Asymmetric Information and Trade Policy

Giacomo Ponzetto

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Giacomo A. M. Ponzetto
CREI – Universitat Pompeu Fabra

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Abstract

Economists understand protectionism as a costly mechanism to redistribute from the average citizen to special-interest groups; yet political platforms that deviate from free trade have surprising popular appeal. I present an explanation based on heterogeneous information across citizens whose voting decision has an intensive margin. For each politician and each sector, the optimal trade-policy choice caters to the preferences of those voters who are more likely to be informed of that proposal. An overall protectionist bias emerges because in every industry producers are better informed than consumers. This asymmetry emerges in equilibrium because co-workers share industry-specific knwoledge, and because producers have greater incentives to engage in costly learning about their sector. My model implies that more widespread information about trade policy for an industry is associated with lower protection. Cross-sectoral evidence on U.S. non-tariff barriers and newspaper coverage is consistent with this prediction.

I. Introduction

The efficiency of free trade is among the least controversial propositions in economics. Trade restrictions are understood to be mostly wasteful redistributive measures that benefit special-interest groups but harm the general public. The prevailing explanation of protectionism hinges on the power of organized lobbies to sway politicians and obtain favorable policies at the expense of the average citizen (Grossman and Helpman 1994). However, protectionist policies have a surprisingly enduring popular appeal. In the United

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States, Taussig (1888) argued that nineteenth-century politicians supported high tariffs in response to their constituents' protectionist feelings and convictions. Today, the media have remarked that protectionism has been more prominent in campaign rhetoric than in actual policy choices (Leonhardt 2008). In fact, the 2008 presidential race witnessed a paradoxical trade-policy scandal during the Democratic primaries: the Obama campaign was accused of privately reassuring Canadian officials of the candidate's support for free trade, and acknowledging that his public criticism of NAFTA was meant to pander to protectionist sentiment among the domestic audience (DeMora 2008).

These patterns are not accounted for by studies of the political economy of trade policy that have focused on the political influence that organized interest groups acquire by means of strategic campaign contributions. Models of lobbying depict, implicitly (Hillman 1982; Grossman and Helpman 1994) or explicitly (Magee, Brock and Young 1989; Mayer and Li 1994), a political trade-off between the increased campaign funding from lobbies profiting from protection, and the diminished electoral appeal of policies that burden voters with a deadweight loss. This would induce politicians to attempt to hide their policy bias from voters, rather than openly campaigning on a protectionist platform.

In this paper I derive the structure of trade policy from a model of electoral competition in which political parties choose their platforms to attract heterogeneously informed voters. My analysis relies on two fundamental assumptions: asymmetric information and the presence of an intensive margin of political support. A policy proposal is more likely to be noticed by certain citizens, whose voting decision is thus more likely to be determined by it. Then the equilibrium level of protection for each industry rationally caters to each voter's preferences in proportion to his level of political knowledge concerning the sector.

Asymmetric information accounts for the varying influence of a special-interest group across policy areas. This contrasts both with lobbying models and with existing electoral models of tariff formation in which a citizens's importance depends on his probability of being the pivotal voter (Mayer 1984; Yang 1995). The ability to organize into a lobby and the likelihood of casting the decisive ballot grant agents the same influence over all policy choices. In my model, instead, every individual wields political power only on the specific issues about which he is disproportionately informed.

This feature provides an explanation for the observed protectionist bias in trade policy. In every industry, producers are on average more informed than consumers. This asymmetry entails that every sector receives positive protection in equilibrium, as well as accounting for the popular appeal of protectionist policies. I show how such a skewed knowledge pattern results from the diffusion of political news through social networks. Colleagues share information on proposals affecting their sector, which leads every voter to be more informed about policy for the industry he works in. This process of social

networking represents an opportunity for organized lobbies to affect policy outcomes by controlling the transmission of information rather than by offering contributions to politicians.

Producers also have greater incentives than the average citizen to invest in acquiring information about proposed tariffs for their sector. If costly effort is required to learn about policy platforms, no voter is willing exert it purely to cast a more informed ballot, since the probability that his vote decides the election is vanishing. However, producers need to forecast the future price of their output to optimize their investment in production capacity. Hence they benefit from knowledge of trade-policy proposals for their industry, and will incur a cost in order to acquire it. In equilibrium, these unequal incentives translate into an asymmetric distribution of information that is systematically skewed in producers' favor. This mechanism not only explains why trade policies have an overall protectionist bias, but also suggests why politicians resort to distortionary tariffs instead of more efficient instruments of redistribution. A proposed transfer to producers is noticed by its intended recipients, and thus proves politically expedient, only if it distorts prices and investments.

My theoretical analysis delivers a robust empirical prediction: equilibrium policy for an industry is closer to free trade when the public has more information about the sector. This is what Bhagwati (1988) calls "the Dracula effect," referring to the tendency of protectionism to shrivel when brought to the sunlight. I present some evidence of this phenomenon with respect to newspaper coverage and non-tariff barriers for U.S. manufacturing industries in 1983. The findings are consistent with the theory: protection is lower for sectors with higher media attention, and the effect is proportional to import demand elasticity and import penetration, as implied by the model.

Finally, I briefly discuss the ability of my framework to account for predictable differences in the trade-policy proposals of competing political parties. These are a direct consequence of voters' partisan ideology, which makes some more likely to learn about one politician's proposals than the competitor's (Glaeser, Ponzetto and Shapiro 2005). The model suggests a connection between the long-run decline of protectionism and the gradual shift from economic to cultural factors as the main determinants of political polarization.

