Labor Tax, rel. Pareto weights 1

December 22, 2017

1 Tables with Results

	No tax	Optimal policy	Optimal SS tax	Optimal Flat tax
τ_0	0.00000	-0.29444	-0.10526	0.02222
$\bar{\tau}$	0.00000	0.19428	-0.10526	0.02222
Half life	-	13.00000	-	-
Welfare (weighted)	-10.29030	-10.17092	-10.37036	-10.28787
Welfare workers	-5.86691	-5.81440	-6.25191	-5.80398
Welfare entrepreneurs	-19.13709	-18.88397	-18.60728	-19.25567

	Constant τ_0	Constant $\bar{\tau}$
τ_0	-0.29444	0.19428
$\bar{\tau}$	-0.29444	0.19428
Half life	-	-
Welfare (weighted)	-10.75017	-10.47927
Welfare workers	-7.24267	-5.58331
Welfare entrepreneurs	-17.76516	-20.27119

Experiment	Total welfare	Worker welfare	Entrepreneur welfare
Optimal policy	0.00414	0.00158	0.01274
Optimal flat tax	0.00008	0.00189	-0.00591
Constant τ_0	-0.01579	-0.04043	0.07100
Constant $\bar{\tau}$	-0.00652	0.00854	-0.05513

2 Parameters and functional forms

2.1 Functional forms etc.

- Occupational choice: No
- Workers save: No
- Decreasing returns to scale: Yes
- Productivity process: Ornstein-Uhlenbeck, $d\log(z) = -\nu \log(z)dt + \sigma dW$
- Period utility function:

$$u(c,l) = (1-\gamma)^{-1}c^{1-\gamma} - \nu(l), \quad \nu(l) = (1+1/\chi)^{-1}l^{1+1/\chi}$$

- Production function: $y = F(z,k,n) = zA((k-f_k)^+)^\alpha((n-f_n)^+)^\beta$
- Tax schedule: $\tau_l(t) = \bar{\tau}_l + e^{-\gamma t}(\tau_{l,0} - \bar{\tau}_l)$

2.2 Parameter values

Pareto weight workers		0.667
Population share of workers	$popshare$	0.667
Total population	$popmass$	1.000
Discount rate entrepreneurs	ρ_e	0.050
Discount rate workers	ρ_w	0.030
Relative risk aversion	γ	1.000
Inverse Frisch elasticity	φ	1.000
Depreciation rate	δ	0.000
Death rate	θ	0.000
Fixed cost capital	f_k	0.000
Fixed cost labor	f_n	0.000
Financial constraint parameter	λ	2.000
Common TFP parameter	A	1.000
Capital share	α	0.297
Labor share	β	0.603
Returns to scale	$\alpha + \beta$	0.900
Interest rate	r^*	0.030
Effect of productivity on effective labor supply	η	0.000
Productivity drift parameter	ν	0.163
Productivity yearly autocorrelation	$e^{-\nu}$	0.850
Productivity standard deviation parameter	σ	0.300
Productivity mean	$\bar{z}$	1.148
Poisson arrival rate		0.100
Parameter of Pareto distribution of Poisson shocks		1.100
Contraction of initial distribution	χ	0.100

2.3 Iteration parameters

Number of grid points assets	I	200.000
Number of grid points productivity	J	30.000
Number of grid points time	N	150.000
Number of time periods	T	150.000
Max assets	a_{max}	350.000
Mean wealth relative to steady state		0.100
Range of initial tax rate tested	τ_0	[-0.350,-0.250]
Range of final tax rate tested	$\bar{\tau}$	[0.150,0.250]

