Online Appendix

Gini Coefficients and Mean Absolute Difference Statistics

The relative mean absolute difference (RMD) for an income distribution is equal to the ratio of mean absolute difference (MAD) to the mean of the income distribution, which, in turn, is equal to twice the Gini coefficient.

$$RMD = \frac{MAD}{MeanIncome} = 2 \times Gini \Rightarrow MAD = 2 \times Gini \times MeanIncome$$

It follows that MAD is simply $2 \times Gini \times MeanIncome$. I focus on three income distributions. *Primary* is the income distribution of households before taxes and transfers. *Gross* adds the value of social security transfers gross of taxes and social security contributions. *Disposable* refers to the distribution of household income and social security transfers net of taxes and contributions. This is the sum of equalized disposable household income and equalized gross social benefits. The MAD calculations reported in Figure **??** are

$$MAD_{primary} = 2 \times E(Primary) \times Gini_{primary}$$

$$MAD_{gross} = 2 \times E(Gross) \times Gini_{gross}$$

$$MAD_{disposable} = 2 \times E(Disposable) \times Gini_{disposable}$$

Comparative Statics

With a center-right coalition, the Lagrangian function takes the form:

$$\mathcal{L}^L = f^M(t_y, t_c) + g^M(t_k) + \lambda^L(U_R^L - f^L(t_y, t_c) - g^L(t_k)).$$

In this case, t_k is exogenous and determined by I_R^H. The gradient of this function is

$$\nabla \mathcal{L}^L = \begin{bmatrix} \frac{\partial \mathcal{L}^L}{\partial t_y} \\ \frac{\partial \mathcal{L}^L}{\partial t_c} \\ \frac{\partial \mathcal{L}^L}{\partial \lambda} \end{bmatrix} = \begin{bmatrix} f_y^M - \lambda^L f_y^L \\ f_c^M - \lambda^L f_c^L \\ U_R^L - f^L(t_y, t_c) - g^L(t_k) \end{bmatrix},$$

and the Jacobian of the gradient is

$$\mathbf{J_t} = \begin{bmatrix} \delta_{yy} & \delta_{yc} & -f_y^L \\ \delta_{cy} & \delta_{cc} & -f_c^L \\ -f_y^L & -f_c^L & 0 \end{bmatrix},$$

where $\delta_{\ell\ell} = \frac{\partial^2 f^M}{\partial t_\ell^2} - \lambda \frac{\partial^2 f^L}{\partial t_\ell^2}, \ell \in \{y, c\}$ and $\delta_{yc} = \frac{\partial^2 f^M}{\partial t_y \partial t_c} - \lambda \frac{\partial^2 f^L}{\partial t_y \partial t_c}$. The Jacobian of the gradient with respect to the exogenous parameter t_k is

$$\mathbf{J_k} = \begin{bmatrix} 0 \\ 0 \\ -g_k^L \end{bmatrix}.$$

The vector of comparative statics for the constrained optimal tax rates is

$$\mathbf{J_{t*(k)}} = \begin{bmatrix} \frac{dt_y}{dt_k} \\ \frac{dt_c}{dt_k} \\ \frac{d\lambda}{dt_k} \end{bmatrix}.$$

The solution is provided by the implicit function theorem:

$$\mathbf{J_{t*(k)}} = -\mathbf{J_t^{-1}J_k}.$$

The inverse is

$$\mathbf{J_t^{-1}} = \begin{bmatrix} -\frac{\left(f_c^L\right)^2}{\Delta} & \frac{f_c^L f_y^L}{\Delta} & \frac{\delta_{cc} f_y^L - \delta_{yc} f_c^L}{\Delta} \\ \frac{f_c^L f_y^L}{\Delta} & -\frac{\left(f_y^L\right)^2}{\Delta} & \frac{\delta_{yy} f_c^L - \delta_{yc} f_y^L}{\Delta} \\ \frac{\delta_{cc} f_y^L - \delta_{yc} f_c^L}{\Delta} & \frac{\delta_{yy} f_c^L - \delta_{yc} f_y^L}{\Delta} & \frac{\delta_{cc}\delta_{yy} - \left(\delta_{yc}\right)^2}{\Delta} \end{bmatrix},$$

where $\Delta = \left(2\delta_{yc} f_c^L f_y^L - \delta_{yy}\left(f_c^L\right)^2 - \delta_{cc}\left(f_y^L\right)^2\right)$.

$$\begin{bmatrix} \frac{dt_y}{dt_k} \\ \frac{dt_c}{dt_k} \\ \frac{d\lambda}{dt_k} \end{bmatrix} = \begin{bmatrix} \frac{\left(\delta_{cc} f_y^L - \delta_{yc} f_c^L\right) g_k^L}{\Delta} \\ \frac{\left(\delta_{yy} f_c^L - \delta_{yc} f_y^L\right) g_k^L}{\Delta} \\ \frac{\left(\delta_{cc}\delta_{yy} - \left(\delta_{yc}\right)^2\right) g_k^L}{\Delta} \end{bmatrix}$$

The capital tax rate is exogenous because it is determined by the reservation net-of-tax return on capital investment. This relationship is

$$t_k = 1 - \left(I_R^H / I^H\right).$$

Thus, we can rewrite the comparative statics in terms of I_R^H:

$$\begin{bmatrix} \frac{dt_y}{dI_R^H} \\ \frac{dt_c}{dI_R^H} \\ \frac{dt_k}{dI_R^H} \end{bmatrix} = \begin{bmatrix} -\frac{\left(\delta_{cc} f_y^L - \delta_{yc} f_c^L\right) g_k^L}{\Delta I^H} \\ -\frac{\left(\delta_{yy} f_c^L - \delta_{yc} f_y^L\right) g_k^L}{\Delta I^H} \\ -\frac{1}{\Delta I^H} \end{bmatrix}.$$