II. Tariff Formation with Imperfectly Informed Voters

A small open economy is populated by agents with identical preferences, described by a quasi-linear utility function defined over consumption of a numeraire (indexed by 0) and

G other goods:

$$u(\mathbf{c}) = c_0 + \sum_{g=1}^{G} u_g(c_g). \tag{1}$$

Each sub-utility function $u_g(.) \in \mathcal{C}^2$ is monotone increasing and concave. Let every agent have sufficient income y to consume a positive amount of the numeraire in equilibrium. Then the price of each non-numeraire good uniquely determines its consumption per person $c_g(p_g) = u_g'^{-1}(p_g)$, which is homogeneous across agents. Every individual therefore derives identical consumer surplus

$$s_g(p_g) = u_g(c_g(p_g)) - p_g c_g(p_g) \tag{2}$$

and indirect utility can be written

$$v(y, \mathbf{p}) = y + \sum_{g=1}^{G} s_g(p_g). \tag{3}$$

The production technology has constant returns to scale, and domestic producers are perfectly competitive. The numeraire is produced employing one unit of labor per unit of output. The endowment of labor in the economy is assumed to be sufficiently large that a positive amount of the numeraire is produced in equilibrium, fixing the wage at unity. Each non-numeraire good g is produced employing both labor and an industry-specific input. The specific factors are in exogenous, inelastic supply, so that the only adjustments to the structure of production come from the allocation of the single mobile factor, i.e., labor. For a fixed wage rate, the price of each good determines the labor intensity of its production, and therefore the aggregate reward accruing to owners of the sector-specific factor. The latter is described by the monotone increasing and convex function $\pi_g(p_g) \in \mathcal{C}^2$. By Hotelling's Lemma, the competitive domestic supply function for each non-numeraire good is $x_g(p_g) = \pi_g'(p_g)$, a function of own price alone.

The world prices of all non-numeraire goods are exogenously given by the vector $\mathbf{p}^*$, which is not affected by domestic conditions. However, the government can influence the domestic price vector $\mathbf{p}$. In particular, the policy instrument available to politicians is precisely the creation of a wedge between the domestic and international price of each good. When positive, $t_g = (p_g - p^*)/p^*$ represents an import tariff for importing sectors and an export subsidy for exporting ones; when negative, respectively an import subsidy and an export tax. Each sector then generates tariff revenue per capita

$$r_g(p_g) = \frac{1}{N}\left(p_g - p_g^*\right) m_g(p_g), \tag{4}$$

where N denotes the size of the population and

$$m_g(p_g) = Nc_g(p_g) - x_g(p_g) \tag{5}$$

is the net import demand function, which is monotone decreasing. Government revenues are rebated homogeneously to all citizens through a lump-sum payment, or government expenditures are defrayed through a uniform poll tax. Each agent thus receives a net transfer in the amount $\sum_{g=1}^{G} r_g(p_g)$.

Individuals differ in their factor endowments. Agent i inelastically supplies an amount $l^i > 0$ of labor, and owns a fraction $\kappa_g^i \geq 0$ of the specific input for sector g. The sector-specific factors represent specialized human capital that, like labor, cannot be traded by their owners. Every agent's income is the sum of the government transfer, his wage, and his share of profits in each sector whose specific input he supplies:

$$y\left(\mathbf{p}, \boldsymbol{\kappa}^i, l^i\right) = l^i + \sum_{g=1}^{G} \left[\kappa_g^i \pi_g(p_g) + r_g(p_g)\right]. \tag{6}$$

World prices and factor endowments define a bounded feasible set of domestic prices. Arbitrary price support cannot be sustained with the finite resources available in the economy. Moreover, every citizen needs to be able to pay the homogeneous levy that finances industry subsidies. Yet this upper bound on feasible subsidies lacks both practical relevance and theoretical interest. Therefore the analysis is carried out under the maintained assumption that domestic prices are in the feasible set

$$\mathcal{F} = \left\{ \mathbf{p} > 0 : y\left(\mathbf{p}, \boldsymbol{\kappa}^i, l^i\right) > \sum_{g=1}^{G} p_g c_g(p_g) \text{ for all } i \right\}, \tag{7}$$

ensuring that every agent has sufficient income net of government transfers to consume a positive quantity of the numeraire.

Individual utility can be expressed as

$$U\left(\mathbf{p}, \boldsymbol{\kappa}^i, l^i\right) = l^i + \textstyle\sum_{g=1}^{G} U_g\left(p_g, \kappa_g^i\right), \tag{8}$$

where the contribution of each sector g to agent i's welfare is

$$U_g\left(p_g, \kappa_g^i\right) = \kappa_g^i \pi_g(p_g) + r_g(p_g) + s_g(p_g). \tag{9}$$

The welfare impact of a marginal policy change is then

$$\frac{\partial U}{\partial p_g} = \left(\kappa_g^i - \frac{1}{N}\right) x_g(p_g) + \frac{1}{N}(p_g - p^*) m_g'(p_g) \tag{10}$$

This expression highlights the two effects of any policy intervention: on distribution and on efficiency. The first term shows redistribution from consumers to producers, and thus from the general population to the owners of the sector-specific factor. It is positive if and only if $\kappa_g^i > 1/N$, namely for individuals with a greater than average ownership share in the sector. The second term captures the deadweight loss arising from a distortion of the price system. Since $m_g' < 0$, it is negative for $p_g > p^*$ and positive for $p_g < p^*$, showing that efficiency always increases when the domestic price is brought into closer alignment with the world price.

The social optimum coincides with the preferred policy of a hypothetical average citizen owning a fraction $1/N$ of every sector-specific factor, i.e. free trade. It is well known that in a small open economy whose domestic markets are free of distortions this is the first-best policy from the point of view of maximization of the aggregate real income in the economy.

However, unequal factor ownership implies that efficiency-reducing policies are advantageous for some agents who benefit from the resulting redistribution of resources. Intuitively, the desired amount of protection for a sector is increasing in the individual's ownership stake of the sector-specific factor κ_g^i. Agents who own little or no sector-specific input conversely desire import subsidies that lower the price of the good for domestic consumption, thereby extracting the factor reward from the owners of the specific input.

