The Political Economy of In-Kind Redistribution

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2011

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May 2012

Abstract

Why do politicians redistribute resources through in-kind rather than cash transfers? This paper examines political incentives for in-kind government redistribution. By analyzing the political game between office-motivated politicians and self-interested citizens, I first show that in economies with competitive markets in-kind transfers are not required. Politicians can win elections targeting groups of voters with differential cash transfers. However, in-kind transfers arise in the presence of externalities in consumption. In that case, targeting groups of voters with in-kind rather than cash transfers allows politicians to attract simultaneously voters in additional groups with the same amount of resources. Politicians undertake political redistribution depending on the expected electoral returns obtained from targeting both cash and in-kind transfers into different groups. Furthermore, electoral competition leads the economy to achieve Pareto efficient allocations that markets cannot reach. Politicians internalize the presence of external effects when competing for marginal voters who could swing their vote.

*I am grateful for helpful comments from Alessandra Casella, Navin Kartik, Massimo Morelli, Patrick Bolton, Yeon-Koo Che, Josepa Miquel-Florensa, Xavier Sala-i-Martin, Bernard Salanié and seminar participants at Columbia University.

1 Introduction

In advanced democracies, governments raise taxes and redistribute resources on a large scale. Evidence shows that a significant part of this redistribution is undertaken through in-kind transfers such as health services, education, housing or child and elderly care.[1]For instance, public health care spending in 2008 represented on average 7% of GDP and 16% of government expenditures in OECD countries. In the US, public spending in primary and secondary education stands at 5% of GDP. Overall, in-kind transfers in the OECD represent around 15% of GDP.[2]Why do politicians redistribute resources through in-kind rather than cash transfers? The goal of this paper is to examine political incentives for in-kind government redistribution.

In particular, I investigate whether politicians who compete for office need to make use of in-kind transfers when there are no constraints in the available taxation policy tools. The common view in political economy literature is that in-kind transfers emerge as an instrument to redistribute resources across groups of citizens.[3]However, my first main result shows that in-kind transfers are not required when politicians can court groups of citizens with differential cash transfers.

In order to analyze the political choice between cash and in-kind transfers, I consider a society in which individuals belong to a finite number of groups. Citizens care about their available income and the consumption of goods that might be subject to public provision such as health and education. Through a political process, citizens have to elect a government who can raise taxes to fund cash and in-kind transfers. There are no constraints in the available taxation policy that government can use and economic policies are non-distortionary.

The government is elected from two office-motivated political parties that compete for power. Politicians credibly commit to a combination of net taxation policy and in-kind transfers targeted to groups in order to maximize their chance of winning elections. Furthermore, each party holds fixed ideological positions non-related with economic policy such as positions on value issues. Citizens have heterogeneous attachments toward those parties' ideological views and share a common valuation of the competing parties. Hence, each citizen votes for the party that maximizes her own well-being given promised economic policies, ideological views and the valuation of political parties. The party that obtains the majority of the votes wins the election and implements the announced policies.

With the purpose of focusing the analysis on the distributional side, I assume the existence of competitive firms that produce goods such as health care or education. In a market economy without government intervention, the access to those goods depends on individuals' income, but

[1]By *in-kind transfers* I refer to government expenditures intended to provide the consumption of specific goods, regardless of whether production is public or private.

[2]Source: OECD Economic Outlook 2009 and OECD Health Data 2010; See Currie and Gahvari (2008) and Alesina and Glaeser (2004) for a detailed discussion on that evidence.

[3]See for instance Epple and Romano (1996a,b), Gouveia (1997) and Currie and Gahvari (2008).

the market allocation is not politically sustainable. Once electoral competition is introduced, politicians have incentives to redistribute resources in order to win elections. The gainers of the political process are the groups with lower initial amount of resources and homogeneous ideological positions.

However, this does not imply that redistribution must occur through in-kind transfers. Politicians compete for pivotal voters that could swing their vote but can court those swing voters by targeting differential cash transfers across groups of citizens. Hence, why is in-kind redistribution so prevalent? Normative analysis justifies in-kind transfers as optimal responses of a benevolent planner to either market failures or equity concerns.[4]Currie and Gahvari (2008) survey normative theoretical explanations for in-kind transfers and review limited empirical evidence. They consider interdependent preferences such as externalities and paternalism as the leading candidates to explain governments' use of in-kind transfers.[5]I introduce this type of preferences into the distributive politics game. In that situation, I find that in-kind redistribution is politically necessary. Politicians can attract more voters making use of in-kind rather than cash transfers. I focus on two particular cases in order to analyze how political redistribution is affected by interdependent preferences.

I first discuss the role of in-kind transfers in the presence of consumption externalities. Specifically, I explore the case in which the available health care coverage of the elderly generates a positive externality for the rest of the population. In that case, politicians can court simultaneously swing voters in all groups targeting in-kind transfers to the group whose consumption generates a positive external effect. These political incentives lead the economy to increase the overall consumption levels of the good subject to in-kind transfers.

I then explore how incentives for political redistribution are affected by the presence of egalitarian preferences on the consumption of specific commodities. For instance, individuals could believe that health and education are fundamental rights. These rights should not be dependent on citizens' ability to pay or any other circumstances. I show that politicians implement in-kind transfers in order to reduce inequalities. However, an egalitarian distribution is not attainable because of the political incentives for differential treatment across groups. Office-motivated politicians exploit individuals' concerns for their own economic well-being, courting voters with differential in-kind transfers. Those incentives also lead to decreasing aggregate consumption levels of goods subject to egalitarian views.

An appealing result of my research is that the electoral competition for marginal voters exhausts potential Pareto improvements in the economy. Politicians redistribute resources using available

[4]See Stiglitz (1995) and Rosen and Gayer (2010) for a textbook treatment of failures in markets for health and education such as asymmetries of information, liquidity constraints or spillover effects; Musgrave (1959) and Besley (1988) for paternalistic motives on the individuals' lack of skills and myopia to make good choices on merit goods.

[5]Currie and Gahvari (2008) also discuss the extensive literature on the role of in-kind transfers as screening device to redistribution in the presence of asymmetric information (Nichols and Zeckhauser,1982; Blackorby and Donaldson, 1988; Bruce and Waldman, 1991). However, they highlight the limited practical feasibility of such self-selection mechanism.

policy tools in such a manner that the allocation of resources that results from electoral competition and individuals' market decisions is Pareto efficient. The efficiency argument in electoral competition was made informally by Wittman (1989, 1995). Furthermore, Besley and Coate (1998) and Besley (2007) highlighted that efficiency should be reached in static political economy models without constraints in policy tools. The novelty of my contribution relies on showing that this efficiency result holds in the political choice of cash versus in-kind redistribution in the presence of externalities and equity concerns. Politicians competing for marginal voters lead the economy to achieve Pareto-efficient allocations that markets cannot reach.

It is important to notice that this efficiency result is not the choice of a benevolent planner that implements in-kind transfers either to correct market imperfections or to satisfy equity concerns. Instead, the efficient allocation is the equilibrium outcome of the political game between politicians and voters. The political process does not generate allocative inefficiencies and the implemented allocation in the Pareto set depends on the political clout of different groups.

One of the advantages of the present positive analysis over the normative one is that we do not need to rely on value judgments on the weight of groups in society in order to characterize economic policies. The characterization of redistributive schedules announced by politicians depends on the political influence of groups. Such an influence is explained by the expected electoral returns obtained from targeting both cash and in-kind transfers into different groups.

The model builds on previous work on probabilistic voting developed by Lindbeck and Weibull (1987) and Dixit and Londregan (1996) to study political redistribution of cash transfers across groups of voters.[6]I extend that framework, allowing politicians to court groups of citizens with both cash and in-kind transfers when market provision of the targeted goods is also feasible. By exploiting a probabilistic voting model, this paper can tractably handle political equilibria with multidimensional policy space without imposing severe constraints into policy tools. This modeling strategy allows me to show that previous results on the political use of in-kind transfers are driven by policy constraints imposed in order to ensure the existence of equilibrium. Influential contributions such as Fernandez and Rogerson (1995), Epple and Romano (1996a,b) and Levy (2005) rationalize the use of in-kind transfers as tool of political redistribution across groups of citizens. Those transfers could emerge without the necessity of assuming market failures or equity concerns. However, this paper shows that a pure redistributive motive does not explain the political use of in-kind transfers once a sufficiently rich set of policy instruments is available.

Essential for my results is the possibility of allowing the targeting of in-kind transfers toward groups of citizens. That form of targeting has been mainly ignored by both the literature on redistributive politics and theoretical research on in-kind transfers. Those contributions have generally assumed that politicians offer universal homogeneous provision of health and education. However,

[6]Those models were extended by Persson and Tabellini (2000) and Lizzeri and Persico (2004) to analyze the size and scope of government spending.

evidence supports the possibility of targeting in-kind transfers. The most obvious cases are the Medicare and the Medicaid programs targeted to the elderly and the poor in the US. Furthermore, even in systems of universal provision the coverage is not uniform. As an example, the co-payments schedules in European public health systems depends on citizens' age, level of income or employment status. Similarly, the exemptions of course fees in public universities are determined by family income or geographic mobility. Hence, this paper opens the way to new empirical analysis on the political targeting of in-kind transfers towards specific groups or constituencies.

The paper is organized as follows. In the next section, I present the benchmark of a competitive market allocation. Section III analyzes the role of in-kind transfers as a tool of political redistribution. Section IV introduces external effects into the distributive politics game. Section V explores political redistribution in the presence of equity concerns. Finally, the last section concludes and discusses potential further research.

2 The Economy: Market Allocation

Consider an economy with a continuum of citizens whose measure can be normalized to 1. Citizens are divided into a finite number of groups, $j \in \{1, ..., J\}$, with measure μ^j. No group constitutes a majority of the population. Each individual in group j has an endowment of w^j units of a numeraire good. This endowment can be thought as the level of income or money obtained by citizens of a given occupation or type in a market economy. The total amount of resources in the economy is defined as:

$$w = \sum_{j=1}^{J} \mu^j w^j \tag{1}$$

Competitive firms produce health services at different quality levels, h,[7] using a linear technology that requires qh units of the numeraire commodity to produce one unit of health services at quality h. All individuals in the population have the same preferences over the consumption of the numeraire commodity, c, and health care quality, h, represented by the following utility function:

$$U^j(c^j, h^j) = u(c^j, h^j) \qquad \forall j \tag{2}$$

This function is continuous, twice differentiable, strictly increasing ($u_c > 0, u_h > 0$) and strictly concave ($u_{cc} < 0$, $u_{hh} < 0$) in c and h. Marginal utilities are bounded away from 0 and $u_c(0, h) = \infty$ and $u_h(c, 0) = \infty$. There are no complementarities between health quality and the numeraire (i.e. $u_{ch} = 0$) and both commodities are assumed to be normal goods.

I assume perfectly competitive markets.[8]Firms with constant returns to scale produce whatever quality of health care that citizens demand at price, p_h, equal to marginal cost, q. Competitive

[7]For expositional reasons, I focus on health care but the analysis is also valid for education.

[8]I abstract away potential market imperfections such as asymmetries of information and imperfect competition.

firms make zero profits. Citizens endowed with available resources, w^j, purchase in competitive markets the quality of health care that they desire at market price p_h. The residual amount of resources is left for consumption of the numeraire commodity. Thus, individual's budget constraint is given by:

$$w^j = c^j + p_h h^j \tag{3}$$

The choice problem for individual i located in group j who acquires health services in the market is defined as follows:

$$\forall i \in j \quad \max_{h^j} \; U^j(c^j, h^j) = u(w^j - p_h h^j, h^j) \quad \text{s.t. } h^j \geq 0 \tag{4}$$

where the FOCs for an interior optimum are:

$$[h^j] \qquad -p_h u_c + u_h = 0 \rightarrow u_h = p_h u_c \qquad \forall j \tag{5}$$

The optimal market choice, (c_m^{j*}, h_m^{j*}) $\forall j$, for individuals with initial endowment w^j, satisfies (5) such that:

$$u_h(c_m^{j*}, h_m^{j*}) = p_h u_c(c_m^{j*}, h_m^{j*}) \qquad \forall j \tag{6}$$

From this relation, we can implicitly define the marshallian demand functions for health care quality and numeraire commodity:

$$h_m^{j*} = h_m^j(w^j, p_h) \qquad \forall j \tag{7}$$

$$c_m^{j*} = c_m^j(w^j, p_h) \qquad \forall j \tag{8}$$

Definition (Market Allocation): A competitive market equilibrium is an allocation of numeraire commodity and health services quality for each group of the polity, $\{c_m^{j*}, h_m^{j*}\}_{j=1}^J$, such that consumers solve problem (4); and competitive firms with constant returns to scale produce whatever amount citizens demand at price p_h, equal marginal cost, q. In equilibrium, economy feasibility constraint holds with equality:

$$\sum_{j=1}^{J} \mu^j c_m^{j*} + \sum_{j=1}^{J} \mu^j p_h h_m^{j*} = w \tag{9}$$

In a competitive equilibrium, the rate at which consumers are willing to trade health services for numeraire commodity, $MRS_{h,c}$, is equal for all individuals and equal to the rate at which the economy is able to transform numeraire into health care quality, $MRT_{h,c}$. Therefore, Market allocation is Pareto Optimal.

This assumption is made in order to focus the analysis on the distributional side. i.e. how differences of available income affect access to health care quality.

$$MRS^j_{h,c} = MRT_{h,c} = q \qquad \forall\ j \in \{1, ..., J\} \tag{10}$$

Market equilibrium yields an allocation of resources such that individuals who belong to groups with larger amount of initial endowment choose higher quality of health services and consume larger amounts of numeraire good than individuals who belong to groups associated to low initial endowments. This folllows directly from assumptions about homogeneity of preferences and normality of both goods. Is this market allocation politically sustainable?

3 The Polity: Political Allocation

3.1 Political Game

The initial distribution of the endowment across groups can be modified by public intervention. Through a political process the polity has to choose a government who can raise taxes and devote these fiscal revenues to redistribute resources through both cash (i.e. numeraire) transfers and the public provision of health services. Public provision is modeled as conditional transfers. Citizens receive non-tradable transfers that can be uniquely spent to purchase health services in markets.[9]I do not impose any constraint on the taxation schedule that government can use and economic policies are non-distortionary.[10]

There are two purely office-motivated political parties, $P \in \{A, B\}$, competing for office. Hence, parties announce taxation policy and in-kind transfers to each group j in order to maximize their chances of winning elections. I assume majority voting, therefore winning corresponds to obtaining the support of more than fifty percent of the population. Voting is costless and nobody abstains.

Let y^j_P denote the amount of numeraire commodity promised by party P to group j. This net income is the result of taxation policy targeted to j by P. Furthermore, politicians can announce group-specific in-kind transfers. Let h^j_{gP} be the publicly provided quality of health care promised by P. The marginal cost of the public funding of health services quality is equal to the market price, p_h. Politicians can credibly commit to a policy platform $x_P = \{y^j_P, h^j_{gP}\}^J_{j=1}$ to be implemented if party P wins the elections. The allocation of resources after government intervention must satisfy economic feasibility:

$$\sum_{j=1}^{J} \mu^j y^j_P + \sum_{j=1}^{J} \mu^j p_h h^j_{gP} = w \tag{11}$$

[9] As an alternative, I could assume that governments can directly produce these services with exactly the same technology available to the private sector. In that case, results in terms of allocations of resources would be the same.

[10] Formally, those assumptions imply that governments are able to tax away all the initial endowment of resources. Then, politicians redistribute that fixed budget across groups allocating cash and in-kind transfers. See Lizzeri and Persico (2004) for a close approach in economies with cash transfers and pure public goods.

This constraint defines a budget set of private and public spending allocations that are feasible. The policy set of available and attainable policies that captures all restictions, $X \subset \mathbb{R}^{2J}$, is non-empty, convex and compact.

Citizens care about their own economic well-being represented by preferences (2) and have access to health care markets. Once one of the parties P wins the elections and implements announced policies, individuals are able to purchase health services, h^j_{mP}, at price p_h. The overall quality of health services in group j under government P would be the sum of the public and private provision, $h^j_P = h^j_{gP} + h^j_{mP}$. The residual amount of available resources are allocated to the consumption of numeraire commodity, $c^j_{mP} = y^j_P - p_h h^j_{mP}$.

In addition to economic policy, citizens care about non-economic issues. Specifically, I adopt a partisanship probabilistic voting model.[11] Political parties hold fixed and differentiated positions in some dimension other than economic policy. For instance, parties A and B could represent respectively conservative and liberal positions on *value* issues (e.g. pro-life versus pro-choice views), foreign policy or the role of religion in public life. Individuals have biases toward those parties' ideological views. Define σ^i as the relative attachment that individual i has to party B's positions (i.e. $\sigma^i = \sigma^i_B - \sigma^i_A$). This ideological bias can be positive or negative.

Parties do not know the party attachment of each individual. However, the group-specific distribution of relative ideological biases for each group is common-knowledge. I assume that the idiosyncratic biases for citizens in group j are drawn from a uniform distribution over the range $[\sigma^j_a, \sigma^j_b]$:

$$\sigma_i \sim U\left[-\frac{1}{2\phi^j} + \overline{\sigma}^j, \frac{1}{2\phi^j} + \overline{\sigma}^j\right] \qquad \forall i \in j \tag{12}$$

Groups might differ with respect to both their average ideological bias, $\overline{\sigma}^j = (\sigma^j_a + \sigma^j_b)/2$, and the ideological homogeneity within the group. Groups with a broader support of party biases (i.e. greater ideological dispersion) have a lower density $\phi^j = 1/(\sigma^j_b - \sigma^j_a)$. Denote $\phi = \sum_{j=1}^J \mu^j \phi^j$ the weighted average of ideological heterogeneity across groups. In spite of bias diversity within and across groups, I assume that there is no aggregate ideological bias in the overall population. Furthermore, there are ideologically neutral voters, $\sigma^i = 0$, in all groups.

