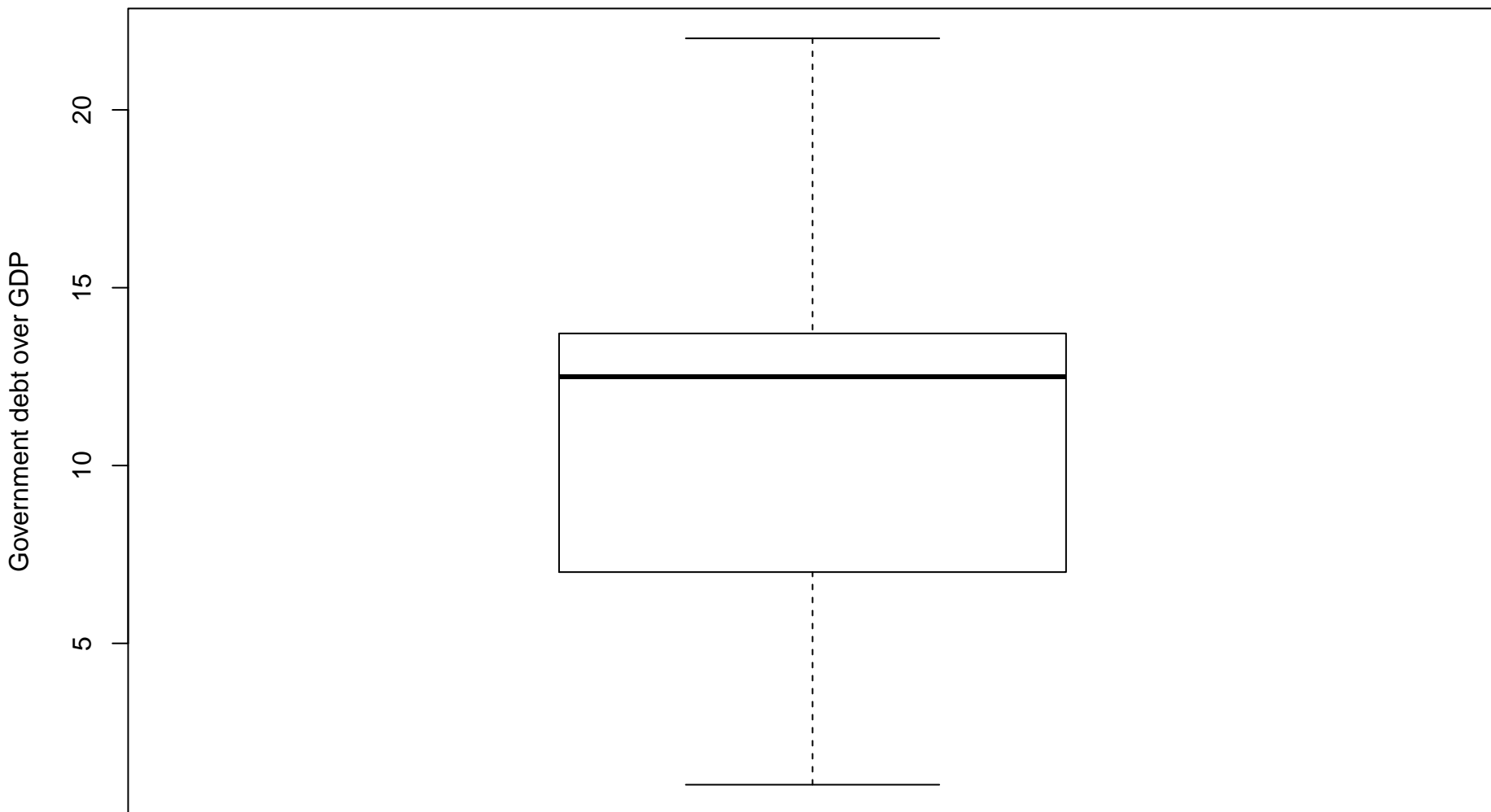
(bar: median / box: 2nd−3rd quartile / whiskers: max−min / points: outliers / MC runs = 10 / period = 301 − 600)

