Restuccia and Rogerson (2008) - Policy distortions and aggregate productivity with heterogeneous establishments

The model of Restuccia and Rogerson (2008) studies the role of idiosyncratic distortions to firms on aggregate outcomes. The focus is on comparing outcomes between different stationary competitive equilibria. Because all of the shocks are permanent, while the model is in principle dynamic in practice it is effectively static. Restuccia and Rogerson (2008) take an approach to solving the model that exploits this static nature of the solution, and additionally exploits that it is known to be linear in the mass of entrants. The codes used to replicate the model do not attempt to exploit either of these, and solve *as if* the model was fully dynamic and stochastic with time-varying shocks potentially non-linear in the mass of entrants; while this makes it notably slower than the code provided by RR2008 it illustrates how even code that is written for solving more general problems can often still be used for simple problems as long as speed is not essential.[1]

The code provided by RR2008 (namely RR_model_RED.m) contains an error. It sets variable i as interest rate on line 23. It then overwrites this as part of using i in a for-loop on lines 43-46 so that value of i ends up equal to 'length(datazupper2)'. On line 68 i is used to calculate rho, with the intention that i is still the interest rate, but this is no longer true.[2]

Tables 1-9 essentially replicate perfectly. Table 7 took some time as from paper it is not easy to determine what exactly is being reported. First there is the bottom row of Table 7 which reports Y_s/Y. Page 715 defines Y_s/Y as ' *the output share of establishments that are receiving a subsidy*'. Table 7 relates to Section 6.1 which considers when all but some establishments are taxed and aggregate capital is allowed to change; since the subsidy was set to keep aggregate capital unchanged, this suggests that the subsidy should equal zero, and this interpretation is supported by line 337 of the codes of RR2008 which sets 'sub=0'. This would immediately imply that $Y_s = 0$ by definition (and thus $Y_s/Y = 0$). What is not clear is that in Table 7 you need to reinterpret/redefine Y_s as relating to 'non-taxed' rather than 'subsidised'. The top-left most entry of my Table 6 appears erroneous, but I could not find where in my replication code the problem lies (it is just one number, so at some point diminishing returns kicked in...).

The model has both a standard endogenous entry condition (which introduces a free-entry general equilibrium condition) and a further 'conditional entry' condition. The Conditional entry condition is that after deciding to enter firms draw their initial state, (s, τ), and then *conditional* on this firms can decide whether or not they will actually enter; this might also be thought of as a 'conditional decision to abort entry'. This conditional entry decision is additional to the standard endogenous entry condition and imposes a further general equilibrium condition. In the model of RR2008 we thus have both the free-entry condition and a condition relating to the conditional entry condition on $\bar{e}(s, \tau)$ (which they denoted $\bar{x}(s, \tau)$). There is a third general equilibrium condition, namely choosing the mass of entrants N_e (which they denoted E) to ensure labour market clearance; because the model is linear in N_e this can simply be ignored at first when solving the other two general equilibrium conditions, and then imposed by renormalizing the solutions. This renormalization is the approach taken by RR2008, and which the replication follows for the baseline case. When solving the other cases there is typically an additional requirement that the subsidy rate is determined in general equilibrium to keep aggregate capital equal to it's value in the baseline (see RR2008 for explanation of why they wish to do so), and in this case the renormalization

[1]The full replication codes also solve many 'cases' that are not reported/needed for the actual replication, further adding to run time.

[2]Thanks to Denise Manfredini who brought this to my attention.

relating N_e to the labour market clearance cannot be imposed afterwards (would change aggregate capital stock to no longer equal baseline value) and so this 'renormalization' general eqm condition is treated by replication codes as a standard general equilibrium condition for all the non-baseline cases.

Exit is exogenous, and the rest of the model is standard. The optimal choices of capital and labour (and hence profits) can all be solved in closed form as functions of the exogenous state and the equations are in RR2008, I additionally provide the derivation for these are below (*kbar* and *nbar*).