3 Figures

Optimal steady state tax rate = -0.105

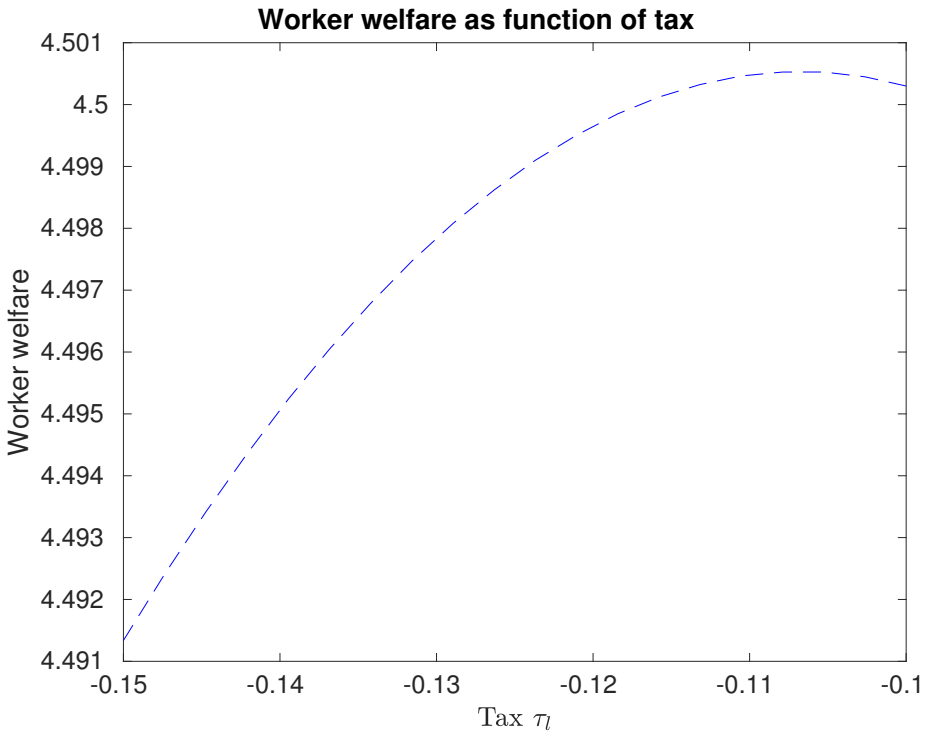

Figure 1

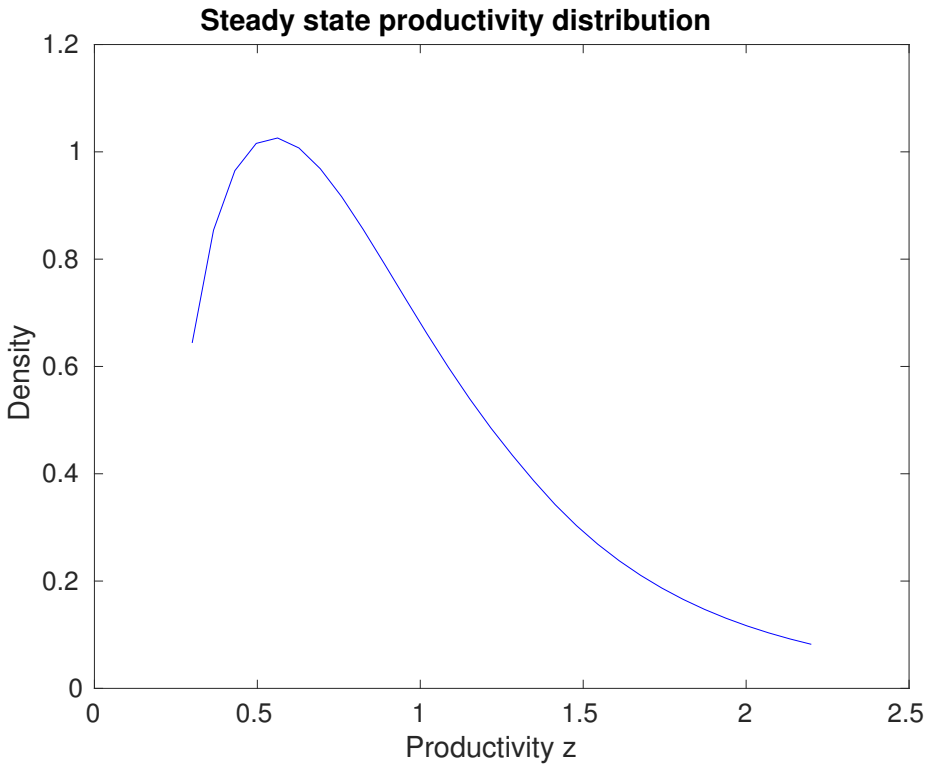

Figure 2

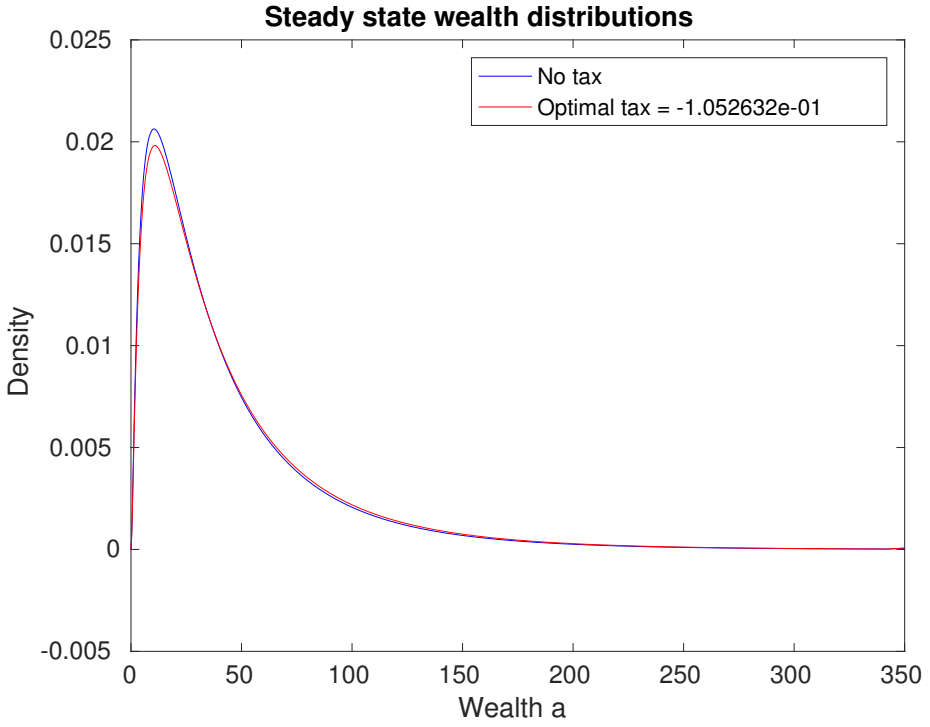

Figure 3

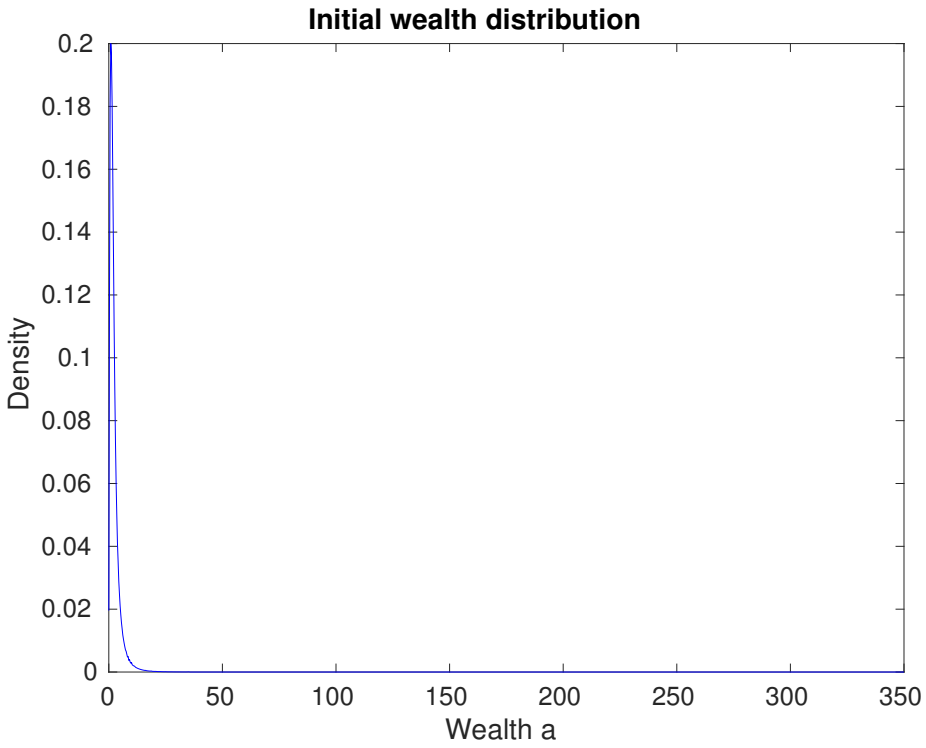
Initial wealth distribution
Density
Wealth a
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0
50
100
150
200
250
300
350