Enacted trade policies depend on the aggregation of citizens' heterogeneous preferences. In a representative democracy, the fundamental mechanism driving policy formation is the electoral process. Consider an election contested by two parties, labelled L and R, whose only goal is to win office and which accordingly choose their policy proposals to maximize the probability of obtaining a majority of the votes cast.

The electorate consists of a measure-N continuum of voters $i \in \mathcal{I}$. Following the probabilistic-voting approach (Coughlin 1992), voters' preferences for the competing parties comprise two independent elements. Each voter i reaches the election with beliefs $\hat{\mathbf{p}}^{L,i}$ and $\hat{\mathbf{p}}^{R,i}$ about the policies endorsed by either politician, which correspond to individual utility respectively $U\left(\hat{\mathbf{p}}^{L,i}, \boldsymbol{\kappa}^i, l^i\right)$ and $U\left(\hat{\mathbf{p}}^{R,i}, \boldsymbol{\kappa}^i, l^i\right)$. Moreover, the parties have fixed characteristics, such as ideology or the personal qualities of party leaders, that cannot be credibly altered with the choice of an electoral platform; and the voters have individual tastes, respectively ξ_L^i and ξ_R^i, for these characteristics. Thus voter i votes for party R if and only if

$$U\left(\hat{\mathbf{p}}^{L,i}, \boldsymbol{\kappa}^i, l^i\right) + \xi_L^i \leq U\left(\hat{\mathbf{p}}^{R,i}, \boldsymbol{\kappa}^i, l^i\right) + \xi_R^i. \tag{11}$$

An individual's relative assessment of the two parties can be disaggregated into a common and an idiosyncratic component: $\xi_L^i - \xi_R^i = \Psi + \psi^i$. Both Ψ and ψ^i are unobservable to the parties, but independently drawn from common-knowledge probability distributions. The common shock Ψ accounts for the aggregate uncertainty in the electoral

outcome. The idiosyncratic shock ψ^i provides the intensive margin of political support, and is assumed to be i.i.d. across agents with uniform distribution on a support $\left[-\bar{\psi}, \bar{\psi}\right]$ sufficiently wide that each voter's ballot is not perfectly predictable on the basis of policy considerations only.

The voters form their beliefs $\hat{\mathbf{p}}^{L,i}$ and $\hat{\mathbf{p}}^{R,i}$ on the basis of imperfect information, according to the following timeline:

1. Citizens have initial beliefs $\bar{\mathbf{p}}^L$ and $\bar{\mathbf{p}}^R$ about the policy vector that either party will endorse.

2. The two parties simultaneously choose their platforms $\mathbf{p}^L$ and $\mathbf{p}^R$.

3. Each voter i is informed of the proposal p_g^P of party $P \in \{L, R\}$ for sector g with probability $\theta_g^{P,i}$. For every proposal he does not observe, he maintains the original belief $\bar{p}_g^P$. The arrival of information is independent across voters.

4. Each voter i observes the realization of ξ_L^i and ξ_R^i, independent of his information. The election is held.

5. The winning party $W \in \{L, P\}$ implements its policy $\mathbf{p}^W$.

There are J types of citizens $j = 1, ...J$ (with J a large number), such that all agents of type j have an identical endowment of specific factors $\boldsymbol{\kappa}^j$ and identical information-acquisition probabilities $\left(\boldsymbol{\theta}^{L,j}, \boldsymbol{\theta}^{R,j}\right)$. Each type j comprises fraction α^j of the population, with $\sum_{j=1}^J \alpha^j = 1$.

Since there is a continuum of agents in every type and the arrival of information is independent across agents, when the election takes place each group is composed of a share $\theta_g^{P,j}$ of agents who have observed the true proposal p_g^P, and a share $1 - \theta_g^{P,j}$ who have not and rely instead on their prior $\bar{p}_g^P$. Given the independent realizations of the uniform idiosyncratic shock ψ^i, the fraction of citizens of type j who vote for party R equals

$$\phi_R^j = \frac{1}{2} + \frac{1}{2\bar{\psi}} \left\{ \sum_{g=1}^G \left[\begin{array}{c} \theta_g^{R,j} U_g\left(p_g^R, \kappa_g^j\right) + \left(1 - \theta_g^{R,j}\right) U_g\left(\bar{p}_g^R, \kappa_g^j\right) \\ -\theta_g^{L,j} U_g\left(p_g^L, \kappa_g^j\right) - \left(1 - \theta_g^{L,j}\right) U_g\left(\bar{p}_g^L, \kappa_g^j\right) \end{array} \right] - \Psi \right\}, \tag{12}$$

as a function of the common shock Ψ.

Thus the realization of Ψ fully determines the number of ballots cast for each politician: party R receives more votes than party L if and only if

$$\Psi < \sum_{j=1}^J \alpha^j \sum_{g=1}^G \left[\begin{array}{c} \theta_g^{R,j} U_g\left(p_g^R, \kappa_g^j\right) + \left(1 - \theta_g^{R,j}\right) U_g\left(\bar{p}_g^R, \kappa_g^j\right) \\ -\theta_g^{L,j} U_g\left(p_g^L, \kappa_g^j\right) - \left(1 - \theta_g^{L,j}\right) U_g\left(\bar{p}_g^L, \kappa_g^j\right) \end{array} \right]. \tag{13}$$

Hence, for any distribution of the unobservable common shock Ψ, party R seeks to maximize the right-hand side, and party L to minimize it.

III. The Structure of Trade Policy

When the information structure is common knowledge, in a rational-expectations equilibrium the eventual policy choices can be predicted with perfect foresight. As a consequence, even voters who do not receive information correctly anticipate the platforms of the two parties ($\bar{\mathbf{p}}^P = \mathbf{p}^P$). Politicians' optimal strategies are driven by asymmetric information off the equilibrium path: some voters are more likely than others to notice a deviation from the expected policy choice, and the party optimally caters to their preferences. Suppose that a party has a protectionist audience: the whole electorate rationally expects it to run on a protectionist platform. If unexpectedly it endorsed free trade, many of its protectionist listeners would be informed and disappointed, withdrawing their support. Instead, the rest of the electorate is less likely to be informed, and thus few new supporters would be gained. Hence, deviating from the expected proposal is unprofitable for the politician.