Citizens value the personal attributes of the politicians running in the elections. I assume that between the announcement of cash and in-kind policies and elections each party receives aggregate shocks, ε_A and ε_B, common to all voters in the population. I normalize the common shock, $\varepsilon = \varepsilon_B - \varepsilon_A$, which measures the perception that voters have on party B's candidate with respect to candidate A at the time of elections (i.e. average relative popularity of candidate B). I assume that

[11] I use the specification of individuals concerns on non-economic ideological issues and popularity of political parties proposed by Persson and Tabellini (1999). See Persson and Tabellini (2000) for a detailed discussion.

the common shock ε is uniformly distributed, independently from σ_i, with density ψ and expected value, $E(\varepsilon)$, equal to 0.

$$\varepsilon \sim U[-\frac{1}{2\psi}, \frac{1}{2\psi}] \tag{13}$$

The timing of the political game is as follows: **1)** Political parties simultaneously and non-cooperatively credibly commit to their economic policy platforms, $x_A = \{y_A^j, h_{gA}^j\}_{j=1}^J$ and $x_B = \{y_B^j, h_{gB}^j\}_{j=1}^J$. **2**) The random idiosyncratic, σ_i, and common popularity shocks, ε, are realized. **3)** Citizens vote for the candidate that they prefer, $\{A, B\}$. **4**) Whichever party P that obtains the majority of the votes, wins the election and implements the economic policy promised at the beginning of the game. Finally, **5)** individuals make consumption choices through competitive markets, $\{c_{mP}^j, h_{mP}^j\}_{j=1}^J$.

3.2 Stages of the Game

The political game presented above has three stages:

Stage 1 - Policy Announcements: taking its opponent's policy platfom as given, each party chooses the net taxation policy and in-kind transfers for each social group that are economically feasible and maximize its chances of winning elections. Parties take into account expected voting decisions of citizens, knowing that they can supplement health services quality in competitive markets.

Stage 2 - Elections: citizens vote for the party that they prefer given economic policy announcements, their ideological biases and the popularity of politicians.

Stage 3 - Market Decisions: once one of the parties wins the election and implements announced policies, individuals make market choices. Individuals can make private purchases of health care with their available income.

I characterize the Subgame Perfect Nash equilibrium of the political game by backward induction.

3.2.1 Third Stage: Market Decisions

In the last stage of the game, given implemented policies by winner party P, $\{y_P^j, h_{gP}^j\}_{j=1}^J$, individuals decide whether to purchase health services through competitive markets, $\{h_{mP}^j\}_{j=1}^J \geq 0$. The residual available resources are allocated to the consumption of the numeraire commodity, $\{c_{mP}^j\}_{j=1}^J$.

Individual's budget constraint in group j under P's government is given by:

$$y_P^j = c_{mP}^j + p_h h_{mP}^j \qquad \forall j \tag{14}$$

Consumer $i \in j$'s choice problem can be written as:

$$\max_{h^j_{mP}} \quad U^j(c^j, h^j) = u(y^j_P - p_h h^j_{mP}, h^j_{gP} + h^j_{mP}) \quad \text{s.t.} \quad h^j_{mP} \geq 0 \qquad \forall j \tag{15}$$

The FOCs for a maximum are given by:

$$[h^j_{mP}] \qquad u_h + \gamma^j_h = p_h u_c \quad \forall j \tag{16}$$

$$\gamma^j_h h^j_{mP} = 0 \; ; \;\; \gamma^j_h \geq 0 \quad \forall j \tag{17}$$

where γ^j_h is the Lagrange multiplier associated to the non-negativity constraint, $h^j_{mP} \geq 0$. The choice problem for group j yields two alternatives. In the first alternative, individuals decide not to make private purchases of health care, $h^j_{mP} = 0$, if and only if this condition holds:

$$u_h(y^j_P, h^j_{gP}) \leq p_h u_c(y^j_P, h^j_{gP}) \qquad \forall j \tag{18}$$

Given group j's available income, y^j_P, the quality of publicly provided health services to this group, h^j_{gP}, is such that the marginal benefit of acquiring one unit of health care is lower than the marginal cost in terms of lower consumption of numeraire commodity. Individuals do not purchase private coverage and net income is fully devoted to the consumption of the numeraire commodity, $c^j_{mP} = y^j_P$. Hence, the indirect utility function for groups that do not supplement (NS) public health coverage under P's government is given by:

$$V^{jNS}_P(y^j_P, h^j_{gP}; p_h) = u(y^j_P, h^j_{gP}) \quad \forall j \;\; \text{and} \; \forall \; P \in \{A, B\} \tag{19}$$

Otherwise, when the sign of condition (18) is reversed, individuals make private purchases, $h^j_{mP} > 0$. The optimality condition of consumer's choice problem yields:

$$u_h(y^j_P - p_h h^j_{mP}, h^j_{gP} + h^j_{mP}) = p_h u_c(y^j_P - p_h h^j_{mP}, h^j_{gP} + h^j_{mP}) \qquad \forall j \tag{20}$$

This condition implicitly defines the ordinary demand function of health services quality for group j under P's government, $h^j_{mP} = h^j_m(y^j_P, h^j_{gP}, p_h) \;\; \forall j$. Using individual budget constraint (14), the consumption of numeraire commodity is defined as:

$$c^j_{mP} = y^j_P - p_h h^j_m(y^j_P, h^j_{gP}, p_h) \qquad \forall j \tag{21}$$

The indirect utility function for groups that make private purchases (S) under P's government is given by:

$$V^{jS}_P(y^j_P, h^j_{gP}; p_h) = u(y^j_P - p_h h^j_{mP}, h^j_{gP} + h^j_{mP}) \quad \forall j \;\; \text{and} \; \forall \; P \in \{A, B\} \tag{22}$$

3.2.2 Second Stage: Voting

At the voting stage, individuals consider announced policies, x_A and x_B, credible commitments that parties implement if they win elections. Citizens value promised policies according to the impact on their own economic well-being. Individuals take into account that they will be able to make private decisions on health care markets once policies had been implemented. Thus, individuals valuation of policies are summarized by either indirect utility function (22) or (19) depending whether they supplement or not the quality of health care publicly provided.

Suppose that a member of group j is promised economic policies (y_A^j, h_{gA}^j) by party A and (y_B^j, h_{gB}^j) by B. Given ideological biases and the popularity of politicians, citizen i in group j votes for party A if:

$$V_A^j(y_A^j, h_{gA}^j) > V_B^j(y_B^j, h_{gB}^j) + \sigma_i + \varepsilon \tag{23}$$

where $V_P^j = \max\{V_P^{jS}, V_P^{jNS}\}_{j=1}^J \ \forall j$ and for $P \in \{A, B\}$. While voting for party B if this inequality is reversed.

In each social group will be citizens with an idiosyncratic ideological bias, σ^j, such that they are indifferent between voting for party A or B. The swing voter type in each group j is defined as:

$$\sigma^j = V_A^j(y_A^j, h_{gA}^j) - V_B^j(y_B^j, h_{gB}^j) - \varepsilon \tag{24}$$

where $V_P^j = \max\{V_P^{jS}, V_P^{jNS}\}_{j=1}^J \ \forall j$ for $P \in \{A, B\}$. Voters located in group j with and ideological type σ_i below (above) the cut-off ideological type find optimal to vote for A (B). Previously, I assumed that the idiosyncratic ideological preferences are uniformly distributed in each group. Furthermore, there is no ideological bias to any of the parties in the overall population. Therefore, the overall vote share for party A is defined as:

$$S_A(x_A, x_B; \varepsilon) = \frac{1}{2} + \sum_{j=1}^{J} \mu^j \phi^j \sigma^j \tag{25}$$

The complement share of citizens votes for party B, S_B.

3.2.3 First Stage: Policy Announcements

At the first stage of the game, when politicians announce policy platforms, the common shock has not been observed. The swing voter type in each group depends on both policy platforms and the realized value of the shock, $\sigma^j = \sigma^j(x_A, x_B; \varepsilon)$. Hence, parties are uncertain about the location of the ideological cut-off type in each group and voting is a random variable from politicians' point of view. I assumed majority voting, therefore office-motivated politicians care about the probability of obtaining more than fifty per cent of the total vote. Given the swing voter type in each group

(24) and distributional assumptions on biases and shock, the probability that party A wins the election can be expressed as:

$$P(x_A, x_B) = \frac{1}{2} + \frac{\psi}{\phi}\left[\sum_{j=1}^{J} \mu^j \phi^j \left[V_A^j(y_A^j, h_{gA}^j) - V_B^j(y_B^j, h_{gB}^j)\right]\right] \tag{26}$$

Party B anticipates winning the election with the complementary probability $1 - P(x_A, x_B)$. This function captures the uncertainty regarding electoral outcome and summarizes expected voting behavior of citizens given announced policies and implied market decisions. The probability is a function of the weighted average of differences in indirect utility due to parties' proposals of cash transfers and provision of health services. The weights depend on the heterogeneity of ideological biases within a group.[12]

Probabilistic voting provides continuity of the probability function. Continuity of both individuals' utility function and distribution of ideological biases insures continuity in both policy platforms of the probability that A wins the election. Furthermore, I assumed concavity of citizens' utility functions and uniform distribution of idiosyncratic ideological positions. Given these assumptions, the probability function is quasi-concave in x_P for each party P.[13]

Taking the opponent's economic policies as given, each political party chooses a combination of available income and public provision of health care for each group, $\{y_P^j, h_{gP}^j\}_{j=1}^J$ for $P \in \{A, B\}$, that maximizes its chances of winning elections subject to economic feasibility and non-negativity constraints. Parties take into account citizens' expected voting decisions (*stage 2*) and individuals' choices in competitive markets (*stage 3*).

The policy choice problem of party A is given by:

$$\max_{\{y_A^j, h_{gA}^j\}_{j=1}^J} \quad P(x_A, x_B) \quad \text{s.t.} \quad (11) \text{ and } \quad y_A^j \geq 0 \ \ \forall j \ \ ; \ \ h_{gA}^j \geq 0 \ \ \forall j \tag{27}$$

The policy choice problem is symmetric to political party B. The First Order Conditions for both political parties $P \in \{A, B\}$ are defined as:

$$[y^j] \qquad \frac{\psi}{\phi}\mu^j \phi^j \frac{dV_P^j(y_P^j, h_{gP}^j)}{dy^j} + \mu^j \gamma_{yP}^j = \mu^j \lambda_P \qquad \forall j \tag{28}$$

$$[h_g^j] \qquad \frac{\psi}{\phi}\mu^j \phi^j \frac{dV_P^j(y_P^j, h_{gP}^j)}{dh_g^j} + \mu^j \gamma_{hP}^j = p_h \mu^j \lambda_P \qquad \forall j \tag{29}$$

[12] See Persson and Tabellini (2000) for a detailed discussion on the properties of probability of winning functions in this kind of electoral competition models.

[13] Austen-Smith and Banks (2005) and Banks and Duggan (2006) present excellent surveys on probabilistic voting with office-motivated politicians. Specially relevant are their technical discussion on continuity and quasiconcavity of parties' probability of winning elections.

$$\lambda_P \left[w - \sum_{j=1}^{J} \mu^j y_P^j - \sum_{j=1}^{J} \mu^j p_h h_{gP}^j \right] = 0 \tag{30}$$

$$\gamma_{yP}^j y_P^j = 0 \quad \forall j \quad ; \quad \gamma_{hP}^j h_{gP}^j = 0 \quad \forall j \tag{31}$$

$$\lambda_P \geq 0 \qquad \gamma_{yP}^j \geq 0 \quad \forall j \quad ; \quad \gamma_{hP}^j \geq 0 \quad \forall j \tag{32}$$

where γ_{yP}^j and γ_{hP}^j are the multipliers associated to the non-negativity constraints $y_P^j \geq 0$ and $h_{gP}^j \geq 0$ for all groups $j \in \{1, ..., J\}$ for $P \in \{A, B\}$;and λ_P is the Lagrange multiplier associated to the economy feasibility constraint for $P \in \{A, B\}$.

3.3 Political Equilibrium

Definition: A Subgame Perfect Nash Equilibrium (SPNE) in the probabilistic electoral competition game is i) a menu of economic policies announced by each political party P, $x_P^N = \{y_P^{jN}, h_{gP}^{jN}\}_{j=1}^J$; ii) a voting decision for each individual of the polity, $\{A, B\}$; and iii) individuals' private choices through competitive markets under P's government, $\{c_{mP}^{jN}, h_{mP}^{jN}\}_{j=1}^J$, such that:

1) Each political party announces a policy proposal that maximizes its chances of winning elections taking as given its opponents' policy announcements, the economy feasibility constraint and citizens' expected voting and market decisions.

2) Each citizen votes for the party that maximizes her own well-being given announced economic policies, ideological biases, popularity shock and decisions in competitive markets.

3) Each individual, given implemented policies, chooses the bundle of numeraire commodity and health services that maximizes her utility given her available resources.

Proposition 1 (Existence) *A SPNE in pure strategies exists.*

Proof. Given that i) the feasible set of strategies for both political parties is non-empty, compact and convex; and ii) candidates objective functions are continuous in policy strategies (x_A, x_B) and quasiconcave in x_A, x_B for each party respectively. Furthermore, given that i) individuals' budget set is also non-empty, compact and convex; and ii) citizens' utility functions are assumed to be continuous and concave in both goods. Then, according to Glicksberg's Theorem, there does exist a Subgame Perfect Nash Equilibrium in pure strategies. ■

3.3.1 Political Allocation

Solving backwards, I characterize the Political Equilibrium of the game.[14]For both political parties, the equilibrium net taxation and in-kind transfers policies for any group j, (y_P^{jN}, h_{gP}^{jN}) , must satisfy:

$$\frac{\psi}{\phi}\phi^j\mu^j\frac{dV_P^j(y_P^{jN}, h_{gP}^{jN})}{dh_g^j} = p_h\frac{\psi}{\phi}\phi^j\mu^j\frac{dV_P^j(y_P^{jN}, h_{gP}^{jN})}{dy^j} \tag{33}$$

$\forall j \in \{1, ..., J\}$ and $\forall P \in \{A, B\}$, such that economic feasibility holds. In the pre-election stage, politicians announce policies such that the marginal benefit of targeting one unit of in-kind transfers in terms of probability of winning elections is equal to the marginal opportunity cost. That cost is measured by the marginal decrease in probability due to a reduction of targeted net income by p_h units.

The presence of competitive markets allows the existence of multiple equilibrium policies for each group j. In the pre-election stage, politicians take into account that in the post-election stage individuals have access to health care markets. In equilibrium, both political parties are indifferent to announce different combinations of net taxation policy and in-kind transfers for each social group j. However, the targeted consumption bundle of numeraire and health care to group j is the same regardless of the choosen equilibrium policy. In equilibrium:

$$u_h(c_P^{jN}, h_P^{jN}) = p_h u_c(c_P^{jN}, h_P^{jN}) \tag{34}$$

where $c_P^{jN} = y_P^{jN} - p_h h_{mP}^{jN}$ and $h_P^{jN} = h_{gP}^{jN} + h_{mP}^{jN}$ $\forall j \in \{1, ..., J\}$ and $P \in \{A, B\}$.

The combination of choosen policies, $\{y_P^{jN}, h_{gP}^{jN}\}_{j=1}^J$, imply consumption bundles for all groups that satisfy the economy feasibility constraint. That set of bundles, $\{c_P^{jN}, h_P^{jN}\}_{j=1}^J$, is the one that maximizes politicians' chances of winning elections given expected voting, competitive equilibrium behavior of citizens and economic feasibility.

Proposition 2 (Equilibrium Policies) *Politicians are indifferent between announcing pure private provision, pure public provision or a combination of public and private provision of health services for each group j such that the consumption bundle intended for the groups is reached and economic feasibility holds.*

Corollary 3 (In-kind transfers not necessary) *Office-motivated politicians need not resort to in-kind transfers to win elections.*

The existence of competitive markets allows any consumption bundle to be reached targeting differential cash transfers. That result contrasts with previous significant political economy contributions such as Fernandez and Rogerson (1995), Epple and Romano (1996a,b) and Gouveia (1997).

[14]See Mathematical Appendix A for a detailed discussion and complete characterization of the political equilibrium and the propositions presented in this subsection.

In that literature, in-kind transfers emerge as the political instrument to redistribute resources across groups of voters. However, those results are driven by severe policy constraints imposed in order to ensure the existence of political equilibrium. Specifically, those models do not allow the possibility of income redistribution. Therefore, those insights cannot be generalized when cash transfers are allowed.

One exception in the literature is Levy (2005) who analyzes the possibility of in-kind transfers when income redistribution is also feasible. In the presence of heterogeneous preferences, public provision of education (i.e. in-kind transfers) could emerge as the result of a coalition between the rich and the young poor. Nevertheless, in that case, in-kind redistribution arises because cash transfers are constrained to be uniform for all the population.

In order to overcome the limitations imposed by modeling constraints, I introduce a probabilistic voting model in the policy choice between cash and in-kind transfers. That allows relaxing the constraints in policy tools allowing for differential targeting cash and in-kind transfers. I show that when there are no severe constraints in redistributive schedules, in-kind transfers are possible but not politically necessary.