Figure 4

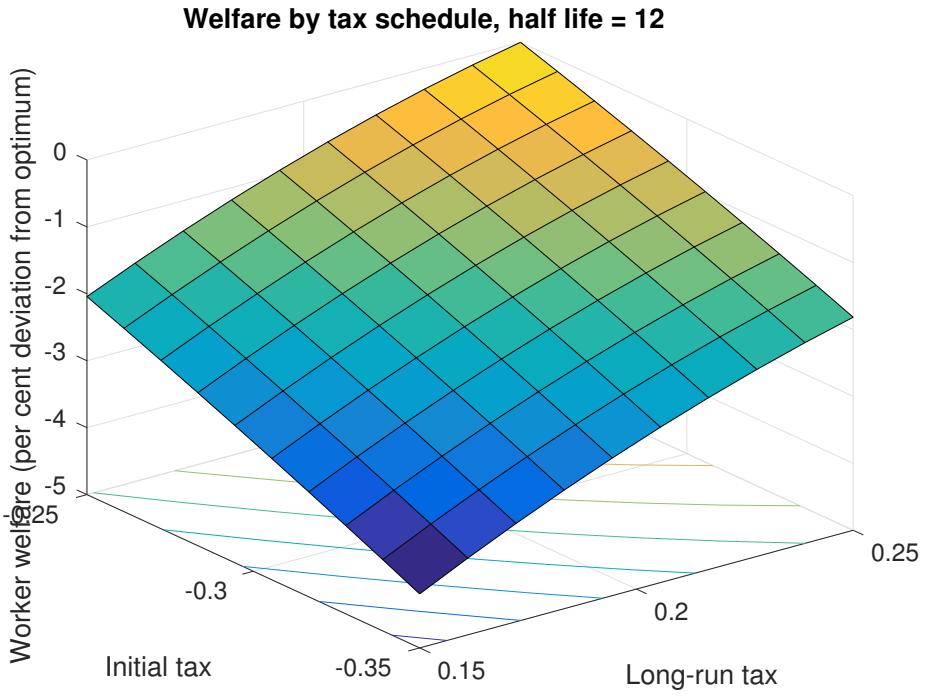

Figure 5

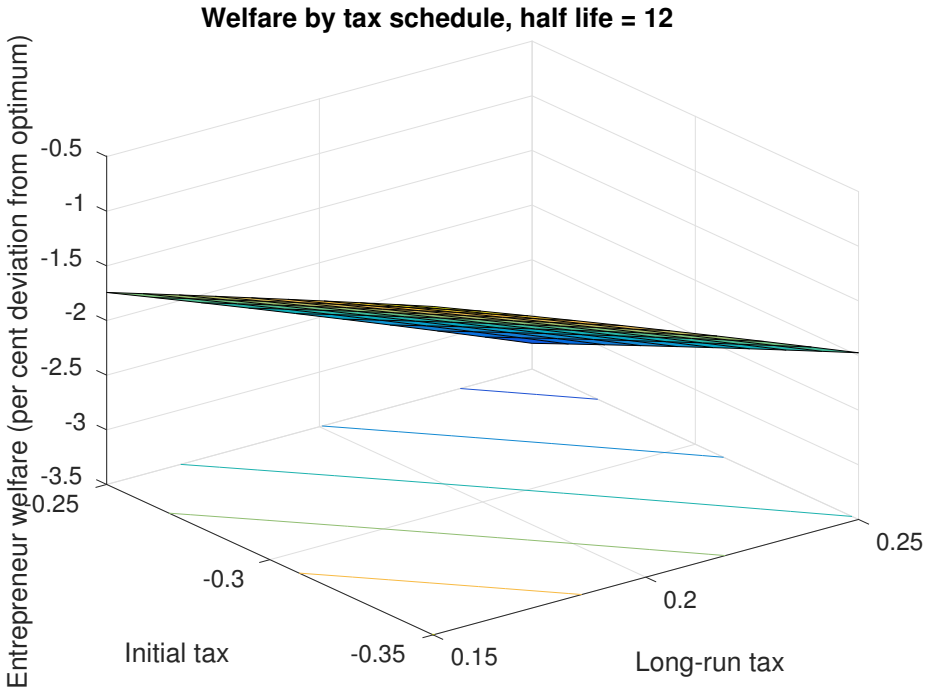

Figure 6

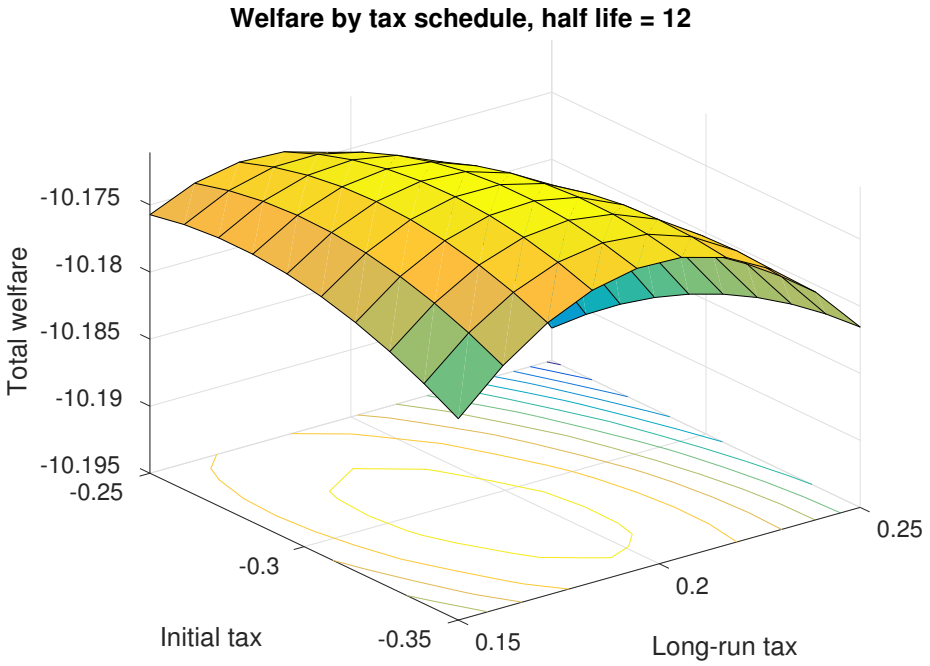

Figure 7

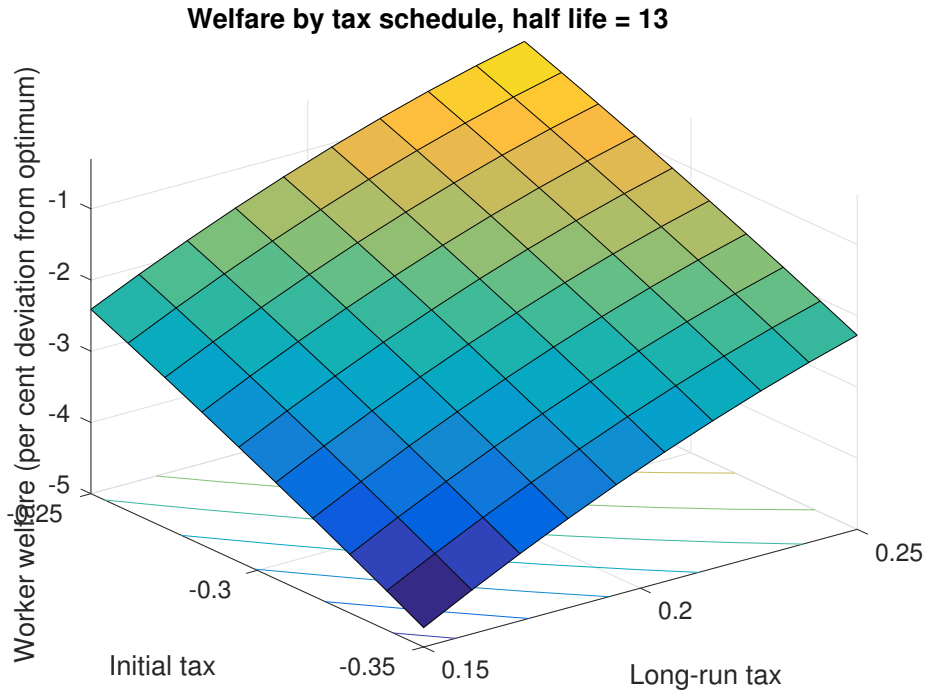

Figure 8

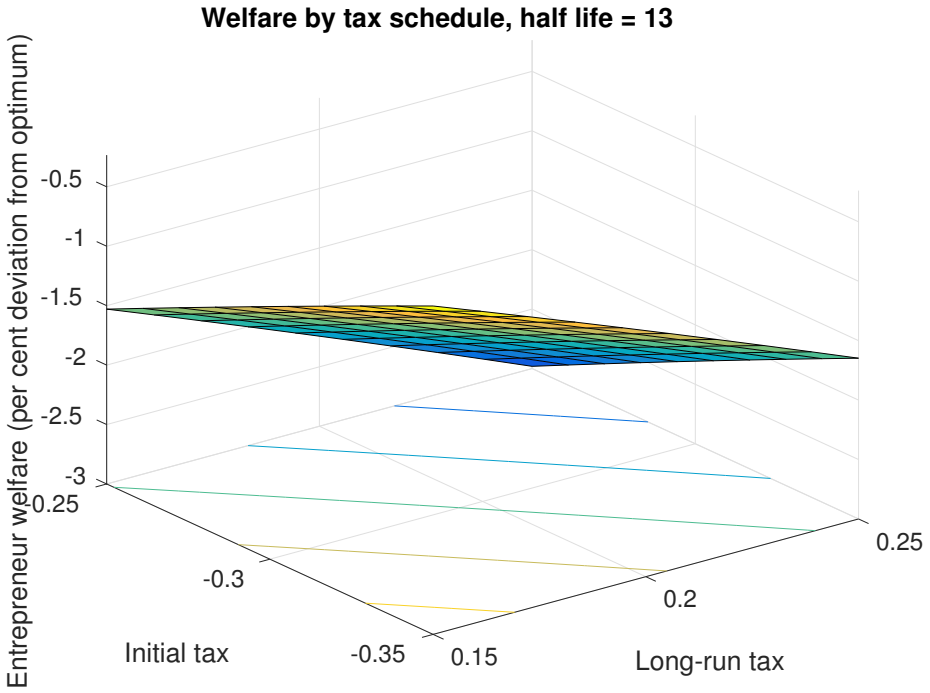