Credit supply

Total banks credit supply over GDP

(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)
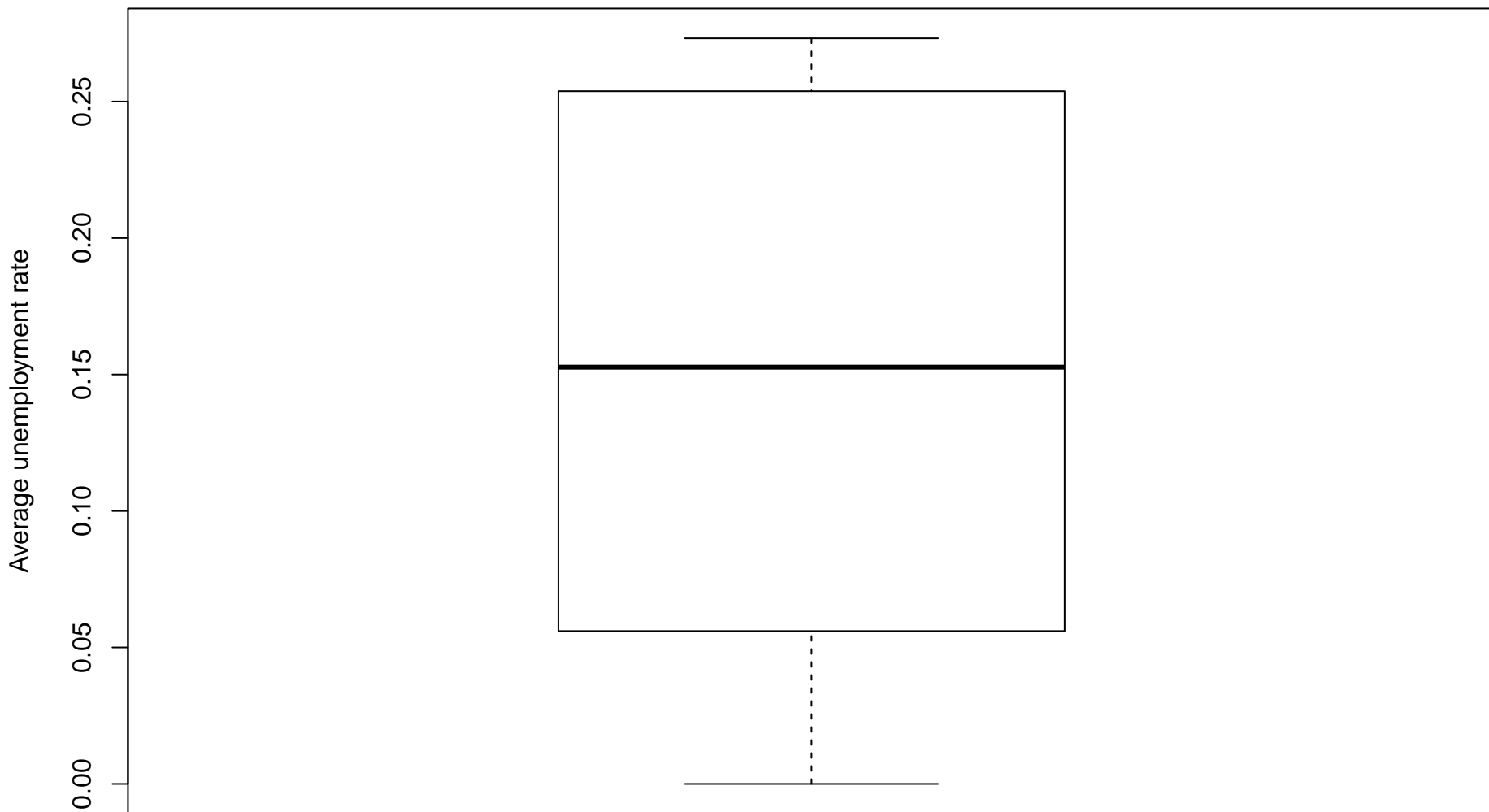
Capacity utilization