In the pre-election stage, political parties could announce different combinations of net taxation and in-kind transfers policies. Then, policy divergence is possible. However, office-motivated politicians propose economic policies that implement the same allocation of resources once individuals make private choices in competitive markets, $\{c^{jN}, h^{jN}\}_{j=1}^{J}$:

$$c^{jN} = c_A^{jN} = c_B^{jN} \quad \text{and} \quad h^{jN} = h_A^{jN} = h_B^{jN} \qquad \forall j \in \{1, ..., J\} \tag{35}$$

Proposition 4 (Political Allocation) *The political game between office-motivated politicians and self-interested citizens yields to a unique consumption bundle of numeraire commodity and health services for each group,* $\{c^{jN}, h^{jN}\}_{j=1}^{J}$.

3.3.2 Distributive Politics

In equilibrium, parties announce economic policies such that ideologically neutral voters ($\sigma^i = 0$) are expected to be indifferent between political parties. Hence, politicians compete in each group for pivotal indifferent voters that could swing their vote. The electoral competition between office-motivated politicians leads to the consumption patterns of numeraire and health care across groups implicitly defined by the following equations:

$$\phi^k u_c(c^{kN}, h^{kN}) = \phi^{k'} u_c(c^{k'N}, h^{k'N}) \quad \forall k, k' \in \{1, ..., J\} \tag{36}$$

$$\phi^k u_h(c^{kN}, h^{kN}) = \phi^{k'} u_h(c^{k'N}, h^{k'N}) \quad \forall k, k' \in \{1, ..., J\} \tag{37}$$

The relative treatment across groups depends on both the concentration of expected swing voters and the sensitivity of the expected ideological cut-point (24) to policy proposals. Those incentives for political redistribution are consistent with the well-known insights on distributive politics highlighted by Lindbeck and Weibull (1997) and Dixit and Londregan (1996) who analyze the political allocation of cash transfers across groups. I extend those results allowing for differential targeting of commodities when market provision is feasible.

Proposition 5 (Swing Voters) *The group-specific consumption bundle of numeraire and health care that results from the political process is monotonically increasing in the density of expected swing voters in each group.*

Proof. Given the assumption of homogeneity of preferences and concavity of utility function, equilibrium conditions hold if and only if groups with larger densities have lower marginal utility of both numeraire and health services. Therefore, these groups must have larger allocations of both commodities.

$$\text{if} \quad \phi^k > \phi^{k'} \rightarrow u_c(c^{kN}, h^{kN}) < u_c(c^{k'N}, h^{k'N}) \rightarrow c^{kN} > c^{k'N} \tag{38}$$

$$\text{if} \quad \phi^k > \phi^{k'} \rightarrow u_h(c^{kN}, h^{kN}) < u_h(c^{k'N}, h^{k'N}) \rightarrow h^{kN} > h^{k'N} \tag{39}$$

■

The density of the distribution of ideological biases, ϕ^j, measures the ideological heterogeneity within a group. That density captures the expected concentration of marginal voters in the group. Therefore, the political success of a group depends on its degree of ideological homogeneity with respect to the rest of the groups.

Corollary 6 (Homogeneous Biases) *Ideologically homogeneous groups consume more numeraire and health services than groups with larger diversity in ideological biases.*

The political process penalizes groups with more dispersed ideological views. Those groups present a lower concentration of marginal voters who could change their party attachment by parties' economic promises. Instead, groups with more homogenous views and larger concentration of citizens in the expected cut-point receive larger benefits.[15]In the particular case in which all the groups had the same dispersion of ideological biases, the political game yields the utilitarian allocation. That result holds because the expected marginal returns of targeting are identical across groups.

Claim 7 (Utilitarian Allocation) *When social groups have the same extent of ideological heterogeneity, office-motivated politicians announce policies that implement the utilitarian allocation. This allocation implies an egalitarian distribution of numeraire and health care for all individuals of the polity.*

[15]See Lizzeri and Persico (2004) for a close discussion on the effect of ideological heterogeneity in the distribution of cash transfers across groups.

Political incentives to discriminate across groups also depend on the sensitivity of the expected cut-point to policy platforms. Differentiating (24) with respect to both policy alternatives, we can notice the relation between expected electoral returns and convexity of preferences. The expected electoral gain is inversely related with the curvature of the utility function over goods.

For instance, I could suppose the case in which the curvature over the consumption of numeraire is lower than over health care (i.e. the marginal utility decreases faster when individuals increase health care quality than when receive cash transfers). In that case, citizens' willingness to compromise their attachments to political parties falls quicker with increased targeting of health care. This implies that one unit of resources devoted to health care is expected to generate lower electoral returns that one unit targeted to the numeraire. Hence, in this case, opportunistic politicians have incentives to announce policies that increase the consumption of numeraire because of its larger electoral impact.

Furthermore, the marginal electoral returns of differential targeting health care are lower than the returns from discrimination through cash transfers across groups. On the one hand, with risk aversion over health care, politicians can court swing voters by offering lower amount of resources. On the other hand, pivotal voters remain sensitive to larger offers of cash transfers. Hence, the political process would generate lower inequalities in the consumption of health care than in the numeraire commodity.

Claim 8 *The larger the curvature over the consumption of a good is, the lower the groups' differences in the consumption of that good regardless of their expected concentration of swing voters.*

3.3.3 Allocative Efficiency

The allocation of resources that results from the political process, $\{c^{jN}, h^{jN}\}_{j=1}^{J}$, is such that the rate at which consumers are willing to trade health care quality for numeraire commodity is equal across groups and equal to the rate at which the economy is able to transform numeraire into health care:

$$MRS_{h,c}^{jN} = MRT_{h,c} = q \qquad \forall j \quad \text{and} \quad P \in \{A, B\} \tag{40}$$

Proposition 9 (Efficiency) *The electoral competition game between office-motivated politicians who court self-interested citizens leads the economy to reach a Pareto Efficient allocation.*

Hence, the political process does not generate allocative inefficiencies. As highlighted by Wittman (1989, 1995) that result illustrates an important feature of the competition between politicians who strive to be elected. In the probabilistic electoral competition game, if one party promises policies such that swing voters in one group could be made better off without making critical voters in other group worse off, the opponent party could announce policies that Pareto

dominates its policy platforms. Therefore, when politicians compete for marginal voters they have incentives to exhaust the potential Pareto improvements in order to win the elections.

This efficiency result contrasts with significant political economy contributions which viewed in-kind transfers as the distortionary result of political redistribution. For instance, Epple and Romano (1996a) state that if in-kind transfers are purely a consequence of the redistributive motive, then the equilibrium allocation of goods is Pareto inefficient. However, that inefficiency arises because of the restrictions on the technology of taxation but not by the political process. Once I remove these constraints allowing for differential targeting of cash and in-kind transfers, allocative inefficiencies disappear. This result is consistent with Besley and Coate (1998) and Besley (2007) critique to the common claims about inefficiency of political equilibria in static settings. Inefficiencies would be due to the imposed modeling constraints in order to get existence of equilibrium. In static political economy models without constraints in policy tools efficiency should be reached.[16]

Furthermore, Persson and Tabellini (2000) highlight that the system of equations that gives equilibrium policies in partisanship probabilistic voting games corresponds to the solution of the maximization of a weighted utilitarian social welfare function (SWF). Therefore, in those settings, political equilibrium allocations would be Pareto optimal. Nevertheless, it is relevant to be clear on the significant differences between the normative approach that sustains the existence of a SWF and probabilistic voting. On the one hand, the SWF embodies ad hoc distributional value judgments on how society should weight the utility of different social groups (Sen, 1977). On the other hand, probabilistic voting takes a positive approach. The weights of groups depend on their political influence. Those weights determine equilibrium policies which do not generate allocative inefficiencies but modify the distribution of real resources across groups with respect to market allocation.[17]

3.3.4 Market versus Political Allocation

In the previous section, I assumed competitive markets abstracting potential imperfections in order to focus the analysis on the distributional side. I discussed that, in a market economy without government intervention, the access to health care depends on individuals' available income. Is this market allocation sustainable in a political process?

Proposition 10 (Market Sustainability) *Office-motivated politicians announce policies that implement the market allocation of goods if and only if both i) the initial endowment of resources is the same for all individuals; and ii) ideological polarization is equal across groups.*

Proof. i) if groups are not endowed with the same amount of resources, due to concavity of utility function, candidates can increase their expected number of votes targeting resources toward

[16] Inefficiencies in representative democracies could be introduced through other sources such as commitment problems and the strategic use of policy in dynamic settings (Besley and Coate, 1998, and Acemoglu, 2003).

[17] See Besley and Preston (2007) and Besley, Persson and Sturm (2010) for probabilistic voting models with empirical work that measures groups' influence on policy depending on individuals' attachments to parties.

groups with an initial higher marginal utility (i.e. lower initial endowment); ii) if the dispersion of ideological biases is not homogeneous across social groups, politicians can increase their chances of winning elections targeting more resources toward groups with larger ideological heterogeneity (i.e. higher concentration of *swing* voters). ■

Hence, this paper points out that even in the case that markets work properly, market allocation is not politically sustainable. In the presence of initial economic or ideological heterogeneity across groups, office-motivated politicians have incentives to redistribute resources. The gainers of the political process are the groups with lower initial amount of resources and homogeneous ideological positions.

4 External Effects

In view of the results outlined above, when citizens only care about their own economic well-being, office-motivated politicians could win elections without promising in-kind transfers. However, evidence shows that elected politicians steadily redistribute resources through in-kind transfers on a large scale.

Normative analysis in public economics has suggested interdependent preferences as one of the leading candidates to explain the use of in-kind transfers. Particularly, literature has highlighted the potential externalities generated by the consumption of health and education.[18] In the normative literature, in-kind transfers emerge as the optimal response of a benevolent government that correct those market imperfections.

However, does this result hold in the presence of office-motivated politicians that compete for voters in elections? Individuals could feel better off when their fellow citizens have access to health and education. Nevertheless, government programs need to be funded and resources are scarce. Then, to what extend are citizens willing to pay more taxes (or receive less cash transfers) in order to fund external effects? And most importantly, who must support the cost of funding those externalities?

I focus on a particular case in order to analyze whether the political game internalizes the presence of externalities. Specifically, I explore the case in which the available health care coverage of the elderly generates a positive externality for the rest of the population. This concern could be motivated by pure altruism between generations. As an alternative, it could be justified by social insurance motives. Individuals care about how society guarantees the access to health services to the elderly.[19]

[18] See Stiglitz (1995) and Rosen and Gayer (2010) for a textbook treatment on the spillover effects of education or the positive externalities due to the consumption of health care. Currie and Gahvari (2008) highlight justifications based on interdependent preferences and paternalism. They also survey alternative explanations such as the role of in-kind transfers to increase the efficiency of the taxation system; and its potential use as screening device to redistribute towards the needy.

Regardless of the empirical relevance of this particular case, the goal of this section is to analyze how incentives for political redistribution are affected by the presence of consumption externalities.

4.1 Distributive Politics with Externalities

Consider an economy composed of three social groups: the workers, L, the enterpreneurs, F, and the elderly, E. Each individual located in group $j \in \{L, F, E\}$ is endowed with w^j units of the numeraire commodity. Office-motivated politicians compete for office targeting both group-specific net taxation policy and in-kind transfers. The selected combination of policies, $\{y_P^j, h_{gP}^j\}_{j=1}^J$, must be feasible (11) and citizens have access to competitive health care markets.

Preferences for the elderly are well-represented by the utility function (2) whose properties were discussed in section II. However, now elderly's consumption of health services, h^E, is a positive externality for the workers and the enterpreneurs. The preferences for non-elderly citizens, $k \in \{L, F\}$, are represented by an utility separable in own-group consumption of goods and elderly's health care. Let β^k denote the salience that captures group's relative weight between both concerns. The larger the magnitude of the salience is, the greater the external effect.

$$U^k(c^k, h^k, h^E) = u(c^k, h^k) + \beta^k v(h^E) \qquad \forall k \in \{L, F\} \tag{41}$$

The first component measures utility derived from group k's own economic well-being. The function $u(\cdot)$ is well-behaved. The second component captures the external effects. Citizens in group k value E's health care quality according to $v(\cdot)$. I assume that this function is continuous, twice differentiable, strictly increasing and strictly concave in h^E.

$$v_{h^E} > 0 \qquad \text{and} \qquad v_{h^E h^E} < 0 \tag{42}$$

4.1.1 Political Allocation

Solving backwards, I characterize the Political Equilibrium of the game.[20] For both political parties, the equilibrium net taxation and in-kind transfers policies for any group k, (y_P^{kN}, h_{gP}^{kN}), satisfy the same equilibrium conditions than in an economy without external effects. However, now the equilibrium policies for group E must satisfy:

$$\frac{\psi}{\phi}\left[\phi^E \mu^E \frac{dV_P^E(y_P^{EN}, h_{gP}^{EN})}{dh_g^E} + \sum_{k=L}^{F} \phi^k \mu^k \frac{dV_P^k(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dh_g^E}\right] = p_h \frac{\psi}{\phi} \phi^E \mu^E \frac{dV_P^E(y_P^{EN}, h_{gP}^{EN})}{dy^E} \tag{43}$$

[19] The elderly are the big consumers of health care in the OECD countries. Increases in both life expectancy and cost of treatments due to new technologies explain observed significant increases in health care spending. Source: OECD Health Data 2010.

[20] See Mathematical Appendix B for a detailed discussion and complete characterization of the political equilibrium and the propositions presented in this subsection.

$\forall k \in \{L, F\}$ and $\forall P \in \{A, B\}$. In the pre-election stage, politicians announce policies to group E such that the marginal benefit of targeting one unit of in-kind transfers in terms of probability of winning elections is equal to the marginal opportunity cost. The benefit depends on both the direct effect in group E and the electoral impact in groups L and F. The cost is measured by the marginal decrease in probability due to a reduction of targeted net income to group E by p_h units.

Given the existence of competitive markets, both political parties are indifferent to announce different combinations of net taxation policy and in-kind transfers to the non-elderly groups, $\{L, F\}$. Politicians are indifferent between announcing pure private provision, pure public provision or a combination of public and private provision of health services for each group k such that the consumption bundle intended for those groups is reached. However, for both political parties there is a unique equilibrium policy of net taxation and in-kind transfers to group E, (y_P^{EN}, h_{gP}^{EN}). Politicians constrain health consumption choices of the elderly in order to internalize the external effects in the rest of the groups.

The combination of choosen policies, $\{y_P^{jN}, h_{gP}^{jN}\}_{j=L}^{E}$, imply consumption bundles for all groups that satisfy the economy feasibility constraint. The set of bundles, $\{c_P^{jN}, h_P^{jN}\}_{j=1}^{J}$, is the one that maximizes politicians' chances of winning elections given expected voting, competitive equilibrium behavior of citizens and economic feasibility. In Equilibrium:

$$u_h(c_P^{kN}, h_P^{kN}) = p_h u_c(c_P^{kN}, h_P^{kN}) \tag{44}$$

$$u_h(c_P^{EN}, h_P^{EN}) + \sum_{k=L}^{F} \frac{\phi^k}{\phi^E} \frac{\mu^k}{\mu^E} \beta^k v_{h^E}(h_P^{EN}) = p_h u_c(c_P^{EN}, h_P^{EN}) \tag{45}$$

where $c_P^{EN} = y_P^{EN}$; $h_P^{EN} = h_{gP}^{EN}$; $c_P^{kN} = y_P^{kN} - p_h h_{mP}^{kN}$ and $h_P^{kN} = h_{gP}^{kN} + h_{mP}^{kN}$ $\forall k \in \{L, F\}$ and $P \in \{A, B\}$.

Proposition 11 (Externalities and In-kind transfers) *Politicians must target in-kind transfers to the group which consumption choices generates positive externalities in the rest of the population.*

If politicians target group E uniquely with cash transfers, the elderly expected behavior in markets imply that they would allocate available resources between health and numeraire without taking into account the external effects originated into groups L and F. In order to maximize their chances of winning elections, politicians select a combination of feasible policies such that E are constrained to consume more health services than they would buy in competitive markets if targeted resources were given in cash.

In equilibrium, office-motivated politicians propose economic policies that, once individuals

make private choice in competitive markets, implement the same allocation of resources $\{c^{jN}, h^{jN}\}_{j=1}^{J}$.

$$c^{jN} = c_A^{jN} = c_B^{jN} \quad \text{and} \quad h^{jN} = h_A^{jN} = h_B^{jN} \qquad \forall j \in \{L, F, E\} \tag{46}$$

Proposition 12 (Political Allocation with External Effects) *The political game between office-motivated politicians and self-interested citizens with interdependent preferences yields to a unique consumption bundle of numeraire commodity and health services for each group,* $\{c^{jN}, h^{jN}\}_{j=1}^{J}$.

4.1.2 Distributive Politics

Political parties announce economic policies such that the ideological cut-point is expected to be equal to zero for all groups. The equilibrium relative treatment between groups in the presence of external effects is implicitly defined by the following system of equations:

$$\phi^k u_c(c^{kN}, h^{kN}) = \phi^E u_c(c^{EN}, h^{EN}) \qquad \forall k \in \{L, F\} \tag{47}$$

$$\phi^k u_h(c^{kN}, h^{kN}) = \phi^E u_h(c_P^{EN}, h_P^{EN}) + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \phi^k \beta^k v_{h^E}(h_P^{EN}) \qquad \forall k \in \{L, F\} \tag{48}$$

The patterns of numeraire commodity are characterized by the same conditions previously discussed. Groups with larger concentration of swing voters and lower initial endowments receive more cash transfers (or pay fewer taxes). However, the consumption of health care is affected by the presence of externalities. The novel element is that politicians can court simultaneously swing voters in all groups targeting in-kind transfers to the groups which consumption choices generate positive externalities in the rest of the population. Those incentives leads politicians to announce policies that change both the distribution of health services across groups and its overall consumption in order to court a larger amount of pivotal voters.