Figure 9

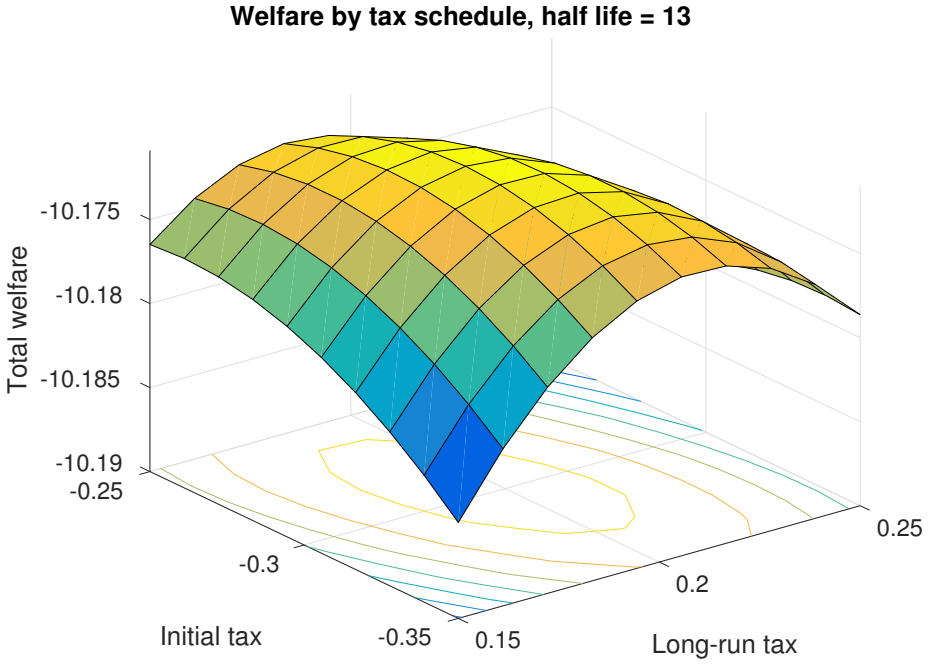

Figure 10

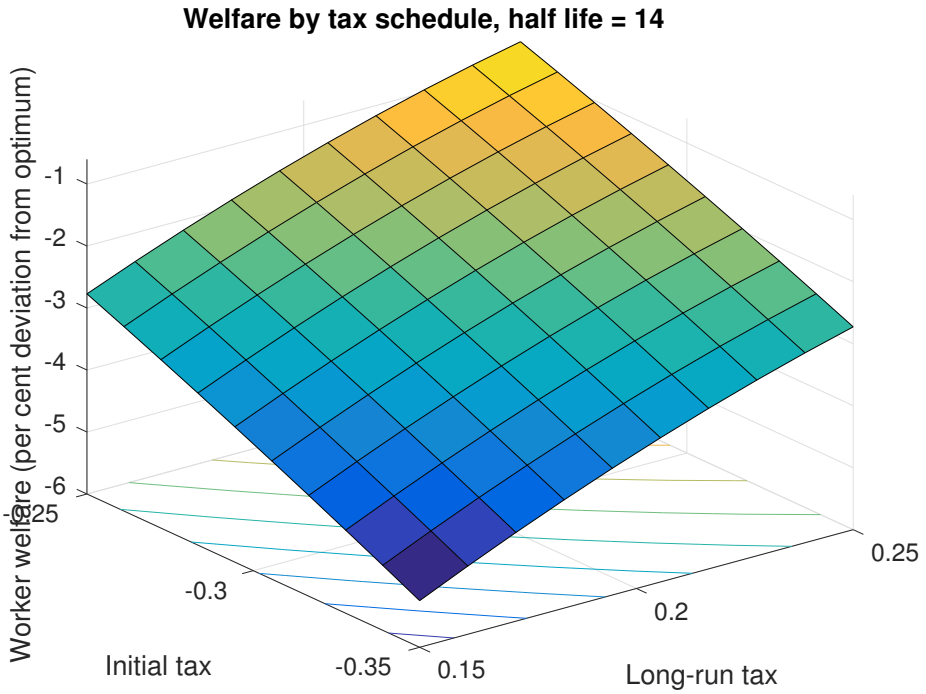

Figure 11

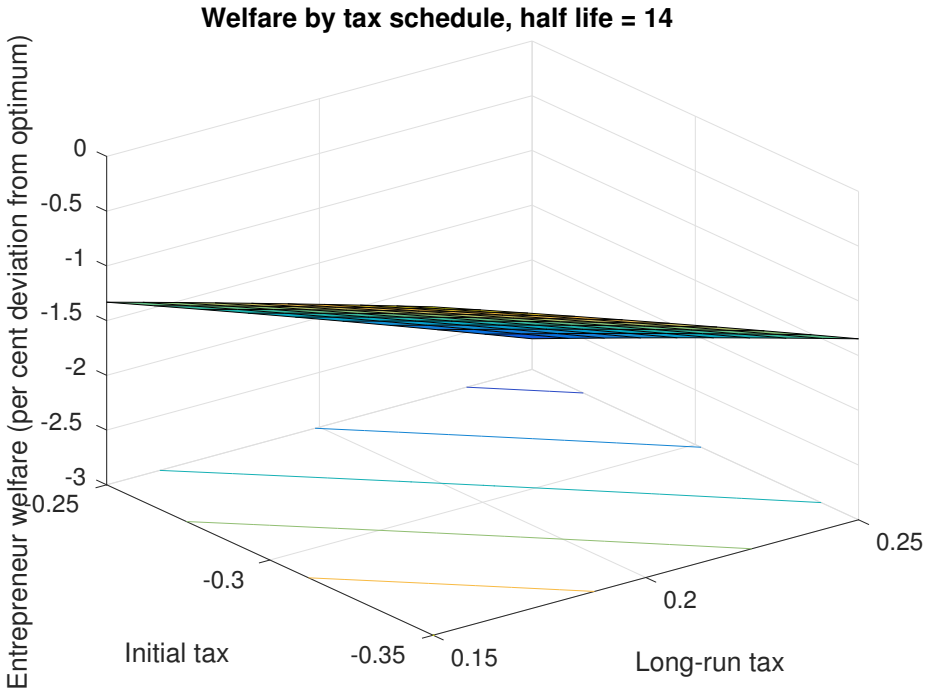

Figure 12

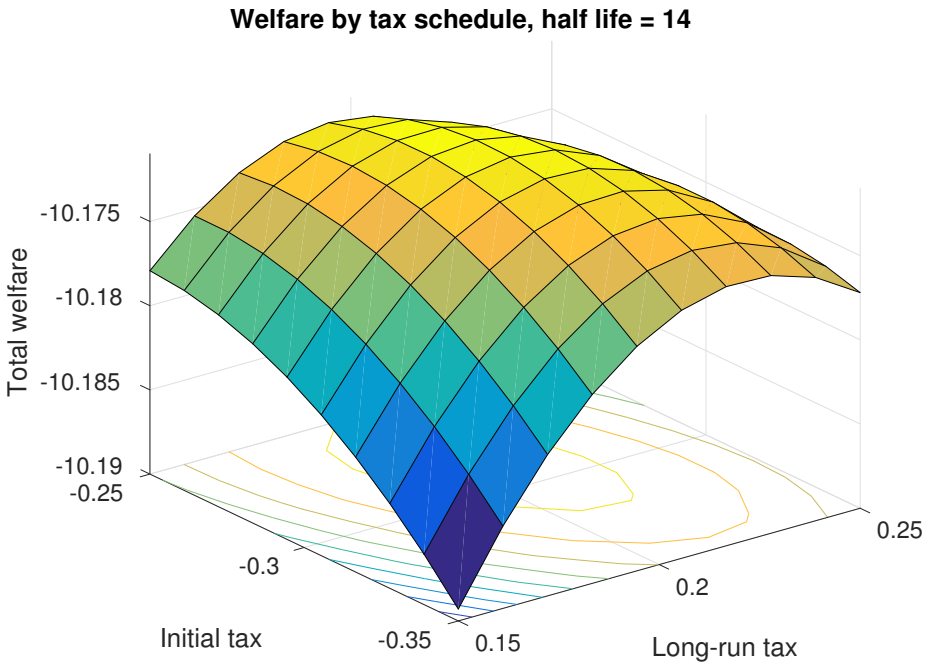
Welfare by tax schedule, half life = 14