The problem of an existing firm is to choose capital and labour inputs to maximize expected present value of profits conditional on their idiosyncratic values of productivity, s, and tax/subsidy τ,

$$\begin{aligned} V(s,\tau) &= \max_{n,k} \pi(n,k) + \frac{1}{1+r}\lambda EV(s',\tau') \\ \text{s.t} \quad & \pi(n,z) = (1-\tau)y - wn - rk - c_f \\ & y = sk^{\alpha}n^{\gamma} \\ & s' = s, \tau' = \tau \end{aligned}$$

where π is (period) profit; r is the interest rate (in this model equivalent to the rental rate of capital and to the return on capital); n is labour input, k is capital input; w is wage; c_f is fixed-cost of production.[3] since this problem is essentially static (as every period is independent) it can be written as such and solved directly (see RR2008). However to determine entry we still need to calculate the expected present discounted value (as this is what matters for the entry decision) and so the replication codes simply solve the full dynamic programing problem directly, rather than following RR2008 who used based results from summation of sequences to massively simplify this. This simplified decision uses the static case to solve analytically for k and n and give results in the following simplified problem,

$$\begin{aligned} V(s,\tau) &= \pi(n,k) + \frac{1}{1+r}\lambda EV(s',\tau') \\ \text{s.t} \quad & \pi(n,z) = (1-\tau)y - wn - rk - c_f \\ & k = \left(\frac{\alpha}{r}\right)^{\frac{1-\gamma}{1-\gamma-\alpha}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\gamma-\alpha}} ((1-\tau)s)^{\frac{1}{1-\gamma-\alpha}} \quad n = (\frac{(1-\tau)s\gamma}{w})^{\frac{1}{1-\gamma}} k^{\frac{\alpha}{1-\gamma}} \quad s' = s, \tau' = \tau \end{aligned}$$

(The replication code uses slight further simplifications of expressions for n, y, and π which are derived in full below.)

The calculation of the stationary agents distribution is standard for cases of endogenous entry and exogenous exit, with conditional entry adding the minor change that the distribution of entrants used when iterating the agents distribution is the distribution of potential entrants times the conditional entry decision; again RR2008 avoid this iterating on the agents distribution by taking advantage of the fact that there are no time-varying idiosyncratic shocks, and the exogenous and constant value of the probability of exit to avoid iterating on the agent distribution and instead again just using results from summing infinite sequences (this time on distributions).

The conditional entry decision is $\max_{\bar{e}(s,\tau)}\{\bar{e}(s,\tau)\beta V(s,\tau), 0\}$, for each (s,τ). It is a general equilibrium condition on $\bar{e}$.

[3]Since c_f is a lump-sum and exit is exogenous it does not change any decisions of existing firms. From the perspective of potential entrants it is no different to the fixed-cost of entry c_e, and so plays no (seperate) role there. But it does effect the 'conditional entry' decisions (which c_e does not).

The free-entry condition is $\beta \int V(s,\tau)\bar{e}(s,\tau)dg(s,\tau) - c_e = 0$. Notice that this is the requirement that the (discounted) expected value of being a new entrant is equal to the (fixed) cost of entry; as otherwise there would be more (or less) entry if this did not hold with equality. Notice that the expectation is taken across the distribution of actual entrants (the conditional entry decision times the distribution of potential entrants). This general equilibrium condition is used to determine the wage w (as this in turn determines the value function and so can be chosen to ensure that the free-entry condition holds; other models instead commonly use this condition to instead determine the fixed cost of entry).

There is a (representative) household side of the economy, which essentially provides two general equilibrium conditions. The first can be reduced to just a calibration issue, that $r = 1/\beta - (1-\delta)$, the second is that labour supply equals one (households have endowment of one unit of time which they supply perfectly inelastically), and so leads to the labour market clearance condition that labour demand of the firms must equal labour supply (which equals one). RR2008 solve this by simply renormalizing the mass of potential entrants after solving all the other general equilibrium conditions (which works for this specific model as the total mass is linear in potential entrants, and the decisions are unaffected); the replication codes use this for some but not all cases.

Many of the experiments performed by RR2008 involve setting the subsidy rate so that the aggregate capital remains equal to it's baseline level, which is computationally equivalent to condsidering this (aggregate capital minus baseline aggregate capital equals zero) as an additional 'general eqm' condition. This is the approach taken by the replication codes.