Note that the second order condition requires that the bordered Hessian is negative definite:

$$\mathbf{B} = \begin{bmatrix} 0 & -f_y^L & -f_c^L \\ -f_y^L & \delta_{yy} & \delta_{yc} \\ .-f_c^L & \delta_{cy} & \delta_{cc} \end{bmatrix}$$

With two choice variables and one constraint, the definiteness of $\mathbf{B}$ is given by the determinant of the full matrix (i.e., the first principal minor). If the determinant has the same sign as $(-1)^2$, the bordered Hessian is negative definite. The determinant of $\mathbf{B}$ is $\left(2\delta_{yc} f_c^L f_y^L - \delta_{yy}\left(f_c^L\right)^2 - \delta_{cc}\left(f_y^L\right)^2\right)$. Consequently, the second order condition requires that $\Delta > 0$. The signs of the comparative statics results are determined by the numerators of the ratios on the right-hand-side of the equation. Under reasonable assumptions, these are negative, positive and negative respectively.

Numerical Illustration: Low Mobility

Remove["Global*"];

nl = 40; nm = 50; nh = 10;

rL = 14; rH = 104;

a0L = 10; a1L = 5; a2L = 30;

a0R = 10; a1R = 5; a2R = 35;

b0m = 30; b0l = 10; b0h = 100;

b1m = 1; b1l = 1; b1h = 1;

y1m = 15; y1l = 15; y1h = 15;

y2m = 25; y2l = 35; y2h = 15;

c1m = 1; c1l = 10; c1h = 10;

c2m = 15; c2l = 15; c2h = 15;

k1m = 20; k1l = 10; k1h = 5;

k2m = 25; k2l = 15; k2h = 25;

$\boldsymbol{n}$ = nl + nm + nh;

(* 1 Majoritarian Democracy : Unconstrained Optimization *)

um = b0m + y1m * ty − y2m * ty^2 + c1m * tc − c2m * tc^2 + k1m * tk − k2m * tk^2 − b1m * tc * ty − b1m * ty * tk − b1m * tc * tk;

ul = b0l + y1l * ty − y2l * ty^2 + c1l * tc − c2l * tc^2 + k1l * tk − k2l * tk^2 − b1l * tc * ty − b1l * ty * tk − b1l * tc * tk;

uh = b0h + y1h * ty − y2h * ty^2 + c1h * tc − c2h * tc^2 + k1h * tk − k2h * tk^2 − b1h * tc * ty − b1h * ty * tk − b1h * tc * tk;

d1 = D[um, ty];

d2 = D[um, tc];

d3 = D[um, tk];

d4 = D[ul, ty];

d5 = D[ul, tc];

d6 = D[ul, tk];

d7 = D[uh, ty];

d8 = D[uh, tc];

d9 = D[uh, tk];

solutions3 = N[NSolve[{d1 == 0, d2 == 0, d3 == 0}, {ty, tc, tk}]]

solutions4 = N[NSolve[{d4 == 0, d5 == 0, d6 == 0}, {ty, tc, tk}]]

solutions5 = N[NSolve[{d7 == 0, d8 == 0, d9 == 0}, {ty, tc, tk}]]

{{ty → 0.291912, tc → 0.0104712, tk → 0.393952}}

{{ty → 0.205258, tc → 0.315959, tk → 0.315959}}

{{ty → 0.486724, tc → 0.31431, tk → 0.0839793}}

umsol = um/.solutions3[[1]]

ulsol = ul/.solutions3[[1]]

uhsol = uh/.solutions3[[1]]

solutions3[[1]]

36.1341

12.9887

101.171

$\{ty \rightarrow 0.291912, tc \rightarrow 0.0104712, tk \rightarrow 0.393952\}$

spend = (ty * (umbase * nm + ulbase * nl) + tc * (umbase * nm + ulbase * nl + uhbase * nh) + tk * uhbase * nh)/n;

spendsol = N[NSolve[{umsol == umbase * (1 − ty) * (1 − tc) + spend, ulsol ==

ulbase * (1 − ty) * (1 − tc) + spend, uhsol == uhbase * (1 − tk) * (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions3[[1]];

spend/.spendsol/.solutions3[[1]]

$\{11.5822\}$

(* 2 Proportional Democracy with Center−Left Coalition : One − Tail Constrained Optimization *)

um = b0m + y1m * ty − y2m * ty^2 + c1m * tc − c2m * tc^2 + k1m * tk − k2m * tk^2 − b1m * tc * ty − b1m * ty * tk − b1m * tc * tk;

ul = b0l + y1l * ty − y2l * ty^2 + c1l * tc − c2l * tc^2 + k1l * tk − k2l * tk^2 − b1l * tc * ty − b1l * ty * tk − b1l * tc * tk;

uh = b0h + y1h * ty − y2h * ty^2 + c1h * tc − c2h * tc^2 + k1h * tk − k2h * tk^2 − b1h * tc * ty − b1h * ty * tk − b1h * tc * tk;

lgf = um + lm * (ul − rL);

d1 = D[lgf, ty]; d2 = D[lgf, tc]; d3 = D[lgf, tk]; d4 = D[lgf, lm];

solutions2 = N[NSolve[{d1 == 0, d2 == 0, d3 == 0, d4 == 0, ty ≥ 0, tc ≥ 0, tk ≥ 0}, {ty, tc, tk, lm}, Reals]]

$\{\{ty \rightarrow 0.175707, tc \rightarrow 0.49288, tk \rightarrow 0.194273, lm \rightarrow -2.74541\}, \{ty \rightarrow 0.254032, tc \rightarrow 0.118938, tk \rightarrow 0.374743, lm \rightarrow 0.5509\}\}$

umsol = um/.solutions2[[2]]

ulsol = ul/.solutions2[[2]]

uhsol = uh/.solutions2[[2]]

solutions2[[2]]

35.918

14.