In equilibrium, parties equalize across groups the expected electoral returns of targeting one unit of health care. The expected returns of targeting in-kind transfers in each group depends on the density of swing voters and the sensitivity of the expected cut-point in each group to changes in offers of health services. When politicians target in-kind transfers to the elderly they expect to affect the ideological cut-point of the workers and the entrepreneurs. In order to attract swing voters in those groups, politicians increase the amount of health services targeted to the elderly. That increase raises the overall consumption of the good in the economy.

Claim 13 *In the presence of external effects, the consumption of health services is larger with respect to economies where individuals only care about their own economic well-being.*

The overall return of targeting in-kind transfers to the elderly depends on the impact within that group and the external effects generated in the rest of the groups. The return on the elderly

mimics previous results: the effect of the amount targeted is directly related with the concentration of pivotal voters and indirectly with the curvature over health services.

The expected electoral returns on groups L and F depends on the salience of external effects and the convexity of preferences weighted by the density of expected swing voters in each group. A larger salience, β^k, means that an extra unit of health care targeted to the elderly is expected to affect group k ideological cut-point by a larger size. Furthermore, the impact on group k's ideological cut-off is inversely related with the curvature of utility $v(\cdot)$ over h^E. Therefore, the quicker marginal utility declines, the lower the expected electoral return in group k.

Resources are scarce and increases of in-kind transfers to the elderly must be balanced with decreases of targeted resources in other groups. For instance, it could imply a reduction of the amount of health services targeted to group k. That reduction implies a decrease in the expected number of votes in k which size depends on its expected density of swing voters and the convexity of preferences. The expected electoral losses in group k also depend on the relative size of the groups. The smaller the elderly group is, the lower the expected losses in group k. Politicians can increase in-kind transfers to the elderly decreasing group k's consumption in a lower proportion.

In equilibrium politicians balance expected gains and losses of votes. The size of in-kind transfers targeted to the elderly depends on the density of elderly swing voters and the magnitude of other groups concerns on external effects. The effect of this magnitude on in-kind transfers is directly related with the success of the workers and the entrepreneurs in distributive politics (i.e. their expected concentration of swing voters). Furthermore, the size of in-kind transfers is inversely related with the size of the group E. The larger the size of the group is, the lower the impact of external effects on the targeted amount. For instance, society ageing will reduce elderly consumption of health care. In that situation, maintaining previous levels of funding would imply additional reductions in the consumption levels of the rest of the groups, L and F. Politicians should reduce in-kind transfers to the elderly in order to court swing voters in the rest of the population.

Furthermore, office-motivated politicians target a combination of cash and in-kind transfers that constraint consumption choices of the elderly regardless of their political clout. Two potential cases are worthy to discuss. For instance, when the elderly group presents a broader support of ideological attachments (i.e. low density, ϕ^E), they could receive low cash transfers but large levels of health coverage. As an alternative, when the elderly are highly influential (i.e. high density, ϕ^E), politicians target larger in-kind transfers than desired by the old in order to court marginal voters in non-elderly groups. The elderly would prefer allocations with lower health care quality and larger available income. However, the expected marginal gains to court swing elderly citizens with cash would be lower than the expected marginal losses of swing voters within the workers and the entrepreneurs. Therefore, politicians must constrain elderly consumption decisions in order to court marginal voters in the rest of the population.

4.1.3 Allocative Efficiency and Markets

In equilibrium, the bundles of numeraire and health services consumed by the workers and the enterpreneurs, $\{c^k, h^k\}_{k=L}^F$, satisfy:

$$MRS_{h,c}^{kN} = MRT_{h,c} = q \qquad \forall k \in \{L, F\} \tag{49}$$

Furthermore, the consumption bundle of the elderly, (c^E, h^E), which results from the political process takes into account the existence of external effects:

$$MRS_{h^E,c^E}^{EN} + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \beta^k MRS_{h^E,c^k}^{kN} = MRT_{h,c} = q \tag{50}$$

Proposition 14 (Efficiency and External Effects) *The electoral competition game between office-motivated politicians who court self-interested individuals in the presence of external effects yields an allocation in the set of Pareto efficient allocations.*

The efficiency result is explained by the electoral competition for marginal voters. For instance, if one party announced only cash transfers to group E, its opponent, with the same amount of resources, could target in-kind transfers in that group and attract more swing voters from the rest of the population. The competition for courting the maximum amount of swing voters leads politicians to announce net taxation and in-kind transfers policies that lead the economy to reach efficient allocations.

In the case that health care decisions were not subject to the political process, competitive markets do not internalize external effects. The elderly would not take into account the effect of their consumption decisions on the rest of the population. Therefore, the political process leads the economy to achieve Pareto-efficient allocations that markets cannot reach.

It is important to notice that this efficiency result is not obtained by assuming the presence of benevolent governments. Efficiency is the equilibrium outcome of the political process. Looking for their own-interest, office-motivated politicians internalize the external consequences of elderly health consumption in the rest of the population.

Few contributions have discussed the role of political competition to increase efficiency in the presence of market imperfections. One exception in the analysis of in-kind transfers is Blomquist and Christiansen (1999). In the presence of asymmetric information, in-kind transfers could be used as a screening device that alleviates the self-selection constraint and increases efficiency.[21] In polities where citizens have preferences for redistribution toward low income citizens, well-designed

[21] Blomquist and Christiansen (1999) introduce the main insights of Nichols and Zeckhauser (1982) on the screening role of in-kind transfers into a political economy setting. However, they impose severe constraints into the number of groups and preferences in order to reduce the political game to one dimension. Those assumptions limit the generality of their results.

in-kind transfers lead high and low ability individuals to reveal their type. Politicians compete for office announcing redistributive policies that improve efficiency and equity in the presence of asymmetric information.

Other relevant contribution that explores the efficiency-enhancing role of electoral competition is Besley, Persson and Sturm (2010). They analyze the effect of electoral competition on the choice of pro-growth policies in the US states. They make use of probabilistic voting to model the electoral competition for voters with party's loyalties (i.e. swing versus core voters). Their results show that political competition between parties tends to increase efficiency. The larger the competition for marginal swing voters is, the larger the incentives to choose efficient policies.

5 Commodity Egalitarianism

Recent contributions on positive political economy have suggested that citizens' support over redistributive policies depends not only on the effect of policies on individuals' own economic well-being but on their beliefs on the fairness of social outcomes.[22] Individuals would be averse to inequalities generated by luck and support policies that reduce those inequalities that they consider unfair. That literature has focused on views about the proper distribution of income and citizens' preferences over cash redistribution. However, citizens could also be concerned about the proper consumption of specific commodities.

In particular, I work the case in which individuals are averse to inequalities in the consumption of goods such as health and education.[23]For instance, individuals could believe that health and education are fundamental rights. These rights not should be related with citizens' ability to pay or any other characteristic.

Furthermore, inequalities in the consumption of these goods could be a proxy for unfair inequalities. For instance, in a market economy, an unlucky child born in a low income family would have access to a low quality education. The market provision of education and its effect on the future children's income would be due to luck.[24]The consumption of health services could also be associated to luck. As an example, the fatal diseases and serious medical conditions caused not by individual behavior but by random factors such as genetics and virus. In a market economy, the access to expensive advanced treatments and then the probability of surviving to a fatal disease depends only on citizens' income.

[22]Piketty (1995), Alesina and Angeletos (2005), Bénabou and Tirole (2006) are important contributions on the relation between social beliefs and preferences over redistributive policies. See Alesina and LaFerrara (2004) and Fong (2001) for empirical work on the US case. Alesina and Giuliano (2010) provide a comprehensive theoretical and empirical review of the literature.

[23]This notion of commodity egalitarianism was suggested by James Tobin (1970).

[24]Gasparini and Pinto (2006) presents a normative analysis based on equality of opportunities to justify aversion to inequality in the access of education.

Hence, individuals could be against the inequality in the access to health care and education because the relation between their consumption and random components associated to luck. The existence of those unfair inequalities caused by luck could sustain commodity egalitarian preferences. Other alternatives could be suggested to model social preferences over the consumption of health and education.[25]However, the goal of this section is to analyze how incentives for political redistribution change in the presence of equity concerns limited to specific goods.

5.1 Distributive Politics with Egalitarianism

Consider the same economy with a finite number of groups presented in the preceding sections. Politicians announce taxation schedules and in-kind transfers, $\{y_P^j, h_{gP}^j\}_{j=1}^J \ \forall P \in \{A, B\}$, in order to win elections. Economic policy platforms must satisfy the economy feasibility constraint (11). Furthermore, there are competitive markets where citizens are able to acquire health care services.

I assume that citizens' preferences have two components. The first one measures individual's own economic well-being. The second component captures the utility derived from social outcomes. Let $\Omega(\mathbf{h})$ be citizens' common valuation of health care distribution where $\mathbf{h} = \{h^j\}_{j=1}^J$ is the allocation of health services across groups. Furthermore, let δ^j denote the relative weight that individuals who belong to group j assigns to equity concerns with respect to private utility. The preferences of a citizen i located in group j can be represented by an additively separable utility function:

$$U^j(c^j, \mathbf{h}) = u(c^j, h^j) + \delta^j \Omega(\mathbf{h}) \quad \text{where } \mathbf{h} = \{h^j\}_{j=1}^J \tag{51}$$

The individual private utility is well-represented by the non-satiable preferences (2) discussed previously. However, it is common to assume that the social preference component is better represented by satiated preferences. In the commodity egalitarian case, that component could be represented by the following preferences:

$$\Omega(\mathbf{h}) = -\frac{1}{2}\sum_{j=1}^{J} \mu^j (h^j - \overline{h})^2 \text{ where } \overline{h} = \sum_{j=1}^{J} \mu^j h^j \tag{52}$$

[25]For instance, citizens could support that everyone should have access to at least some minimum level of schooling or medical care. Furthermore, individuals could disagree over the notion of fairness and hold heterogeneous views about how the consumption of goods should be evaluated.

5.2 Political Allocation

Solving backwards, I characterize the Political Equilibrium of the game.[26] For both political parties, the equilibrium net taxation and in-kind transfers policies for any group k, (y_P^{kN}, h_{gP}^{kN}), must satisfy:

$$\frac{\psi}{\phi}\left[\sum_{j=1}^{J}\phi^j\mu^j\frac{dV_P^j(y_P^{jN},\mathbf{h}_{gP}^N)}{dh_g^k}\right]=p_h\frac{\psi}{\phi}\phi^k\mu^k\frac{dV_P^k(y_P^{kN},\mathbf{h}_{gP}^N)}{dy^k} \tag{53}$$

$\forall k, j \in \{1, ..., J\}$ and $\forall P \in \{A, B\}$. In the pre-election stage, the expected electoral benefit of targeting one unit of in-kind transfers depends on both the direct effect in group k's economic well-being and the effect on the distribution of health consumption across groups. Politicians announce policies to group k such that the marginal benefit of targeting in terms of probability of winning elections is equal to the marginal opportunity cost. The cost is measured by the marginal decrease in probability due to a reduction of targeted net income to group k by p_h units.

In the presence of egalitarian views, for both political parties there exists a unique equilibrium policy of net taxation and in-kind transfers for each group k, (y_P^{kN}, h_{gP}^{kN}). Furthermore, politicians choose economic policies such that individuals are expected to no supplement health services in competitive markets, $h_{mP}^{jN} = 0$. The combination of choosen policies, $\{y_P^{jN}, h_{gP}^{jN}\}_{j=1}^J$, imply a set of consumption bundles $\{c_P^{jN}, h_P^{jN}\}_{j=1}^J$, that maximizes politicians' chances of winning elections given expected voting, competitive equilibrium behavior of citizens and economic feasibility. In Equilibrium:

$$u_h(c_P^{kN}, h_P^{kN})+\sum_{j=1}^{J}\frac{\mu^j}{\mu^k}\frac{\phi^j}{\phi^k}\delta^j\frac{\partial\Omega(\mathbf{h}^N)}{\partial h^k}=p_h u_c(c_P^{kN}, h_P^{kN}) \tag{54}$$

where $c_P^{jN} = y_P^{jN}$ and $h_P^{jN} = h_{gP}^{jN}$ $\forall j \in \{1, ..., J\}$ and $P \in \{A, B\}$.

Proposition 15 (Egalitarianism and In-kind transfers) *Politicians constrain consumption choices of individuals targeting in-kind transfers to all groups in order to reduce inequalities in the consumption of specific commodities.*

If politicians target group k uniquely with cash transfers, individuals would allocate available resources between health and numeraire without taking into account the effect of their decisions on the health consumption inequality in the overall population. Individuals value an egalitarian allocation of health, however this valuation has a public good nature which is subject to free-riding behavior in competitive markets. For this reason, vote-maximizer politicians select a combination of feasible policies such that fully constrain consumption decisions of individuals. Hence, commodity egalitarianism prevents that individuals could make their private decisions through competitive markets. The health care coverage of all individuals is decided by office-motivated politicians.

[26] See Mathematical Appendix C for a detailed discussion and complete characterization of the political equilibrium and the propositions presented in this subsection.

In equilibrium, office-motivated politicians propose the same economic policies (i.e. policy convergence) and therefore implement the same allocation of resources $\{c^{jN}, h^{jN}\}_{j=1}^{J}$.

$$c^{jN} = c_A^{jN} = c_B^{jN} \quad \text{and} \quad h^{jN} = h_A^{jN} = h_B^{jN} \qquad \forall j \in \{1, ..., J\} \tag{55}$$

Proposition 16 (Political Allocation with Commodity Egalitarianism) *The political game between office-motivated politicians and citizens who are averse to inequalities in the consumption of specific goods yields to a unique consumption bundle of numeraire commodity and health services for each group,* $\{c^{jN}, h^{jN}\}_{j=1}^{J}$.

5.2.1 Distributive Politics

The equilibrium patterns of cash and in-kind redistribution across groups are implicitly defined by the following equations:

$$\phi^k u_c(c^{kN}, h^{kN}) = \phi^{k'} u_c(c^{k'N}, h^{k'N}) \tag{56}$$

$$\phi^k u_h(c^{kN}, h^{kN}) + \sum_{j=1}^{J} \frac{\mu^j}{\mu^k} \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}^N)}{\partial h^k} = \phi^{k'} u_h(c^{k'N}, h^{k'N}) + \sum_{j=1}^{J} \frac{\mu^j}{\mu^{k'}} \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}^N)}{\partial h^{k'}} \tag{57}$$

these equilibrium conditions hold $\forall k, k' \in \{1, ..., J\}$ and $\forall P = \{A, B\}$.

Electoral competition focuses on courting ideological neutral voters in each group. Groups with higher concentration of swing voters are targeted with both larger cash and in-kind transfers. However, the existence of egalitarian views limits the use of differential targeting of in-kind transfers across groups.

In equilibrium, both parties equalize the expected electoral returns of targeting one unit of health care across groups. The overall return of targeting in-kind transfers to citizens who belong to any group k has two components. The first one is the increase of the expected number of votes in the targeted group by self-interested motives. That effect depends on both the concentration of swing voters in the group and the marginal impact in citizens' own-economic well-being.

The second component captures the effect of targeting in-kind transfers in the distribution of health. Citizens take into account how in-kind transfers affect the consumption of health in the overall population. When targeting in-kind transfers to group k increases inequality, it implies a reduction of the expected number of voters in all groups.

For the particular specification of social preferences previously presented (52), the marginal

effect of targeting group k on the valuation of inequality for any group j is given by:

$$\frac{\partial \Omega(\mathbf{h}^N)}{\partial h^k} = -\mu^k(h^{kN} - \overline{h}^N) \tag{58}$$

The impact on the expected ideological cut-point in any group j is increasing in the utility losses which rise with health inequality. Therefore, the larger the inequality is, the greater the expected loss of votes in all groups.

Although all groups are assumed to hold homogeneous valuations of social outcomes, they could differ in their willingness to compromise social preferences in return to economic benefits. Thus, the larger the group-specific salience δ^j is, the larger the impact of health inequalities in the expected ideological cut-point of group j. The electoral impact of egalitarian views in group j also depends on its density of swing voters. The larger the density is, the greater the losses of voters.

Furthermore, resources are scarce and increasing in-kind transfers to one group must be balanced by reducing targeted resources in other groups. For instance, it could imply a reduction of the amount of health care targeted to group k'. That reduction implies a decrease in the expected number of votes in k'. The size of that loss depends on group k''s expected density of swing voters and the convexity of preferences over health. Furthermore, there is an additional increase in inequality through the reduction of health consumption in k'. Hence, there are additional expected losses of votes in all groups. In equilibrium, politicians balance the expected gains and losses of votes and implement a more egalitarian distribution of health. Therefore, groups with more swing voters receive less health care with respect to a political game in which citizens do not have egalitarian views.

Hence, in the presence of commodity egalitarianism, politicians announce universal in-kind transfers. However, the political process does not yield to uniform levels of health consumption. Office-motivated politicians exploit individuals concerns for their own economic well-being courting voters with differential in-kind transfers. Groups with larger concentration of swing voters have access to higher quality of services. Therefore, even when all citizens agree that a perfect equal distribution of a good is desirable, this allocation is not politically attainable.