We thus have three general equilibrium conditions: conditional entry, free entry, and labour market clearance. (In the baseline model we can just solve for the first two, the third can be done as a renormalization, and the fourth is not relevant.)

The definition of stationary competitive eqm in this model is standard. It involves finding the parameters w, $\bar{e}$, and N_e ($\bar{e}$ can be thought of as a decision, or just as an equilibrium parameter, denoted $\bar{x}$ by RR2008; N_e is the mass of potential entrants, denoted E by RR2008). These are chosen to satisfy the conditional entry condition, the free-entry condition, labour market clearance.

Replication involves computing many different stationary competitive equilibria and comparing various model outputs from these. However it typically also involves adding a condition that is to choose the subsidy rate τ_s to satisfy the requirement that capital remains equal to it's baseline value. This is done in the codes by simply considering this requirement as if it were a fourth general equilibrium condition.

The results of the replication are Figure 1 and Tables 3-19. Everything appears to replicate just fine.

Derive nbar and kbar: With the output tax, take the FOCs of $(1-\tau)sk^{\alpha}n^{\gamma} - wn - rk - c_f$ w.r.t. k and n to get:

$$\alpha(1-\tau)sk^{\alpha-1}n^{\gamma} - r = 0$$
$$\gamma(1-\tau)sk^{\alpha}n^{\gamma-1} - w = 0$$

rearranging the second of these

$$n^{1-\gamma} = \frac{\gamma(1-\tau)sk^{\alpha}}{w}$$

so

$$n = \left(\frac{(1-\tau)s\gamma}{w}\right)^{\frac{1}{1-\gamma}} k^{\frac{\alpha}{1-\gamma}} \tag{1}$$

That is nbar done. Now, rearrange first FOC to get

$$k^{1-\alpha} = \frac{\alpha(1-\tau)sn^{\gamma}}{r}$$

substitute our expression for nbar in here for n to get

$$k^{1-\alpha} = ((1-\tau)s)\frac{\alpha}{r}((1-\tau)s)^{\frac{\gamma}{1-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\gamma}} k^{\frac{\alpha\gamma}{1-\gamma}}$$

so

$$k = ((1-\tau)s)^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\alpha-\gamma}} \left(\frac{\alpha}{r}\right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \tag{2}$$

by returning to sub this into the eqn for *nbar* we can get the alternative formula,

$$n = ((1-\tau)s)^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{1-\alpha}{1-\alpha-\gamma}} \left(\frac{\alpha}{r}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \tag{3}$$

that completes our derivation of formulae for *kbar* and *nbar* with an output tax. We can also substitute these into the production function, $sk^{\alpha}n^{\gamma}$ to get

$$y = (1-\tau)^{\frac{\alpha+\gamma}{1-\alpha-\gamma}} s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{r}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\alpha-\gamma}} \tag{4}$$

Derive nbar and kbar with capital tax: With the output tax, take the FOCs of $sk^{\alpha}n^{\gamma} - wn - (1+\tau)rk - c_f$ w.r.t. k and n to get:

$$\begin{aligned} \alpha sk^{\alpha-1}n^{\gamma} - (1+\tau)r &= 0 \\ \gamma sk^{\alpha}n^{\gamma-1} - w &= 0 \end{aligned}$$

rearranging the second of these

$$n^{1-\gamma} = \frac{\gamma sk^{\alpha}}{w}$$

so

$$n = \left(\frac{\gamma}{w}\right)^{\frac{1}{1-\gamma}} k^{\frac{\alpha}{1-\gamma}} \tag{5}$$

That is nbar done. Now, rearrange first FOC to get

$$k^{1-\alpha} = \frac{\alpha sn^{\gamma}}{(1+\tau)r}$$

substitute our expression for nbar in here for n to get

$$k^{1-\alpha} = s\frac{\alpha}{(1+\tau)r} s^{\frac{\gamma}{1-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\gamma}} k^{\frac{\alpha\gamma}{1-\gamma}}$$

so

$$k = s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\alpha-\gamma}} \left(\frac{\alpha}{(1+\tau)r}\right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \tag{6}$$

by returning to sub this into the eqn for *nbar* we can get the alternative formula,

$$n = s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{1-\alpha}{1-\alpha-\gamma}} \left(\frac{\alpha}{(1+\tau)r}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \tag{7}$$

that completes our derivation of formulae for *kbar* and *nbar* with a capital tax. We can also substitute these into the production function, $sk^\alpha n^\gamma$ to get

$$y = s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{(1+\tau)r}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w}\right)^{\frac{\gamma}{1-\alpha-\gamma}} \tag{8}$$

