# Social Heterogeneity and Wasteful Lobbying

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## Abstract

Using a general equilibrium model with endogenous policy, we explore how heterogeneity affects wasteful lobbying by sectoral interest groups. With the help of a simulation approach, we first investigate the impact of information heterogeneity on how lobbies react to a shift from a soft to a strict government budget constraint. Next, we examine how lobbying is influenced by heterogenous perception of the general equilibrium implications of lobbying effort. Finally, we explore the consequences of heterogenous specialization in households' asset portfolios. We conclude that social heterogeneity in information, perceptions, and portfolio compositions increases incentives to lobby.

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# Heterogeneity and Wasteful Lobbying

## *1. Heterogeneity as a Source of Wasteful Lobbying*

Thanks to the important contributions of the public choice school, economists and political scientists have long recognized that lobbying activities can be an important source of resource wastage (e.g., Tullock, 1980; Krueger, 1974; Bhagwati, 1982). This happens not only through the policy distortions which lobbying may induce, but also through the wastage of resources which are rationally expended in lobbying activities by special interest groups. In recent years, considerable attention has been given to the role of heterogeneity of incomes or endowments in collective action (e.g., Quiggin, 1993; Johnson and Libecap, 1982). In that literature, heterogeneity has been analyzed in terms of the role which intra-group differences play on the ability of a group to cooperate, generally finding that some forms of heterogeneity are detrimental to successful cooperation (e.g., Baland and Platteau, 1996). Here, we focus instead on aspects of heterogeneity across groups which may induce particular groups to modify their lobbying behavior.

Interest in inter-group heterogeneity is in part motivated by widespread political liberalization which has removed the lid on internal conflicts of influence over the state. In highly heterogenous societies, like those in the Balkans, Eastern Europe, and Africa, such conflicts have frequently unleashed intense wars of influence over state policy. One factor that seems to have played an important role in the success of economic and political reforms is the degree of inter-group heterogeneity characterizing the communities that have acquired greater control over local governments in the wake of political liberalization.

Interest in inter-group heterogeneity is also related to the effect it has on the outcome of economic liberalization. Reforms modify the prevailing political equilibrium and appear to induce a flurry of new lobbying activity. For instance, stabilization and adjustment policies have typically closed the era of debt-financed soft budget constraints. In their stead, these policies have introduced strict budgetary rules. These changes seem to have created incentives for increased lobbying. Further, in a context of heterogeneity, uneven information about reforms across groups may induce better informed groups to increase lobbying and capture a rent from the other groups' ignorance. Rising heterogeneity in sectoral rigidities can also induce more rigid sectors to seek trade protection through lobbying. Finally, increasing heterogeneity in the asset portfolio of households may induce more lobbying compared to a situation where the state plays an important redistributive role and economic interests are less polarized. If sectoral rigidities get reinforced by growth and liberalization, and if household portfolios of physical and human capital become increasingly sector-specific, incentives may be created for sectors and interest groups to intensify wasteful lobbying expenditures, thereby dissipating some of the expected benefits of economic reform.

In this paper, we develop a formal model of endogenous lobbying behavior to explore these aspects of the role of heterogeneity. The framework is inspired from the works of Tullock (1980), Zusman (1976), Becker (1983), and Magee, Brock, and Young (1989). Specifically, we use an archetype general equilibrium model where specific social and economic features lead to different levels of endogenous resource wastage in lobbying. Unlike Grossman and Helpman (1994), we do not restrict ourselves to a particular set of political institutions, e.g., campaign supports. In our model, the policy is defined by maximization of a governance function which can be derived, following

Zusman (1976), from a game theoretic formulation in which the government has its own agenda which lobbies can influence by rewards and punishments. Instead of focusing on direct transfers between groups, as in Swinnen and de Gorter (1993), we focus on trade policy. In the formulation that we adopt, interest groups have a Stackelberg leadership position relative to the state, while they play a Nash non-cooperative game with each other. We do not, as in Baik (1994), allow winners to compensate losers through side payments. The simulation framework we propose is highly versatile and can be adapted to explore other aspects of collective action in a general equilibrium framework where the level of complexity typically prevents obtaining analytical solutions.

We focus our attention on aspects of heterogeneity that are potential determinants of increased resource wastage in lobbying. First, we consider shifts in budgetary rules from soft budget constraint to fiscal discipline and heterogenous information across groups about the reforms in progress. We then turn to heterogenous time horizons across groups and assume that some groups only visualize the partial equilibrium implications of lobbying. We examine whether there is room for strategic games of myopia where pretense of ignorance of the general equilibrium effects of lobbying may enhance the bargaining position of a particular lobby. Next, we investigate the effect of heterogeneity in sectoral rigidity. Finally, we explore how lobbying efforts respond to increasing heterogeneity in the level of specialization of household assets portfolios. Given that our results rely on numerical simulations, they should be considered as exploratory and are not fully generalizable without further analytical work. They nevertheless provide valuable insights regarding the processes at work and should help guide future work in this promising area.

## *2. A Model of Lobbying for Trade Protection*

To minimize the risk of 'black box' effects that often plague intricate general equilibrium models, we organize our presentation around a simple neo-classical model with three sectors, two of which produce tradables (e.g., Fafchamps, Sadoulet and de Janvry (1993)). The state chooses tariffs to maximize a weighted sum of individual utilities. Owners of physical and human capital in each sector lobby the state for trade protection. Lobbying is wasteful. The order in which agents make decisions is assumed to be as follows. Lobbies move first by choosing their level of lobbying effort. All lobbies move simultaneously. Lobbying determines, through an influence function, the weights that the state attributes to each sector in its governance function. Taking the lobbies' actions as given, the state then maximizes social welfare by choosing a set of trade taxes, tariffs and subsidies. These policies affect relative prices and thus the production and consumption decisions of producers and consumers in the economy. Thus, while the state act as a Stackelberg leader with respect to producers and consumers, lobbies as a group act as Stackelberg leaders with respect to the state: they set the level of their lobbying effort after internalizing the state's reaction function. Among themselves, however, lobbies play a Nash game.

The three-tier Nash-Stackelberg structure of the model makes it difficult to derive analytical results linking lobbying to heterogeneity in the economy itself. This is why we rely on a numerical approach. We begin by presenting the structure of the economy. We then introduce the state's optimization problem and explain how trade policy is determined. We then model tariff seeking by lobbies. The functional forms and numerical algorithm used in the simulations are presented in a technical appendix.