102.013

$\{ty \rightarrow 0.254032, tc \rightarrow 0.118938, tk \rightarrow 0.374743, lm \rightarrow 0.5509\}$

spend = (ty * (umbase * nm + ulbase * nl) + tc * (umbase * nm + ulbase * nl + uhbase * nh) + tk * uhbase * nh)/n;

spendsol = N[Solve[{umsol == umbase * (1 − ty) * (1 − tc) + spend, ulsol ==

ulbase * (1 − ty) * (1 − tc) + spend, uhsol == uhbase * (1 − tk) * (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions2[[2]];

spend/.spendsol/.solutions2[[2]]

$\{14.0664\}$

(* 3 PR – Corporatist Democracy with Center–Left Coalition : Two – Tail Constrained Optimization *)

piecb = a0L * (1 − tk);

pienc = 7.5;

tksol = Solve[piecb == pienc, tk];

tksol = N [tksol[[1]]]

{tk → 0.25}

um = b0m + y1m * ty − y2m * ty^2 + c1m * tc − c2m * tc^2 + k1m * tk − k2m * tk^2 − b1m * tc * ty − b1m * ty * tk − b1m * tc * tk/.tksol;

ul = b0l + y1l * ty − y2l * ty^2 + c1l * tc − c2l * tc^2 + k1l * tk − k2l * tk^2 − b1l * tc * ty − b1l * ty * tk − b1l * tc * tk/.tksol;

uh = b0h + y1h * ty − y2h * ty^2 + c1h * tc − c2h * tc^2 + k1h * tk − k2h * tk^2 − b1h * tc * ty − b1h * ty * tk − b1h * tc * tk/.tksol;

lgf = um + lm * (ul − rL);

d1 = D [lgf, ty]; d2 = D [lgf, tc]; d3 = D [lgf, lm];

solutions = N [NSolve[{d1 == 0, d2 == 0, d3 == 0, ty ≥ 0, tc ≥ 0}, {ty, tc, lm}, Reals]]/.tksol

{{ty → 0.171002, tc → 0.517728, lm → −2.51188}, {ty → 0.255466, tc → 0.125198, lm → 0.568326}}

umsol = um/.solutions[[2]]

ulsol = ul/.solutions[[2]]

uhsol = uh/.solutions[[2]]

solutions[[2]]

35.4008

14.

103.43

{ty → 0.255466, tc → 0.125198, lm → 0.568326}

spend = (ty * (umbase * nm + ulbase * nl) + tc * (umbase * nm + ulbase * nl + uhbase * nh) + tk * uhbase * nh)/n;

spendsol = N [Solve[{umsol == umbase * (1 − ty) * (1 − tc) + spend, ulsol ==

ulbase * (1 − ty) * (1 − tc) + spend, uhsol == uhbase * (1 − tk) * (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions[[2]]/.tksol;

spend/.spendsol/.solutions[[2]]/.tksol

{12.3375}

(* 4 Proportional Democracy with Center–Right Coalition : One – Tail Constrained Optimization *)

um = b0m + y1m * ty − y2m * ty^2 + c1m * tc − c2m * tc^2 + k1m * tk − k2m * tk^2 − b1m * tc * ty − b1m * ty * tk − b1m * tc * tk;

ul = b0l + y1l * ty − y2l * ty^2 + c1l * tc − c2l * tc^2 + k1l * tk − k2l * tk^2 − b1l * tc * ty − b1l * ty * tk − b1l * tc * tk;

uh = b0h + y1h * ty − y2h * ty^2 + c1h * tc − c2h * tc^2 + k1h * tk − k2h * tk^2 − b1h * tc * ty − b1h * ty * tk − b1h * tc * tk;

lgf = um + lm * (uh − rH);

d1 = D [lgf, ty]; d2 = D [lgf, tc]; d3 = D [lgf, tk]; d4 = D [lgf, lm];

solutions2 = N [Solve[{d1 == 0, d2 == 0, d3 == 0, d4 == 0, ty ≥ 0, tc ≥ 0, tk ≥ 0}, {ty, tc, tk, lm}, Reals]]

{{ty → 0.353892, tc → 0.144205, tk → 0.258745, lm → 0.778231}}

umsol = um/.solutions2[[1]]

ulsol = ul/.solutions2[[1]]

uhsol = uh/.solutions2[[1]]

solutions2[[1]]

35.3309

13.4584

104.

{ty → 0.353892, tc → 0.144205, tk → 0.258745, lm → 0.778231}

spend = (ty ∗ (umbase ∗ nm + ulbase ∗ nl) + tc ∗ (umbase ∗ nm + ulbase ∗ nl + uhbase ∗ nh) + tk ∗ uhbase ∗ nh)/n;

spendsol = N[Solve[{umsol == umbase ∗ (1 − ty) ∗ (1 − tc) + spend, ulsol ==

ulbase ∗ (1 − ty) ∗ (1 − tc) + spend, uhsol == uhbase ∗ (1 − tk) ∗ (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions2[[1]];

spend/.spendsol/.solutions2[[1]]

{14.6026}

(* 5 PR – Corporatist Democracy with Center–Right Coalition : Two – Tail Constrained Optimization *)

wcb = a0R ∗ (1 − ty);

wnc = 8;

tysol = Solve[wcb == wnc, ty];

tysol = N[tysol[[1]]]