While the structure of a rational-expectation equilibrium is intuitive, the outcome is robust to alternative equilibrium specifications. The additive separability of equation 13 implies that each party's optimal policy is independent both of the opponent's platform and of voters' initial beliefs. Therefore, the same results hold identically if voters lack perfect foresight, or even full rationality.

The parties' problem from equation 13 implies immediately that a purely office-seeking party strategically behaves as if it were maximizing a weighted average of citizens' welfare, with weights equal to the likelihood that each voter is informed of the party's proposal.

Lemma 1 *The optimal policy proposal for party $P \in \{L, R\}$ is*

$$p_g^P = \arg\max_{p_g} \sum_{j=1}^{J} \alpha^j \theta_g^{P,j} U_g\left(p_g, \kappa_g^j\right) \text{ for } g = 1, 2, ..., G.$$

This result embodies formally the notion that policies are chosen to maximize a political support function that attaches different weights to the welfare of different agents. Introduced by Stigler (1971) and Peltzman (1976) in the context of economic regulation, this approach was explicitly applied to tariff policy by Hillman (1982). Long and Vousden (1991) assumed in reduced form that politicians maximize a weighted average of the welfare of the average citizen and that of powerful special-interest groups. Grossman and Helpman (1994) derive a similar objective function from a model of "protection for sale", in which organized special-interest groups offer pecuniary contributions in exchange for the adoption of favorable policies.

In Lemma 1, political support does not come from organized lobbies, but rather—consistent with Becker's (1976) insights—from looser groupings of voters, characterized less by a shared special interest than by their members' privileged access to political

information. This complementary source of influence has long been recognized in the economic analysis of the political system (Downs 1957). It can explain politicians' trade-off between welfare-maximization and contribution-seeking, since the former appeals to informed voters but the latter provides resources to attract the uninformed (Baron 1994; Grossman and Helpman 1996); the influence on government spending of the mass media, since these enable voters to judge whether their interests are being served (Besley and Burgess 2002; Strömberg 2004); the divergence of party positions, since rival politicians are concerned with pleasing different audiences of partisan voters (Glaeser, Ponzetto and Shapiro 2005).[1]

An important feature of asymmetric information is that it naturally varies not only across agents but also across issues for the same individual. This distinguishes it from other sources of political power, such as the ability to organize into lobbies or the ideological predisposition to be a swing voter. As a consequence, a special-interest group can be extremely important for the choice of trade policy in a particular sector which its members are especially informed about, while having marginal influence on other policy decisions. This can explain one of the most evident features of trade policy: deviations from free trade have a strong protectionist bias, and almost invariably aim at constraining imports rather than subsidizing them (Rodrik 1995). Such a pattern results from information asymmetries that systematically favor producers over consumers, as we are about to see.

Equation 10 and Lemma 1 characterize for each industry the trade policy proposal that each party makes in equilibrium. Assuming that the prices belong to the feasible set $\mathcal{F}$, the following characterizes equilibrium platforms (proofs are provided in the appendix).

Proposition 1 *The optimal policy proposal for party $P \in \{L, R\}$ satisfies*

$$\frac{p_g^P - p_g^*}{p_g^P} = \rho\left(\theta_g^P, \kappa_g\right) \frac{\sigma}{\mu}\left(\theta_g^P\right) \frac{\sigma}{\mu}\left(\kappa_g\right) \frac{x_g\left(p_g^P\right)}{\left|m_g\left(p_g^P\right)\right|} \frac{\left|m_g\left(p_g^P\right)\right|}{\left|m_g'\left(p_g^P\right)\right| p_g^P} \text{ for } g = 1, 2, ..., G,$$

where ρ denotes the correlation coefficient and σ/μ the coefficient of variation.

This structure of protection implies that the deviation from the first best is inversely proportional to the absolute elasticity of import demand or export supply ($\left|p_g m_g'/m_g\right|$). The rationale is analogous to the Ramsey rule of commodity taxation: higher-elasticity industries generate a greater deadweight loss for any level of distortion, and therefore they are the target of less distortionary policies, all else being equal. Distortion is also inversely proportional to the trade penetration ratio ($\left|m_g\right|/x_g$). This reflects the rational

[1] Different strands of the literature have also considered forms of political knowledge other than information about policy decisions: the ability to estimate politicians' quality from the observation of their actions (Lohmann 1998, 2003; Myerson 1999); or to assess the indirect effects of observed policies (Grossman and Helpman 2001, §3.2).

weighting of distributive and efficiency considerations: the stakes of the redistribution game are proportional to the size of domestic output (x_g), while the magnitude of the deadweight loss is the same as that of international trade in the affected sector ($|m_g|$).

These results are a direct consequence of Lemma 1. The preferences of every citizen follow the same pattern $p_g - p^* \propto x_g(p_g) / |m'_g(p_g)|$, with different proportionality coefficients based on factor ownership. Hence, enacted policy shares this pattern whenever politicians maximize a weighted sum of citizens' welfare. This prediction, which is shared by Proposition 1 and Grossman and Helpman's (1994) model of lobbying, has received robust empirical support from the evidence of effective protection both in the United States (Goldberg and Maggi 1999; Gawande and Bandyopadhyay 2000; Eicher and Osang 2002; Mitra, Thomakos and Ulubaşoğlu 2006) and in around the world (Mitra, Thomakos and Ulubaşoğlu 2002, 2006; McCalman 2004).

Furthermore, Proposition 1 shows that the structure of protection is determined by the joint distribution of factor ownership and access to information, which in turns determines political influence. An industry is protected if and only if there is positive correlation between a person's ownership share of the specific factor and her knowledge of policy proposals affecting prices in the sector ($\rho\left(\theta_g^P, \kappa_g\right) > 0$). Therefore, a protectionist bias emerges across the board when each agent has greater knowledge about his own sector of employment. The following sections provide microfoundations of this distribution of information.