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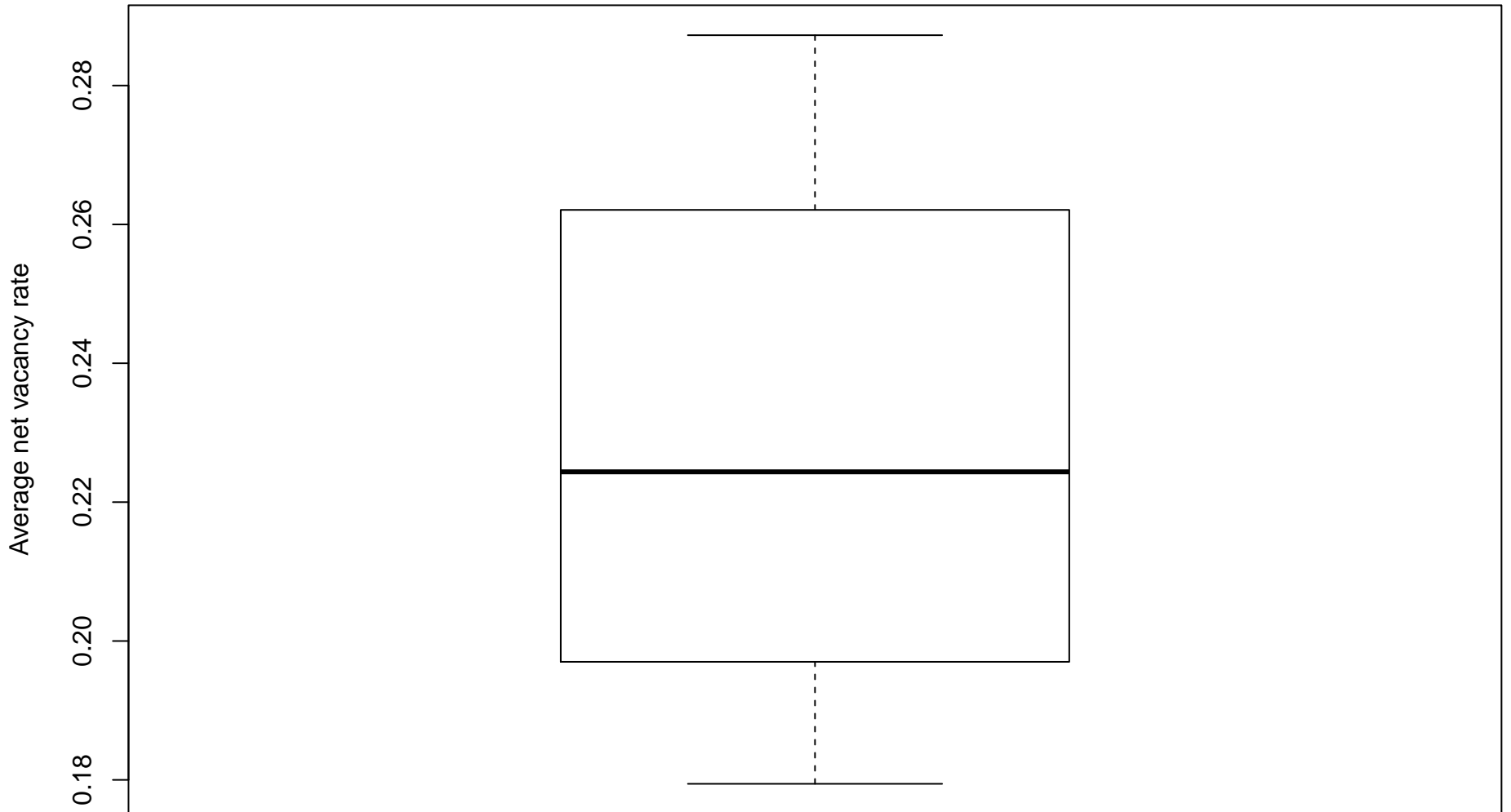
Full employment frequency