{ty → 0.2}

um = b0m + y1m ∗ ty − y2m ∗ ty^2 + c1m ∗ tc − c2m ∗ tc^2 + k1m ∗ tk − k2m ∗ tk^2 − b1m ∗ tc ∗ ty − b1m ∗ ty ∗ tk − b1m ∗ tc ∗ tk/.tysol;

ul = b0l + y1l ∗ ty − y2l ∗ ty^2 + c1l ∗ tc − c2l ∗ tc^2 + k1l ∗ tk − k2l ∗ tk^2 − b1l ∗ tc ∗ ty − b1l ∗ ty ∗ tk − b1l ∗ tc ∗ tk/.tysol;

uh = b0h + y1h ∗ ty − y2h ∗ ty^2 + c1h ∗ tc − c2h ∗ tc^2 + k1h ∗ tk − k2h ∗ tk^2 − b1h ∗ tc ∗ ty − b1h ∗ ty ∗ tk − b1h ∗ tc ∗ tk/.tysol;

lgf = um + lm ∗ (uh − rH);

d1 = D[lgf, tk]; d2 = D[lgf, tc]; d3 = D[lgf, lm];

solutions = N[NSolve[{d1 == 0, d2 == 0, d3 == 0, tk ≥ 0, tc ≥ 0}, {tk, tc, lm}, Reals]]/.tysol

{{tk → 0.0181012, tc → 0.396041, lm → −5.28707}, {tk → 0.160951, tc → 0.251324, lm → 3.28707}}

umsol = um/.solutions[[2]]

ulsol = ul/.solutions[[2]]

uhsol = uh/.solutions[[2]]

solutions[[2]]

33.7524

14.2638

104.

{tk → 0.160951, tc → 0.251324, lm → 3.28707}

```
spend = (ty * (umbase * nm + ulbase * nl) + tc * (umbase * nm + ulbase * nl + uhbase * nh) + tk * uhbase * nh)/n;
spendsol = N [Solve[{umsol == umbase * (1 − ty) * (1 − tc) + spend, ulsol ==
ulbase * (1 − ty) * (1 − tc) + spend, uhsol == uhbase * (1 − tk) * (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions[[2]]/.tysol;
spend/.spendsol/.solutions[[2]]/.tysol
```

{13.6722}

Numerical Illustration: High Mobility

```
Remove["Global*"];
nl = 40; nm = 50; nh = 10;
rL = 14; rH = 104;


a0L = 10; a1L = 5; a2L = 30;
a0R = 10; a1R = 5; a2R = 35;


b0m = 30; b0l = 10; b0h = 100;
b1m = 1; b1l = 1; b1h = 1;


y1m = 15; y1l = 15; y1h = 15;
y2m = 25; y2l = 35; y2h = 15;


c1m = 1; c1l = 10; c1h = 10;
c2m = 15; c2l = 15; c2h = 15;


k1m = 20; k1l = 10; k1h = 5;
k2m = 25; k2l = 15; k2h = 25;


n = nl + nm + nh;
```

(* 1 Majoritarian Democracy : Unconstrained Optimization *)
```
um = b0m + y1m * ty − y2m * ty^2 + c1m * tc − c2m * tc^2 + k1m * tk − k2m * tk^2 − b1m * tc * ty − b1m * ty * tk − b1m * tc * tk;
ul = b0l + y1l * ty − y2l * ty^2 + c1l * tc − c2l * tc^2 + k1l * tk − k2l * tk^2 − b1l * tc * ty − b1l * ty * tk − b1l * tc * tk;
uh = b0h + y1h * ty − y2h * ty^2 + c1h * tc − c2h * tc^2 + k1h * tk − k2h * tk^2 − b1h * tc * ty − b1h * ty * tk − b1h * tc * tk;

d1 = D[um, ty];
d2 = D[um, tc];
d3 = D[um, tk];
d4 = D[ul, ty];
d5 = D[ul, tc];
d6 = D[ul, tk];
d7 = D[uh, ty];
d8 = D[uh, tc];
d9 = D[uh, tk];
```

solutions3 = *N* [NSolve[{d1 == 0, d2 == 0, d3 == 0}, {ty, tc, tk}]]

solutions4 = *N* [NSolve[{d4 == 0, d5 == 0, d6 == 0}, {ty, tc, tk}]]

solutions5 = *N* [NSolve[{d7 == 0, d8 == 0, d9 == 0}, {ty, tc, tk}]]

{{ty → 0.291912, tc → 0.0104712, tk → 0.393952}}

{{ty → 0.205258, tc → 0.315959, tk → 0.315959}}

{{ty → 0.486724, tc → 0.31431, tk → 0.0839793}}

umsol = um/.solutions3[[1]]

ulsol = ul/.solutions3[[1]]

uhsol = uh/.solutions3[[1]]

solutions3[[1]]

36.1341

12.9887

101.171

{ty → 0.291912, tc → 0.0104712, tk → 0.393952}

spend = (ty * (umbase * nm + ulbase * nl) + tc * (umbase * nm + ulbase * nl + uhbase * nh) + tk * uhbase * nh)/*n*;

spendsol = *N* [NSolve[{umsol == umbase * (1 − ty) * (1 − tc) + spend, ulsol ==

ulbase * (1 − ty) * (1 − tc) + spend, uhsol == uhbase * (1 − tk) * (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions3[[1]];

spend/.spendsol/.solutions3[[1]]

{11.5822}

(* 2 Proportional Democracy with Center−Left Coalition : One − Tail Constrained Optimization *)

um = b0m + y1m * ty − y2m * ty^2 + c1m * tc − c2m * tc^2 + k1m * tk − k2m * tk^2 − b1m * tc * ty − b1m * ty * tk − b1m * tc * tk;

ul = b0l + y1l * ty − y2l * ty^2 + c1l * tc − c2l * tc^2 + k1l * tk − k2l * tk^2 − b1l * tc * ty − b1l * ty * tk − b1l * tc * tk;

uh = b0h + y1h * ty − y2h * ty^2 + c1h * tc − c2h * tc^2 + k1h * tk − k2h * tk^2 − b1h * tc * ty − b1h * ty * tk − b1h * tc * tk;

lgf = um + lm * (rL − ul);

d1 = *D*[lgf, ty]; d2 = *D*[lgf, tc]; d3 = *D*[lgf, tk]; d4 = *D*[lgf, lm];

solutions2 = *N* [NSolve[{d1 == 0, d2 == 0, d3 == 0, d4 == 0, ty ≥ 0, tc ≥ 0, tk ≥ 0}, {ty, tc, tk, lm}, Reals]]

{{ty → 0.175707, tc → 0.49288, tk → 0.194273, lm → 2.74541}, {ty → 0.254032, tc → 0.118938, tk → 0.374743, lm → −0.5509}}

umsol = um/.solutions2[[2]]

ulsol = ul/.solutions2[[2]]

uhsol = uh/.solutions2[[2]]

solutions2[[2]]

35.918

14.