### 2.1 The Economy

The economy has three sectors denoted $a$, $m$, and $s$. Two of these sectors, which for exposition purposes we shall call agriculture $a$ and manufacturing $m$, produce tradables. The third, $s$, which we call services, produces non-tradables. Interindustry flows of intermediate goods are ignored. Output is produced with two factors, capital and labor. Sector-specific human capital and skills are treated as part of capital. Unlike in Mayer (1984), capital is treated as a fixed factor: it cannot be reallocated from one sector to another. Labor is mobile across sectors; consequently, there is a single wage rate $p_l$.

Producers maximize profits. They behave competitively and take prices $p_a$, $p_m$, $p_s$, and wages $p_l$ as given. Profits $\Pi_h$ in sector $h \in H \equiv \{a, m, s\}$ are given by the profit function $\Pi_h(p_a, p_m, p_s, p_l)$. Output supply in sector $h$ is denoted $Q_{hh}$; labor demand in the same sector (which, by construction, is a negative number) is written $Q_{hl}$. From optimality we have:

$$Q_{hh} = \frac{\partial \Pi_h}{\partial p_h} \quad \text{and} \quad Q_{hl} = \frac{\partial \Pi_h}{\partial p_l}, \quad h \in \{a, m, s\}. \tag{1}$$

Factor income is distributed to households according their their endowments of capital and labor. Each household has one unit of pure labor sold at the going wage rate $p_l$. Households own all the capital in the economy. Relative endowments of capital and labor are idential across households but individual households own capital only in one of the three sectors.[1] As a result, they naturally identify with that sector. Unlike Magee, Brock, and Young (1989), we focus on sectoral issues and ignore possible divergence of interest between workers and owners of capital. Given these assumptions, lobbying is

[1] We dispense with this assumption in section 5 where we investigate the effect of asset portfolio composition on lobbying.

organized along sectoral interest lines.

The number of households who own capital in sector $h$ is written $N_h$; they are all identical. Total population is denoted $N \equiv \sum_{h \in H} N_h$. Household income is the sum of sectoral profits $\Pi_h$, wage income $p_l N_h$, taxes $T_h$, and lobbying expenditures $p_l L_h$ where $L_h$ is the level of labor resources devoted to lobbying (see infra). Individual income is thus:

$$y_h = \frac{1}{N_h}\left[\Pi_h(p_a, p_m, p_s, p_l) + p_l N_h - T_h - p_l L_h\right], \quad h \in H. \tag{2}$$

Households take prices as given and maximize their utility subject to the above budget constraint. Their indirect utility function is $V_h(y_h, p_a, p_m, p_s)$. Consumption demand by household $h$ for good $k$ is denoted $c_{hk}$. It is a function of prices and income and is related to $V_h$ by Roy's identity, i.e.:

$$c_{hk} = -\frac{\partial V_h / \partial p_k}{\partial V_h / \partial y_h}. \tag{3}$$

The market clearing condition for labor and services are:

$$\sum_{h \in H} (N_h + Q_{hl} - L_h) = 0 \tag{4}$$

$$\sum_{h \in H} (Q_{hs} - N_h c_{hs}) = 0 \tag{5}$$

The price of tradable goods $t \in \{a, m\}$ is fully determined by the exchange rate $e$, the international price $p_t^*$, and an ad valorem tariff denoted $t_t$:

$$p_t = e\, p_t^* (1 + t_t), \quad \text{for } t \in \{a, m\}. \tag{6}$$

The tariff turns into a trade subsidy if $t_t < 0$. The balance of trade is:

$$\sum_{t \in \{a, m\}} p_t^* \sum_{h \in H} (Q_{ht} - N_h c_{ht}) = 0. \tag{7}$$

Equations (1) to (7) fully describe how the economy responds to changes in lobbying $L_h$, taxes $T_h$, and tariffs $t_t$. Since the resulting system of equations is homogenous in prices and satisfies Walras Law, one price, $p_l$, is chosen as numeraire and the trade balance,

equation (7), is dropped.

### 2.2 The State's Optimization Problem

The state maximizes a governance function $\sum_{h \in H} I_h V_h(y_h, p_a, p_m, p_s)$ defined over the utility levels of the three types of households. Welfare weights $I_h$ capture the sympathies of the state; they can be altered through lobbying. Unlike in Feenstra and Bhagwati (1982) and Findlay and Wellisz (1982) where a direct relationship between lobbying and policy is postulated, we assume that lobbying by sectoral interest groups only influence the weight they have in the government's welfare function. The state, not lobbies, remains ultimately in charge of policy decisions.

To focus attention on trade protection, we assume that the policy instruments controlled by the state include sector-specific tariffs $t_a$ and $t_m$ on tradable goods. The state's budget constraint is:

$$G = - \sum_{t \in \{a,\ m\}} e\ p_t^* t_t \sum_{h \in H} (Q_{ht} - N_h c_{ht}), \tag{8}$$

where $G$ is government surplus (deficit in the case of trade subsidies). This surplus is returned to households through lumpsum transfers $T_h$. Unlike Swinnen and de Gorter (1993), we assume that the state cannot use these transfers to redistribute resources among households.[2] Consequently, we assume that $G$ is redistributed equally among households, i.e.:

$$T_h = \frac{N_h}{N} G. \tag{9}$$

[2] If lumpsum transfers can be used for redistribution, the second welfare theorem implies that allocative decisions can be separated from equity issues: interest groups would lobby for direct transfers but preserve first best in trade (e.g., Feenstra and Bhagwati (1982)). Grossman and Helpman (1994) identify conditions under which lobbies may prefer to have the government use trade policy to transfer income.

The state is subject to political pressure but is otherwise efficient. As in Appelbaum and Katz (1987), the state takes consumers' and producers' reaction functions into account when setting relative prices through its choice of tariffs. The state also understands the budgetary and general equilibrium implications of its policies. It treats world prices $p_t^*$, lobbying effort $L_h$, and populations $N_h$ as given. Its optimization problem can thus be written:

$$\underset{t_a,\, t_m}{Max} \sum_{h \in H} I_h V_h(y_h,\, p_a,\, p_m,\, p_s) \tag{10}$$

subject to equations (1) to (6), (8), (9), and $p_l = 1$.