Derive nbar and kbar with labour tax: With the output tax, take the FOCs of $sk^\alpha n^\gamma - (1+\tau)wn - rk - c_f$ w.r.t. k and n to get:

$$\begin{aligned} \alpha s k^{\alpha-1} n^\gamma - r &= 0 \\ \gamma s k^\alpha n^{\gamma-1} - (1+\tau)w &= 0 \end{aligned}$$

rearranging the second of these

$$n^{1-\gamma} = \frac{\gamma s k^\alpha}{(1+\tau)w}$$

so

$$n = \left(\frac{\gamma}{(1+\tau)w}\right)^{\frac{1}{1-\gamma}} k^{\frac{\alpha}{1-\gamma}} \tag{9}$$

That is nbar done. Now, rearrange first FOC to get

$$k^{1-\alpha} = \frac{\alpha s n^\gamma}{r}$$

substitute our expression for nbar in here for n to get

$$k^{1-\alpha} = s\frac{\alpha}{r} s^{\frac{\gamma}{1-\gamma}} \left(\frac{\gamma}{(1+\tau)w}\right)^{\frac{\gamma}{1-\gamma}} k^{\frac{\alpha\gamma}{1-\gamma}}$$

so

$$k = s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\gamma}{(1+\tau)w}\right)^{\frac{\gamma}{1-\alpha-\gamma}} \left(\frac{\alpha}{r}\right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \tag{10}$$

by returning to sub this into the eqn for *nbar* we can get the alternative formula,

$$n = s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\gamma}{(1+\tau)w}\right)^{\frac{1-\alpha}{1-\alpha-\gamma}} \left(\frac{\alpha}{r}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \tag{11}$$

that completes our derivation of formulae for *kbar* and *nbar* with a labour tax. We can also substitute these into the production function, $sk^\alpha n^\gamma$ to get

$$y = s^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{r}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{(1+\tau)w}\right)^{\frac{\gamma}{1-\alpha-\gamma}} \tag{12}$$

Table 1: Figure 1 of Restuccia & Rogerson (2008)

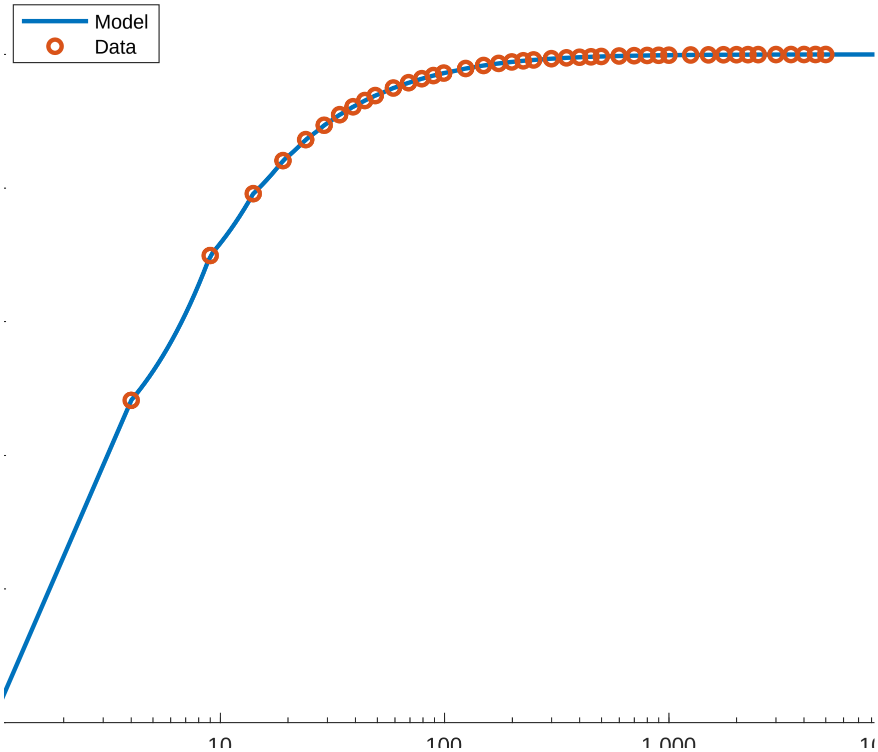

Table 2: Original Figure 1 of Restuccia & Rogerson (2008)