102.013

{ty → 0.254032, tc → 0.118938, tk → 0.374743, lm → −0.5509}

spend = (ty ∗ (umbase ∗ nm + ulbase ∗ nl) + tc ∗ (umbase ∗ nm + ulbase ∗ nl + uhbase ∗ nh) + tk ∗ uhbase ∗ nh)/*n*;

spendsol = *N*[Solve[{umsol == umbase ∗ (1 − ty) ∗ (1 − tc) + spend, ulsol ==

ulbase ∗ (1 − ty) ∗ (1 − tc) + spend, uhsol == uhbase ∗ (1 − tk) ∗ (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions2[[2]];

spend/.spendsol/.solutions2[[2]]

{14.0664}

(* 3 PR – Corporatist Democracy with Center–Left Coalition : Two – Tail Constrained Optimization *)

piecb = a0L ∗ (1 − tk);

pienc = 9;

tksol = Solve[piecb == pienc, tk];

tksol = *N*[tksol[[1]]]

{tk → 0.1}

um = b0m + y1m ∗ ty − y2m ∗ ty^2 + c1m ∗ tc − c2m ∗ tc^2 + k1m ∗ tk − k2m ∗ tk^2 − b1m ∗ tc ∗ ty − b1m ∗ ty ∗ tk − b1m ∗ tc ∗ tk/.tksol;

ul = b0l + y1l ∗ ty − y2l ∗ ty^2 + c1l ∗ tc − c2l ∗ tc^2 + k1l ∗ tk − k2l ∗ tk^2 − b1l ∗ tc ∗ ty − b1l ∗ ty ∗ tk − b1l ∗ tc ∗ tk/.tksol;

uh = b0h + y1h ∗ ty − y2h ∗ ty^2 + c1h ∗ tc − c2h ∗ tc^2 + k1h ∗ tk − k2h ∗ tk^2 − b1h ∗ tc ∗ ty − b1h ∗ ty ∗ tk − b1h ∗ tc ∗ tk/.tksol;

lgf = um + lm ∗ (rL − ul);

d1 = *D*[lgf, ty]; d2 = *D*[lgf, tc]; d3 = *D*[lgf, lm];

solutions = *N*[NSolve[{d1 == 0, d2 == 0, d3 == 0, ty ≥ 0, tc ≥ 0}, {ty, tc, lm}, Reals]]/.tksol

{{ty → 0.207031, tc → 0.328825, lm → 53.3939}, {ty → 0.209465, tc → 0.317298, lm → −51.4485}}

umsol = um/.solutions[[2]]

ulsol = ul/.solutions[[2]]

uhsol = uh/.solutions[[2]]

solutions[[2]]

32.4831

14.

104.278

{ty → 0.209465, tc → 0.317298, lm → −51.4485}

spend = (ty ∗ (umbase ∗ nm + ulbase ∗ nl) + tc ∗ (umbase ∗ nm + ulbase ∗ nl + uhbase ∗ nh) + tk ∗ uhbase ∗ nh)/*n*;

spendsol = *N*[Solve[{umsol == umbase ∗ (1 − ty) ∗ (1 − tc) + spend, ulsol ==

ulbase ∗ (1 − ty) ∗ (1 − tc) + spend, uhsol == uhbase ∗ (1 − tk) ∗ (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions[[2]]/.tksol;

spend/.spendsol/.solutions[[2]]/.tksol

{14.5915}

(* 4 Proportional Democracy with Center–Right Coalition : One – Tail Constrained Optimization *)

um = b0m + y1m ∗ ty − y2m ∗ ty^2 + c1m ∗ tc − c2m ∗ tc^2 + k1m ∗ tk − k2m ∗ tk^2 − b1m ∗ tc ∗ ty − b1m ∗ ty ∗ tk − b1m ∗ tc ∗ tk;

ul = b0l + y1l ∗ ty − y2l ∗ ty^2 + c1l ∗ tc − c2l ∗ tc^2 + k1l ∗ tk − k2l ∗ tk^2 − b1l ∗ tc ∗ ty − b1l ∗ ty ∗ tk − b1l ∗ tc ∗ tk;

uh = b0h + y1h ∗ ty − y2h ∗ ty^2 + c1h ∗ tc − c2h ∗ tc^2 + k1h ∗ tk − k2h ∗ tk^2 − b1h ∗ tc ∗ ty − b1h ∗ ty ∗ tk − b1h ∗ tc ∗ tk;

lgf = um + lm ∗ (uh − rH);

d1 = D[lgf, ty]; d2 = D[lgf, tc]; d3 = D[lgf, tk]; d4 = D[lgf, lm];

solutions2 = N[Solve[{d1 == 0, d2 == 0, d3 == 0, d4 == 0, ty ≥ 0, tc ≥ 0, tk ≥ 0}, {ty, tc, tk, lm}, Reals]]

{{ty → 0.353892, tc → 0.144205, tk → 0.258745, lm → 0.778231}}

umsol = um/.solutions2[[1]]
ulsol = ul/.solutions2[[1]]
uhsol = uh/.solutions2[[1]]
solutions2[[1]]

35.3309

13.4584

104.