This system of equations is undetermined in $e$ and $t_t$. It is indeed easy to see from equation (6) that tariffs and the exchange rate always appear jointly in the form $e(1+t_t)$. The exchange rate cannot, therefore, be identified separately from the $t_t$'s. The reason is that the same domestic prices can be achieved through a low exchange rate $e$ and high tariffs $t_a$ and $t_m$, or with a high $e$ and low tariffs. Since by construction the balance of trade is always in equilibrium, the tax incidence on the government budget is identical in both cases. To eliminate this indeterminacy, we normalize the exchange rate and set it equal to one. With this normalization, the government effectively sets the domestic prices of tradables by choosing trade taxes. The model can thus be simplified by letting the government choose domestic prices of tradables directly and dropping equations (6). With these changes, the state optimization problem can be rewritten:

$$\underset{p_a,\, p_m,\, p_s,\, G}{Max} \sum_{h \in H} I_h V_h(y_h,\, p_a,\, p_m,\, p_s) \tag{11}$$

subject to

$$y_h = \frac{1}{N_h}\left[\Pi_h(p_a,\, p_m,\, p_s,\, 1) + N_h + \frac{N_h}{N}\, G - L_h\right], \quad h \in H \tag{12}$$

$$G = -\sum_{t \in \{a,\ m\}} (1 - p_t) \sum_{h \in H} (Q_{ht} - N_h c_{ht}) \tag{13}$$

$$\sum_{h \in H} (N_h + Q_{hl} - L_h) = 0 \tag{14}$$

$$\sum_{h \in H} (Q_{hs} - N_h c_{hs}) = 0 \tag{15}$$

and the output supply, input demand, and consumption demand equations (equations 1 and 3). Taken together, these equations represent the optimization problem that the government faces. They also implicitly determine the state's reaction to changes in welfare weights.

### 2.3 Tariff Seeking

We now turn to lobbying.[3] Interest groups have to spend real resources in order to gain influence (Krueger (1974), Posner (1975), Varian (1989)). We assume that lobbying requires -- and thus wastes -- labor. The idea is that lobbying diverts productive manpower to directly unproductive activities such as hiring consultants and lawyers, involving employees and management in lobbying activities, withdrawing production to put pressure on government, encouraging or allowing strikes to occur, etc (e.g., Bhagwati (1982)).

The economic, social, and political process whereby sectoral interest groups influence the state is summarized by a reduced form influence function that transforms lobbying labor $L_h$ into welfare weights $I_h$:

$$I_h = f_h(L_a, L_m, L_s). \tag{16}$$

Welfare weights sum to ones. Without lobbying, they are proportional to the relative size of the population in each group, as in Becker (1983). Given the symmetry of the econ-

[3] The term 'lobbying' is understood here in a broad sense. Our framework is sufficiently general to accomodate other forms of political pressure.

omy, they are also equivalent to Negishi weights. Consequently, in the absence of lobbying, the state opts for free trade and sets $t_a = t_m = 0$ (Negishi, 1960). The initial sympathies of the state are thus assumed neutral across sectors and in favor of free trade. Lobbying can be described as tariff (or trade subsidy) seeking.

Each sectoral interest group chooses a level of tariff seeking activity $L_h$ that maximizes its own utility $V_h$, taking the level of lobbying by other interest groups as given.[4] The effect of lobbying on utility $V_h$ depends on how $I_h$ varies with $L_h$, how the state modifies relative prices in response to changes in $I_h$, and how these changes affect production choices, profits, wages, and consumption. Interest groups are assumed to know the influence functions of all other groups, the state's governance function, and the general structure of the economy. They realize that the state is setting domestic relative prices by manipulating trade barriers and incentives. If they are fully rational, they also understand that the state is solving an optimization problem of the form (11) to (15). The solution to this optimization implicitly determines how policies respond to lobbying efforts by sectoral interest groups. The choice facing each interest group *h* can thus be written as:

$$\underset{L_h}{Max}\ V_h(y_h, p_a, p_m, p_s) \tag{17}$$

subject to equation (16) and the first order conditions to the state's optimization problem. Each lobby *h* takes as given the level of lobbying $L_k$, $k \neq h$ by other sectoral interests. The Nash equilibrium of the tariff seeking game is naturally defined as the vector(s) of lobbying efforts $\{L_a^*, L_m^*, L_s^*\}$ at which no group wants to change its level of lobbying given the levels of lobbying of the others.

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[4] Strictly speaking, each interest group cannot spend on lobbying more than the labor resources that have not already been wasted on tariff seeking by other groups. In the simulations reported here, decreasing returns to lobbying ensure that this upper limit is never binding and can be ignored (see appendix).

We also examine what happens when interest groups fail to perceive or refuse to acknowledge some of the macroeconomic constraints that the economy -- and thus the state -- must eventually satisfy. If the reaction they anticipate from the state is different from its actual behavior, interest groups are then said to be myopic or irrational. Their erroneous anticipations nevertheless determine their lobbying effort $L_h$ and thus the equilibrium of the economy. We focus our attention on misperceptions regarding the balanced government budget and the labor market equilibrium condition. To derive the state's reaction function anticipated by myopic lobbies, a different, less constrained state optimization problem must be solved. The reader should keep in mind that this optimization problem is a fabrication of myopic lobbies; it is not the one that subsequently determines the state's actual policy choices.[5]

Formally, the true optimization model of the state is rearranged as follows:

$$\underset{p_a,\, p_m,\, p_s,\, G}{Max} \sum_{h \in H} I_h V_h(y_h,\, p_a,\, p_m,\, p_s) - \lambda_G D^2 - \lambda_L X^2 \tag{18}$$

subject to:

$$y_h = \frac{1}{N_h}\left[\Pi_h(p_a,\, p_m,\, p_s,\, 1) + N_h\left(1 + \frac{X}{N}\right) + \frac{N_h}{N}\, G - L_h\right], \quad h \in H \tag{19}$$

$$D = G - \sum_{t \in \{a,\, m\}} (1 - p_t) \sum_{h \in H} (Q_{ht} - N_h c_{ht}) \tag{20}$$

$$X = -\sum_{h \in H} (N_h + Q_{hl} - L_h) \tag{21}$$

$$\sum_{h \in H} (Q_{hs} - N_h c_{hs}) = 0. \tag{22}$$

Variables $D$ and $X$ represent the government deficit and the excess demand for labor,