Total welfare
-10.175
-10.18
-10.185
-10.19
-0.25
-0.3
-0.35
Initial tax
0.15
0.2
0.25
Long-run tax

Figure 13

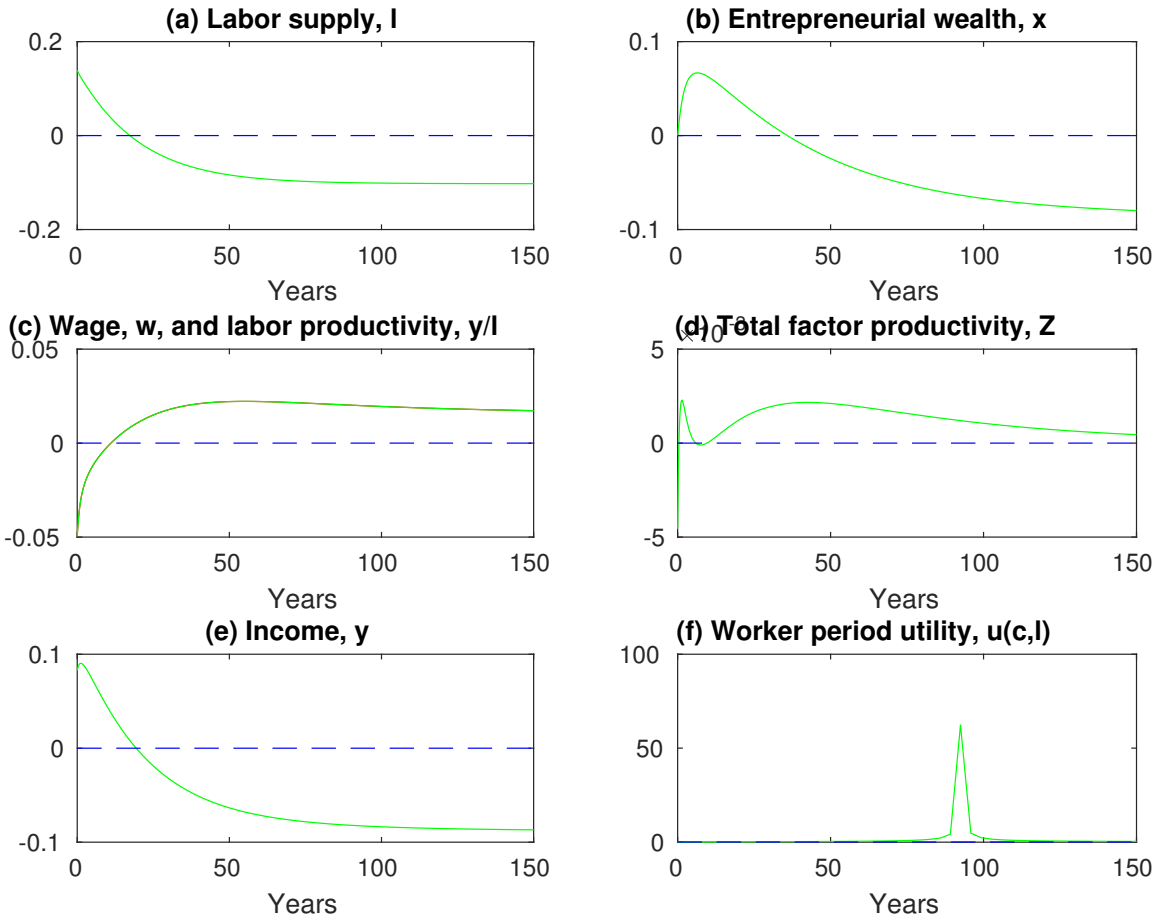

Figure 14 – Proportional deviations of optimal tax equilibrium from the laissez-faire equilibrium