{ty → 0.353892, tc → 0.144205, tk → 0.258745, lm → 0.778231}

spend = (ty ∗ (umbase ∗ nm + ulbase ∗ nl) + tc ∗ (umbase ∗ nm + ulbase ∗ nl + uhbase ∗ nh) + tk ∗ uhbase ∗ nh)/n;
spendsol = N[Solve[{umsol == umbase ∗ (1 − ty) ∗ (1 − tc) + spend, ulsol ==
ulbase ∗ (1 − ty) ∗ (1 − tc) + spend, uhsol == uhbase ∗ (1 − tk) ∗ (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions2[[1]];
spend/.spendsol/.solutions2[[1]]

{14.6026}

(∗ 5 PR – Corporatist Democracy with Center–Right Coalition : Two – Tail Constrained Optimization ∗)

wcb = a0R ∗ (1 − ty);
wnc = 8;

tysol = Solve[wcb == wnc, ty];
tysol = N[tysol[[1]]]

{ty → 0.2}

um = b0m + y1m ∗ ty − y2m ∗ ty^2 + c1m ∗ tc − c2m ∗ tc^2 + k1m ∗ tk − k2m ∗ tk^2 − b1m ∗ tc ∗ ty − b1m ∗ ty ∗ tk − b1m ∗ tc ∗ tk/.tysol;
ul = b0l + y1l ∗ ty − y2l ∗ ty^2 + c1l ∗ tc − c2l ∗ tc^2 + k1l ∗ tk − k2l ∗ tk^2 − b1l ∗ tc ∗ ty − b1l ∗ ty ∗ tk − b1l ∗ tc ∗ tk/.tysol;
uh = b0h + y1h ∗ ty − y2h ∗ ty^2 + c1h ∗ tc − c2h ∗ tc^2 + k1h ∗ tk − k2h ∗ tk^2 − b1h ∗ tc ∗ ty − b1h ∗ ty ∗ tk − b1h ∗ tc ∗ tk/.tysol;
lgf = um + lm ∗ (uh − rH);

d1 = D[lgf, tk]; d2 = D[lgf, tc]; d3 = D[lgf, lm];

solutions = N[NSolve[{d1 == 0, d2 == 0, d3 == 0, tk ≥ 0, tc ≥ 0}, {tk, tc, lm}, Reals]]/.tysol

{{tk → 0.0181012, tc → 0.396041, lm → −5.28707}, {tk → 0.160951, tc → 0.251324, lm → 3.28707}}

umsol = um/.solutions[[2]]
ulsol = ul/.solutions[[2]]
uhsol = uh/.solutions[[2]]
solutions[[2]]

33.7524

14.2638

104.

$\{tk \to 0.160951, tc \to 0.251324, lm \to 3.28707\}$

spend = (ty ∗ (umbase ∗ nm + ulbase ∗ nl) + tc ∗ (umbase ∗ nm + ulbase ∗ nl + uhbase ∗ nh) + tk ∗ uhbase ∗ nh)/n;

spendsol = N [Solve[{umsol == umbase ∗ (1 − ty) ∗ (1 − tc) + spend, ulsol ==ulbase ∗ (1 − ty) ∗ (1 − tc) + spend, uhsol ==

uhbase ∗ (1 − tk) ∗ (1 − tc) + spend}, {umbase, ulbase, uhbase}]]/.solutions[[2]]/.tysol;

spend/.spendsol/.solutions[[2]]/.tysol

$\{13.6722\}$

Regression Tables

TABLE 1: Consumption Taxes, Full Sample and High Capital Mobility Subsample

	(1)	(2)	(3)	(4)
	FULL	FULL	SUB	SUB
Lagged DV	0.922***	0.867***	0.841***	0.752***
(centered)	(62.98)	(54.64)	(17.72)	(13.10)
PRITM	5.510*	8.041*	7.230**	9.142**
(average)	(2.42)	(2.24)	(2.96)	(3.23)
PRITM	0.272**	0.460*	0.368	0.510**
(centered)	(2.74)	(2.07)	(1.94)	(2.60)
PR w/o ITM	2.077	5.343	2.878	3.962
(average)	(0.96)	(1.62)	(1.20)	(1.60)
PR w/o ITM	0.214	0.257	-0.276*	-0.261*
(centered)	(1.77)	(0.98)	(-2.20)	(-2.01)
Wage Bargaining	-2.941***	-2.835	-2.948***	-3.103**
(average)	(-3.70)	(-1.78)	(-4.01)	(-3.13)
Wage Bargaining	-0.047	-0.072	0.010	-0.011
(centered)	(-1.17)	(-1.44)	(0.19)	(-0.26)
Left Government	8.890	8.217	10.876	14.478**
(average)	(1.79)	(1.60)	(1.96)	(3.08)
Left Government	0.065	0.047	-0.108*	-0.108
(centered)	(0.89)	(0.67)	(-2.19)	(-1.70)
PRITM × Wage	7.454***	6.168*	6.027**	4.570*
(average)	(3.53)	(2.07)	(2.60)	(2.33)
PRITM × Wage	0.025	0.051	0.150**	0.171*
(centered)	(0.53)	(0.78)	(2.84)	(2.02)
N	880	848	530	524

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 2: Consumption Taxes (CONT)