Frequency (probability) of full employment

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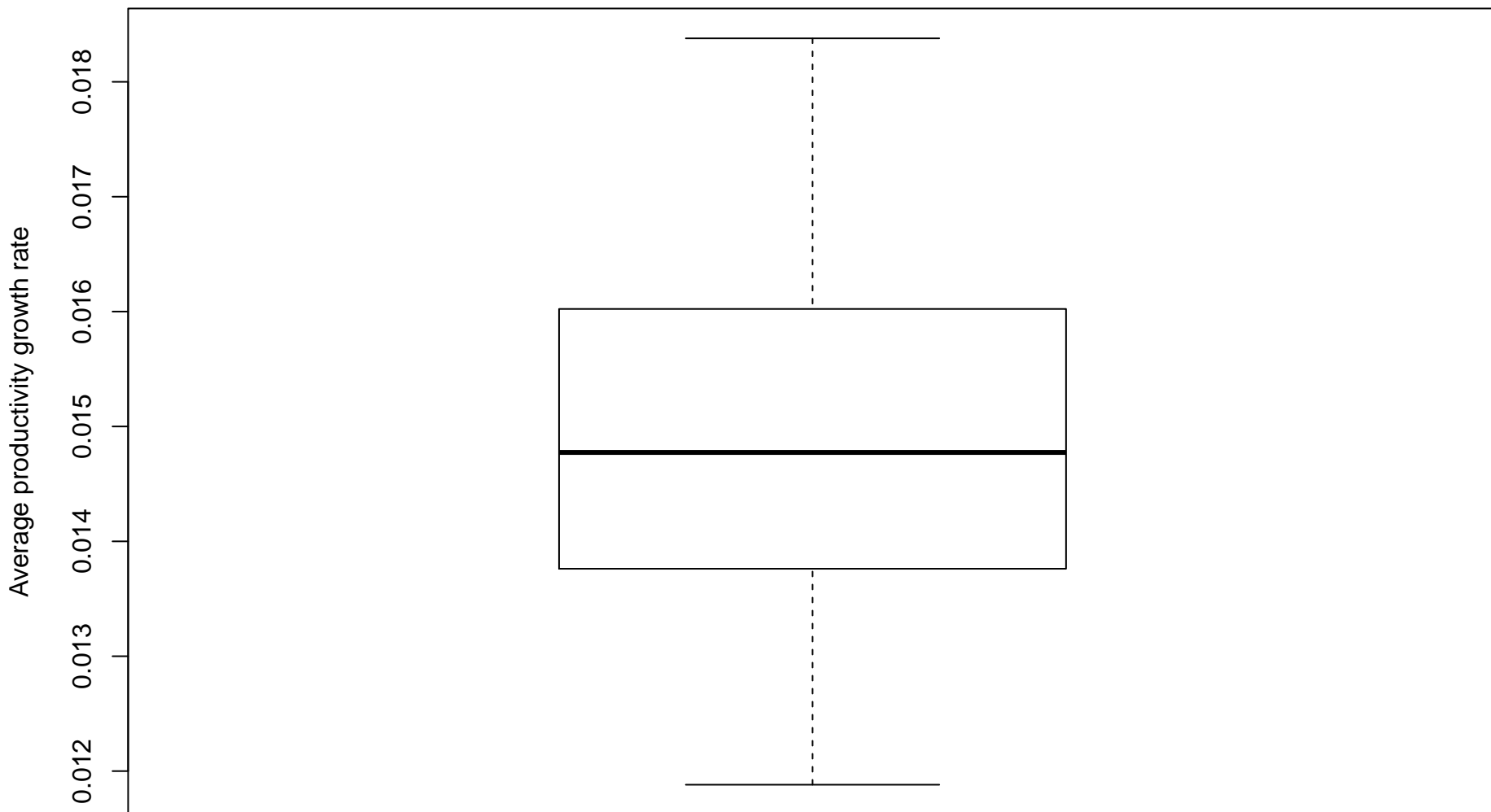
Unemployment