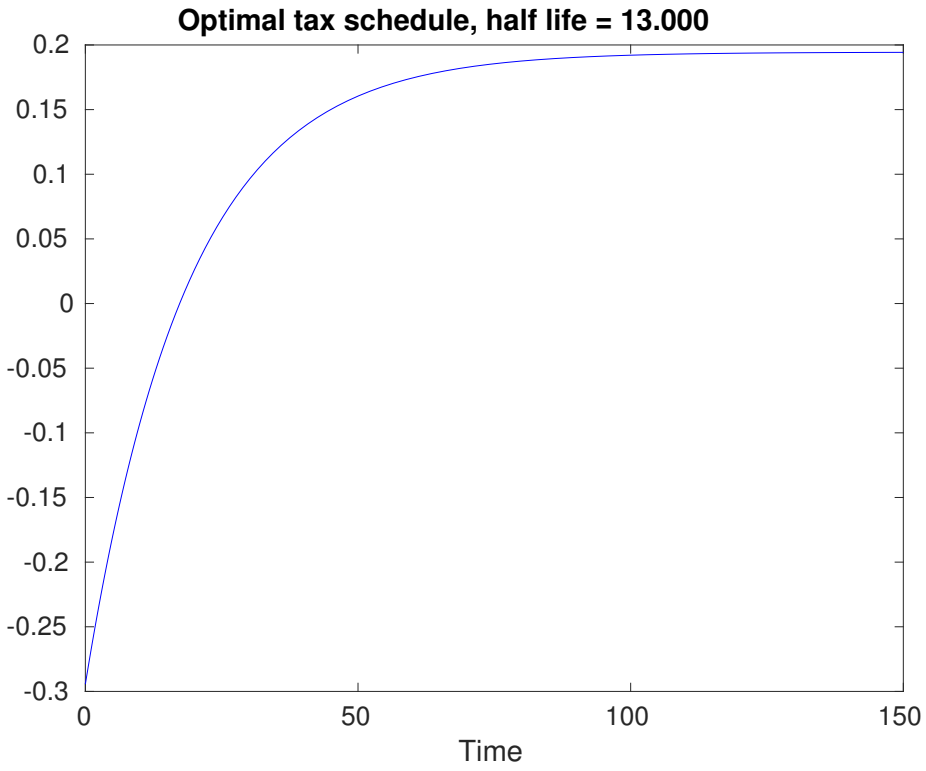

Figure 15

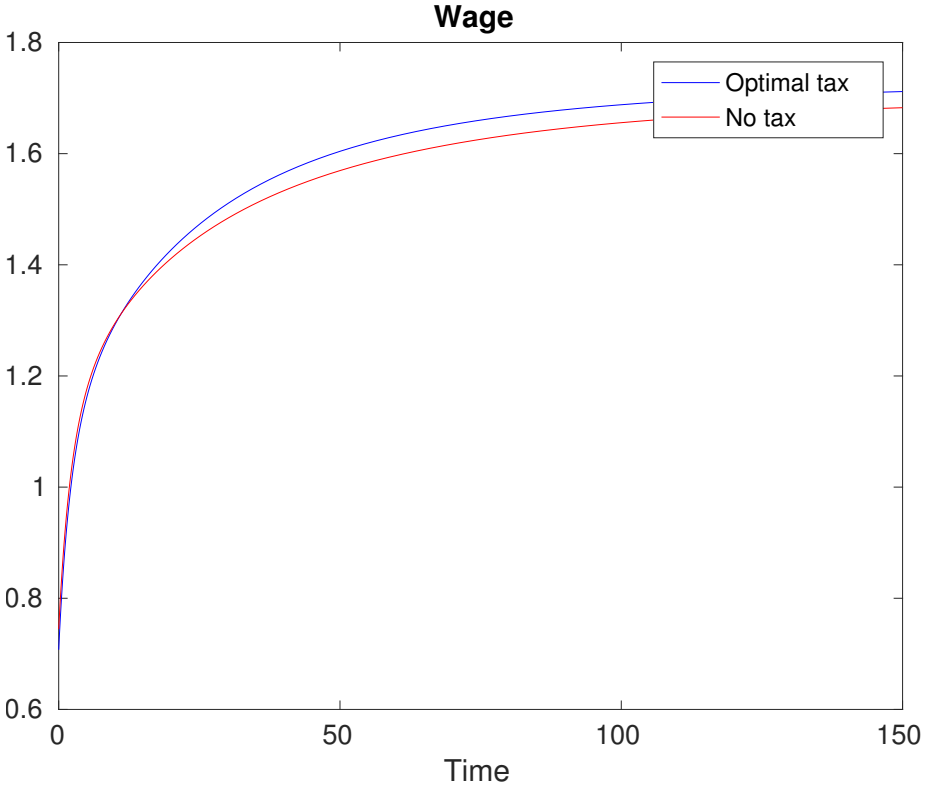

Figure 16

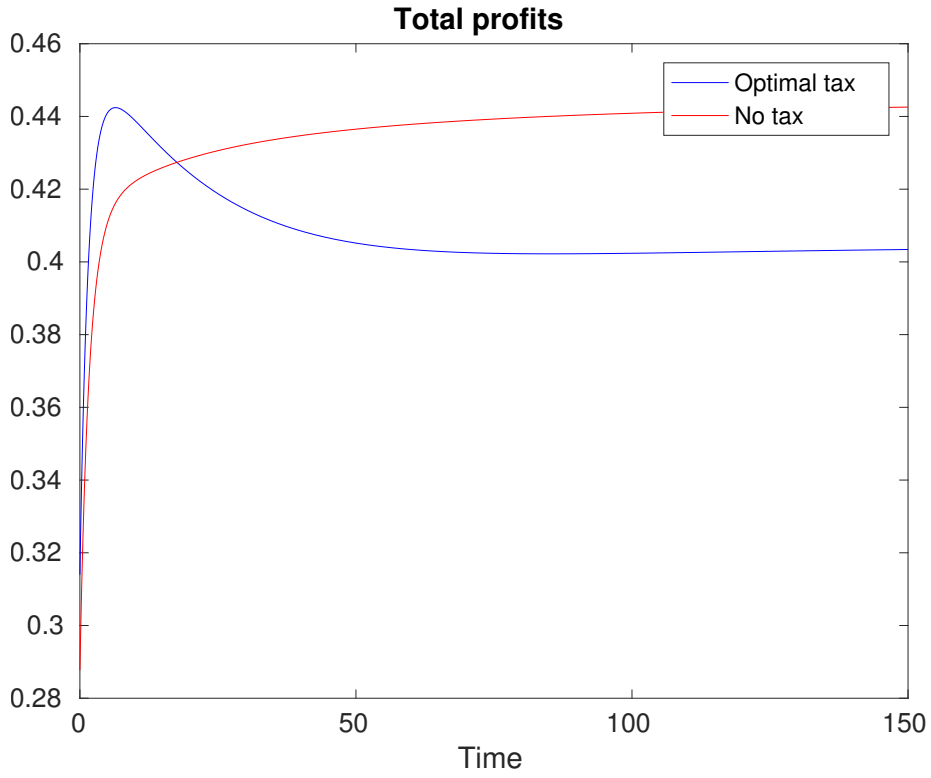

Figure 17

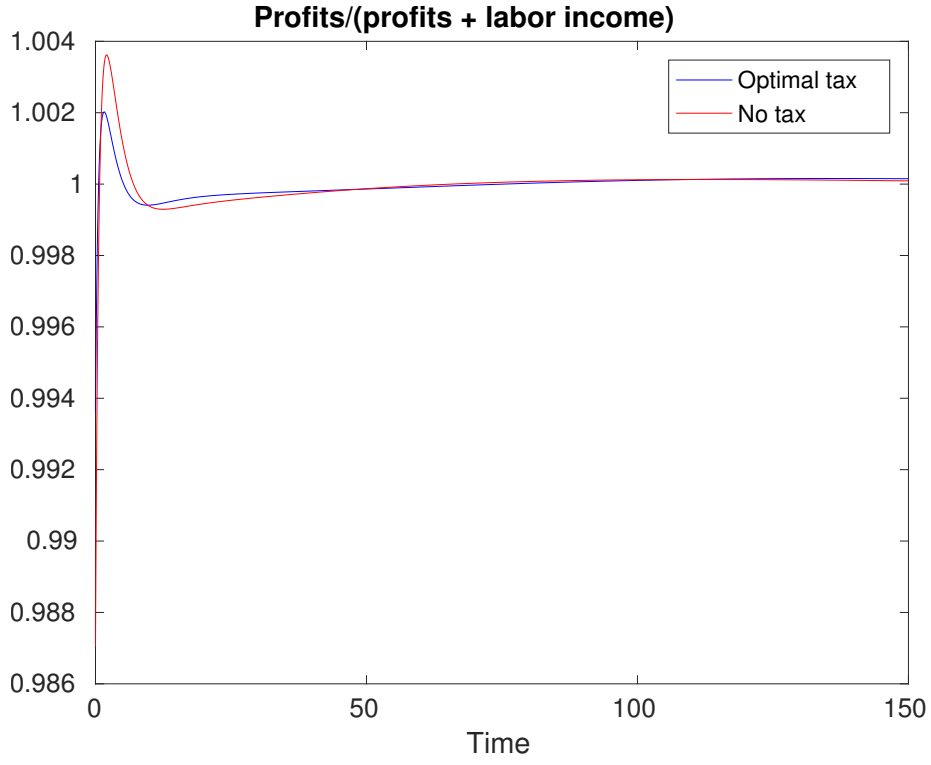

Figure 18

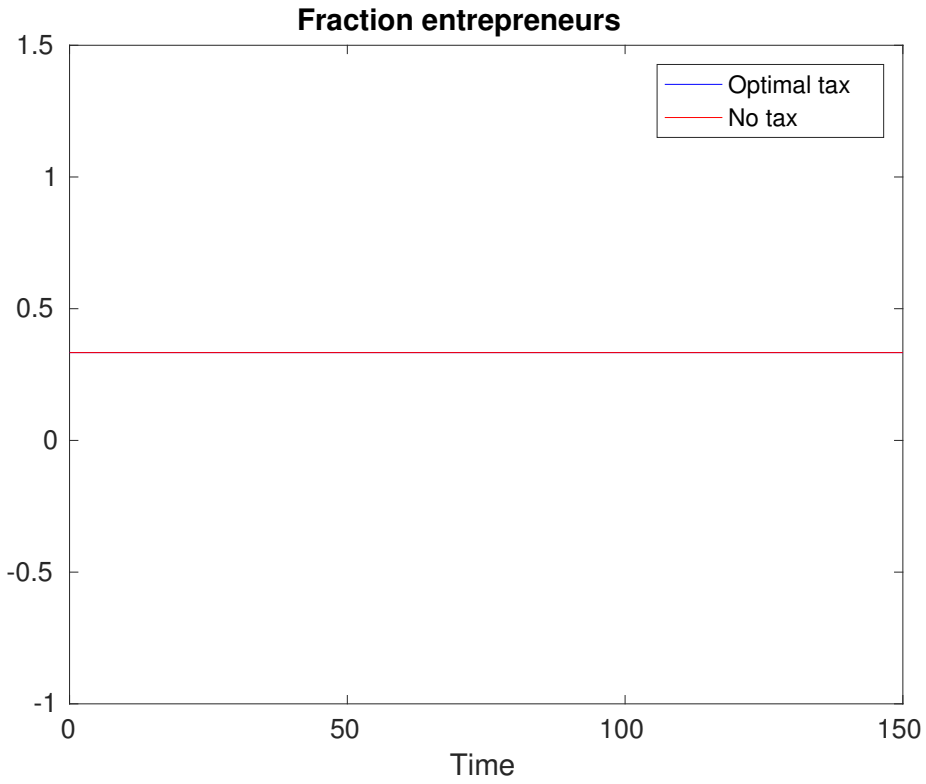

Figure 19