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[5] Provided that levels of lobbying are publicly observable, interest groups should over time revise their expectations regarding the state's response to lobbying. If lobbying is not publicly observable, however, lobbies may form erroneous beliefs regarding the level of lobbying activity by other interest groups (e.g., conspiracy theory) instead of realizing the existence of macroeconomic constraints. This in turn may lead to more lobbying. These issues are left for future research.

respectively. If myopic interest groups implicitly postulate the existence of surplus labor, excess demand for labor $X$ may arise. We assume that it is met by extra effort provided by all households in proportion to their labor force. To ensure that Walras Law still holds, the extra labor income $p_l X$ is distributed among households -- hence the extra $X/N$ term in the modified income equation (19).[6] Similarly, when interest groups ignore the effect of tariff policy on the balance of trade, we suppose that they implicitly assume that foreign borrowing provides the necessary resources to cover the trade deficit and, by Walras Law, the government deficit $D$ as well (see equation (20)).

Variables $X$ and $D$ formally enter the state's objective function with weights $\lambda_G$ and $\lambda_L$. These weights can be thought of as penalty functions: if either or both of them are small, macro constraints are violated. If these weights are large, the welfare cost of failing to satisfy constraints is high, and $D$ and $X$ are kept at a minimum. By setting $\lambda_G$ and $\lambda_L$ to arbitrarily large numbers, the solution to systems (11) to (15) and (18) to (22) can be made to coincide. Myopia regarding the labor market is simulated by setting $\lambda_L$ to 0 and $\lambda_G$ to a large positive number. Myopia about the sustainability of the government deficit is simulated by doing the reverse.

The lobbying model presented here is too complex to be solved analytically but its Nash equilibrium can be found numerically. A detailed description of an algorithm capable of solving the lobbying model is presented in appendix. Simulations are used in the following two sections to explore the effects of heterogeneity on lobbying.

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[6] If Walras Law is violated, the optimization problem of the state is ill defined and, in general, unbounded. This implies that the reaction function of the state is itself undefined.

## *3. From Soft to Strict Budget Constraint With Heterogenous Information*

A systematic feature of the post-1982 economic order is the inability of governments to maintain a soft budget constraint and to continue meeting their budget deficits through higher levels of foreign indebtedness. For that reason, economic liberalization generally means shifting from a soft to a strict government budget constraint. Sectoral interest groups may differ, however, in the extent to which they recognize that the rules of the lobbying game have changed. Differences in information about the true nature of economic liberalization thus characterize one important dimension of heterogeneity that may affect lobbying behavior.

The questions we raise in this section are whether the shift from soft to hard budget constraint tends to increase or decrease lobbying, and what is the impact that asymmetric information about new budgetary rules across interest groups has on the more and less informed sectors and on society at large. The simulation model presented in section 2 helps provide a tentative answer to these important questions. We begin by considering what happens when all sectoral interest groups are equally informed. We then allow for asymmetric information.

### 3.1 Symmetric Information

Before we can discuss the effect that policy change has on lobbying, we need a base run to compare results to. We therefore begin by reporting simulated base run values. Functional forms and parameter values used in these simulations are reported in appendix. The base run assumes perfectly rational lobbies with perfect information about the strict constraints facing the economy. Simulated values are reported in experiments 1 to 3 of Table 1. Experiment 1 shows that, when all $L_h$ = 0, tariffs $t_a$ and $t_m$ equal 0 and all

domestic prices equal 1. This is hardly surprising since the model was deliberately set in such a way that free trade is chosen by the state in the absence of lobbying. Because of symmetry, there is no trade. Since there are no trade taxes or subsidies either, there is no government budget surplus or deficit to be distributed across household groups via transfers and $G = T_h = 0$.

Experiment 2 shows the optimal level of lobbying that sector *a* would choose in the absence of lobbying by other sectors, and the ensuing equilibrium of the economy. Results indicates that a sector that lobbies alone influences the government's welfare function in such a way that it obtains an increase in its own welfare while the utilities of the other two sectors decrease. The welfare gain is obtained through a differential price support for the lobbying sector, with $p_a = 1.023$. The other tradable sector is taxed. The subsidized sector increases its production and becomes net exporter, while the taxed sector decreases its production and becomes a net importer.

The relative prices of the two tradable sectors are determined by the necessary equilibrium between imports and exports imposed by the balance of trade constraint. The price of non-tradables (and thus the real exchange rate) is determined by the aggregate level of the trade imbalance. In this case, a small real devaluation results from the waste of domestic resources due to lobbying. The price distortions imply an export subsidy for *a* and an import subsidy for *m*. These government subsidies are covered by a negative transfer (a tax) on all three sectors. To summarize, the non-tradable sector pays a tax, the lobbying sector gets a favorable price support, partially eroded by tax, and the other tradable sector is detrimentally affected by both the trade distortion and the tax.

Experiment 3 shows what happens as other sectors respond to *a*'s lobbying. A Nash

equilibrium results in which sectors *a* and *m* decide to lobby, there is a general waste of resources, and no effective protection is achieved. Positive marginal returns to lobbying thus give rise to a form of prisoner's dilemma in this game of influence. Tradable sectors lose the most as they fruitlessly expend resources in lobbying. The non-tradable sector, which chooses to passively watch the lobbying efforts of the two other sectors without participating in it, only loses marginally as the overall economy shrinks.

Now that we have described the base run and that we have a better understanding of the mechanisms at work, we are ready to compare what would happen under different assumptions. Our first experiment is to allow for a soft budget constraint and to let foreign capital inflows cover the government deficit. Lobbies correctly anticipate that the state itself does not treat its own budget constraint as binding. The results from this experiment can then be compared to experiment 3 to see how a shift from soft to hard budget constraint affects lobbying. Table 1 reports the outcome of the experiment in three steps: the optimal policy with no lobbying (experiment 4), the optimal lobbying behavior of a single sector when others are not lobbying (experiment 5), and the equilibrium solution of the lobbying game (experiment 6). These experiments are formally equivalent to experiments 1, 2, and 3, except that $\lambda_G$ in equations (18-22) is now set to 0.