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

Vacancy
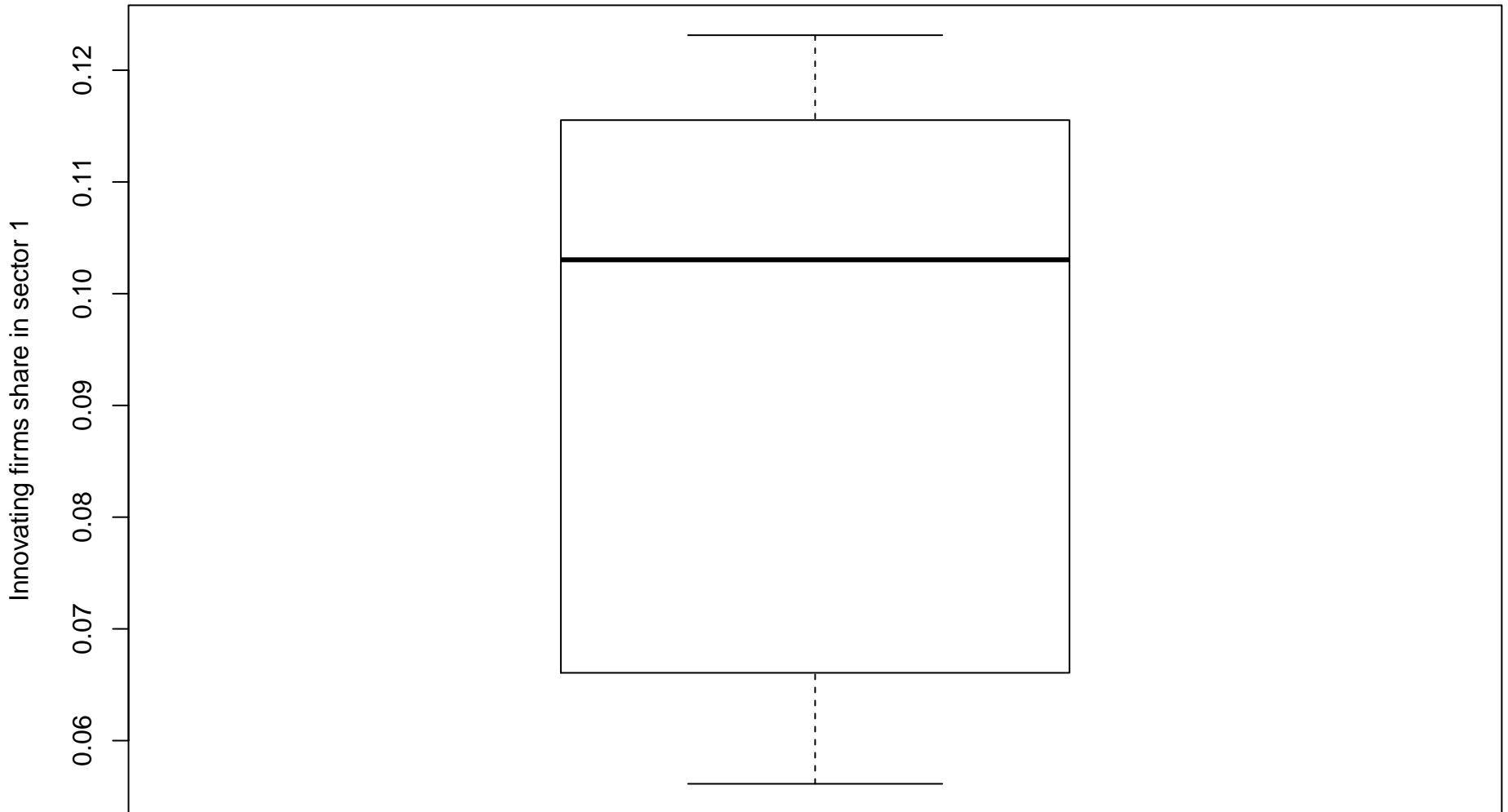

Average net vacancy rate

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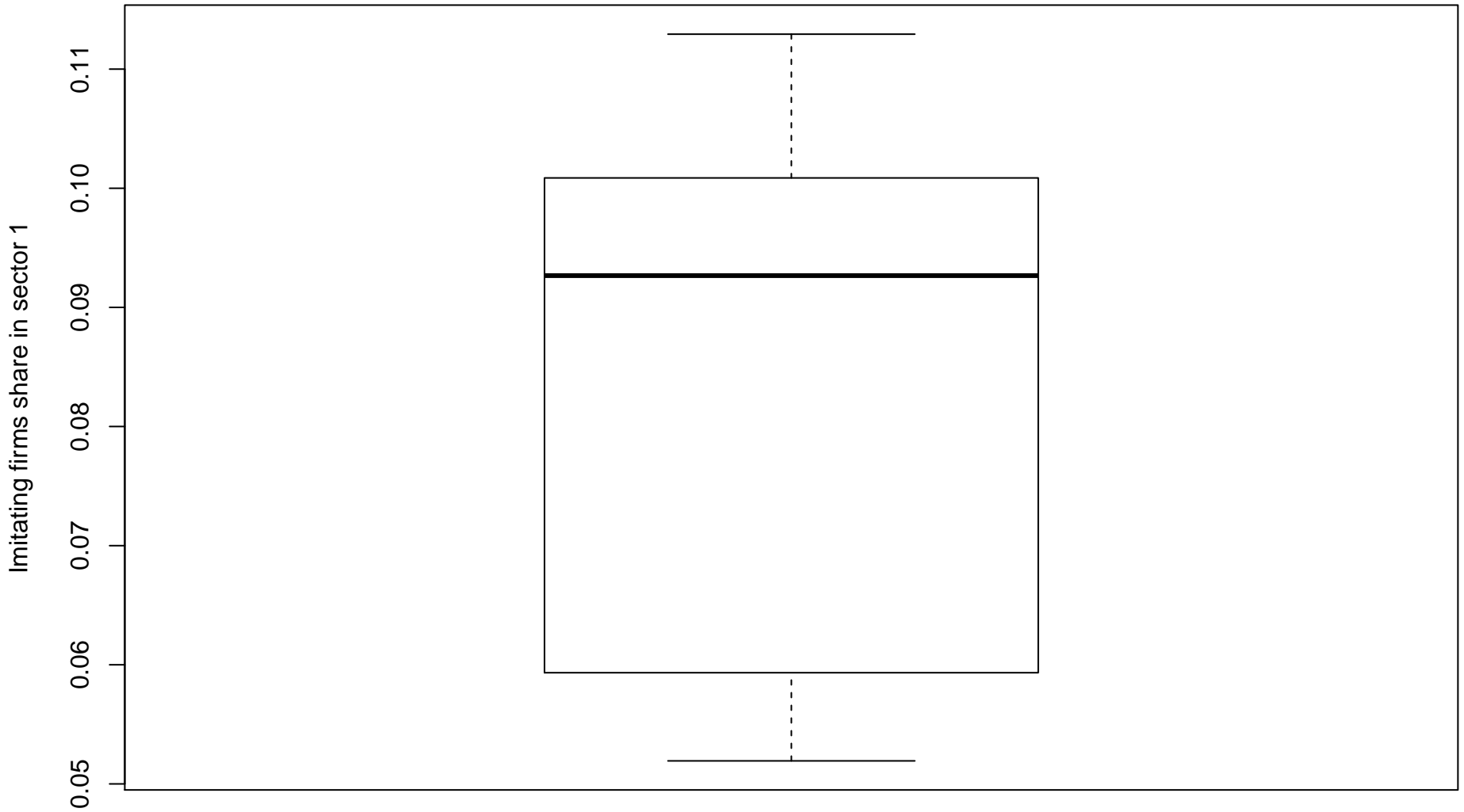
Productivity growth