	(1) FULL	(2) FULL	(3) SUB	(4) SUB
Federalism	-1.079**			
(average)	(-2.59)			
Consensus Democracy		-0.015		-0.008
(centered)		(-0.23)		(-0.16)
Federalism		-0.700*		-8.436
(centered)		(-2.05)		(-1.23)
Capital Account		0.455**		-0.704
(centered)		(3.05)		(-0.39)
Trade		0.529*		0.731*
(centered)		(2.11)		(2.49)
Social Security		-0.023		-0.032*
(centered)		(-1.92)		(-2.20)
EU		0.328**		-1.121*
(centered)		(2.65)		(-2.30)
EMU		-0.127		0.043
(centered)		(-1.32)		(0.37)
Interest Rate		0.007		-0.021
(centered)		(0.84)		(-1.63)
Constant	5.359*	1.256	1.446	0.126
	(2.49)	(0.46)	(0.81)	(0.07)
LN SD (Constant)	1.310***	1.413***	1.375***	1.352***
	(6.35)	(8.66)	(7.19)	(7.08)
LN SD (Disturbance)	-0.375***	-0.400***	-0.676***	-0.738***
	(-5.02)	(-16.23)	(-8.96)	(-10.57)
LN SD (Wage Bargaining)		-2.759***		-1.876***
		(-3.47)		(-3.73)
ARCTANH (cov(Wage,Con))		-8.612		-8.554***
		(-0.01)		(-6.26)

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 3: CAPITAL TAXES

	(1)	(2)
Lagged DV	0.892***	0.835***
(centered)	(61.80)	(49.75)
PRITM	7.213	12.379*
(average)	(1.27)	(2.51)
PRITM	-4.485***	-4.837***
(centered)	(-5.92)	(-4.77)
PR w/o ITM	-1.267	2.667
(average)	(-0.29)	(0.68)
PR w/o ITM	3.664***	5.376***
(centered)	(20.04)	(9.22)
Wage Bargaining	-2.005	-4.970*
(average)	(-1.03)	(-2.51)
Wage Bargaining	0.590	0.668
(centered)	(1.27)	(1.17)
Left Government	-20.005*	-26.695**
(average)	(-2.25)	(-3.09)
Left Government	-0.252	-0.318
(centered)	(-0.66)	(-0.87)
PRITM × Wage	-7.067	-0.455
(average)	(-1.34)	(-0.09)
PRITM × Wage	-1.312*	-1.613*
(centered)	(-2.07)	(-2.20)
N	627	620

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 4: CAPITAL TAXES (CONT)

	(1)	(2)
Capital Account	21.735*	
(average)	(2.06)	
Social Security	1.174*	
(average)	(2.02)	
Consensus Democracy		-0.718*
(centered)		(-2.18)
Federalism		26.612
(centered)		(1.44)
Capital Account		-0.128
(centered)		(-0.08)
Trade		2.312
(centered)		(1.54)
Social Security		0.165
(centered)		(1.13)
EU		0.147
(centered)		(0.27)
EMU		-1.741**
(centered)		(-3.08)
Interest Rate		0.156*
(centered)		(2.18)
Constant	28.299*	57.330***
	(2.54)	(19.73)
LN SD (Wage Bargaining)	-0.456	-0.277
	(-0.80)	(-0.53)
LN SD (Constant)	1.842***	1.958***
	(12.60)	(14.77)
ARCTANH (cov(Wage,Con))	-9.799	-8.789
	(-1.52)	(-1.83)
LN SD (Disturbance)	1.344***	1.321***
	(16.86)	(15.83)
N	627	620

Notes: * for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 5: CENTER-RIGHT GOVERNMENTS

	(1) BINARY	(2) BINARY	(3) SHARE	(4) SHARE
PRITM	-0.048	0.037	-0.367	-0.373*
(average)	(-0.27)	(0.22)	(-1.96)	(-2.08)
PRITM	-0.176	-0.190	-0.282	-0.317
(centered)	(-0.86)	(-0.90)	(-1.52)	(-1.68)
PR w/o ITM	-0.201	-0.072	-0.247	-0.336*
(average)	(-0.99)	(-0.40)	(-1.48)	(-2.22)
PR w/o ITM	-0.167*	-0.165*	-0.159*	-0.190*
(centered)	(-2.54)	(-2.21)	(-2.23)	(-2.52)
Wage Bargaining	0.033	-0.014	0.071	0.076
(average)	(0.43)	(-0.18)	(1.03)	(1.20)
Wage Bargaining	-0.075	-0.074	-0.038	-0.045
(centered)	(-1.44)	(-1.44)	(-0.65)	(-0.81)
Capital Account	-0.244*	-0.273	-0.107	-0.223
(centered)	(-1.96)	(-1.62)	(-0.90)	(-1.25)
PRITM × Wage	-0.168	-0.177	-0.114	-0.121
(centered)	(-1.70)	(-1.82)	(-1.45)	(-1.64)
PRITM × Wage × Capital	0.433***	0.441***	0.295**	0.318**
(centered)	(3.66)	(3.65)	(2.87)	(3.11)
Inflation		0.007		0.052**
(average)		(0.28)		(3.15)
Unemployment		-0.039		-0.029*
(average)		(-1.82)		(-1.97)
Inflation		-0.002		-0.009
(centered)		(-0.23)		(-1.37)
Unemployment		0.000		-0.008
(centered)		(0.03)		(-0.91)
Constant	0.709***	0.871***	0.626***	0.572**
	(5.94)	(4.87)	(5.50)	(3.25)
LN SD (Captial)	-2.702	-6.481	-2.756	-2.749
	(-1.28)	(-0.07)	(-1.67)	(-1.48)
LN SD (Constant)	-1.679***	-1.790***	-1.906***	-2.116***
	(-7.12)	(-8.47)	(-8.49)	(-6.82)
ARCTANH (cov(Capital,Con))	-9.078	-6.142	-8.870	-9.857
	(-1.13)	(-0.01)	(-1.85)	(-0.07)
LN SD (Disturbance)	-0.856***	-0.857***	-1.015***	-1.019***
	(-14.80)	(-14.92)	(-13.33)	(-13.49)
N	263	263	263	263

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 6: SUR and Partisan Interaction Regressions