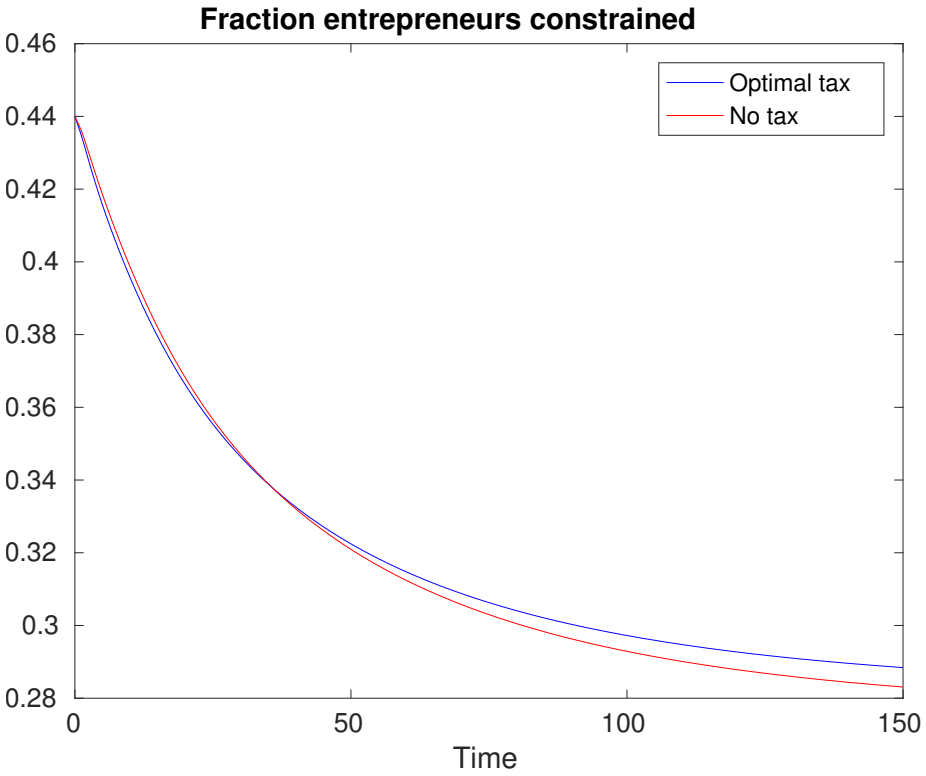

Figure 20

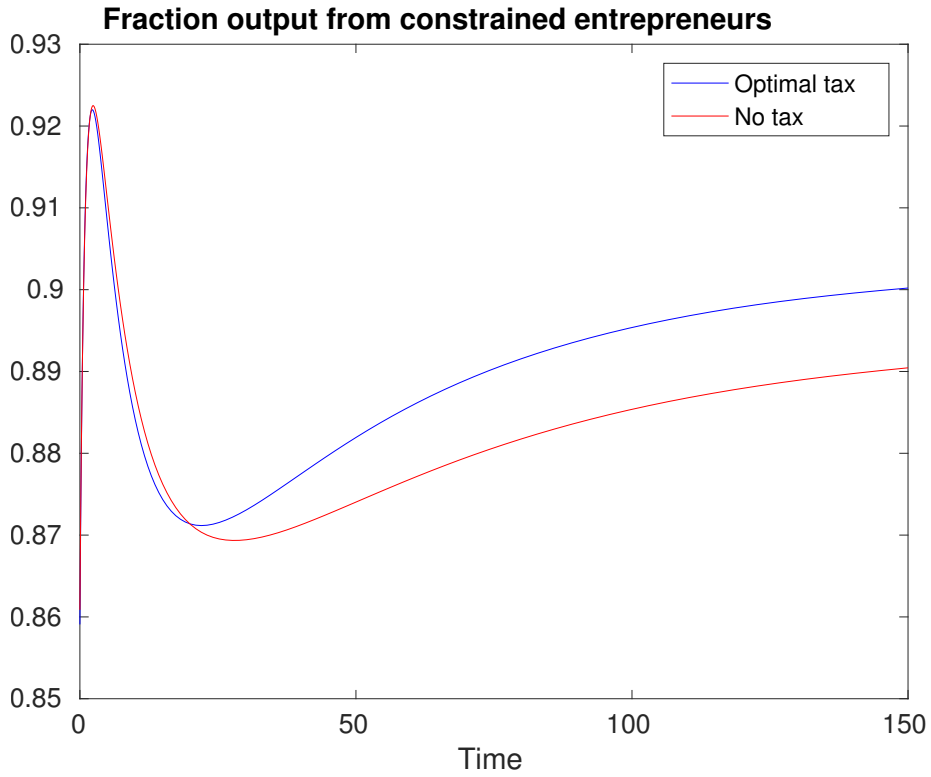

Figure 21

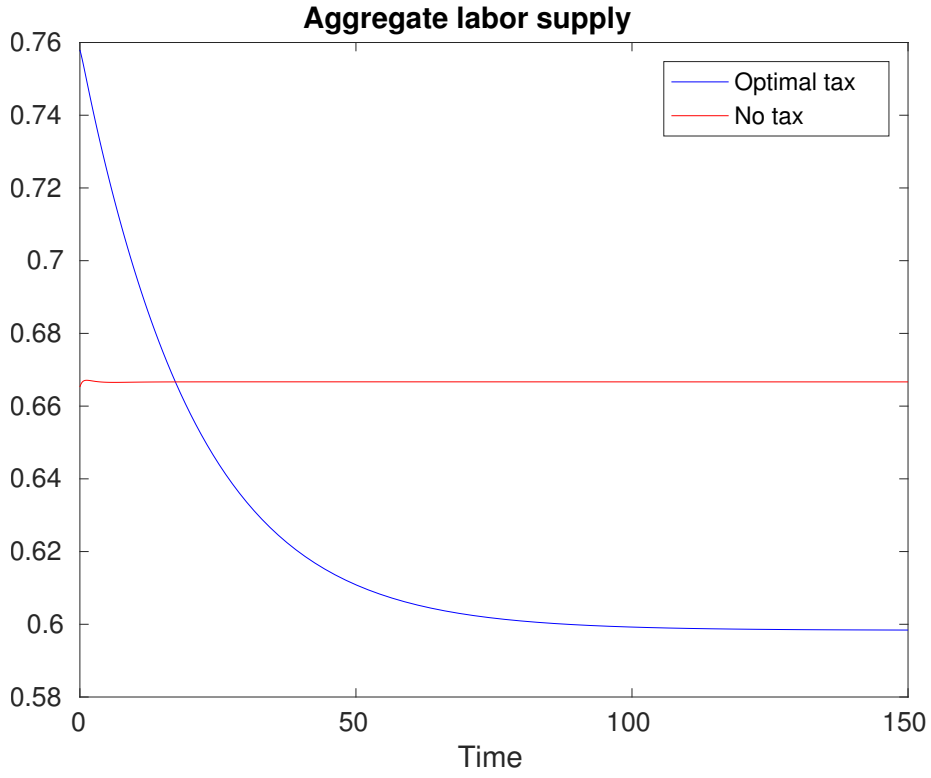

Figure 22

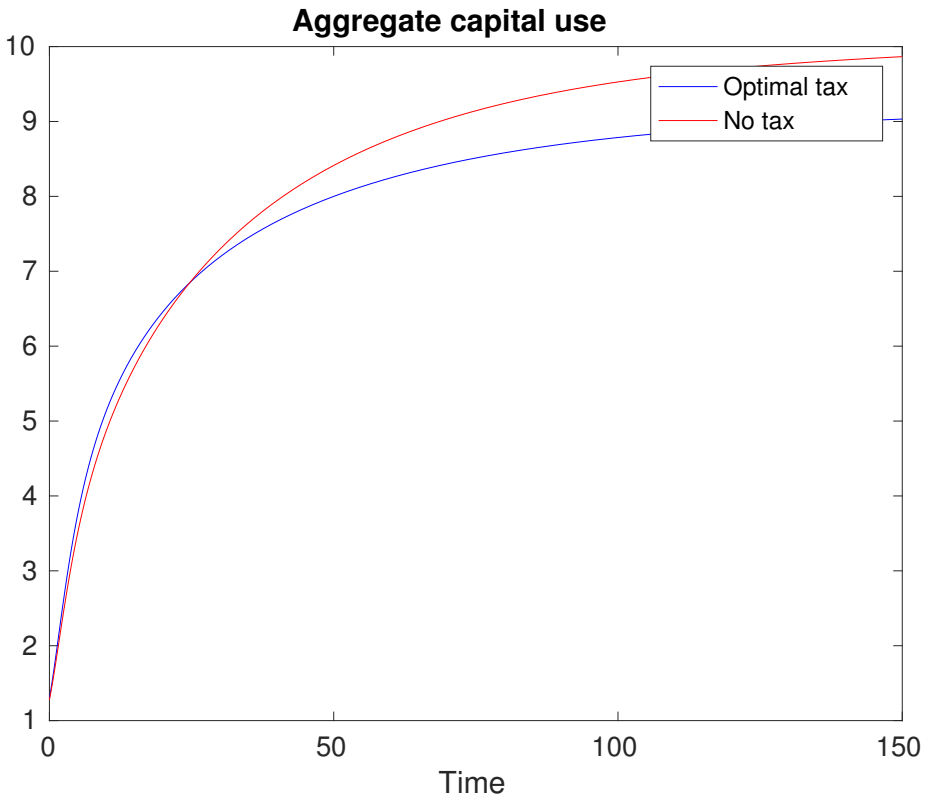
Aggregate capital use
Optimal tax
No tax
10
9
8
7
6
5
4
3
2
1
0
50
100
150
Time