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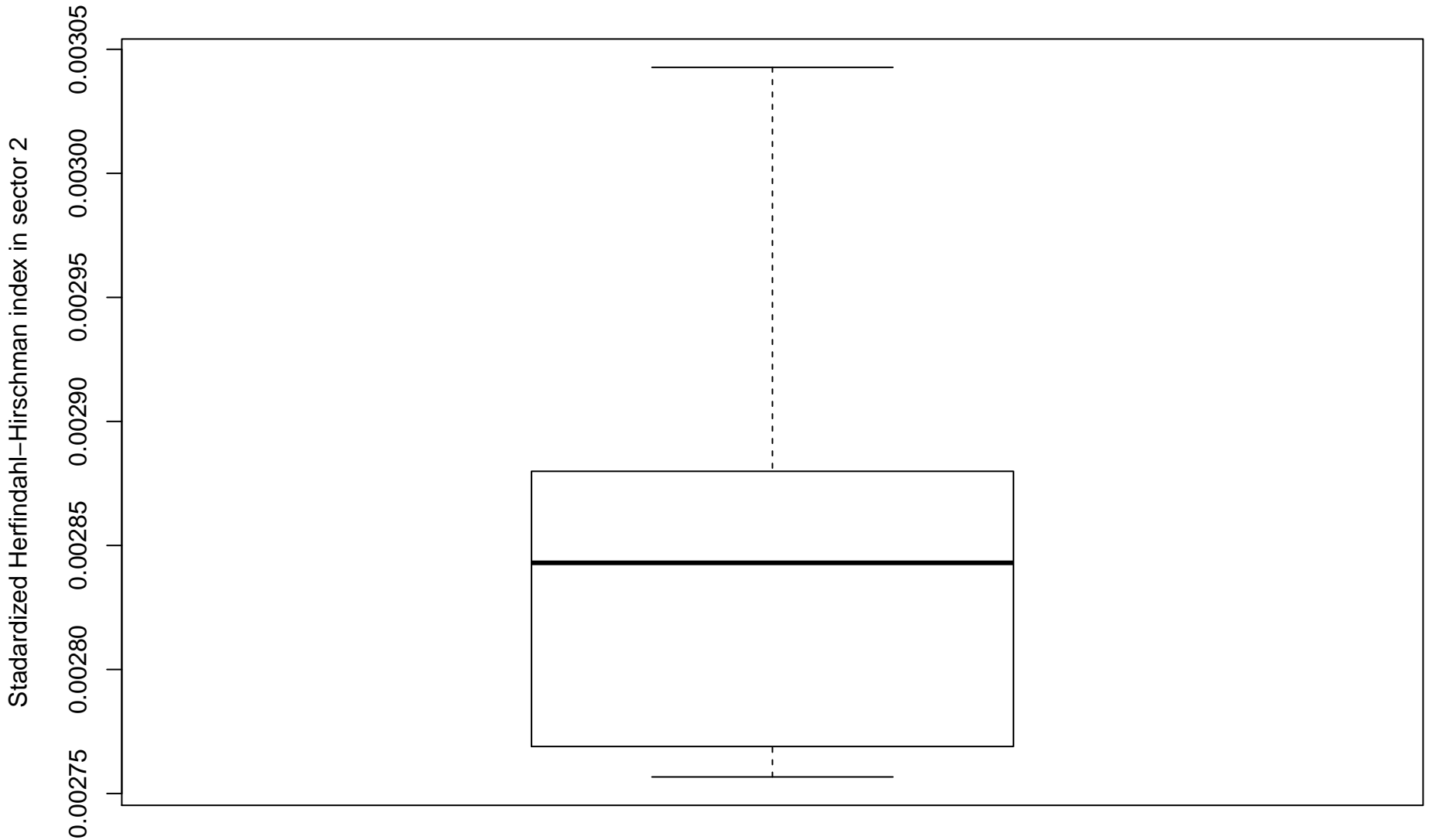
Innovation