	(1) SUR:CON	(2) SUR:CAP	(3) CON	(4) CAP
Lagged DV	0.562***	0.795***	0.752***	0.835***
(centered)	(4.09)	(22.42)	(29.95)	(49.85)
PRITM	6.632***	6.291***	9.061**	12.265*
(average)	(7.41)	(4.05)	(2.94)	(2.55)
PRITM	1.355	-9.259*	0.493	-4.667***
(centered)	(0.62)	(-2.42)	(1.79)	(-3.92)
PR w/o ITM	2.767***	-2.797*	3.941	2.717
(average)	(3.48)	(-1.99)	(1.47)	(0.68)
PR w/o ITM	1.318	-4.392	-0.258	5.376***
(centered)	(0.75)	(-1.47)	(-1.13)	(9.08)
Wage Bargaining	-2.506***	-1.074	-3.119*	-4.989*
(average)	(-5.00)	(-1.22)	(-2.34)	(-2.46)
Wage Bargaining	-0.213	0.963	-0.012	0.643
(centered)	(-0.53)	(1.38)	(-0.17)	(1.10)
Left Government	10.451***	-14.359***	14.576***	-25.947**
(average)	(8.13)	(-6.36)	(3.34)	(-2.99)
Left Government	0.027	-0.583	-0.093	-0.199
(centered)	(0.06)	(-0.68)	(-1.10)	(-0.38)
PRITM × Wage	6.429***	-3.873***	4.670	-0.336
(average)	(9.85)	(-3.35)	(1.93)	(-0.07)
PRITM × Wage	-0.416	-2.638**	0.185	-1.474
(centered)	(-0.82)	(-3.05)	(1.73)	(-1.85)
PRITM × Wage × Left			-0.041	-0.325
			(-0.32)	(-0.56)
N	619	619	524	620

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 7: SUR and Partisan Interaction Regressions (CONT)

	(1) SUR:CON	(2) SUR:CAP	(3) CON	(4) CAP
Consensus Democracy	-0.580	-1.332	-0.008	-0.731*
(centered)	(-1.26)	(-1.63)	(-0.14)	(-2.18)
Federalism	-13.256***	8.657*	-8.577	25.966
(centered)	(-5.29)	(1.97)	(-0.88)	(1.39)
Capital Account	3.340**	-10.133***	-0.713	-0.130
(centered)	(2.76)	(-4.71)	(-0.38)	(-0.08)
Trade	-2.896	3.034	0.729**	2.296
(centered)	(-1.63)	(0.98)	(2.64)	(1.54)
Social Security	-0.383***	-0.143	-0.031*	0.167
(centered)	(-4.01)	(-0.87)	(-2.22)	(1.15)
EU	-2.759**	-1.435	-1.120**	0.119
(centered)	(-2.86)	(-0.87)	(-3.04)	(0.22)
EMU	0.100	-4.028***	0.044	-1.728**
(centered)	(0.16)	(-3.64)	(0.46)	(-3.05)
Interest Rate	-0.011	-0.273*	-0.021	0.155*
(centered)	(-0.16)	(-2.08)	(-1.89)	(2.17)
Constant	2.364**	60.165***	0.097	57.054***
	(2.58)	(37.06)	(0.04)	(18.71)
LN SD (Wage Bargaining)			-1.874***	-0.305
			(-5.29)	(-0.56)
LN SD (Constant)			1.351***	1.952***
			(8.48)	(14.64)
ARCTANH (cov(Wage, Con))			-10.765	-7.564
			(-0.00)	(-1.41)
LN SD (Disturbance)			-0.738***	1.322***
			(-23.38)	(15.84)
N	619	619	524	620

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.

TABLE 8: CENTER-RIGHT GOVERNMENTS, KOF Financial Openness

	(1) BINARY	(2) BINARY	(3) SHARE	(4) SHARE
PRITM	-0.060	0.061	-0.382*	-0.379*
(average)	(-0.34)	(0.35)	(-1.97)	(-2.00)
PRITM	0.085	0.088	-0.126	-0.129
(centered)	(0.62)	(0.66)	(-0.93)	(-1.00)
PR w/o ITM	-0.137	0.012	-0.232	-0.301*
(average)	(-0.63)	(0.07)	(-1.32)	(-2.11)
PR w/o ITM	-0.131*	-0.135	-0.156*	-0.180*
(centered)	(-2.08)	(-1.95)	(-2.10)	(-2.28)
Wage Bargaining	0.036	-0.025	0.073	0.075
(average)	(0.47)	(-0.31)	(1.01)	(1.11)
Wage Bargaining	-0.107*	-0.106*	-0.060	-0.066
(centered)	(-2.12)	(-2.09)	(-1.04)	(-1.21)
Capital Account	-0.008***	-0.009***	-0.004*	-0.007*
(centered)	(-3.84)	(-3.36)	(-1.98)	(-2.33)
PRITM × Wage	-0.559***	-0.572***	-0.353**	-0.377**
(centered)	(-3.77)	(-3.79)	(-2.82)	(-2.99)
PRITM × Wage × Capital	0.010***	0.010***	0.007***	0.007***
(centered)	(4.93)	(5.02)	(3.72)	(4.04)
Inflation		0.002		0.052***
(average)		(0.08)		(3.80)
Unemployment		-0.041		-0.030*
(average)		(-1.90)		(-2.11)
Inflation		-0.005		-0.011
(centered)		(-0.63)		(-1.83)
Unemployment		-0.000		-0.007
(centered)		(-0.01)		(-0.83)
Constant	0.711***	0.895***	0.632***	0.576***
	(6.06)	(5.32)	(5.40)	(3.57)
LN SD (Constant)	-1.599***	-1.744***	-1.883***	-2.078***
	(-7.31)	(-9.15)	(-8.32)	(-6.94)
LN SD (Disturbance)	-0.896***	-0.897***	-1.040***	-1.046***
	(-14.59)	(-14.67)	(-12.92)	(-13.17)
N	270	270	270	270

Notes:* for p<.05, ** for p<.01, and *** for p<.001. Parentheses contain t-statistics.