

## Notes

<sup>1</sup>Note that this is different with respect to Profeta (2002) who assumes that the two groups have different sizes.

<sup>2</sup>Note that  $\Upsilon_t^j$  is a strictly concave function in  $a_t^{Ij}$ . The first order derivative gives  $\frac{\partial \Upsilon_t^j}{\partial a_t^{Ij}} = -\frac{\tau(T+(a_t^{Ij}-1)\tau)^{2-\psi I^2}}{2(1+(a_t^{Ij}-1)\tau)^2}$  and the second order derivative gives  $\frac{\partial^2 \Upsilon_t^j}{\partial (a_t^{Ij})^2} = -\frac{\tau^2 \psi I^2}{2(1+(a_t^{Ij}-1)\tau)^3} < 0$ .

<sup>3</sup>Lindbeck and Weibull 1987 and Dixit and Londregan 1996 demonstrated that the Nash equilibrium obtained if candidates maximize their vote share is identical to that obtained when candidates maximize their probability of winning.

<sup>4</sup>Second order conditions give  $\frac{\partial^2 p_t^j}{\partial (a_t^{Ij})^2} = \frac{\overset{\leq}{\partial V_t^I} \overset{>0}{s^{-1}} \overset{<0}{\partial s^I}}{\partial a_t^{Ij}} \overset{>0}{(1+s^I s^{-1})} + \overset{>0}{s^I s^{-1}} \overset{>0}{\frac{\partial^2 V_t^I}{\partial (a_t^{Ij})^2}}$

whose sign is undetermined.

<sup>5</sup>Note that group sizes do not determine the equilibrium because a larger group has more voters to be won, but the cost of winning them is also proportionately higher.

<sup>6</sup>An extreme case is when  $p_t^j$  is a strictly convex function on  $[a_t^{\min}, a_t^{\max}]$ . In this case each tax credit in the interval may be written as  $a_t^{\min} \frac{a_t^{\max} - a_t^{Ij}}{a_t^{\max} - a_t^{\min}} + a_t^{\max} \left(1 - \frac{a_t^{\max} - a_t^{Ij}}{a_t^{\max} - a_t^{\min}}\right)$  and have  $d(a_t^{Ij}) \leq a_t^{\min} \frac{a_t^{\max} - a_t^{Ij}}{a_t^{\max} - a_t^{\min}} + a_t^{\max} \left(1 - \frac{a_t^{\max} - a_t^{Ij}}{a_t^{\max} - a_t^{\min}}\right) \leq \max(a_t^{\min}, a_t^{\max})$

<sup>7</sup>One may verify that indirect utility functions have two intersection points.

<sup>8</sup>Proposition 10 is applicable here because we are assuming that the solution deriving by the resolution of Kuhn-Tucker conditions under assumption of local concavity at that point is a maximum. If the function is not concave proposition 10 could not be applied because at that point a maximum (and thus equilibrium) does not exist.

<sup>9</sup>The problem is that we cannot say if the value function is concave, convex or neither concave nor convex, given the complexity of the expression. As a consequence, we cannot be sure if stationary points we found from first order conditions are maximum.

<sup>10</sup>see Jones (2007) and Keen (2007)

<sup>11</sup>In this model I do not take into account the impact of taxation on production.

<sup>12</sup>For a complete discussion on the Single Mindedness Theory see Canegrati (2006) and Mulligan & Sala-i-Martin (1999)

<sup>13</sup>The marginal utility of income is decreasing in the level of income.

<sup>14</sup>For a more in details explanation of these definitions, see Canegrati (2006).

<sup>15</sup>I assume that axioms of *Anonymity*, *Population Principle*, *Principle of Transfers*, *Monotonicity*, *Scale Invariance*, *Decomposability*, *Uniform income growth* and *Translation Invariance* (Cowell, 2000) are satisfied.

<sup>16</sup>The graph  $C(F; q)$  against  $q$  describes the *generalised Lorenz curve*

<sup>17</sup>Occupational pensions include all pensions paid from non-social retirement schemes including employer-based pensions for private sector workers and public employees.

<sup>18</sup>Other cash income includes regular private transfers, alimony and child support benefits, other sources of regular cash income, not classified above.

<sup>19</sup>Social insurance transfers include: accident or short-term disability pay, long-term disability pay, social retirement benefits (old age and survivors), unemployment pay, maternity

allowances, military or veteran's benefits, other social insurance.

<sup>20</sup>Universal cash transfers include child and/or family allowances if paid directly by governments. Universal cash transfers paid as refundable income tax credits are counted as negative amounts in the income tax of some countries.

<sup>21</sup>Social assistance includes all income-tested and means-tested benefits, both cash and near-cash.

<sup>22</sup>Inter-generational indexes for all the other countries are available upon request to the author.

<sup>23</sup>In principle, one may study the impact of political communications on voters in order to assess how much the voting behaviour changes as a consequence of the exposure to messages. For instance, one may study the political *manifestos* and the way they are communicated to the audience and eventually calculate which party or candidate is directly favoured by messages form intermediaries. Unfortunately, this analysis is not very reliable because it must be inferred only via experiments; secondly, supposed that these experiments can be done, the message sent is not necessarily the message received by individuals and it is extremely difficult measuring the degree of exposure and the degree of perception of messages. For instance, the political bias should be measured at the source or at the receiver? What signal was sent? How can we measure the degree of exposure to a message?

<sup>24</sup>It is useful to remind that the voting age in the United Kingdom is 18.

<sup>25</sup>with respect to manifestos, press releases are more suited to give an insight into the patterns of communication over the course of campaign.

<sup>26</sup>The sample includes seven newspapers: the Sun, the Daily Mirror, the Daily Mail, the Daily Telegraph, the Times, the Guardian and the Independent.

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