Consider experiment 4 first, that is, the equilibrium without lobbying. The government can rely on foreign borrowing to cover its deficit. The resulting inflow of foreign funds increases domestic output and welfare (GDP rises compared to experiment 1). It also induces the classical Dutch Disease phenomenon: relative to experiment 1, there is a large appreciation of the real exchange rate (the price of non-tradables increases to 1.073). Production in the service sector rises, attracting labor into that sector. The production and prices of tradables decline while consumption goes up: the economy

becomes a net importer of tradables. The total budget deficit is 3.03, which covers the cost of import subsidies (0.11) and allows for sizeable transfers to households (2.92). The inflow of foreign funds allows the country to (temporarily) live above its means and is thus beneficial to the short term welfare of all households: utility goes up in all three groups. Long term detrimental effects on the economy are ignored here as we focus exclusively on the effects of the Dutch Disease on lobbying activity.

Now consider the lobbying efforts of a single sector (experiment 5). Households in sector *a* seek to reduce the discriminatory tax on their sector to increase output and raise profits. The expected impact of lobbying is a lower tax (price rises from .965 to .981). This results in a lower government deficit and thus less foreign borrowing. By supporting the price and production of sector *a*, the government indirectly reduces the inflow of foreign funds. Taxation is raised on the non-lobbying sector, but the overall deficit remains lower than in the non-lobbying case. Hence, the "productivity" of lobbying is reduced by the fact that it reduces the foreign transfer. This explains why the optimum level of lobbying is lower under a soft budget constraint than it is under a strict budget constraint. As is intuitively clear from the argument above, this effect does not depend on parameter values and is qualitatively robust.

When all sectors follow this logic (experiment 6), the symmetry of the economy implies that the resulting war of influence cannot induce any differential among tradables. The outcome is a policy of direct transfer to households, with the implied Dutch Disease, in addition to the resource wastage due to lobbying (experiment 6). By comparing experiment 3 to experiment 6, we thus see that shifting to stricter budgetary rules leads to more lobbying. It also results in higher prices for tradables and lower prices for non-tradables, lower GDP as there is more resource wastage in lobbying and no more

inflows of funds from abroad, and consequently sharply lower utility levels for all sectors.

Stabilization and adjustment are thus prone to enhance resource wastage in domestic wars of influence.[7] The reason why this occurs is that, under a soft budget constraint, lobbying creates redistributive gains at a double net social cost: (1) a wastage of labor and (2) a negative externality. This externality comes from the reduced foreign capital inflows necessary to balance the government budget, as lobbying raises the price of tradables, increases production, reduces imports, and thus lowers the trade deficit and foreign borrowing. By contrast, with a strict budget constraint, lobbying creates redistributive gains with a single net social cost: the associated labor wastage. By reducing the opportunity cost of lobbying, therefore, the new budgetary rules enhance the incentive to invest in the exercise of influence.

### 3.2 Information Heterogeneity

During the transition from soft to strict budgetary rules, not all sectoral interest groups may become simultaneously aware of the new rules of the game: one sector (say *m*) may be informed while the other tradable sector still operates under the illusion that the old soft budget constraint applies. There is heterogeneity. Such a situation is depicted in experiment 7. The level of lobbying of the myopic sector is derived using $\lambda_G = 0$ in equations (18-22), but the actual equilibrium of the economy is obtained using equations (11-15) with a binding government budget constraint.

Simulation results show that the informed sector sharply increases its lobbying

[7] This, of course, should not be considered as an argument against stabilization and adjustment but rather as a warning against an undesirable consequence.

(experiment 7) compared to the former soft budget constraint rule (experiment 6). It also lobbies more than under symmetric information (experiment 3). The uninformed sector increases its lobbying only marginally, and this for defensive purposes as it sees the other step up its attacks. The non-tradable sector again chooses not to lobby. There is less overall lobbying than when the strict budget constraint is recognized by all sectors (experiment 3) and hence less resource wastage and a higher GDP, thanks to the ignorant sector. This GDP gain is basically captured by the informed sector: its price, output, exports, and utility levels rise, while those of the uninformed sector fall marginally. Early information or awareness about the transition from soft to strict budgetary discipline creates a differential rent from lobbying.

## *4. Heterogenous Perceptions and Labor Market Constraints*

We now explore how lobbying behavior is influenced by myopia regarding the effect of lobbying on wages. We focus on differences in the degree to which sectors correctly anticipate and are concerned by the implications of their lobbying on the labor market. In the lobbying equilibrium with full information, we have seen that the real wage increases as labor is wasted in lobbying activities (Table 3, experiment 3). Because the two tradable sectors hire labor to support their lobbying efforts, the increase in real wage represents a net cost to them and thus contributes to reducing the benefit from lobbying. Lobbies may, however, be myopic and fail to recognize the wage impact of lobbying, either because they are ignorant or because they have a very short time horizon. There also may be differences in lobbies' perception of and concern for the real wage implications of their actions.

We begin by examining the lobbying equilibrium in which all sectors are equally myopic about the effect of their lobbying on the economy at large. Next, we investigate what happens when certain sectors are more myopic than others. We also discuss the possible existence of perverse incentives to mimic myopia in order for an interest group to improve its position. Throughout this section, optimal levels of lobbying are obtained by setting $\lambda_L = 0$ in equations (18) to (22) to compute the state's reaction function anticipated by the lobbies, but the realized equilibrium is based on equations (11) to (15) with full employment.

### 4.1 Symmetrical Myopia

In order to understand why myopic interest groups lobby more, we must depict what they implicitly expect to happen as a result of their action. Experiment 7 in Table 2 presents what one sector expects to happen when it is the only one to lobby. What both sectors expect to happen at the myopic Nash equilibrium is depicted in experiment 8. Experiment 9 shows what actually happens when the labor market constraint is real. Given that lobbies implicitly postulate the existence of a labor reserve, they anticipate that all domestic prices could be raised and that production would grow in all sectors. When only one sector actively lobbies (experiment 7), it expects to obtain a favorable treatment which would allow it to grow more than the other sectors and hence to become an exporter. Because of the trade balance constraint, it anticipates that the other tradable sector will begin importing. The anticipated impact on the government budget is small: the import tariff revenue exceeds the cost of export subsidies only by a little. The net government revenue so generated (0.08) is distributed to households. The increase in labor force needed to satisfy the labor demand is equivalent to 15% of the initial labor

available in the economy. In this myopic model, lobbies assume that this additional employment will generate wage payments for their members.