Corollary 17 (Universal Public Provision with Targeting) *In the presence of commodity egalitarianism, opportunistic politicians implement universal public systems of health care. Nevertheless, politicians do not target the same quality of services across groups.*

However, commodity egalitarianism reduces the electoral returns of differential in-kind transfers. Those incentives reduce not only health care inequality but lower politicians' incentives to allocate resources to in-kind transfers. Devoting resources to cash transfers is electorally more profitable.

Claim 18 *In an economy with commodity egalitarianism, the inequality levels and the overall consumption of health care would be lower with respect to economies in which individuals only care about their own economic well-being.*

This crowding out effect is related with the main insights that we learnt from Lizzeri and Persico (2001, 2004). In a distributive politics game, targetability yields a premium for office-motivated politicians. Politicians have electoral incentives to devote more resources to a targetable policy tool such as cash transfers and reduce the resources to fund public goods.

Commodity egalitarism introduce a public good nature in the consumption of health services. The targetability of in-kind transfers is reduced because now the valuation of the distribution of health consumption is non-rival and non-excludable. Politicians aim to discriminate between voters and in-kind transfers lose part of their effectiveness. That leads the economy to a reduction in the aggregate consumption of health services.

In the presence of egalitarian views, the political incentives for targeting in-kind transfers differ from the ones in the consumption externality case. In the latter, politicians use in-kind to court more swing voters in the rest of the population. Those incentives lead the economy to increase the consumption of health care. In the former, targeting in-kind transfers aims to reduce the loss of votes caused by unequal levels of consumption of specific goods. However, differential targeting is penalized and the overall consumption of health care decreases.

Utilitarian Allocation In the particular case in which all groups had the same extent of ideological heterogeneity, the marginal returns of targeting both cash and in-kind transfers would be the same for all groups. Therefore, office-motivated politicians announce policies that implement the utilitarian allocation. Politicians do not have incentives to make differential targeting of cash transfers. Therefore, the relative electoral advantage of cash over in-kind transfers disappears and the amount of health care consumption in the economy is maximized.

In that specific case, politicians would not need to resort on in-kind transfers. They could announce a uniform level of cash transfers such that individuals acquire the intended uniform amount of health services in competitive markets. Political redistribution would be undertaken from groups with large initial endowments to low income groups. Furthermore, only in this particular case, society reaches the socially desired egalitarian allocation of health care.

5.2.2 Allocative Efficiency and Markets

The political process leads to a bundle of numeraire and health services consumed by individuals who belong to group k, $\forall k \in \{1, ..., J\}$, that satisfies:

$$MRS_{h,c}^{kN} + \sum_{j=1}^{J} \frac{\mu^j}{\mu^k} \delta^j MRS_{\Omega^k, c^j}^{jN} = MRT_{h,c} = q \tag{59}$$

Proposition 19 (Efficiency and Egalitarianism) *The electoral competition game between office-motivated politicians and self-interested citizens who are averse to commodity inequalities yields an allocation in the Pareto set.*

Politicians take into account that voters penalize policy proposals that lead to unequal distribution of health consumption. Those incentives drive parties to select menus of net taxation and in-kind transfers that internalize the presence egalitarian views. Electoral competition for marginal voters leads to a more egalitarian consumption of specific goods and to achieve allocative efficiency that a market economy cannot reach.

In competitive markets, even when all individuals share the same egalitarian preferences, each individual has an incentive to free-ride on the egalitarian allocation by others. Therefore, in economies with different income levels, normality of goods leads markets to provide unequal distributions of consumption depending on the dispersion of available income.

In order to overcome the free-rider problem, politicians announce combinations of economic policies that fully constrain individuals' health consumption decisions. In spite of the existence of competitive markets, office-motivated politicians must crowd out individual market decisions and choose health consumption of all individuals.

That result is not obtained because of a benevolent government that takes into account egalitarian tastes in order to maximize a given definition of social welfare. However, it is the result of the electoral competition between office-motivated politicians. In order to win elections, politicians internalize the fact that citizens are willing to sacrifice part of their own economic well-being in order to get a more egalitarian distribution of goods.

It is commonly presumed that politics leads to inefficient provision of public goods. However, as previously discussed, in static models of electoral competition, those claims are due to the modeling restrictions in the available policy set. Besley (2007) proposes a probabilistic voting electoral competition model to overcome those limitations. As an example, Besley introduces the proposed model into the political provision of pure public goods in the presence of distributive politics. Results show that political competition leads politicians to implement a Lindhal Samuelson rule depending on the politicial clout of core and swing voters. My analysis focuses on swing voters and it is consistent with the efficiency result when I introduce a public good nature in the valuation of private goods.

6 Conclusions

This paper provides new insights on the political incentives to redistribution through in-kind transfers. I have shown that even when markets work properly and societies do not have preferences for redistribution, the market allocation is not politically sustainable. Office-motivated politicians have incentives to undertake political redistribution. However, it does not necessarily imply that redistribution must occur through in-kind transfers.

Indeed, in economies with competitive markets, in-kind transfers are an additional policy tool that politicians might use to reach their desired allocation of resources. Nevertheless, political

parties could win elections by promising differential cash transfers across groups of voters. That result contrasts with former positive political economy contributions in which in-kind transfers emerge as a political instrument to redistribute resources across groups. This paper shows that without imposing severe constraints in the available taxation technology, the pure redistributive motive alone could not explain the use of in-kind transfers by politicians.

However, I found that in-kind redistribution is politically necessary in the presence of interdependent preferences such as consumption externalities and equity concerns. My research shows that when citizens care about other individuals' consumption of specific commodities, politicians have incentives to make use of in-kind transfers. Targeting specific groups of voters with in-kind rather than cash transfers allows politicians to simultaneously attract voters in other groups with the same amount of resources.

Furthermore, I found that electoral competition for marginal voters exhausts potential Pareto improvements in the economy. The political process reaches Pareto efficient allocations that markets cannot reach in the presence of equity concerns and externalities. This efficiency result is not obtained by assuming the existence of a benevolent government that implements in-kind transfers either to correct market imperfections or to satisfy equity concerns. Instead, the efficient allocation is the equilibrium outcome of political game between politicians and voters. Politicians choose in-kind rather than cash transfers when the amount of voters that they can attract is larger.

In order to handle political equilibria with multidimensional policy space, I have adopted a well-known probabilistic voting model. That model is based on the literature of distributional politics and swing voters established by Lindbeck and Weibull (19987) and Dixit and Londregan (1996). Those contributions have focused on the allocation of cash transfers across social groups. My research examines political incentives for redistribution when politicians are able to use both in-kind and cash transfers when market alternatives are also feasible. Furthermore, I extend the literature on redistributive politics exploring how political redistribution is affected by the presence of interdependent preferences between groups of voters.

Some direct extensions of this distributive politics framework with competitive markets are worthy to be considered for further research. I first aim to explore the relation between heterogeneous preferences and political redistribution. For instance, I could assume that individuals' self-interested preferences over commodities are related with some idiosyncratic characteristics such as age. As an example, the young households could prefer higher quality educational services than the old citizens. This extension would allow us to discuss the political incentives for tagging individuals with immutable characteristic either through in-kind or cash transfers.

Furthermore, I intend to endogenize individuals' income by introducing labor supply decisions. That would enable us to analyze the potential trade-off between allocative efficiency and political redistribution. For instance, the existence of information asymmetries would constraint the

available government instruments to tax individuals' abilities. In that case, when governments can uniquely use distortionary taxation, redistribution of resources generates deadweight losses. I aim to explore the political incentives to use in-kind instead of cash transfers in order to increase the efficiency of the taxation system. That could enlarge the available amount of resources for political redistribution. Further research is necessary to analyze these extensions which might provide interesting new results.

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MATHEMATICAL APPENDIX

A. **DISTRIBUTIONAL GAME**

A.1. **Political Equilibrium**

Taking the opponent's economic policies as given, each political party $P \in \{A, B\}$ chooses a combination of net taxation policy and public provision of health care for each group, $\{y_P^j, h_{gP}^j\}_{j=1}^J$, that maximizes its chances of winning elections subject to economic feasibility and non-negativity constraints. Parties take into account citizens' expected voting decisions (*stage 2*) and individuals' choices in competitive markets (*stage 3*). The policy choice problem of party A is given by:

$$\begin{aligned} \pounds^A &= \frac{1}{2} + \frac{\psi}{\phi} \sum_{j=1}^{J} \mu^j \phi^j \left[V_A^j(y_A^j, h_{gA}^j) - V_B^j(x_B) \right] + \\ &+ \lambda_A \left[w - \sum_{j=1}^{J} \mu^j y_A^j - \sum_{j=1}^{J} \mu^j p_h h_{gA}^j \right] + \sum_{j=1}^{J} \mu^j \gamma_{yA}^j y_A^j + \sum_{j=1}^{J} \mu^j \gamma_{hA}^j h_{gA}^j \end{aligned} \tag{60}$$

The policy choice problem of political party B is symmetric. The First Order Conditions for both political parties $P \in \{A, B\}$ are defined as:

$$[y^j] \qquad \frac{\psi}{\phi} \mu^j \phi^j \frac{dV_P^j(y_P^j, h_{gP}^j)}{dy^j} + \mu^j \gamma_{yP}^j = \mu^j \lambda_P \qquad \forall j \tag{61}$$

$$[h_g^j] \qquad \frac{\psi}{\phi} \mu^j \phi^j \frac{dV_P^j(y_P^j, h_{gP}^j)}{dh_g^j} + \mu^j \gamma_{hP}^j = p_h \mu^j \lambda_P \qquad \forall j \tag{62}$$

$$\lambda_P \left[w - \sum_{j=1}^{J} \mu^j y_P^j - \sum_{j=1}^{J} \mu^j p_h h_{gP}^j \right] = 0 \tag{63}$$

$$\gamma_{yP}^j y_P^j = 0 \quad \forall j \;\; ; \;\; \gamma_{hP}^j h_{gP}^j = 0 \quad \forall j \tag{64}$$

$$\lambda_P \geq 0 \qquad \gamma_{yP}^j \geq 0 \quad \forall j \;\; ; \;\; \gamma_{hP}^j \geq 0 \quad \forall j \tag{65}$$

Solving backwards, I characterize the Political Equilibrium of the game. The system of equations formed by the best responses for each political party and their feasibility constraints, simultaneously determine the Nash Equilibrium in the first stage of the game.Therefore, for both political parties, the equilibrium net taxation and in-kind transfers policies announced to group j, (y_P^{jN}, h_{gP}^{jN}), must satisfy:

$$\frac{\psi}{\phi} \mu^j \phi^j \frac{dV_P^j(y_P^{jN}, h_{gP}^{jN})}{dh_g^j} + \mu^j \gamma_{hP}^{jN} = p_h \left[\frac{\psi}{\phi} \mu^j \phi^j \frac{dV_P^j(y_P^{jN}, h_{gP}^{jN})}{dy^j} + \mu^j \gamma_{yP}^{jN} \right] \tag{66}$$

$\forall j \in \{1, ..., J\}$ and $\forall P \in \{A, B\}$. Those equilibrium conditions hold if and only if taxation policies announced by parties imply a positive level of net income for all groups, $\{y_P^{jN}\}_{j=1}^J > 0$. .

Proof. Suppose that group j is targeted no numeraire commodity, $y_P^j = 0$. By Envelope Theorem:

$$\frac{dV_P^j(y_P^j, h_{gP}^j)}{dy^j} = u_c(0, h) = \infty \tag{67}$$

Thus equation (66) would not hold. Therefore, equilibrium net taxation policy must imply a positive available income for each group, $y_P^{jN} > 0$, and then, in equilibrium, the multipliers associated to the non-negative constraints of net income are equal to zero, $\gamma_{yP}^{jN} = 0 \ \ \forall j \in \{1, ..., J\}$ and $P \in \{A, B\}$.

■

Furthermore, for each group j, politicians must decide whether targeting in-kind transfers. In the case that party $P \in \{A, B\}$ chooses not targeting in-kind transfers to group j, $h_{gP}^{jN} = 0$, politicians take into account that voters are expected to purchase health care in competitive markets with their available income $y_P^{jN} > 0$. For any positive net income targeted by party P, the optimal behavior in competitive markets of an individual who belongs to group j is characterized by:

$$u_h(y_P^j - p_h h_{mP}^j, h_{mP}^j) = p_h u_c(y_P^j - p_h h_{mP}^j, h_{mP}^j) \tag{68}$$

When individuals purchase health care through competitive markets and there is no public provision, by Envelope Theorem:

$$\frac{dV_P^{jS}(y_P^j, h_{gP}^j)}{dy^j} = u_c(y_P^j - p_h h_{mP}^j, h_{mP}^j) \tag{69}$$

$$\frac{dV_P^{jS}(y_P^j, h_{gP}^j)}{dh_g^j} = u_h(y_P^j - p_h h_{mP}^j, h_{mP}^j) \tag{70}$$

Given the expected behavior of voters in competitive markets, equilibrium condition (66) for a group j not targeted with in-kind transfers holds if and only if the targeted net taxation policy, y_P^{jN}, implies that the multiplier associated to the non-negative constraint of in-kind transfers must be zero, $\gamma_{hP}^{jN} = 0$. Hence, the equilibrium condition for a group j not targeted with in-kind tranfers that acquires health services in competitive markets, h_{mP}^{jN}, is given by:

$$u_h(y_P^{jN} - p_h h_{mP}^{jN}, h_{mP}^{jN}) = p_h u_c(y_P^{jN} - p_h h_{mP}^{jN}, h_{mP}^{jN}) \tag{71}$$

As an alternative, political party $P \in \{A, B\}$ could choose targeting in-kind transfers to group j, $h_{gP}^{jN} > 0$ and then $\gamma_{hP}^{jN} = 0$. In that case, politicians take into account that voters in group j are expected not to make private purchases of health care in markets, $h_{mP}^{jN} = 0$, if and only if this condition holds:

$$u_h(y_P^j, h_{gP}^j) \leq p_h u_c(y_P^j, h_{gP}^j) \tag{72}$$

Otherwise, when the sigh of this condition is reversed, politicians expect that individuals make private purchases, $h_{mP}^{jN} > 0$. The expected optimal behavior of individuals that suplement health services in competitive markets is given by:

$$u_h(y_P^j - p_h h_{mP}^j, h_{gP}^j + h_{mP}^j) = p_h u_c(y_P^j - p_h h_{mP}^j, h_{gP}^j + h_{mP}^j) \tag{73}$$

In the first alternative, when individuals do not purchase health care through competitive markets and there is public provision, by Envelope Theorem:

$$\frac{dV_P^{jNS}(y_P^j, h_{gP}^j)}{dy^j} = u_c(y_P^j, h_{gP}^j) \tag{74}$$

$$\frac{dV_P^{jNS}(y_P^j, h_{gP}^j)}{dh_g^j} = u_h(y_P^j, h_{gP}^j) \tag{75}$$

Thus, party P's equilibrium condition (66) when group j is targeted with in-kind transfers, $h_{gP}^{jN} > 0$, and net income, $y_P^{jN} > 0$, such that individuals do not supplement health services, $h_{mP}^{jN} = 0$, is given by:

$$u_h(y_P^{jN}, h_{gP}^{jN}) = p_h u_c(y_P^{jN}, h_{gP}^{jN}) \tag{76}$$

Therefore, in equilibrium, condition (72) for group j holds with equality.

Otherwise, when individuals purchase health care through competitive markets and there is public provision, by Envelope Theorem:

$$\frac{dV_P^{jS}(y_P^j, h_{gP}^j)}{dy^j} = u_c(y_P^j - p_h h_{mP}^j, h_{gP}^j + h_{mP}^j) \tag{77}$$

$$\frac{dV_P^{jS}(y_P^j, h_{gP}^j)}{dh_g^j} = u_h(y_P^j - p_h h_{mP}^j, h_{gP}^j + h_{mP}^j) \tag{78}$$

Hence, party P's equilibrium condition (66) when group j is targeted with in-kind transfers, $h_{gP}^{jN} > 0$, and net income, $y_P^{jN} > 0$, such that individuals do supplement health services with purchases in markets, $h_{mP}^{jN} > 0$, is given by:

$$u_h(y_P^{jN} - p_h h_{mP}^{jN}, h_{gP}^{jN} + h_{mP}^{jN}) = p_h u_c(y_P^{jN} - p_h h_{mP}^{jN}, h_{gP}^{jN} + h_{mP}^{jN}) \tag{79}$$

Thus, the equilibrium net taxation and in-kind transfers policies for any group j, (y_P^{jN}, h_{gP}^{jN}) , must satisfy:

$$\frac{\psi}{\phi}\phi^j \mu^j \frac{dV_P^j(y_P^{jN}, h_{gP}^{jN})}{dh_g^j} = p_h \frac{\psi}{\phi}\phi^j \mu^j \frac{dV_P^j(y_P^{jN}, h_{gP}^{jN})}{dy^j} \tag{80}$$

$\forall j \in \{1, ..., J\}$ and $\forall P \in \{A, B\}$. In the pre-election stage, politicians announce policies such that the marginal benefit of targeting one unit of in-kind transfers in terms of probability of winning elections is equal to the marginal opportunity cost. That cost is measured by the marginal decrease

in probability due to a reduction of targeted net income by p_h units. The presence of competitive markets allows the existence of multiple equilibrium policies for each group j. In equilibrium, both political parties are indifferent to announce different combinations of net taxation policy and in-kind transfers for each social group j such that (80) holds. Therefore, the targeted consumption bundle of numeraire and health care to group j implicitly defined by (71), (76) and (79) is the same regardless of the choosen equilibrium policy. In Equilibrium:

$$u_h(c_P^{jN}, h_P^{jN}) = p_h u_c(c_P^{jN}, h_P^{jN}) \tag{81}$$

where $c_P^{jN} = y_P^{jN} - p_h h_{mP}^{jN}$ and $h_P^{jN} = h_{gP}^{jN} + h_{mP}^{jN} \quad \forall j \in \{1, ..., J\}$ and $P \in \{A, B\}$; with $y_P^{jN} > 0, h_{gP}^{jN} \geq 0$ and $h_{mP}^{jN} \geq 0$.