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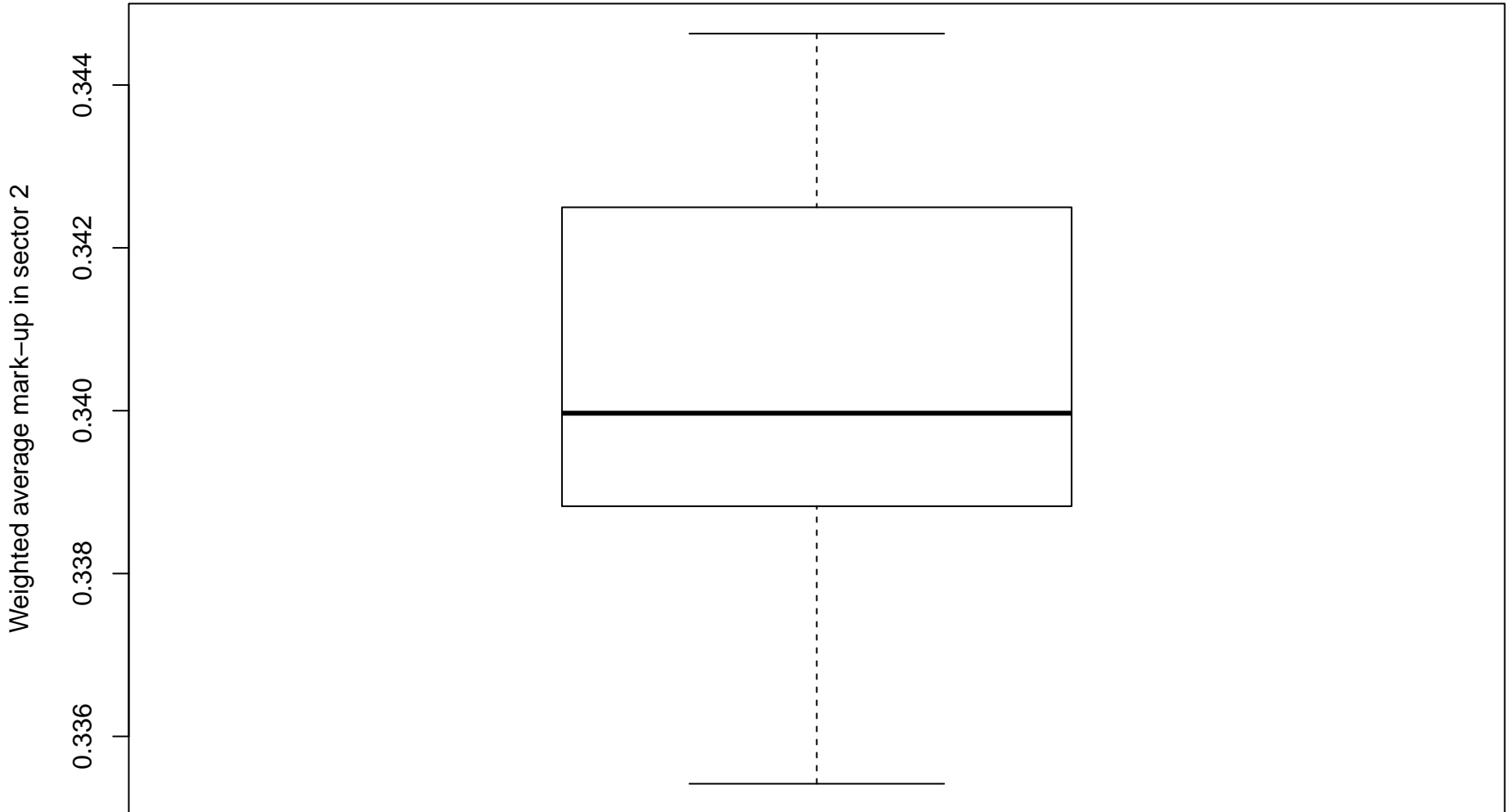
Imitation