If both sectors are myopic and actively lobby, the outcome is a high level of lobbying by the two tradable sectors. The service sector again chooses not to lobby for trade distorsions. The differential benefits sought by the lobbies cancel each other. However, they expect that economic growth will take place and benefit all (experiment 8). In reality, the economy does not have idle labor resources (experiment 9). Because of greater use of labor in lobbying, the real wage increase by 4.2% instead of the anticipated large drop. The economy wastes more resources and is forced into a higher real exchange rate devaluation. The utility level in the two tradable sectors is sharply less than expected, and also less than under perfect information. The failure to recognize that economic resources are limited and wasted by the lobbying process thus results in more lobbying; myopia is wasteful for all.

### 4.2 Asymmetrical Myopia

We now consider the case when there is heterogeneity in the sense that only one sector, say *a*, is myopic. Experiment 10 presents the Nash equilibrium expected by sector *a* when all sectors choose their level of lobbying optimally; experiment 11 shows the realized equilibrium. Simulation results indicate than the myopic sector lobbies more than the non-myopic sector. This is because myopia induces it to underestimate the cost of lobbying. It expects the economy to grow rapidly, thereby generating benefits for all, but especially for itself (experiment 10). The real outcome (experiment 11) is of course much less favorable. The waste of labor resource induces a real devaluation. All sectors lose compared to the case of lobbying under perfect foresight. Yet, the myopic sector

ends up better off than the informed sector, because it has lobbied more: it is less taxed and its utility level is above that of the informed sector.

Does this result imply that lobbies have an incentive to be or to pretend to be myopic? Not in terms of absolute utility. This can be seen by comparing sectoral payoffs in experiments 3, 9, and 11 (Table 2). The corresponding payoff matrix is summarized in the first part of Table 3. As the Table shows, if the other sector is myopic (e.g., sector *a* in experiment 11), being informed yields the highest utility: 0.498 instead of 0.494. Similarly, if the other sector is informed (sector *m* in experiments 3 and 11), the best option is to be informed as well: utility is 0.521 compared to 0.516. It is therefore always in a player's interest to be informed. Myopia is costly both at the individual and the aggregate levels.

The interesting issue is when lobbies reason in relative instead of absolute terms, as would be the case if sectoral payoffs with lobbying serve as threat points in a negotiation and thus influence the bargaining power of each lobby. By pretending to be myopic, a lobby can credibly threaten to impose a high penalty on the other sector at a relatively low cost to itself, should the negotiation break down. Compare, for instance, experiment 3 where no sector is myopic to experiment 11 where sector *a* is myopic and sector *m* is not: by being myopic, sector *a* reduces its utility from 0.521 to 0.516. But at the same time it reduces its opponent's utility from 0.521 to 0.498 (Table 3, second part). Next, compare experiment 11, where only sector *m* is informed, to experiment 9 where both sectors are myopic: by being myopic, sector *m* reduces its own utility from 0.498 to 0.494, but its opponent's utility drops from 0.516 to 0.494. Both sectors may thus *pretend* to be myopic in order to improve their negotiating stance. If negotiations fail, interest groups may feel that their future credibility is at risk unless they act the way they claimed

they would. The result is an enheightened war of influence and increased wastage of domestic resources.

## *5. Heterogeneity in Asset Portfolios*

There are other dimensions of heterogeneity whose effect on lobbying deserve to be explored. We focus here on differences across economies in the degree to which the physical and human capital portfolio of households is diversified across sectors. Assets portfolio specialization increases the dependence of individual households on the fate of specific sectors of the economy. Owners of installed production capacity and sector-specific capital and skills identify more readily with a particular sector and hence may intensify their lobbying to protect their interests. As we now show, simulation results confirm this intuition and indicate that sectoral heterogeneity in asset portfolios result in greater lobbying effort.

In the base run (experiment 3), households have fully specialized asset portfolios: all the physical and human capital they own is in a single sector. We now simulate a situation where households have diversified portfolios and assume that one third of the assets owned by *m* households is in sector *a*, and vice versa for sector *a* (experiment 12). The rest of the capital held by households *m* and *a* continues to be in their own sector. Results, shown in Table 4, show that, even though portfolio diversification is not complete, the motivation to lobby has virtually disappeared. Even though households in sector *s* remain with a fully specialized portfolio, they continue to stay out of the lobbying race because they have little to gain from trade protection.

These results clearly indicate that polarized economic interests in sectors exposed to

international trade result in higher levels of lobbying for trade protection. They are thus broadly consistent with the casual observation that countries with polarized sectoral interests such as those in Latin America appear less able to introduce policy reforms than countries assets portfolios are more diversified, such as Taiwan and Malaysia. Taiwan indeed has a more egalitarian land distribution, thanks to a widespread and successful land reform conducted in the 1950s; its industry is highly decentralized; and human capital is widely distributed thanks to a proactive education policy. Malaysia has pursued a policy aiming at spreading the benefits of growth across the different communities. Ruling over heterogeneity appears as an evident challenge. Institutional mechanisms that reduce portfolio specialization, such as land reform, the organization of a stock exchange, and the creation of mutual funds, may help reduce the conflicts of interest over trade policy and thus minimize wasteful lobbying.

## *6. Conclusions*

Simulations with the general equilibrium model of endogenous lobbying developed in this paper have shown that heterogeneity can have high social costs and creates serious challenges for governance. According to our results, the shift from soft budget constraints to strict fiscal rules that many countries have experienced as part of stabilization and adjustment policies, is expected to induce more lobbying. Misinformation about the new rules, especially if it is distributed unevenly across sectors, enables better informed sectors to lobby more and to capture a lobbying rent from other sectors' ignorance.