A.2. **Distributive Politics**

From the the First Order Conditions for both political parties $P \in \{A, B\}$, taking (61) for a pair of groups k and k' and arranging I get:

$$\frac{\psi}{\phi}\phi^k \frac{dV_P^k(y_P^k, h_{gP}^k)}{dy^k} + \gamma_{yP}^k = \frac{\psi}{\phi}\phi^{k'} \frac{dV_P^{k'}(y_P^{k'}, h_{gP}^{k'})}{dy^{k'}} + \gamma_{yP}^{k'} \tag{82}$$

Given the equilibrium policies for each group j discussed above, the relative treatment between groups in terms of numeraire are implicitly defined by:

$$\phi^k u_c(c^{kN}, h^{kN}) = \phi^{k'} u_c(c^{k'N}, h^{k'N}) \qquad \forall k, k' \in \{1, ..., J\} \tag{83}$$

where $c^{kN} = c_P^{kN} = y_P^{kN} - p_h h_{mP}^{kN}$ and $h_P^{kN} = h_{gP}^{kN} + h_{mP}^{kN} \quad \forall k, k' \in \{1, ..., J\}$ and $P \in \{A, B\}$; with $y_P^{kN} > 0$, $h_{gP}^{kN} \geq 0$ and $h_{mP}^{kN} \geq 0$.

Similarly taking the FOCs (62) for a pair of groups k and k', the equilibrium patterns of health services across groups of voters are given by:

$$\phi^k u_h(c^{kN}, h^{kN}) = \phi^{k'} u_h(c^{k'N}, h^{k'N}) \qquad \forall k, k' \in \{1, ..., J\} \tag{84}$$

where $c^{kN} = c_P^{kN} = y_P^{kN} - p_h h_{mP}^{kN}$ and $h_P^{kN} = h_{gP}^{kN} + h_{mP}^{kN} \quad \forall k, k' \in \{1, ..., J\}$ and $P \in \{A, B\}$; with $y_P^{kN} > 0$, $h_{gP}^{kN} \geq 0$ and $h_{mP}^{kN} \geq 0$.

A.3. **First Best Allocations: Allocative Efficiency**

The first-best problem consists of the maximization of the weighted average of individual utilitites with group-specific Pareto weights, α^j, subject to the economy feasibility constraint. The solution to this optimization problem yields the set of Pareto efficient allocations:

$$\max_{\{c^j, h^j\}_{j=1}^J} \quad \sum_{j=1}^J \mu^j \alpha^j u(c^j, h^j) \quad \text{s.t} \quad \sum_{j=1}^J \mu^j c^j + \sum_{j=1}^J \mu^j q h^j \leq \sum_{j=1}^J \mu^j w^j \tag{85}$$

The FOCs for an interior optimum are given by:

$$[c^j] \qquad \mu^j \alpha^j u_c = \lambda \mu^j \qquad \forall j \in \{1, ..., J\} \tag{86}$$

$$[h^j] \qquad \mu^j \alpha^j u_h = \lambda \mu^j q \qquad \forall j \in \{1, ..., J\} \tag{87}$$

The set of Pareto efficient allocation of resources, $\{c^j_{PO}, h^j_{PO}\}^J_{j=1}$, satisfies (86), (87) and the economy feasibility constraint such that:

$$\frac{u_h(c^j_{PO}, h^j_{PO})}{u_c(c^j_{PO}, h^j_{PO})} = q \rightarrow MRS^j_{h,c} = MRT_{h,c} \qquad \forall j \tag{88}$$

In a Pareto efficient allocation the rate at which individuals are willing to trade health services for numeraire commodity is equal across groups and equal to the rate at which the economy is able to transform numeraire into health care.

In the political equilibrium, the combination of choosen policies, $\{y^{jN}_P, h^{jN}_{gP}\}^J_{j=1}$ is such that (81) holds for all $P \in \{A, B\}$. Those equilibrium policies imply consumption bundles for all groups, $\{c^{jN}_P, h^{jN}_P\}^J_{j=1}$, that satisfy the economy feasibility constraint given expected voting and competitive equilibrium behavior of citizens. In equilibrium:

$$u_h(c^{jN}_P, h^{jN}_P) = p_h u_c(c^{jN}_P, h^{jN}_P) \rightarrow MRS^{jN}_{h,c} = MRT_{h,c} \qquad \forall j \tag{89}$$

where $c^{jN}_P = y^{jN}_P - p_h h^{jN}_{mP}$ and $h^{jN}_P = h^{jN}_{gP} + h^{jN}_{mP} \;\; \forall j \in \{1, ..., J\}$ and $P \in \{A, B\}$; with $y^{jN}_P > 0, h^{jN}_{gP} \geq 0$ and $h^{jN}_{mP} \geq 0$.

Therefore, the political process leads the economy to reach a Pareto Efficient allocation.

B. **EXTERNAL EFFECTS**

B.1. **Political Equilibrium**

The stages of the political game with externalities follow symmetric to the pure distributional game. However, in the presence of external effects, the indirect utility functions of individuals who belong to groups $\{L, F, E\}$ are given by:

$$V^k_P(y^k_P, h^k_{gP}, h^E_{gP}) = u(y^k_P - p h^k_{mP}, h^k_{gP} + h^k_{mP}) + \beta^k v(h^E_{gP} + h^E_{mP}) \;\; \forall k \in \{L, F\} \tag{90}$$

$$V^E_P(y^E_P, h^E_{gP}) = u(y^E_P - p h^E_{mP}, h^E_{gP} + h^E_{mP}) \tag{91}$$

where $y^j_P \geq 0$; $h^j_{mP} \geq 0$; and $h^j_{gP} \geq 0 \;\; \forall j \in \{L, F, E\}$ and $\forall P \in \{A, B\}$.

Therefore, the swing voter type in group $k \in \{L, F\}$ is defined as:

$$\sigma^k = V_A^k(y_A^k, h_{gA}^k, h_{gA}^E) - V_B^k(y_B^k, h_{gB}^k, h_{gB}^E) - \varepsilon \tag{92}$$

The swing voter type in the elderly group, E, follows:

$$\sigma^E = V_A^E(y_A^E, h_{gA}^E) - V_B^E(y_B^E, h_{gB}^E) - \varepsilon \tag{93}$$

Taking into account the presence of external effects, the policy choice problem of party A is given by:

$$\begin{aligned}\pounds^A &= \frac{1}{2} + \frac{\psi}{\phi}\left[\sum_{k=L}^{F}\mu^k\phi^k\left[V_A^k(y_A^k, h_{gA}^k, h_{gA}^E) - V_B^k(x_B)\right] + \mu^E\phi^E\left[V_A^E(y_A^E, h_{gA}^E) - V_B^E(x_B)\right]\right] \\ &+\lambda^A\left[w - \sum_{j=1}^{J}\mu^j y_A^j - \sum_{j=1}^{J}\mu^j p_h h_{gA}^j\right] + \sum_{j=1}^{J}\mu^j\gamma_{yA}^j y_A^j + \sum_{j=1}^{J}\mu^j\gamma_{hA}^j h_{gA}^j \end{aligned} \tag{94}$$

The policy choice problem is symmetric to political party B. The First Order Conditions for both political parties $P \in \{A, B\}$ are defined as:

$$[y^k] \qquad \frac{\psi}{\phi}\mu^k\phi^k\frac{dV_P^k(y_P^k, h_{gP}^k, h_{gP}^E)}{dy^k} + \mu^k\gamma_{yP}^k = \mu^k\lambda_P \qquad \forall k \in \{L, F\} \tag{95}$$

$$[y^E] \qquad \frac{\psi}{\phi}\mu^E\phi^E\frac{dV_P^E(y_P^E, h_{gP}^E)}{dy^E} + \mu^E\gamma_{yP}^E = \mu^E\lambda_P \tag{96}$$

$$[h_g^k] \qquad \frac{\psi}{\phi}\mu^k\phi^k\frac{dV_P^k(y_P^k, h_{gP}^k, h_{gP}^E)}{dh_g^k} + \mu^k\gamma_{hP}^k = \mu^k p_h\lambda_P \qquad \forall k \in \{L, F\} \tag{97}$$

$$[h_g^E] \qquad \frac{\psi}{\phi}\left[\mu^E\phi^E\frac{dV_P^E(y_P^E, h_{gP}^E)}{dh_g^E} + \sum_{k=L}^{F}\mu^k\phi^k\frac{dV_P^k(y_P^k, h_{gP}^k, h_{gP}^E)}{dh_g^E}\right] + \mu^E\gamma_{hP}^E = \mu^E p_h\lambda_P \tag{98}$$

$$\lambda_P\left[w - \sum_{j=L}^{E}\mu^j y_P^j - \sum_{j=L}^{E}\mu^j p_h h_{gP}^j\right] = 0 \tag{99}$$

$$\gamma_{yP}^j y_P^j = 0 \;\; ; \;\; \gamma_{hP}^j h_{gP}^j = 0 \quad \forall j \in \{L, F, E\} \tag{100}$$

$$\lambda_P \geq 0 \qquad \gamma_{yP}^j \geq 0 \;\; ; \;\; \gamma_{hP}^j \geq 0 \quad \forall j \in \{L, F, E\} \tag{101}$$

The system of equations formed by the best responses for each political party and their feasibility constraints, simultaneously determine de Nash Equilibrium in the first stage of the game. For both political parties, the equilibrium net taxation and in-kind transfers policies for any group

$k \in \{L, F\}$, (y_P^{kN}, h_{gP}^{kN}), satisfy the same equilibrium conditions discussed for an economy without external effects. Furthermore, the equilibrium net taxation policy must also imply a positive available income for group E, $y_P^{EN} > 0$. Therefore, in equilibrium the multiplier associated to the non-negative constraint of net income of the elderly is equal to zero, $\gamma_{yP}^{EN} = 0 \quad \forall\ P \in \{A, B\}$. Hence, equilibrium policies targeted to group E must satisfy:

$$\frac{\psi}{\phi}\left[\phi^E\mu^E\frac{dV_P^E(y_P^{EN}, h_{gP}^{EN})}{dh_g^E} + \sum_{k=L}^{F}\phi^k\mu^k\frac{dV_P^k(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dh_g^E}\right] + \mu^E\gamma_{hP}^E = p_h\frac{\psi}{\phi}\phi^E\mu^E\frac{dV_P^E(y_P^{EN}, h_{gP}^{EN})}{dy^E} \tag{102}$$

Politicians must decide whether targeting in-kind transfers to the elderly. In the case that party $P \in \{A, B\}$ chooses not targeting in-kind transfers to group E, $h_{gP}^{EN} = 0$, politicians take into account that voters are expected to purchase health care in competitive markets with their available income $y_P^{EN} > 0$. For any positive net income targeted by party P, the optimal behavior in competitive markets of an individual who belongs to group E is characterized by:

$$u_h(y_P^E - p_h h_{mP}^E, h_{mP}^E) = p_h u_c(y_P^E - p_h h_{mP}^E, h_{mP}^E) \tag{103}$$

When the elderly purchase health care through competitive markets and there is no public provision, by Envelope Theorem:

$$\frac{dV_P^E(y_P^E, h_{gP}^E)}{dy^E} = u_c(y_P^E - p_h h_{mP}^E, h_{mP}^E) \tag{104}$$

$$\frac{dV_P^E(y_P^E, h_{gP}^E)}{dh_g^E} = u_h(y_P^E - p_h h_{mP}^E, h_{mP}^E) \tag{105}$$

Furthermore, elderly's health care consumption affects the utility of individuals who belong to group $k \in \{L, F\}$, by Envelope Theorem:

$$\frac{dV_P^k(y_P^k, h_{gP}^k, h_{gP}^E)}{dh_g^E} = \beta^k v_{h^E}(h_{mP}^E) \tag{106}$$

Given (104), (105) and (106) and introducing into the equilibrium condition (102), it yields:

$$\frac{\psi}{\phi}\left[\phi^E\mu^E u_h(y_P^E - p_h h_{mP}^E, h_{mP}^E) + \sum_{k=L}^{F}\phi^k\mu^k\beta^k v_{h^E}(h_{mP}^E)\right] + \mu^E\gamma_{hP}^E = p_h\frac{\psi}{\phi}\phi^E\mu^E u_c(y_P^E - p_h h_{mP}^E, h_{mP}^E) \tag{107}$$

$$\left[\frac{u_h(y_P^E - p_h h_{mP}^E, h_{mP}^E)}{u_c(y_P^E - p_h h_{mP}^E, h_{mP}^E)} + \sum_{k=L}^{F}\frac{\phi^k\mu^k}{\phi^E\mu^E}\beta^k\frac{v_{h^E}(h_{mP}^E)}{u_c(y_P^E - p_h h_{mP}^E, h_{mP}^E)} + \frac{\mu^E\gamma_{hP}^E}{\phi^E\mu^E u_c(y_P^E - p_h h_{mP}^E, h_{mP}^E)}\frac{\phi}{\psi}\right] = p_h \tag{108}$$

Given elderly's expected behavior in competitive markets (103), equilibrium condition would be:

$$\left[p_h + \sum_{k=L}^{F} \frac{\phi^k \mu^k}{\phi^E \mu^E} \beta^k \frac{v_{h^E}(h^E_{mP})}{u_c(y^E_P - p_h h^E_{mP}, h^E_{mP})}\right] + \frac{\mu^E \gamma^E_{hP}}{\phi^E \mu^E u_c(y^E_P - p_h h^E_{mP}, h^E_{mP})} \frac{\phi}{\psi} = p_h \tag{109}$$

By concavity, $v_h > 0$ and $u_c > 0$. Therefore, equilibrium condition holds if and only if $\gamma^E_{hP} < 0$ which is not possible. Thus, in equilibrium parties must target in-kind transfers to the elderly, $h^{EN}_{gP} > 0 \ \forall \ P \in \{A, B\}$, and then $\gamma^E_{hP} = 0 \ \forall \ P \in \{A, B\}$. Hence, for both political parties, the equilibrium net taxation and in-kind transfers policies announced to group E, (y^{EN}_P, h^{EN}_{gP}), must satisfy:

$$\frac{\psi}{\phi}\left[\phi^E \mu^E \frac{dV^E_P(y^{EN}_P, h^{EN}_{gP})}{dh^E_g} + \sum_{k=L}^{F} \phi^k \mu^k \frac{dV^k_P(y^{kN}_P, h^{kN}_{gP}, h^{EN}_{gP})}{dh^E_g}\right] = p_h \frac{\psi}{\phi} \phi^E \mu^E \frac{dV^E_P(y^{EN}_P, h^{EN}_{gP})}{dy^E} \tag{110}$$

$\forall k \in \{L, F\}$ and $\forall P \in \{A, B\}$.