Imitating firms share in sector 1

(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

Weighted average mark−up in sector 2

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

Net entry of firms

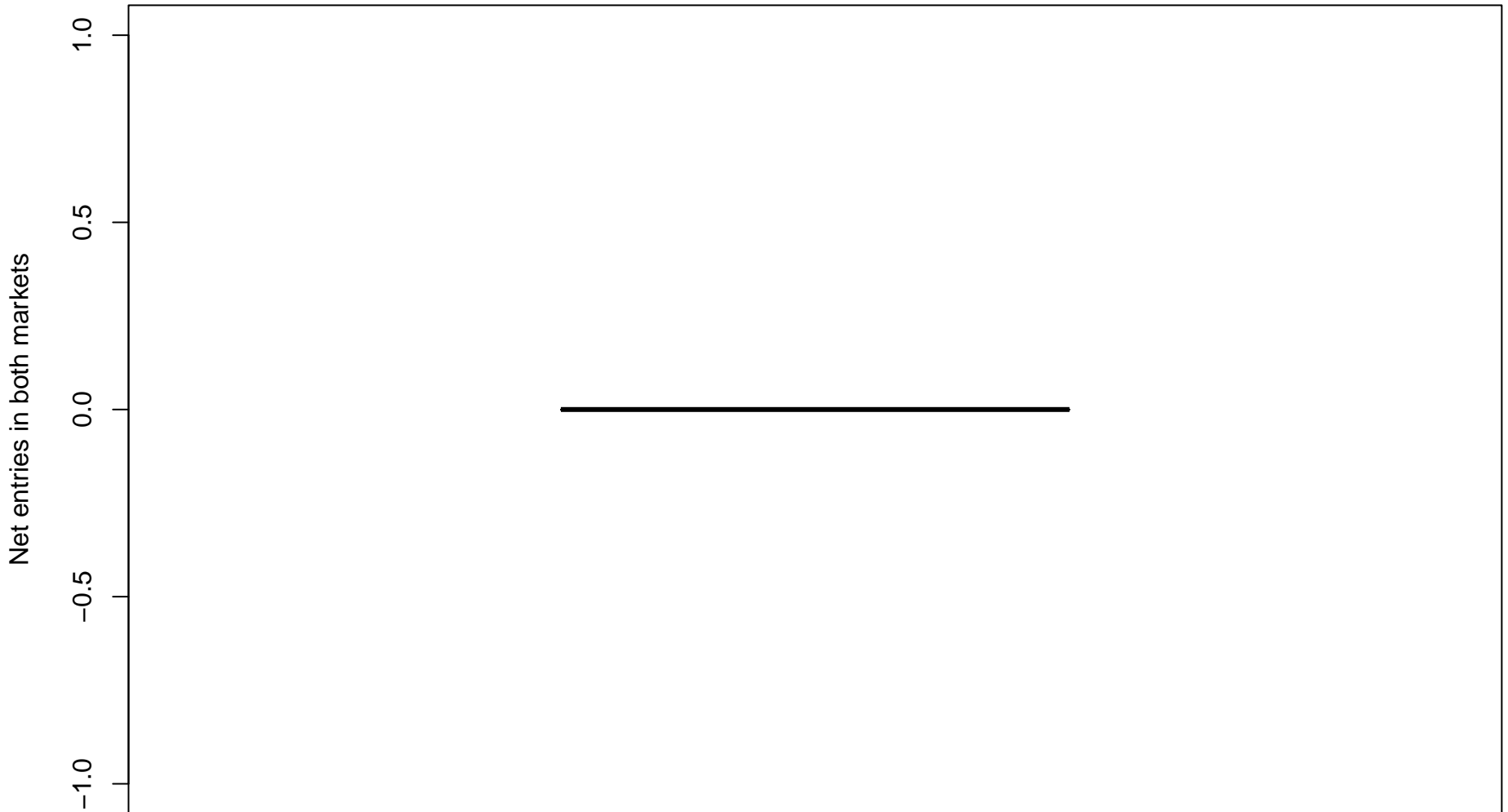Net entries in both markets

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

Monte Carlo descriptive statistics (all experiments)

	Avg[1]	SD[1]	Min[1]	Max[1]
GDP growth	0.01487	0.001769	0.01151	0.01828
Volatility of GDP growth	0.08481	0.01517	0.04599	0.1024
Likelihood of GDP crises	0.245	0.06875	0.08	0.32
Inflation	0.001472	0.0009566	0.0001205	0.003046
Tax	0.02695	0.004923	0.02295	0.04031
Government total expenditure	0.06439	0.04435	2.662e−06	0.1188
Government deficit	0.1772	0.09063	0.0009182	0.3239
Government debt	11.26	5.835	1.025	22.01
Credit supply	−1.153e−09	7.117e−10	−2.567e−09	−3.872e−10
Loans	2.82	4.704	0.9024	16.16
Capacity utilization	0.5066	0.0486	0.3697	0.5362
Full employment frequency	0.257	0.3381	0	1
Unemployment	0.1542	0.1006	0	0.2732
Vacancy	0.2964	0.239	0.1794	0.9698
Productivity growth	0.01485	0.001777	0.01188	0.01838
Innovation	0.09577	0.02497	0.05613	0.1231
Imitation	0.08623	0.02274	0.05193	0.1129
Market concentration	0.002704	0.0005198	0.001246	0.003043
Mark−ups	0.3417	0.00612	0.3354	0.3576
Net entry of firms	0	0	0	0

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