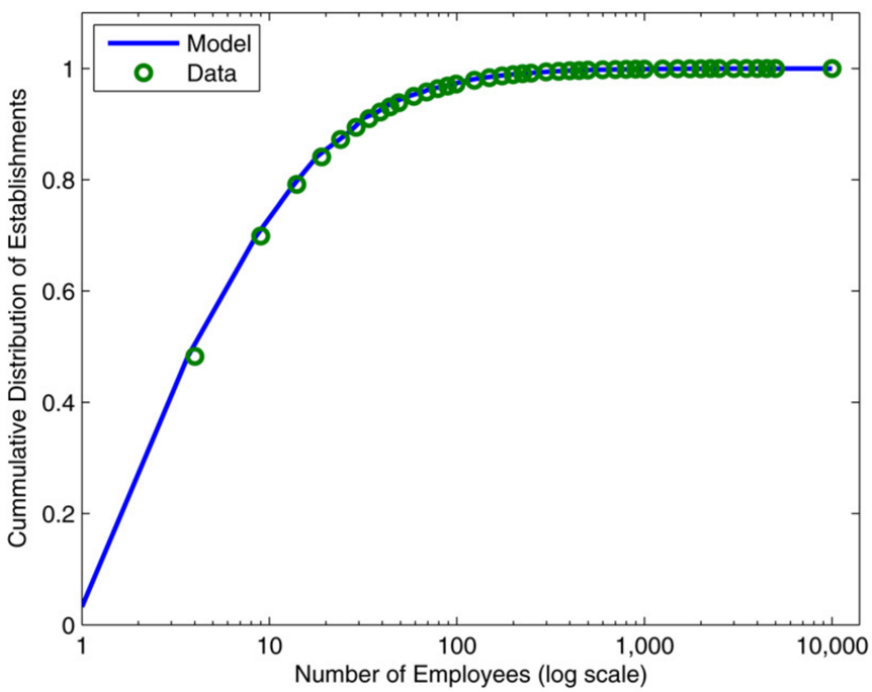

Fig. 1. Distribution of establishments by employment—model vs. data.

Table 3: Table 1 of Restuccia & Rogerson (2008)
Benchmark calibration to US data

Parameters	Value	Target
α	0.283	Capital income share
γ	0.567	Labour income share
β	0.96	Real rate of return
δ	0.08	Investment to output rate
c_e	1.0	Normalization
c_f	0.0	Benchmark rate
λ	0.1	Annual exit rate
s range	[1, 3.98]	Relative establishment sizes
$h(s)$	see Fig. 1	Size distribution of establishments

Table 4: Original Table 1 of Restuccia & Rogerson (2008)

Table 1
Benchmark calibration to US data

Parameter	Value	Target
α	0.283	Capital income share
γ	0.567	Labor income share
β	0.96	Real rate of return
δ	0.08	Investment to output ratio
c_e	1.0	Normalization
c_f	0.0	Benchmark case
λ	0.1	Annual exit rate
s range	$[1, 3.98]$	Relative establishment sizes
$h(s)$	see Fig. 1	Size distribution of establishments

Table 5: Table 2 of Restuccia & Rogerson (2008)
Distribution statistics of benchmark economy

	Establishment size (number of employees)		
	<5	5 to 49	≥50
Share of establishments	0.52	0.42	0.06
Share of output	0.07	0.33	0.60
Share of labour	0.07	0.33	0.60
Share of capital	0.07	0.33	0.60
Share of employment	2.34	14.68	178.42

Table 6: Original Table 2 of Restuccia & Rogerson (2008)

Table 2
Distribution statistics of benchmark economy

	Establishment size (number of employees)		
	< 5	5 to 49	⩾ 50
Share of establishments	0.56	0.39	0.05
Share of output	0.08	0.34	0.58
Share of labor	0.08	0.34	0.58
Share of capital	0.08	0.34	0.58
Average employment	2.4	15.5	183.0

References

Diego Restuccia and Richard Rogerson. Policy distortions and aggregate productivity with heterogeneous establishments. Review of Economic Dynamics, 11:707–720, 2008.