Politicians choose in-kind transfers to the elderly taking into account that voters in group E are expected not to make private purchases of health care in markets, $h^{EN}_{mP} = 0$, if and only if this condition holds:

$$u_h(y^E, h^E_{gP}) \leq p_h u_c(y^E_P, h^E_{gP}) \tag{111}$$

otherwise, when the sigh of this condition is reversed, politicians expect that individuals make private purchases, $h^{EN}_{mP} > 0$. The expected optimal behavior of individuals that suplement health services in competitive markets is given by:

$$u_h(y^E_P - p_h h^E_{mP}, h^E_{gP} + h^E_{mP}) = p_h u_c(y^E_P - p_h h^E_{mP}, h^E_{gP} + h^E_{mP}) \tag{112}$$

In the first place, when the elderly purchase health care through competitive markets and there is public provision, by Envelope Theorem:

$$\frac{dV^E_P(y^E_P, h^E_{gP})}{dy^E} = u_c(y^E_P - p_h h^E_{mP}, h^E_{gP} + h^E_{mP}) \tag{113}$$

$$\frac{dV^E_P(y^E_P, h^E_{gP})}{dh^E_g} = u_h(y^E_P - p_h h^E_{mP}, h^E_{gP} + h^E_{mP}) \tag{114}$$

Furthermore, elderly's health care consumption affects the utility of individuals who belong to group $k \in \{L, F\}$, by Envelope Theorem:

$$\frac{dV^k_P(y^k_P, h^k_{gP}, h^E_{gP})}{dh^E_g} = \beta^k v_{h^E}(h^E_{gP} + h^E_{mP}) \tag{115}$$

Given (113), (114) and (115) and introducing into the equilibrium condition (110), it yields:

$$\frac{\psi}{\phi}\left[\phi^E\mu^E u_h(y_P^E - p_h h_{mP}^E, h_{gP}^E + h_{mP}^E) + \sum_{k=L}^{F}\phi^k\mu^k\beta^k v_{h^E}(h_{gP}^E + h_{mP}^E)\right] = p_h\frac{\psi}{\phi}\phi^E\mu^E u_c(y_P^E - p_h h_{mP}^E, h_{gP}^E + h_{mP}^E) \tag{116}$$

$$\left[\frac{u_h(y_P^E - p_h h_{mP}^E, h_{gP}^E + h_{mP}^E)}{u_c(y_P^E - p_h h_{mP}^E, h_{gP}^E + h_{mP}^E)} + \sum_{k=L}^{F}\frac{\phi^k\mu^k}{\phi^E\mu^E}\beta^k\frac{v_{h^E}(h_{gP}^E + h_{mP}^E)}{u_c(y_P^E - p_h h_{mP}^E, h_{gP}^E + h_{mP}^E)}\right] = p_h \tag{117}$$

Given elderly's expected behavior in competitive markets (112), equilibrium condition would be:

$$\left[p_h + \sum_{k=L}^{F}\frac{\phi^k\mu^k}{\phi^E\mu^E}\beta^k\frac{v_{h^E}(h_{gP}^E + h_{mP}^E)}{u_c(y_P^E - p_h h_{mP}^E, h_{gP}^E + h_{mP}^E)}\right] = p_h \tag{118}$$

By concavity, $v_h > 0$ and $u_c > 0$. Therefore, equilibrium condition does not hold. Thus, in equilibrium both parties $\{A, B\}$ must target a combination of net taxation policy and in-kind transfers to the elderly (y_P^{EN}, h_{gP}^{EN}) such that the elderly do not supplement health services in competitive markets, $h_{mP}^E = 0$. When the elderly do not purchase health care through competitive markets and there is public provision, by Envelope Theorem:

$$\frac{dV_P^E(y_P^E, h_{gP}^E)}{dy^E} = u_c(y_P^E, h_{gP}^E) \tag{119}$$

$$\frac{dV_P^E(y_P^E, h_{gP}^E)}{dh_g^E} = u_h(y_P^E, h_{gP}^E) \tag{120}$$

Furthermore, elderly's health care consumption affects the utility of individuals who belong to group $k \in \{L, F\}$, by Envelope Theorem:

$$\frac{dV_P^k(y_P^k, h_{gP}^k, h_{gP}^E)}{dh_g^E} = \beta^k v_{h^E}(h_{gP}^E) \tag{121}$$

Given (119), (120) and (121) and introducing into the equilibrium condition (110), it yields:

$$\frac{\psi}{\phi}\left[\phi^E\mu^E u_h(y_P^{EN}, h_{gP}^{EN}) + \sum_{k=L}^{F}\phi^k\mu^k\beta^k v_{h^E}(h_{gP}^{EN})\right] = p_h\frac{\psi}{\phi}\phi^E\mu^E u_c(y_P^{EN}, h_{gP}^{EN}) \tag{122}$$

Arranging terms, party P's equilibrium condition when group E is targeted with in-kind transfers, $h_{gP}^{EN} > 0$, and net income, $y_P^{EN} > 0$, such that individuals do not supplement health services, $h_{mP}^{EN} = 0$, is given by:

$$u_h(c_P^{EN}, h_P^{EN}) + \sum_{k=L}^{F} \frac{\phi^k}{\phi^E} \frac{\mu^k}{\mu^E} \beta^k v_{h^E}(h_P^{EN}) = p_h u_c(c_P^{EN}, h_P^{EN}) \tag{123}$$

$\forall\ k \in \{L, F\}$ and $\forall\ P \in \{A, B\}$; where $c_P^{EN} = y_P^{EN}$ and $h_P^{EN} = h_{gP}^{EN}$.

B.2. **Distributive Politics**

The relative treatment of health services across groups is affected by the presence of external effects. From the the First Order Conditions for both political parties $P \in \{A, B\}$, taking (97) for group k and (98) for the elderly, in equilibrium:

$$\frac{\psi}{\phi} \phi^k \frac{dV_P^{kN}(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dh_g^k} = \frac{\psi}{\phi} \left[\begin{array}{c} \phi^E \frac{dV_P^{EN}(y_P^{EN}, h_{gP}^{EN})}{dh_g^E} + \\ + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \phi^k \frac{dV_P^{kN}(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dh_g^E} \end{array} \right] \quad \forall k \in \{L, F\} \tag{124}$$

Hence, the political relative treatment in terms of health services between elderly and non-elderly citizens is given by:

$$\phi^k u_h(c^{kN}, h^{kN}) = \phi^E u_h(c^{EN}, h^{EN}) + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \phi^k \beta^k v_{h^E}(h^{EN}) \qquad \forall k \in \{L, F\} \tag{125}$$

where $c^{kN} = c_P^{kN} = y_P^{kN} - p_h h_{mP}^{kN}$ and $h^{kN} = h_P^{kN} = h_{gP}^{kN} + h_{mP}^{kN}$ $\forall k \in \{L, F\}$; $c^{EN} = c_P^{EN} = y_P^{EN}$ and $h^{EN} = h_P^{EN} = h_{gP}^{EN}$; with $y_P^{kN} > 0$, $h_{gP}^{kN} \geq 0$, $h_{mP}^{kN} \geq 0$, $y_P^{EN} > 0$ and $h_{gP}^{EN} > 0$ for all $P \in \{A, B\}$.

Similarly, I can characterize the relative treatment of numeraire commodity across groups. From the the First Order Conditions for both political parties $P \in \{A, B\}$, taking (95) for group k and (96) for the elderly, in equilibrium:

$$\frac{\psi}{\phi} \phi^k \frac{dV_P^{kN}(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dy^k} = \frac{\psi}{\phi} \phi^E \frac{dV_P^{EN}(y_P^{EN}, h_{gP}^{EN})}{dy^E} \qquad \forall k \in \{L, F\} \tag{126}$$

Thus, the political relative treatment in terms of numeraire between elderly and non-elderly citizens is given by:

$$\phi^k u_c(c^{kN}, h^{kN}) = \phi^E u_c(c^{EN}, h^{EN}) \qquad \forall k \in \{L, F\} \tag{127}$$

where $c^{kN} = c_P^{kN} = y_P^{kN} - p_h h_{mP}^{kN}$ and $h^{kN} = h_P^{kN} = h_{gP}^{kN} + h_{mP}^{kN}$ $\forall k \in \{L, F\}$; $c^{EN} = c_P^{EN} = y_P^{EN}$ and $h^{EN} = h_P^{EN} = h_{gP}^{EN}$; with $y_P^{kN} > 0$, $h_{gP}^{kN} \geq 0$, $h_{mP}^{kN} \geq 0$, $y_P^{EN} > 0$ and $h_{gP}^{EN} > 0$ for all $P \in \{A, B\}$.

B.3. **Allocative Efficiency**

The first-best problem consists of the maximization of the weighted average of individual utilitites with group-specific Pareto weights, α^j, subject to the economy feasibility constraint. The solution to this optimization problem yields the set of Pareto efficient allocations:

$$\max_{\{c^j,h^j\}_{j=L}^F} \quad \sum_{k=L}^{F} \mu^k \alpha^k \left[u(c^k,h^k) + \alpha^k \beta^k v(h^E)\right] + \mu^E \alpha^E u(c^E,h^E) \tag{128}$$

$$\text{s.t.} \quad \sum_{j=1}^{J} \mu^j c^j + \sum_{j=1}^{J} \mu^j q h^j \leq \sum_{j=1}^{J} \mu^j w^j \tag{129}$$

The FOCs for an interior optimum are given by:

$$[c^j] \qquad \mu^j \alpha^j u_c = \mu^j \lambda \qquad \forall j \in \{L,F,E\} \tag{130}$$

$$[h^k] \qquad \mu^k \alpha^k u_h = \mu^k q \lambda \qquad \forall k \quad \in \{L,F\} \tag{131}$$

$$[h^E] \qquad \mu^E \alpha^E u_h + \sum_{k=L}^{F} \mu^k \alpha^k \beta^k v_{h^E} = \mu^E q \lambda \tag{132}$$

The set of Pareto efficient allocation of resources, $\{c^j_{PO}, h^j_{PO}\}_{j=L}^E$, satisfies (130,131,132) and the economy feasibility constraint. Therefore, Pareto efficient allocations for the non-elderly groups satisfy:

$$\frac{u_h(c^k_{PO},h^k_{PO})}{u_c(c^k_{PO},h^k_{PO})} = q \rightarrow MRS^k_{h,c} = MRT_{h,c} \qquad \forall k \quad \in \{L,F\} \tag{133}$$

Furthermore, from the FOCs for consumption of the numeraire (130) I obtain:

$$\frac{\alpha^k}{\alpha^E} = \frac{u_c(c^E_{PO},h^E_{PO})}{u_c(c^k_{PO},h^k_{PO})} \tag{134}$$

Therefore, a Pareto efficient allocation of numeraire and health for group E must satisfy:

$$\begin{aligned} \frac{u_h(c^E_{PO},h^E_{PO})}{u_c(c^E_{PO},h^E_{PO})} + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \beta^k \frac{v_{h^E}(h^E_{PO})}{u_c(c^k_{PO},h^k_{PO})} &= q \\ MRS^E_{h,c} + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \beta^k MRS^k_{h^E,c^k} &= MRT_{h,c} \end{aligned} \tag{135}$$

In the political equilibrium, both parties, $P \in \{A,B\}$, announce a menu of net taxation and in-kind transfers policies targeted to the elderly, (y^{EN}_P, h^{EN}_{gP}), such that:

$$u_h(c_P^{EN}, h_P^{EN}) + \sum_{k=L}^{F} \frac{\phi^k}{\phi^E} \frac{\mu^k}{\mu^E} \beta^k v_{h^E}(h_P^{EN}) = p_h u_c(c_P^{EN}, h_P^{EN}) \tag{136}$$

$\forall\ k \in \{L, F\}$ and $\forall\ P \in \{A, B\}$; where $c_P^{EN} = y_P^{EN}$ and $h_P^{EN} = h_{gP}^{EN}$.

From the equilibrium relative treatment between groups in terms of numeraire (127) I obtain:

$$\frac{\phi^k}{\phi^E} = \frac{u_c(c^{EN}, h^{EN})}{u_c(c^{kN}, h^{kN})} \quad \forall k \in \{L, F\} \tag{137}$$

Introducing (137) into the equilibrium political allocation of the elderly (136):

$$\begin{aligned} u_h(c_P^{EN}, h_P^{EN}) + \sum_{k=L}^{F} \frac{u_c(c^{EN}, h^{EN})}{u_c(c^{kN}, h^{kN})} \frac{\mu^k}{\mu^E} \beta^k v_{h^E}(h_P^{EN}) &= p_h u_c(c_P^{EN}, h_P^{EN}) \\ \frac{u_h(c_P^{EN}, h_P^{EN})}{u_c(c_P^{EN}, h_P^{EN})} + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \beta^k \frac{v_{h^E}(h_P^{EN})}{u_c(c^{kN}, h^{kN})} &= p_h \\ MRS_{h,c}^{EN} + \sum_{k=L}^{F} \frac{\mu^k}{\mu^E} \beta^k MRS_{h^E,c^k}^{kN} &= MRT_{h,c} \end{aligned} \tag{138}$$

Hence, the consumption bundle of the elderly, (c^{EN}, h^{EN}), that results from the political process is Pareto efficient.

Furthermore, from the the First Order Conditions for both political parties $P \in \{A, B\}$, taking (95) and (97) for group k in equilibrium:

$$\frac{\psi}{\phi} \frac{dV_P^{kN}(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dh_g^k} = p_h \frac{\psi}{\phi} \frac{dV_P^{kN}(y_P^{kN}, h_{gP}^{kN}, h_{gP}^{EN})}{dy^k} \qquad \forall k \in \{L, F\} \tag{139}$$

In the political equilibrium, both parties, $P \in \{A, B\}$, announce a menu of net taxation and in-kind transfers policies targeted to each group k, (y_P^{kN}, h_{gP}^{kN}), such that (81) holds. Those equilibrium policies imply consumption bundles for each group k, (c_P^{kN}, h_P^{kN}), that satisfy the economy feasibility constraint given expected voting and competitive equilibrium behavior of citizens. In equilibrium:

$$\begin{aligned} u_h(c_P^{kN}, h_P^{kN}) &= p_h u_c(c_P^{kN}, h_P^{kN}) \\ MRS_{h,c}^{kN} &= MRT_{h,c} \qquad \forall k \in \{L, F\} \end{aligned} \tag{140}$$

where $c^{kN} = c_P^{kN} = y_P^{kN} - p_h h_{mP}^{kN}$ and $h^{kN} = h_P^{kN} = h_{gP}^{kN} + h_{mP}^{kN}$ $\forall k \in \{L, F\}$; with $y_P^{kN} > 0$, $h_{gP}^{kN} \geq 0$, $h_{mP}^{kN} \geq 0$ for all $P \in \{A, B\}$.

Therefore, the political process leads the economy to reach a Pareto Efficient allocation.

C. **COMMODITY EGALITARIANISM**

C.1. **Political Equilibrium**

The stages of the political game with commodity egalitarianism follows symmetric to the pure distributional game. Nevertheless, in the presence of egalitarianism, the indirect utility functions of individuals who belong to groups group $j \in \{1, ..., J\}$ are given by:

$$V_P^j(y_P^j, \mathbf{h}_{gP}) = u(y_P^j - ph_{mP}^j, h_{gP}^j + h_{mP}^j) + \delta^j \Omega(\mathbf{h}_P) \tag{141}$$

where $y_P^j \geq 0$; $h_{mP}^j \geq 0$; $h_{gP}^j \geq 0$; and $\mathbf{h}_P = \{h_{gP}^j + h_{mP}^j\}_{j=1}^J \quad \forall j \in \{1, ..., J\}$ and $\forall P \in \{A, B\}$. Furthermore, I work with the case:

$$\Omega(\mathbf{h}_P) = -\frac{1}{2}\sum_{j=1}^{J} \mu^j (h_{gP}^j + h_{mP}^j - \overline{h}_P)^2 \text{ where } \overline{h} = \sum_{j=1}^{J} \mu^j (h_{gP}^j + h_{mP}^j) \tag{142}$$

Therefore, the swing voter type in group $j \in \{1, ..., J\}$ is defined as:

$$\sigma^j = V_A^j(y_A^j, \mathbf{h}_{gA}) - V_B^j(y_B^j, \mathbf{h}_{gB}) - \varepsilon \tag{143}$$

Taking into account the presence of egalitarianism, the policy choice problem of party A is given by:

$$\begin{aligned} \pounds^A \quad = \quad & \frac{1}{2} + \frac{\psi}{\phi}\left[\sum_{j=1}^{J} \mu^j \phi^j \left[V_A^j(y_A^j, \mathbf{h}_{gA}) - V_B^j(x_B)\right]\right] + \\ & + \lambda^A \left[w - \sum_{j=1}^{J} \mu^j y_A^j - \sum_{j=1}^{J} \mu^j p_h h_{gA}^j\right] + \sum_{j=1}^{J} \mu^j \gamma_{yA}^j y_A^j + \sum_{j=1}^{J} \mu^j \gamma_{hA}^j h_{gA}^j \end{aligned} \tag{144}$$

The policy choice problem is symmetric to political party B. The First Order Conditions for both political parties $P \in \{A, B\}$ are defined as:

$$[y^k] \qquad \frac{\psi}{\phi}\mu^k \phi^k \frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dy^k} + \mu^k \gamma_{yP}^k = \mu^k \lambda_P \qquad \forall k \in \{1, ..., J\} \tag{145}$$

$$[h_g^k] \qquad \frac{\psi}{\phi}\left[\begin{array}{c} \mu^k \phi^k \frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dh_g^k} + \\ + \sum_{j=1}^{J} \mu^j \phi^j \frac{dV_P^j(y_P^j, \mathbf{h}_{gP})}{dh_g^k} \end{array}\right] + \mu^k \gamma_{hP}^k = \mu^k p_h \lambda_P \quad \forall \ k \text{ and } j \neq k \in \{1, ..., J\} \tag{146}$$

$$\lambda_P \left[w - \sum_{j=L}^{E} \mu^j y_P^j - \sum_{j=L}^{E} \mu^j p_h h_{gP}^j\right] = 0 \tag{147}$$

$$\gamma_{yP}^{j} y_P^j = 0 \;\; ; \;\; \gamma_{hP}^{j} h_{gP}^{j} = 0 \quad \forall j \in \{1, ..., J\} \tag{148}$$

$$\lambda_P \geq 0 \qquad \gamma_{yP}^{j} \geq 0 \;\; ; \;\; \gamma_{hP}^{j} \geq 0 \quad \forall j \in \{1, ..., J\} \tag{149}$$

The system of equations formed by the best responses for each political party and their feasibility constraints, simultaneously determine the Nash Equilibrium in the first stage of the game. For both political parties, the equilibrium net taxation policy must imply a positive net income for all groups, $y_P^{jN} > 0 \; \forall j$ and $\forall P \in \{A, B\}$. Thus, in equilibrium the multiplier associated to the non-negativity constraint of net income is equal to zero for all groups, $\gamma_{yP}^{jN} = 0 \; \forall j$ and $\forall P \in \{A, B\}$. Hence, equilibrium policies targeted to group k must satisfy:

$$\frac{\psi}{\phi} \left[\begin{array}{c} \mu^k \phi^k \frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dh_g^k} + \\ + \sum_{j=1}^{J} \mu^j \phi^j \frac{dV_P^j(y_P^j, \mathbf{h}_{gP})}{dh_g^k} \end{array} \right] + \mu^k \gamma_{hP}^k = p_h \frac{\psi}{\phi} \mu^k \phi^k \frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dy^k} \quad \forall k \in \{1, ..., J\} \tag{150}$$

Politicians must decide whether targeting in-kind transfers to group k. In the case that party $P \in \{A, B\}$ chooses not targeting in-kind transfers to group k, $h_{gP}^{kN} = 0$, politicians take into account that voters are expected to purchase health care in competitive markets with their available income $y_P^{kN} > 0$. For any positive net income targeted by party P, the optimal behavior in competitive markets of an individual who belongs to group k is characterized by:

$$u_h(y_P^k - p_h h_{mP}^k, h_{mP}^k) = p_h u_c(y_P^k - p_h h_{mP}^k, h_{mP}^k) \tag{151}$$