The magnitude of the distortion is also proportional to the coefficient of variation of the population distributions both of specific-factor ownership and of information. Ceteris paribus, greater asymmetries in both information and capital ownership imply a greater disparity between producer and consumer interests in the policy arena, leading to greater distortions. Thus the model predicts that among protected sectors, those with greater industrial concentration will have higher tariffs, a pattern that has ample support in empirical evidence (Pincus 1975; Saunders 1980; Marvel and Ray 1983; Godek 1985; Trefler 1993; Bombardini 2008). Moreover, information asymmetry is naturally connected to the regional concentration of a sector, whose positive impact on the level of protection is also well documented (Pincus 1975; Caves 1983; Godek 1985).

Further evidence on the role of heterogeneous information as a determinant of trade policy is provided by Hall, Kao and Nelson's (1998) historical analysis. The introduction of women's suffrage throughout the United States in 1920 was associated with a decline in average tariff rates. The authors' explanation hinges on specialization within the American household in the early twentieth century. The husband was uniquely concerned with, and informed of, the effect of policy on factor rewards. It was instead the wife who was aware of consumer prices and the negative impact protectionism had on them. In the terms of the model, the enfranchisement of women then corresponds to the introduction of voters whose information is uncorrelated with household factor ownership. It follows

that politicians would strategically endorse lower levels of protection for all sectors.

IV. Workplace Networks and Protectionism

Voters rarely acquire information directly from candidates; instead, their political awareness is the product of a social process in which personal interactions have decisive influence (Granovetter 1973; Cialdini 1984; Zaller 1992; Beck et al. 2002). The workplace plays a crucial role in the formation of political opinion: people are more likely to discuss politics with their co-workers than in almost any other context (Finifter 1974; Beck 1991; Mutz and Mondak 2006). The work-based aggregation of information can explain an occupational bias in agents' political knowledge, as conversations among colleagues focus on their shared concern for their industry of employment.

Formally, assume that each agent own at most one type of capital, corresponding to his occupation in a single sector. Each sector g employs a fraction $\alpha_g > 0$ of the total population. Every individual exogenously receives information about each policy proposal p_g^P with homogeneous probability $\underline{\theta}_g^P \in (0,1)$. Then the following result obtains.

Proposition 2 *Let every member of sector g belong to a network of $n_g > 1$ colleagues who share information $\left(p_g^L, p_g^R\right)$ regarding their industry.*

The equilibrium policy proposal p^P of either party $P \in \{L, R\}$ satisfies

$$\frac{p_g^P - p_g^*}{p_g^P} = \frac{1-\alpha_g}{\alpha_g + \Theta_g^P\left(\underline{\theta}_g^P, n_g\right)} \frac{x_g\left(p_g^P\right)}{\left|m_g\left(p_g^P\right)\right|} \frac{\left|m_g\left(p_g^P\right)\right|}{\left|m_g'\left(p_g^P\right)\right| p_g^P}, \text{ for } \Theta_g^P\left(\underline{\theta}_g^P, n_g\right) > 0.$$

Every industry is offered positive protection ($p_g^P > p_g^*$) and the distortion is lower when information is more widespread ($\partial p_g^P / \partial \underline{\theta}_g^P < 0$) and higher for industries whose members are fewer ($\partial p_g^P / \partial \alpha_g < 0$) and more connected ($\partial p_g^P / \partial n_g > 0$).

Protectionism is a winning electoral platform because workers' knowledge is specialized along industry lines. Voters' awareness of economic policy is thus disproportionately acquired as producers. A protectionist policy proposal is more likely to be noticed by the factor owners whose income it supports than by the consumers who bear the burden of a price increase (Lohman 2003). At the same time, each agent is disproportionately aware of the elements of a protectionist platform that bring him private benefits; this asymmetry can explain why a majority of voters report protectionist sentiments in opinion polls (Mayda and Rodrik 2005).

Tariffs are lower when more information about the sector is available to the entire population (high $\underline{\theta}_g^P$). Given greater public awareness of a policy proposal, there is a correspondingly lower scope for asymmetric knowledge, and producers' informational advantage over consumers wanes. This induces a decline in protectionism, and the convergence of competing political parties towards a free-trade stance. The long-run evolution

of the policy debate has followed this pattern in the United States and other developed countries, which have witnessed both liberalization and a gradual decrease of partisan difference in trade policy (Mitra, Thomakos and Ulubaşoğlu 2002; McCalman 2004; Milner and Judkins 2004).

Protection is greater for sectors with a smaller number of producers. This result is independent of the source of political influence. It derives from the preferences of insiders, whose ideal policy satisfies

$$\frac{p_g - p_g^*}{p_g} = \frac{1-\alpha_g}{\alpha_g} \frac{x_g(p_g)}{|m_g(p_g)|} \frac{|m_g(p_g)|}{|m_g'(p_g)|\, p_g}. \tag{14}$$

The lower the fraction of the population employed in the sector, the lower the share of the deadweight loss they have to bear, and thus the more extreme their protectionist demands. The power of special interests determines to what extent politicians are responsive to these requests. For a given information asymmetry favoring producers, of which Θ_g^P is an inverse measure, smaller sectors desire and obtain higher protection

Finally, Proposition 2 shows that trade policy is more distorted in favor of industries whose members are connected to a wider social network. A greater ability to share information increases the members' aggregate knowledge and therefore their political clout. This intuitive mechanism can be connected to two economic-policy biases that have prevailed historically in developing countries: a protectionist bias (Edwards 1993) and an anti-rural bias (Lipton 1977). In terms of the model, both follow from the fact that urban manufacturing is the import-competing sector, and at the same time its workers are better placed than rural voters to obtain and aggregate political information.