Table 7: Table 3 of Restuccia & Rogerson (2008)
Effects of idiosyncratic distortions – uncorrelated case

Variable	τ_t (tax rate on output)			
	0.1	0.2	0.3	0.4
Relative Y	0.98	0.96	0.93	0.92
Relative TFP	0.98	0.96	0.93	0.92
Relative E	1.00	1.00	1.00	1.00
Y_s/Y	0.72	0.85	0.93	0.97
S/Y	0.05	0.08	0.09	0.10
τ_s	0.06	0.09	0.10	0.11

Table 8: Original Table 3 of Restuccia & Rogerson (2008)

Table 3
Effects of idiosyncratic distortions—uncorrelated case

Variable	τ_t			
	0.1	0.2	0.3	0.4
Relative Y	0.98	0.96	0.93	0.92
Relative TFP	0.98	0.96	0.93	0.92
Relative E	1.00	1.00	1.00	1.00
Y_s/Y	0.72	0.85	0.93	0.97
S/Y	0.05	0.08	0.09	0.10
τ_s	0.06	0.09	0.10	0.11

Table 9: Table 4 of Restuccia & Rogerson (2008)
Relative TFP – uncorrelated case

Fraction of	τ_t (tax rate on output)			
estabilishments taxed (%)	0.1	0.2	0.3	0.4
90	0.92	0.84	0.78	0.74
80	0.95	0.89	0.84	0.81
60	0.98	0.94	0.91	0.89
50	0.98	0.96	0.93	0.92
40	0.99	0.97	0.95	0.94
20	1.00	0.99	0.98	0.97
10	1.00	0.99	0.99	0.99

Table 10: Original Table 4 of Restuccia & Rogerson (2008)

Table 4
Relative TFP—uncorrelated distortions

Fraction of establishments taxed (%):	τ_t			
	0.1	0.2	0.3	0.4
90	0.92	0.84	0.78	0.74
80	0.95	0.89	0.84	0.81
60	0.98	0.94	0.91	0.89
50	0.98	0.96	0.93	0.92
40	0.99	0.97	0.95	0.94
20	1.00	0.99	0.98	0.97
10	1.00	0.99	0.99	0.99

Table 11: Table 5 of Restuccia & Rogerson (2008)
Effects of idiosyncratic distortions – correlated case

	τ_t (tax rate on output)			
	0.1	0.2	0.3	0.4
Relative Y	0.90	0.80	0.73	0.69
Relative TFP	0.90	0.80	0.73	0.69
Relative E	1.00	1.00	1.00	1.00
Y_s/Y	0.43	0.67	0.83	0.92
S/Y	0.16	0.31	0.42	0.48
τ_s	0.38	0.47	0.50	0.51

Table 12: Original Table 5 of Restuccia & Rogerson (2008)

Table 5
Effects of idiosyncratic distortions—correlated case

Variable	τ_t			
	0.1	0.2	0.3	0.4
Relative Y	0.90	0.80	0.73	0.69
Relative TFP	0.90	0.80	0.73	0.69
Relative E	1.00	1.00	1.00	1.00
Y_s/Y	0.42	0.67	0.83	0.92
S/Y	0.17	0.32	0.43	0.49
τ_s	0.40	0.48	0.52	0.53

Table 13: Table 6 of Restuccia & Rogerson (2008)
Relative TFP – correlated case

Fraction of estabilishments taxed (%)	τ_t (tax rate on output)			
	0.1	0.2	0.3	0.4
90	0.99	0.65	0.56	0.50
80	0.84	0.70	0.61	0.56
60	0.99	0.95	0.69	0.65
50	0.90	0.80	0.73	0.69
40	0.92	0.83	0.77	0.73
20	0.95	0.89	0.84	0.81
10	0.97	0.92	0.89	0.86