When individuals who belong to group k purchase health care through competitive markets and there is no public provision, by Envelope Theorem:

$$\frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dy^k} = u_c(y_P^k - p_h h_{mP}^k, h_{mP}^k) \tag{152}$$

$$\frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dh_g^k} = u_h(y_P^k - p_h h_{mP}^k, h_{mP}^k) + \delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \tag{153}$$

Furthermore, group k's health care consumption affects the utility of individuals in the rest of the population, by Envelope Theorem:

$$\frac{dV_P^j(y_P^j, \mathbf{h}_{gP})}{dh_g^k} = \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \qquad \forall j \neq k \tag{154}$$

Given (152), (153) and (154) and introducing into the equilibrium condition (150), it yields:

$$\frac{\psi}{\phi}\left[\begin{array}{c}\mu^k\phi^k u_h(y_P^k-p_h h_{mP}^k,h_{mP}^k)+\\ +\mu^k\phi^k\delta^k\frac{\partial\Omega(\mathbf{h}_P)}{\partial h_g^k}+\sum_{j=1}^{J}\mu^j\phi^j\delta^j\frac{\partial\Omega(\mathbf{h}_P)}{\partial h_g^k}\end{array}\right]+\mu^k\gamma_{hP}^k=p_h\frac{\psi}{\phi}\mu^k\phi^k u_c(y_P^k-p_h h_{mP}^k,h_{mP}^k) \tag{155}$$

$$\left[\begin{array}{c}\frac{u_h(y_P^k-p_h h_{mP}^k,h_{mP}^k)}{u_c(y_P^k-p_h h_{mP}^k,h_{mP}^k)}+\\ +\frac{\delta^k\frac{\partial\Omega(\mathbf{h}_P)}{\partial h_g^k}+\sum_{j=1}^{J}\mu^j\phi^j\delta^j\frac{\partial\Omega(\mathbf{h}_P)}{\partial h_g^k}}{u_c(y_P^k-p_h h_{mP}^k,h_{mP}^k)}\end{array}\right]+\frac{\mu^k\gamma_{hP}^k}{\mu^k\phi^k u_c(y_P^k-p_h h_{mP}^k,h_{mP}^k)}\frac{\phi}{\psi}=p_h \tag{156}$$

Given the expected behavior in competitive markets of individuals who belong to group k (151), equilibrium condition would be:

$$\left[p_h+\frac{\delta^k\frac{\partial\Omega(\mathbf{h}_P)}{\partial h_g^k}+\sum_{j=1}^{J}\mu^j\phi^j\delta^j\frac{\partial\Omega(\mathbf{h}_P)}{\partial h_g^k}}{u_c(y_P^k-p_h h_{mP}^k,h_{mP}^k)}\right]+\frac{\mu^k\gamma_{hP}^k}{\mu^k\phi^k u_c(y_P^k-p_h h_{mP}^k,h_{mP}^k)}\frac{\phi}{\psi}=p_h \qquad \forall k\in\{1,...,J\} \tag{157}$$

This equilibrium condition holds if and only if all groups have the same ideological heterogeneity and therefore are targeted with the same amount of cash transfers. Otherwise, in equilibrium parties must target in-kind transfers to all groups, $h_g^{kN}>0 \quad \forall P\in\{A,B\}$, and then $\gamma_{hP}^k=0$ $\forall P\in\{A,B\}$. Hence, for both political parties, the equilibrium net taxation and in-kind transfers policies announced to group k, (y_P^{kN},h_{gP}^{kN}), must satisfy:

$$\frac{\psi}{\phi}\left[\mu^k\phi^k\frac{dV_P^k(y_P^k,\mathbf{h}_{gP})}{dh_g^k}+\sum_{j=1}^{J}\mu^j\phi^j\frac{dV_P^j(y_P^j,\mathbf{h}_{gP})}{dh_g^k}\right]=p_h\frac{\psi}{\phi}\mu^k\phi^k\frac{dV_P^k(y_P^k,\mathbf{h}_{gP})}{dy^k} \tag{158}$$

$\forall k\in\{1,...,J\}$ and $\forall P\in\{A,B\}$.

Politicians choose in-kind transfers to individuals who belong to group k taking into account that voters in group k are expected not to make private purchases of health care in markets, $h_{mP}^{kN}=0$, if and only if this condition holds:

$$u_h(y^k,h_{gP}^k)\leq p_h u_c(y_P^k,h_{gP}^k) \tag{159}$$

Otherwise, when the sigh of this condition is reversed, politicians expect that individuals make private purchases, $h_{mP}^{kN}>0$. The expected optimal behavior of individuals that suplement health services in competitive markets is given by:

$$u_h(y_P^k-p_h h_{mP}^k,h_{gP}^k+h_{mP}^k)=p_h u_c(y_P^k-p_h h_{mP}^k,h_{gP}^k+h_{mP}^k) \tag{160}$$

In the first alternative, when individuals who belong to group k purchase health care through

competitive markets and there is public provision, by Envelope Theorem:

$$\frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dy^k} = u_c(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k) \tag{161}$$

$$\frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dh_g^k} = u_h(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k) + \delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \tag{162}$$

Furthermore, group k's health care consumption affects the utility of individuals in the rest of the population, by Envelope Theorem:

$$\frac{dV_P^j(y_P^j, \mathbf{h}_{gP})}{dh_g^k} = \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \qquad \forall j \neq k \tag{163}$$

Given (161), (162) and (163) and introducing into the equilibrium condition (158), it yields:

$$\frac{\psi}{\phi}\left[\begin{array}{c} \phi^k \mu^k u_h(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k) + \\ \phi^k \mu^k \delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} + \sum_{j=1}^{J} \mu^j \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \end{array}\right] = p_h \frac{\psi}{\phi} \phi^k \mu^k u_c(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k) \tag{164}$$

$$\left[\frac{u_h(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k)}{u_c(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k)} + \frac{\delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} + \sum_{j=1}^{J} \mu^j \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k}}{u_c(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k)}\right] = p_h \tag{165}$$

Given the expected behavior in competitive markets of individuals who belong to group k (160), equilibrium condition would be:

$$\left[p_h + \frac{\delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} + \sum_{j=1}^{J} \mu^j \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k}}{u_c(y_P^k - p_h h_{mP}^k, h_{gP}^k + h_{mP}^k)}\right] = p_h \tag{166}$$

This equilibrium condition holds if and only if all groups have the same ideological heterogeneity and therefore are targeted with the same amount of cash transfers. Otherwise, in equilibrium both parties $\{A, B\}$ must target a combination of net taxation and in-kind transfers to each group k, (y_P^{kN}, h_{gP}^{kN}) for $k \in \{1, ..., J\}$ and $\forall P \in \{A, B\}$, such that individuals who belong to any group $k \in \{1, ..., J\}$ do not supplement health services in competitive markets, $h_{mP}^{kN} = 0 \ \forall \ k \in \{1, ..., J\}$. When individuals who belong to group k do not purchase health care through competitive markets and there is public provision, by Envelope Theorem:

$$\frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dy^k} = u_c(y_P^k, h_{gP}^k) \tag{167}$$

$$\frac{dV_P^k(y_P^k, \mathbf{h}_{gP})}{dh_g^k} = u_h(y_P^k, h_{gP}^k) + \delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \tag{168}$$

Furthermore, group k's health care consumption affects the utility of individuals in the rest of the population, by Envelope Theorem:

$$\frac{dV_P^j(y_P^j, \mathbf{h}_{gP})}{dh_g^k} = \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} \qquad \forall j \neq k \tag{169}$$

Given (167), (168) and (169) and introducing into the equilibrium condition (158), it yields:

$$\frac{\psi}{\phi}\left[\phi^k \mu^k u_h(y_P^k, h_{gP}^k) + \phi^k \mu^k \delta^k \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k} + \sum_{j=1}^{j} \phi^j \mu^j \delta^j \frac{\partial \Omega(\mathbf{h}_P)}{\partial h_g^k}\right] = p_h \frac{\psi}{\phi} \phi^k \mu^k u_c(y_P^k, h_{gP}^k) \tag{170}$$

Arranging terms, party P's equilibrium condition when group k is targeted with in-kind transfers, $h_{gP}^{kN} > 0$, and net income, $y_P^{kN} > 0$, such that individuals do not supplement health services, $h_{mP}^{kN} = 0$, is given by:

$$u_h(c_P^{kN}, h_P^{kN}) + \sum_{j=1}^{J} \frac{\phi^j}{\phi^k} \frac{\mu^j}{\mu^k} \delta^j \frac{\partial \Omega(\mathbf{h}_P^N)}{\partial h_g^k} = p_h u_c(c_P^{kN}, h_P^{kN}) \tag{171}$$

$\forall\ k, j \in \{1, ..., J\}$ and $\forall\ P \in \{A, B\}$; where $c_P^{kN} = y_P^{kN}$ and $h_P^{kN} = h_{gP}^{kN}$.

C.2. **Distributive Politics**

The relative treatment of health services across groups is affected by the presence of egalitarianism. From the the First Order Conditions for both political parties $P \in \{A, B\}$, taking (146) for a pair of groups k and k', in equilibrium:

$$\frac{\psi}{\phi}\begin{bmatrix} \phi^k \frac{dV_P^{kN}(y_P^{kN}, \mathbf{h}_{gP}^N)}{dh_g^k} + \\ + \sum_{j=1}^{J} \frac{\mu^j}{\mu^k} \phi^j \frac{dV_P^{jN}(y_P^{jN}, \mathbf{h}_{gP}^N)}{dh_g^k} \end{bmatrix} = \frac{\psi}{\phi}\begin{bmatrix} \phi^{k'} \frac{dV_P^{k'N}(y_P^{k'N}, \mathbf{h}_{gP}^N)}{dh_g^{k'}} + \\ + \sum_{j=1}^{J} \frac{\mu^j}{\mu^{k'}} \phi^j \frac{dV_P^{jN}(y_P^{jN}, \mathbf{h}_{gP}^N)}{dh_g^{k'}} \end{bmatrix} \quad \forall k.k' \in \{1, ..., J\} \tag{172}$$

Hence, the political relative treatment in terms of health services across groups of voters is given by:

$$\begin{bmatrix} \phi^k u_h(c^{kN}, h^{kN}) + \\ + \sum_{j=1}^{J} \frac{\mu^j}{\mu^k} \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}_P^N)}{\partial h_g^k} \end{bmatrix} = \begin{bmatrix} \phi^{k'} u_h(c^{k'N}, h^{k'N}) + \\ + \sum_{j=1}^{J} \frac{\mu^j}{\mu^{k'}} \phi^j \delta^j \frac{\partial \Omega(\mathbf{h}_P^N)}{\partial h_g^{k'}} \end{bmatrix} \qquad \forall k.k' \in \{1, ..., J\} \tag{173}$$

where $c^{kN} = c_P^{kN} = y_P^{kN}$ and $h^{kN} = h_P^{kN} = h_{gP}^{kN}$; and $c^{k'N} = c_P^{k'N} = y_P^{k'N}$ and $h^{k'N} = h_P^{k'N} = h_{gP}^{k'N}$ $\forall k, k' \in \{1, ..., J\}$; with $y_P^{kN}, y_P^{k'N} > 0$ and $h_{gP}^{kN}, h_{gP}^{k'N} > 0$ for all $P \in \{A, B\}$.

Similarly, I can characterize the relative treatment of numeraire commodity across groups. From the the First Order Conditions for both political parties $P \in \{A, B\}$,taking (145) for a pair of groups k and k', in equilibrium:

$$\frac{\psi}{\phi}\phi^k \frac{dV_P^{kN}(y_P^{kN}, \mathbf{h}_{gP}^N)}{dy^k} = \frac{\psi}{\phi}\phi^{k'} \frac{dV_P^{k'N}(y_P^{k'N}, \mathbf{h}_{gP}^N)}{dy^{k\prime}} \qquad \forall k.k' \in \{1, ..., J\} \tag{174}$$

Thus, the political relative treatment in terms of numeraire between elderly and non-elderly citizens is given by:

$$\phi^k u_c(c^{kN}, h^{kN}) = \phi^{k'} u_c(c^{k'N}, h^{k'N}) \qquad \forall k.k' \in \{1, ..., J\} \tag{175}$$

where $c^{kN} = c_P^{kN} = y_P^{kN}$ and $h^{kN} = h_P^{kN} = h_{gP}^{kN}$; and $c^{k'N} = c_P^{k'N} = y_P^{k'N}$ and $h^{k'N} = h_P^{k'N} = h_{gP}^{k'N}$ $\forall k, k' \in \{1, ..., J\}$; with $y_P^{kN}, y_P^{k'N} > 0$ and $h_{gP}^{kN}, h_{gP}^{k'N} > 0$ for all $P \in \{A, B\}$.

C.3. **Allocative Efficiency**

The first-best problem consists of the maximization of the weighted average of individual utilitites with group-specific Pareto weights, α^j, subject to the economy feasibility constraint. The solution to this optimization problem yields the set of Pareto efficient allocations:

$$\max_{\{c^j, h^j\}_{j=1}^J} \quad \sum_{j=1}^J \mu^j \alpha^j \left[u(c^j, h^j) + \delta^j \Omega(\mathbf{h})\right] \tag{176}$$

$$\text{s.t.} \quad \sum_{j=1}^J \mu^j c^j + \sum_{j=1}^J \mu^j q h^j \leq \sum_{j=1}^J \mu^j w^j \tag{177}$$

The FOCs for an interior optimum are given by:

$$[c^k] \qquad \mu^k \alpha^k u_c = \mu^k \lambda \qquad \forall k \in \{1, ..., J\} \tag{178}$$

$$[h^k] \qquad \mu^k \alpha^k u_h + \sum_{j=1}^J \mu^j \alpha^j \delta^j \frac{d\Omega(\mathbf{h})}{dh^k} = \mu^k q \lambda \qquad \forall k, j \in \{1, ..., J\} \tag{179}$$

The set of Pareto efficient allocation of resources, $\{c_{PO}^j, h_{PO}^j\}_{j=1}^J$, satisfies (178), (179) and the economy feasibility constraint. Furthermore, from the FOCs for consumption of the numeraire (178) I obtain:

$$\frac{\alpha^j}{\alpha^k} = \frac{u_c(c_{PO}^k, h_{PO}^k)}{u_c(c_{PO}^j, h_{PO}^j)} \tag{180}$$

Therefore, a Pareto efficient allocation of numeraire and health for group k must satisfy:

$$\frac{u_h(c^k_{PO},h^k_{PO})}{u_c(c^k_{PO},h^k_{PO})}+\sum_{j=1}^{J}\frac{\mu^j}{\mu^k}\delta^j\frac{\frac{\partial\Omega(\mathbf{h})}{\partial h^k}}{u_c(c^j_{PO},h^j_{PO})} = q \tag{181}$$

$$MRS^k_{h,c}+\sum_{j=1}^{J}\frac{\mu^j}{\mu^k}\delta^j MRS^j_{\Omega^k,c^j} = MRT_{h,c} \quad \forall k,j\in\{1,...,J\}$$

In the political equilibrium, both parties, $P\in\{A,B\}$, announce a menu of net taxation and in-kind transfers policies targeted to group k, (y^{kN}_P,h^{kN}_{gP}), such that:

$$u_h(c^{kN}_P,h^{kN}_P)+\sum_{j=1}^{J}\frac{\phi^j}{\phi^k}\frac{\mu^j}{\mu^k}\delta^j\frac{\partial\Omega(\mathbf{h}^N_P)}{\partial h^k_g}=p_h u_c(c^{kN}_P,h^{kN}_P) \tag{182}$$

$\forall\ k,j\in\{1,...,J\}$ and $\forall\ P\in\{A,B\}$; where $c^{kN}_P=y^{kN}_P$ and $h^{kN}_P=h^{kN}_{gP}$.

From the equilibrium relative treatment between groups in terms of numeraire (175) I obtain:

$$\frac{\phi^j}{\phi^k}=\frac{u_c(c^{kN},h^{kN})}{u_c(c^{jN},h^{jN})} \quad k,j\in\{1,...,J\} \tag{183}$$

Introducing (176) into the equilibrium political allocation of group k (182):

$$u_h(c^{kN}_P,h^{kN}_P)+\sum_{j=1}^{J}\frac{u_c(c^{kN},h^{kN})}{u_c(c^{jN},h^{jN})}\frac{\mu^j}{\mu^k}\delta^j\frac{\partial\Omega(\mathbf{h}^N_P)}{\partial h^k_g} = p_h u_c(c^{kN}_P,h^{kN}_P) \tag{184}$$

$$\frac{u_h(c^{kN}_P,h^{kN}_P)}{u_c(c^{kN}_P,h^{kN}_P)}+\sum_{j=1}^{J}\frac{\mu^j}{\mu^k}\delta^j\frac{\frac{\partial\Omega(\mathbf{h}^N_P)}{\partial h^k_g}}{u_c(c^{jN},h^{jN})} = p_h$$

$$MRS^{kN}_{h,c}+\sum_{j=1}^{J}\frac{\mu^j}{\mu^k}\delta^j MRS^{jN}_{\Omega^k,c^j} = MRT_{h,c}$$

Hence, the consumption bundle of group k, $(c^{kN},h^{kN})\ \ \forall k\in\{1,...,J\}$, that results from the political process is Pareto efficient.