Beyond the advantages of an urban location, the extent of worker interactions may be related to other industry characteristics. The most obvious determinant of the size of workers' social networks is the presence of organizations such as trade unions and industry associations. Indeed social networks are at least partially constructed by entrepreneurs to derive political benefits (Murphy and Shleifer 2004). Special-interest groups are able to influence the political process not only by offering pecuniary contributions to politicians, but also by increasing the flow of information to their members. Empirically, both are major activities of organized lobbies (Schlozman and Tierney 1986, Grossman and Helpman 2001).

Formally, assume that the exogenous arrival of information is homogeneous across parties ($\underline{\theta}_g^L = \underline{\theta}_g^R = \underline{\theta}_g$) and that factor ownership among group members follows a Pareto distribution with shape parameter $\eta_g > 1$ (i.e., Gini coefficient $\left(2\eta_g - 1\right)^{-1}$).

Proposition 3 *Let all sector-g producers be represented by an organized interest group. The group controls access to a network that links a continuum of workers, and thus provides all available information about the sector* (p_g^L, p_g^R).

The group chooses to connect to the network all agents whose ownership share of sector-g specific capital is more than λ_g times the population average.

For $\underline{\theta}_g < \alpha_g$ there exists a threshold $\bar{\eta}_g\left(\underline{\theta}_g, \alpha_g\right) > 1$, with $\partial\bar{\eta}_g/\partial\underline{\theta}_g < 0$ and $\partial\bar{\eta}_g/\partial\alpha_g > 0$, such that for all $\eta_g \leq \bar{\eta}_g\left(\underline{\theta}_g, \alpha_g\right)$ the interest group obtains its preferred level of protection.

If $\eta_g > \bar{\eta}_g\left(\underline{\theta}_g, \alpha_g\right)$ or $\underline{\theta}_g \geq \alpha_g$, the group can obtain a maximum price described by

$$\frac{p_g - p_g^*}{p_g} = \left[\lambda_g\left(\underline{\theta}_g, \alpha_g, \eta_g\right) - 1\right] \frac{x_g\left(p_g\right)}{\left|m_g\left(p_g\right)\right|} \frac{\left|m_g\left(p_g\right)\right|}{\left|m_g'\left(p_g\right)\right| p_g},$$

for an optimal threshold $\lambda_g\left(\underline{\theta}_g, \alpha_g, \eta_g\right) \geq \left[\underline{\theta}_g + \left(1 - \underline{\theta}_g\right)\alpha_g\right]^{-1} > 1$ such that $\partial\lambda/\partial\underline{\theta}_g \leq 0$, $\partial\lambda/\partial\alpha_g \leq 0$ and $\partial\lambda_g/\partial\eta_g \leq 0$.

By acting as the gatekeeper for a capillary social network, the interest group controls the flow of information about its sector. Its optimal strategy excludes from the network those group members who are not sufficiently keen on protection, due to their low level of factor ownership. This ensures that the political debate on protection for the sector is dominated by producer interests, so that politicians are going to support high tariffs.

At a minimum, if all industry-g producers are included in the network the equilibrium policy proposal satisfies

$$\frac{p_g - p_g^*}{p_g} = \frac{1 - \alpha_g}{\alpha_g + \underline{\theta}_g / \left(1 - \underline{\theta}_g\right)} \frac{x_g\left(p_g\right)}{\left|m_g\left(p_g\right)\right|} \frac{\left|m_g\left(p_g\right)\right|}{\left|m_g'\left(p_g\right)\right| p_g}. \tag{15}$$

Strategic information management allows the lobby to induce for its sector the same policy it would obtain through cash contributions as the sole bidder in a menu auction run by a politician who puts relative weights $\underline{\theta}_g$ on social welfare and $\left(1 - \underline{\theta}_g\right)$ on campaign contributions (Grossman and Helpman 1994).

When the distribution of factor ownership is sufficiently skewed, and precisely for $\eta_g < 1 + \alpha_g / \left[\underline{\theta}_g\left(1 - \alpha_g\right)\right]$, controlling the access to information gives the interest group even more political power. The optimal network does not include all the owners of the specific factor. The comparative statics then hold with strict inequality: the optimal discrimination is more restrictive and more effective when information is scarce (low $\underline{\theta}_g$), factor ownership is heavily concentrated (low η_g), and the interest group is small (low α_g). These results correspond to intuitive changes in the potential to leverage information asymmetry.

When the opaqueness of the policy environment dominates the extremism of the group's preferences ($\underline{\theta}_g < \alpha_g$: group size is a measure of the alignment of consumers' and producers' preferences) a sufficiently high degree of concentration enables producer interests to succeed in controlling entirely the policy decisions affecting their industry, by exploiting the joint asymmetries in information availability and factor ownership. The

interest group then induces its preferred protectionist policy, described by equation 14.

Proposition 3 shows that by managing information a special-interest group can obtain for its sector a structure of protection analogous to the one it could solicit by offering cash contributions to politicians. The simultaneous recourse to these two channels of lobbying helps explain why U.S. trade policy appears to provide large industry profits (indeed large deadweight losses) for remarkably small equilibrium contributions by industry lobbies (Gawande and Bandyopadhyay 2000; Gawande and Krishna 2003). Information management can be an especially powerful strategy for a special-interest group. If maintaining a social network is either inexpensive or independently useful for other purposes than gaining political influence, its obvious appeal is that it yields benefits that need not be shared with politicians.

These results fit within a broader literature that has highlighted the ability of interest groups to influence policies by disseminating information. Previous studies have analyzed in particular the behavior of lobbyists strategically conveying to politicians their private knowledge about the welfare outcomes of policy decisions (Potters and van Windend 1992; Lohmann 1993, 1995; Austen-Smith 1995; Ball 1995; Krishna and Morgan 2001; Battaglini 2002). Proposition 3 highlights the additional role of communication within the group itself. Not only can an informed lobbyist benefit from transmitting information to the agents he represents (Grossman and Helpman 2001, §6); group organization is beneficial even when knowledge is dispersed across members instead of concentrated among the leaders. Extending Murphy and Shleifer's (2004) insights on social entrepreneurship, the role of the lobby is to create and manage a network that allows rank-and-file members to share their individual information.