Table 14: Original Table 6 of Restuccia & Rogerson (2008)

Table 6
Relative TFP—correlated distortions

Fraction of establishments taxed (%):	τ_t			
	0.1	0.2	0.3	0.4
90	0.81	0.66	0.56	0.51
80	0.84	0.70	0.62	0.57
60	0.88	0.77	0.69	0.65
50	0.90	0.80	0.73	0.69
40	0.92	0.82	0.76	0.72
20	0.95	0.89	0.84	0.81
10	0.97	0.92	0.88	0.86

Table 15: Table 7 of Restuccia & Rogerson (2008)
Taxing all but some exempt establishments ($\tau_t = 0.40$)

Variable	Establishments exempt (%)				
	10	30	50	70	90
Relative Y	0.64	0.56	0.50	0.46	0.42
Relative TFP	0.82	0.72	0.64	0.59	0.55
Relative E	0.35	0.23	0.15	0.08	0.04
Relative w	0.41	0.41	0.41	0.41	0.41
Relative K	0.41	0.41	0.41	0.41	0.41
Y_s/Y	0.09	0.32	0.54	0.73	0.89

Table 16: Original Table 7 of Restuccia & Rogerson (2008)

Table 7
Taxing all but some exempt establishments ($\tau_t = 0.40$)

Variable	Establishments exempt (%)				
	10	30	50	70	90
Relative Y	0.66	0.65	0.65	0.69	0.78
Relative TFP	0.85	0.80	0.78	0.79	0.85
Relative E	0.42	0.47	0.53	0.62	0.75
Relative w	0.42	0.47	0.53	0.62	0.75
Relative K	0.42	0.47	0.53	0.62	0.75
Y_s/Y	0.10	0.31	0.52	0.73	0.89

Table 17: Table 8 of Restuccia & Rogerson (2008)
Idiosyncratic distortions to capital rental rates

Variable	Uncorrelated		Correlated	
	$\tau_t = 0.5$	$\tau_t = 1.0$	$\tau_t = 0.5$	$\tau_t = 1.0$
Relative Y	0.97	0.95	0.90	0.82
Relative TFP	0.97	0.95	0.90	0.82
Relative E	0.97	0.95	0.90	0.82
Y_s/Y	0.74	0.83	0.34	0.47
S/Y	0.03	0.04	0.10	0.13
τ_s	0.14	0.15	0.50	0.50

Table 18: Original Table 8 of Restuccia & Rogerson (2008)

Table 8
Idiosyncratic distortions to capital rental rates

	Uncorrelated		Correlated	
	$\tau_t = 0.50$	$\tau_t = 1.00$	$\tau_t = 0.50$	$\tau_t = 1.00$
Relative Y	0.97	0.95	0.89	0.82
Relative TFP	0.97	0.95	0.89	0.82
Relative E	0.97	0.95	0.89	0.82
Y_s/Y	0.74	0.83	0.33	0.46
S/Y	0.03	0.04	0.10	0.14
τ_s	0.14	0.15	0.51	0.51

Table 19: Table 9 of Restuccia & Rogerson (2008)
Idiosyncratic distortions–outputs vs wages

Variable	Uncorrelated		Correlated	
	Output	Wages	Output	Wages
Relative Y	1.14	0.84	0.67	0.58
Relative TFP	0.98	0.89	0.67	0.68
Relative K	1.70	0.84	0.98	0.58
Relative E	1.70	0.84	0.98	0.58
Relative w	1.70	1.67	0.98	1.01
Y_s/Y	1.00	0.98	0.97	0.81
S/Y	0.50	0.56	0.49	0.46

Table 20: Original Table 9 of Restuccia & Rogerson (2008)

Table 9
Idiosyncratic distortions—output vs. wages

	Uncorrelated		Correlated	
	Output	Wages	Output	Wages
Relative Y	1.14	0.84	0.65	0.58
Relative TFP	0.98	0.89	0.66	0.67
Relative K	1.70	0.84	0.96	0.58
Relative E	1.70	0.84	0.96	0.58
Relative w	1.70	1.67	0.96	1.00
Y_s/Y	1.00	0.98	0.97	0.79
S/Y	0.50	0.56	0.48	0.45