Figure 23

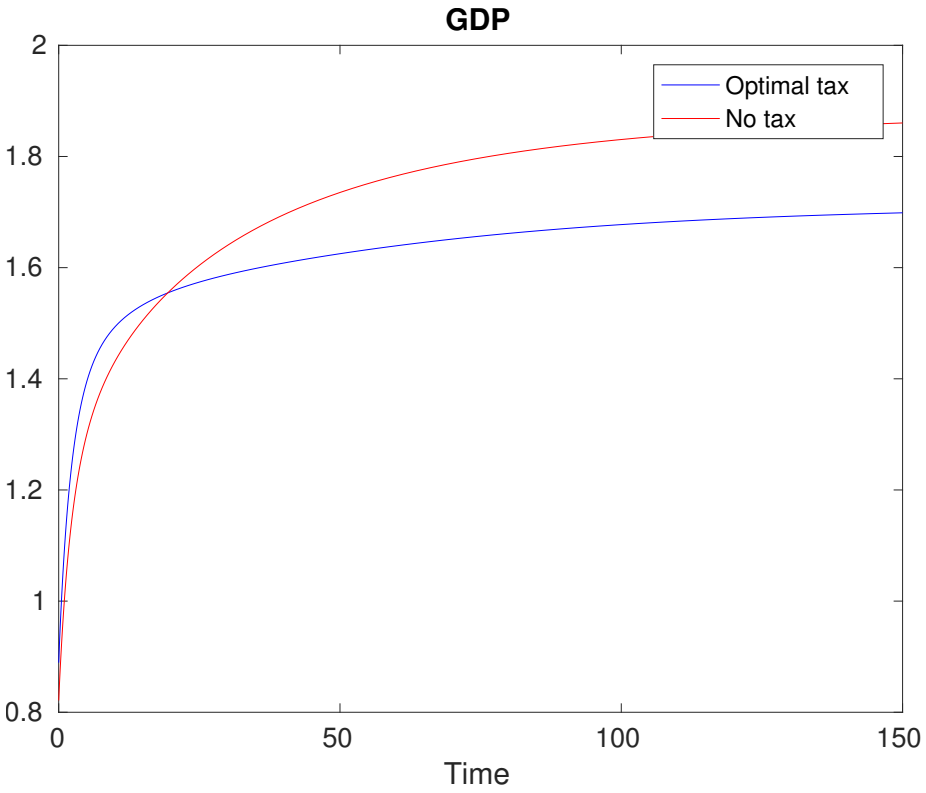

Figure 24

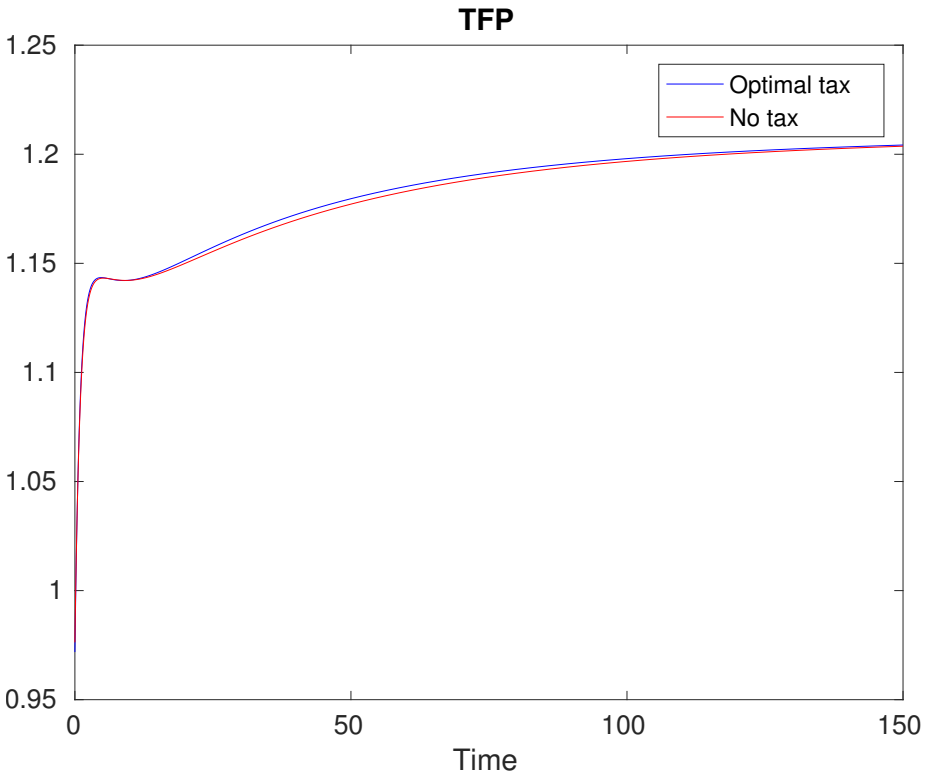

Figure 25

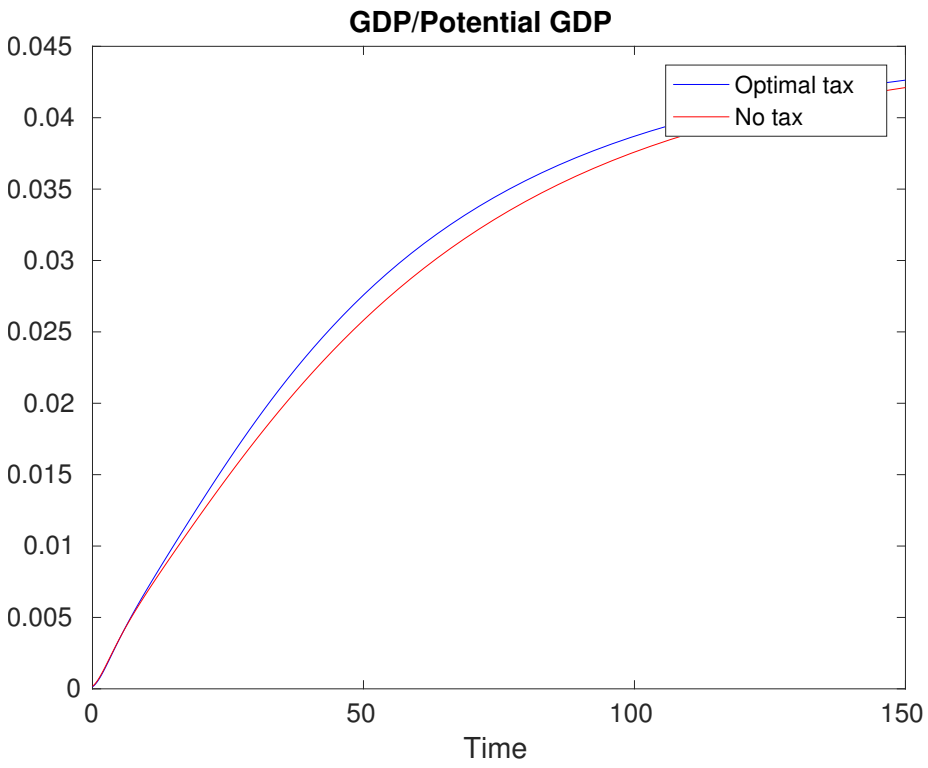

Figure 26

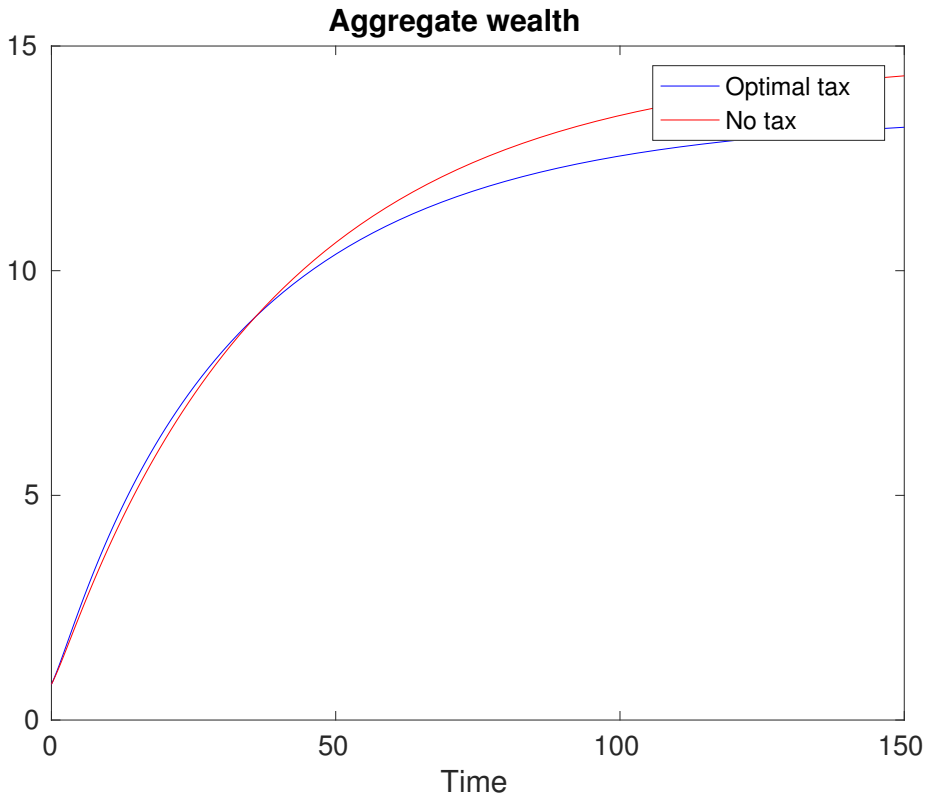

Figure 27

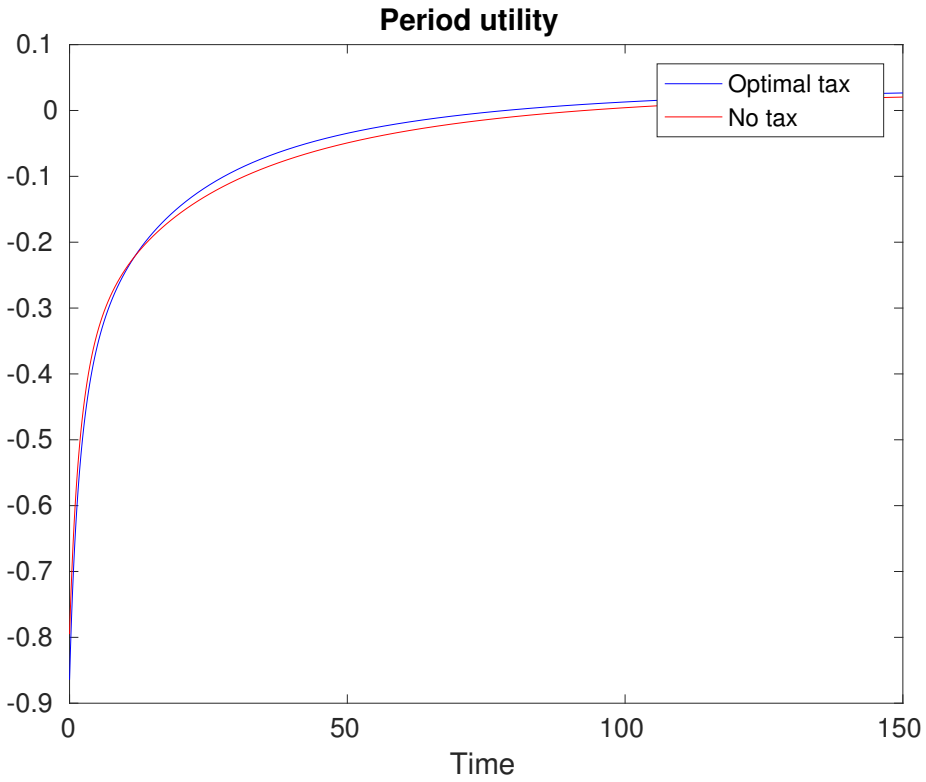

Figure 28

Figure 29