Myopia about the general equilibrium effects that lobbying has on the labor market creates an incentive to lobby more as some of the costs from lobbying are underestimated. As a result, more myopic sectors lobby more intensively. While interest groups

cannot improve their absolute welfare by stategically pretending to be shortsighted, they can enhance their relative position by doing so. This creates an incentive for interest groups to blatanty disregard the secondary effects of their lobbying and to engage in destructive lobbying initiatives, an attitude reminiscent of populist mobilization of mass support. Finally, greater heterogeneity in the ownership of productive assets leads to more lobbying, explaining why reforms are more adamantly resisted in countries where households' physical and human capital endowments are highly specialized. Although these results were derived using simulations, they are qualitatively robust: the general equilibrium effects that underlie them are fairly general and do not depend on specific parameter values.

Heterogeneity in information, perceptions, and portfolio compositions thus tend to induce socially wasteful lobbying. This result extends to inter-group issues the importance recently given to intra-group heterogeneity for collective action. It calls upon policy interventions aimed at reducing inter-group heterogeneity as an instrument to achieve greater social efficiency when complex political economy mechanisms are involved. Such interventions include improved information-sharing about the reforms in progress and the secondary consequences of lobbying, and reduced specialization in households' asset portfolio of physical and human capital through wider access to financial markets and better (re)training opportunities.

On the methodological side, we have demonstrated that numerical simulations provide a useful tool to further our understanding of the general equilibrium processes that influence lobbying for trade protection. The methodology developed in this paper can be used to similarly explore other political economy processes that arise in a wide range of concrete setups. Our analysis nevertheless serves as a warning against too much

optimism in our ability to derive important insights from more complicated numerical models: even in the fully symmetrical economy used as reference point in this paper, results are not trivial to interpret as they occur through channels that involve complex economic and political processes. The complexity of these processes also implies that modeling these issues analytically is likely to be difficult. Simulations can help to get a better grasp on the most relevant mechanisms at work, thereby opening fruitful avenues for further analytical work. This is left for future research.

## Technical Appendix

Numerical simulations are conducted as follows. To keep simulations results free from composition effects, we consider a fully symmetrical economy, i.e., one in which all sectors have the same labor endowments $N_h$ and production technology, face the same consumption preferences for their products, and have identical elasticities and influence functions. Each sector produces a single good. Intermediate demand is ignored. Total value added in each sector is equal to 9. In the absence of lobbying, labor gets two thirds of it. Income is spend equally on all three commodities, each sector is exactly self-sufficient in labor and there is no external trade. Prices are normalized to equal 1 in the absence of lobbying.

Specific functional forms are chosen for the profit function, the indirect utility function, and the influence function. All three sectors share the same Generalized Leontief profit function:

$$\Pi_h = 18p_h + 15p_l - 18\sqrt{p_h p_l}\,.$$

The price elasticity of output is equal to 0.5 and the corresponding wage elasticity of labor demand is 0.75. All households share the same Translog indirect utility function:

$$V_h = -\sum_j \frac{1}{3}\ln\frac{p_j}{y} + \frac{1}{2}\sum_j\sum_k 0.1932\,\ln\frac{p_j}{y}\,\ln\frac{p_k}{y}.$$

Elasticities are calibrated so that all restrictions imposed by homogeneity and symmetry are satisfied. The influence function is given the following form, preferred for its ease of use and flexibility:

$$I_h = \frac{N_h + L_h^{\beta}}{\sum_{k\in H} N_k + L_k^{\beta}},$$

where $\beta = 0.5$ to reflect the idea that there are decreasing returns in rent seeking. This

assumption is essential to keep the lobbying equilibrium away from corner solutions. Raising β makes lobbying easier, and results in more lobbying; other qualitative results are essentially unchanged.

The Nash equilibrium of the lobbying game is computed numerically using a Fortran coded algorithm developed for this purpose. The iterative numerical procedure is articulated around a series of nested algorithms that follow closely the presentation of the model in the text. An innermost algorithm solves the economy for output and consumption much as a general computable equilibrium model, treating lobbying levels $L_h$ and tariffs $t_h$ as given. Government transfers are endogenously determined using equation (9). When lobbies are myopic, the modified version of the economy is used instead (see equations 19-22).

This inner algorithm essentially determines a numerical relationship between tariff rates $t_h$ and utility $V_h$. It is then 'fed' to a first outer algorithm that solves the state's optimization problem. This outer algorithm takes lobbying efforts $L_h$ and welfare weights $I_h$ as given and returns utility levels for each sectoral interest group. This outer algorithm defines a new (numerical) function mapping lobbying $L_h$ to utility $V_h$. Again, if lobbies are myopic, the modified version of the state's optimization problem is used instead.

A second outer algorithm then finds the optimum level of lobbying for, say, interest group *a* by maximizing *a*'s utility subject to the numerical relationship between its level of lobbying $L_a$ and $V_a$ given by the first outer algorithm (or subroutine). When maximizing its own utility, interest group *a* treats the levels of lobbying $L_m$ and $L_s$ as given. The solution to this second outer algorithm gives *a*'s best response to actions $L_a$ and $L_s$ taken

by the other two lobbies.

The Nash equilibrium of the lobbying game is found by iterating among the three interest groups as follows. We first find $L_a^*$ given $L_m = L_s = 0$. We then find $L_m^*$ given $L_a = L_a^*$ and $L_s = 0$. Next, we find $L_s^*$ given $L_a = L_a^*$ and $L_m = L_m^*$. We then go back to *a* and resolves for $L_a^{**}$ given $L_m = L_m^*$ and $L_a = L_a^*$. Iterating among the three interest group eventually converges in a cobweb-like fashion to a vector of lobbying efforts that is the (evolutionary stable) Nash equilibrium of the lobbying game. In the case of myopic lobbies, we then resolve the state's optimization problem using these levels of lobbying and the true macroeconomic constraints. Simulation results are reported in Tables 1 to 4 and discussed in detail in the text.