V. Costly Information Acquisition and Protectionism

The previous section showed how producer bias emerges from the social diffusion of political information. The mechanism reflected the lack of incentives to exert any effort to acquire political knowledge. This is a facet of the paradox of the rational voter, which is put into sharp relief by probabilistic-voting models with a continuum of agents. Every atomistic citizen has probability zero of influencing the outcome of the election, and therefore no instrumental reason to invest in making a more informed voting decision. Consistent with this theoretical perspective, Graber (1984) finds that for the vast majority of Americans being informed about politics is a consumption decision, and not an investment with economic payoffs.

On the other hand, producers routinely invest in acquiring information that helps them assess and forecast industry trends, including knowledge of policy decisions affecting

their sector. These asymmetric incentives for information acquisition constitute another channel leading to a protectionist bias in trade policy. This mechanism can be captured analytically by assuming that the owners of the specific factors must hire labor in advance, on the basis of their expectation of future prices. When uncertainty is eventually resolved, they are no longer able to adjust employment and output

Ex ante, producers' profit-maximization problem implies that labor demand per unit of the specific factor is a function of the expected price $\mathbb{E}^i p_g$ alone:

$$l_g\left(\mathbb{E}^i p_g\right) = \mathbb{E}^i p_g \pi'_g\left(\mathbb{E}^i p_g\right) - \pi_g\left(\mathbb{E}^i p_g\right). \tag{16}$$

The output of the sector-g good by an agent with a share κ_g^i of its specific factor and an expectation $\mathbb{E}^i p_g$ of its price is determined ex ante to be

$$q_g\left(\kappa_g^i, \mathbb{E}^i p_g\right) = \kappa_g^i \pi'_g\left(\mathbb{E}^i p_g\right). \tag{17}$$

Aggregate domestic output in sector g, which will be denoted by x_g, thus depends on the expectations $\mathbb{E}^i p_g$ of all agents with $\kappa_g^i > 0$. Conversely, it does not depend directly on the ex post realization of p_g, which determines individual income

$$\begin{aligned} &y\left(\mathbf{p}, \mathbf{x}, \mathbb{E}^i \mathbf{p}, \boldsymbol{\kappa}^i, l^i\right) = \\ &= l^i + \sum_{g=1}^{G} \left\{ \kappa_g^i \left[\pi_g\left(\mathbb{E}^i p_g\right) + \left(p_g - \mathbb{E}^i p_g\right) \pi'_g\left(\mathbb{E}^i p_g\right)\right] + \left(p_g - p_g^*\right) \left[c_g\left(p_g\right) - \frac{1}{N} x_g\right] \right\}, \end{aligned} \tag{18}$$

and therefore utility

$$U\left(\mathbf{p}, \mathbf{x}, \mathbb{E}^i \mathbf{p}, \boldsymbol{\kappa}^i, l^i\right) = l^i + \textstyle\sum_{g=1}^{G} U_g\left(p_g, x_g, \mathbb{E}^i p_g, \kappa_g^i\right), \tag{19}$$

where the contribution of each sector g to agent i's welfare is

$$\begin{aligned} &U_g\left(p_g, x_g, \mathbb{E}^i p_g, \kappa_g^i\right) = \\ &= \kappa_g^i \left[\pi_g\left(\mathbb{E}^i p_g\right) + \left(p_g - \mathbb{E}^i p_g\right) \pi'_g\left(\mathbb{E}^i p_g\right)\right] + \left(p_g - p_g^*\right) \left[c_g\left(p_g\right) - \frac{1}{N} x_g\right] + s_g\left(p_g\right). \end{aligned} \tag{20}$$

Ex post, the welfare impact of a marginal policy change is

$$\frac{\partial U}{\partial p_g} = \kappa_g^i \pi'_g\left(\mathbb{E}^i p_g\right) - \frac{1}{N} x_g + \left(p_g - p_g^*\right) c'_g\left(p_g\right). \tag{21}$$

Everyone suffers from deadweight losses when prices are distorted away from the efficient level p_g^*. This confirms the optimality of free trade. Artificially higher prices are an inefficient mechanism to redistribute towards producers. Since production is planned ex

ante, each agent's stakes in the distributional game are given directly by his predetermined output ($\kappa_g^i \pi_g' (\mathbb{E}^i p_g)$) compared to industry output per capita (x_g/N), rather than indirectly by factor ownership as in the baseline model.

The timing of the policy-making game is modified to account for the hiring of labor ex ante, and for a previous stage of costly information acquisition. This consists in an optional investment of effort that linearly reduces an agent's labor supply, and therefore his income and utility. The timeline is the following:

1. Citizens know the ex ante distribution of $\mathbf{p}^*$. Its components are independently distributed, and none is deterministic. Voters have rational beliefs $\bar{\mathbf{p}}^L (\mathbf{p}^*)$ and $\bar{\mathbf{p}}^R (\mathbf{p}^*)$ about the strategies that the parties will follow to formulate their platforms conditional on the realization of $\mathbf{p}^*$.

2. The two parties observe the realization of $\mathbf{p}^*$ and choose simultaneously their platforms $\mathbf{p}^L (\mathbf{p}^*)$ and $\mathbf{p}^R (\mathbf{p}^*)$.

3. Each voter i makes a costly investment $\iota_g^i \geq 0$ in learning about each sector g. This determines the probability $\theta_g \left(\iota_g^i\right)$ that he is informed of $\left(p_g^*, p_g^L, p_g^R\right)$. The arrival of information is independent across voters and sectors.