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**Table 1. Lobbying With Strict and Soft Government Budget Constraints**

| | Strict budget constraint | | | Soft budget constraint | | | Only sector m informed |
|---|---|---|---|---|---|---|---|
| | No lobbying | Lobbying | | No lobbying | Lobbying | | |
| | | by a | by all | | by a | by all | Lob. by all |
| | -1- | -2- | -3- | -4- | -5- | -6- | -7- |
| **Lobbying effort** | | | | | | | |
| by sector a | 0 | 0.144 | 0.143 | 0 | 0.096 | 0.097 | 0.099 |
| by sector m | 0 | 0 | 0.143 | 0 | 0 | 0.097 | 0.143 |
| **Utility** | | | | | | | |
| in sector a | 0.550 | 0.578 | 0.521 | 0.674 | 0.693 | 0.654 | 0.520 |
| in sector m | 0.550 | 0.491 | 0.521 | 0.674 | 0.635 | 0.654 | 0.530 |
| in sector s | 0.550 | 0.546 | 0.549 | 0.859 | 0.855 | 0.854 | 0.548 |
| **Domestic prices** | | | | | | | |
| of good a | 1.000 | 1.023 | 0.979 | 0.965 | 0.981 | 0.951 | 0.977 |
| of good m | 1.000 | 0.957 | 0.979 | 0.965 | 0.937 | 0.951 | 0.988 |
| of good s | 1.000 | 0.989 | 0.979 | 1.073 | 1.064 | 1.056 | 0.982 |
| **Production** | | | | | | | |
| in sector a | 9.00 | 9.10 | 8.90 | 8.84 | 8.91 | 8.77 | 8.89 |
| in sector m | 9.00 | 8.80 | 8.90 | 8.84 | 8.70 | 8.77 | 8.94 |
| in sector s | 9.00 | 8.95 | 8.90 | 9.31 | 9.28 | 9.21 | 8.92 |
| **Trade** | | | | | | | |
| export of good a | 0 | 0.45 | 0 | -1.52 | -1.15 | -1.49 | -0.08 |
| export of good b | 0 | -0.45 | 0 | -1.52 | -1.86 | -1.49 | 0.08 |
| trade deficit | 0 | 0 | 0 | 3.03 | 3.00 | 2.98 | 0 |
| **GDP** | 27.00 | 26.85 | 26.71 | 30.01 | 29.89 | 29.77 | 26.76 |
| **Total transfers** | 0 | -0.03 | 0 | 2.92 | 2.86 | 2.84 | 0 |

**Table 2. Lobbying With Myopia about Labor Market Conditions**

| | Perfect information | Symmetrical myopia | | | Only sector a myopic | |
|---|---|---|---|---|---|---|
| | | Expected by all | | Actual | Lobbying by all | |
| | Lobbying by all | Lobbying by a | Lobbying by all | Lobbying by all | Expected by a | Actual |
| | -3- | -7- | -8- | -9- | -10- | -11- |
| **Lobbying effort** | | | | | | |
| by sector a | 0.143 | 0.291 | 0.278 | 0.278 | 0.284 | 0.284 |
| by sector m | 0.143 | 0.000 | 0.278 | 0.278 | 0.142 | 0.142 |
| **Utility** | | | | | | |
| in sector a | 0.521 | 0.744 | 0.659 | 0.494 | 0.683 | 0.516 |
| in sector m | 0.521 | 0.613 | 0.659 | 0.494 | 0.655 | 0.498 |
| in sector s | 0.549 | 0.697 | 0.704 | 0.549 | 0.703 | 0.548 |
| **Domestic prices** | | | | | | |
| of good a | 0.979 | 1.243 | 1.166 | 0.959 | 1.191 | 0.982 |
| of good m | 0.979 | 1.128 | 1.166 | 0.959 | 1.158 | 0.956 |
| of good s | 0.979 | 1.183 | 1.166 | 0.959 | 1.174 | 0.969 |
| **Production** | | | | | | |
| in sector a | 8.904 | 9.926 | 9.666 | 8.811 | 9.753 | 8.917 |
| in sector m | 8.904 | 9.527 | 9.666 | 8.811 | 9.638 | 8.794 |
| in sector s | 8.904 | 9.725 | 9.665 | 8.811 | 9.695 | 8.855 |
| **Trade (Exports)** | | | | | | |
| export of good a | 0.000 | 0.668 | 0.000 | 0.000 | 0.192 | 0.181 |
| export of good b | 0.000 | -0.668 | 0.000 | 0.000 | -0.192 | -0.181 |
| trade deficit | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Labor market** | | | | | | |
| labor deficit | 0.000 | 2.671 | 2.709 | 0.000 | 2.688 | 0.000 |
| real wage | 1.022 | 0.846 | 0.858 | 1.042 | 0.851 | 1.032 |
| **GDP** | 26.710 | 29.178 | 28.995 | 26.432 | 29.087 | 26.566 |
| **Total transfers** | 0.000 | 0.076 | 0.000 | 0.000 | 0.006 | -0.005 |

**Table 3. Payoff Matrix for Strategic Myopia about the Labor Market Constraint**

**A. Absolute Utility**

| | **Sector a** | |
|---|---|---|
| **Sector m** | Informed | Myopic |
| Informed | 0.521 ; 0.521 | 0.498 ; 0.516 |
| Myopic | 0.516 ; 0.498 | 0.494 ; 0.494 |

**B. Relative Utility**

| | **Sector a** | |
|---|---|---|
| **Sector m** | Informed | Myopic |
| Informed | 1 ; 1 | 0.965 ; 1.036 |
| Myopic | 1.036 ; 0.965 | 1 ; 1 |

**Table 4. Lobbying With Sectoral Rigidity and Diversified Portfolios**

| | Base case | | Diversified porfolios |
|---|---|---|---|
| | No lobbying -1- | Lobbying by all -3- | Lobbying by all -12- |
| **Lobbying effort** | | | |
| by sector a | 0.000 | 0.143 | 0.002 |
| by sector m | 0.000 | 0.143 | 0.002 |
| **Utility** | | | |
| in sector a | 0.550 | 0.521 | 0.548 |
| in sector m | 0.550 | 0.521 | 0.548 |
| in sector s | 0.550 | 0.549 | 0.548 |
| **Domestic prices** | | | |
| of good a | 1.000 | 0.979 | 1.000 |
| of good m | 1.000 | 0.979 | 1.000 |
| of good s | 1.000 | 0.979 | 1.000 |
| **Production** | | | |
| in sector a | 9.000 | 8.904 | 8.998 |
| in sector m | 9.000 | 8.904 | 8.998 |
| in sector s | 9.000 | 8.904 | 8.998 |
| **GDP** | 27.000 | 26.710 | 26.996 |
| **Real wage** | 1.000 | 1.022 | 1.000 |