4. Agents with specific capital $\kappa_g^i > 0$ hire labor and thus predetermine individual output.

5. Each voter i observes the realization of ξ_L^i and ξ_R^i, independent of his information. The election is held.

6. The winning party $W \in \{L, P\}$ implements its policy $\mathbf{p}^W$.

The problem faced by either party is identical. There are no economic linkages across sectors, as utility is quasilinear, there is a single mobile factor, and all random shocks are independently distributed. Thus we will focus on a rational-expectations equilibrium in which voters expect the parties to follow symmetric strategies and the proposed price for each sector to depend only on the international market price for the sector itself:

$$\bar{p}_g^L (\mathbf{p}^*) = \bar{p}_g^R (\mathbf{p}^*) = \bar{p}_g \left(p_g^*\right). \tag{22}$$

In addition, both voters and politicians have rational expectations that agents invest in acquiring information about each sector depending on their ownership of the respective specific factor, according to a function $\bar{\iota}_g \left(\kappa_g^i\right)$. For ease of notation, let $\bar{\theta}_g^j = \theta_g \left(\bar{\iota}_g \left(\kappa_g^j\right)\right)$ and denote by

$$\bar{\omega}_g = 1 - N \sum_{j=1}^{I} \alpha^j \bar{\theta}_g^j \kappa_g^j \in [0, 1] \tag{23}$$

the fraction of the specific factor that is expected to belong to uninformed producers.

Denote by $\tilde{m}'_g(p_g) = Nc'_g(p_g)$ the sensitivity of net imports to unexpected price changes, and recall that $x_g(p_g) = \pi'_g(p_g)$ is aggregate domestic supply as a function of expected price. Given expectations about the citizens' information acquisition, the optimal platform admits a characterization analogous to Proposition 1.

Lemma 2 *The optimal policy proposal satisfies*

$$\frac{p_g - p_g^*}{p_g} = \left\{ \rho\left(\bar{\theta}_g, \kappa_g\right) \frac{\sigma}{\mu}\left(\bar{\theta}_g\right) \frac{\sigma}{\mu}(\kappa_g) + \bar{\omega}_g \left[1 - \frac{x_g(\mathbb{E}\bar{p}_g)}{x_g(p_g)}\right] \right\} \frac{x_g(p_g)}{|m_g(p_g)|} \frac{|m_g(p_g)|}{\left|\tilde{m}'_g(p_g)\right| p_g}.$$

where ρ denotes the correlation coefficient and σ/μ the coefficient of variation.

The only difference between this policy proposal and the equilibrium platform described by Proposition 1 for the baseline model consists in a desire to increase customs revenues by exploiting uninformed producers ($\omega_g > 0$) who cannot adjust ex-post to the eventual price realization. When prices are higher than expected, these producers cannot increase output, which implies greater net imports and higher tariff revenues than in the original model. For a given tariff rate, net imports and tariff revenues are conversely lower than the baseline when prices are below their expected value.

As a consequence, it becomes more difficult in this setting for free trade to be politically feasible. It is no longer the politicians' preferred policy whenever information is uncorrelated with factor ownership ($\rho\left(\bar{\theta}_g, \kappa_g\right) = 0$). For free trade to prevail almost surely in sector g, it is now necessary that all citizens are perfectly informed about the respective policy proposals ($\bar{\theta}_g^j = 1 \forall j \Leftrightarrow \rho\left(\bar{\theta}_g, \kappa_g\right) = \bar{\omega}_g = 0$).

In equilibrium, for an agent with factor ownership κ_g^i, learning ex ante the true price p_g instead of retaining the rational expectation $\mathbb{E}\bar{p}_g$ is worth an increase in income equal to

$$\Delta_g\left(p_g, \kappa_g^i\right) = \kappa_g^i \left[\pi_g(p_g) - \pi_g(\mathbb{E}\bar{p}_g) + (p_g - \mathbb{E}\bar{p}_g)\pi'_g(\mathbb{E}\bar{p}_g)\right]. \tag{24}$$

The expected value of acquiring information about a sector is proportional to an agent's ownership share of the respective factor. The gain per unit of ownership is

$$v_g = \mathbb{E}\pi_g(\bar{p}_g) - \pi_g(\mathbb{E}\bar{p}_g), \tag{25}$$

which is positive for every non-degenerate distribution of $\bar{p}_g$ and every convex profit function π_g.

The emergence of an endogenous anti-trade bias can be seen most starkly when perfect political information can be acquired at a small but positive cost.

Proposition 4 *Let all agents with a positive ownership share of the specific factor for sector g own at least a minimum $\underline{\kappa}_g > 0$: for all $i \in \mathcal{I}$, $\kappa_g^i > 0 \Rightarrow \kappa_g^i \geq \underline{\kappa}_g > 0$.*

Let there be a level of investment $\hat{\iota}_g > 0$ that yields perfect knowledge about sector g ($\theta_g(\hat{\iota}_g) = 1$), while any lower investment $\iota_g^i \in [0, \hat{\iota}_g)$ implies an exogenous probability of receiving information $\underline{\theta}_g \in [0, 1)$.

Then there exists a threshold $\bar{\iota}_g > 0$ such that for all $\hat{\iota}_g \in (0, \bar{\iota}_g)$, in equilibrium all consumers with $\kappa_g^i = 0$ invest $\iota_g^i = 0$ and are informed with probability $\underline{\theta}_g \in [0, 1)$, while all producers with $\kappa_g^i > 0$ invest $\iota_g^i = \hat{\iota}_g > 0$ and are informed with certainty. Enacted policy satisfies

$$\frac{p_g - p_g^*}{p_g} = \frac{1 - \alpha_g}{\alpha_g + \underline{\theta}_g / \left(1 - \underline{\theta}_g\right)} \frac{x_g(p_g)}{|m_g(p_g)|} \frac{|m_g(p_g)|}{\left|\tilde{m}_g'(p_g)\right| p_g}.$$

The sector is offered positive protection with certainty ($p_g > p_g^*$), and the distortion is higher for industries with fewer members ($\partial p_g^P / \partial \alpha_g < 0$) and for which public information is scarcer ($\partial p_g^P / \partial \underline{\theta}_g < 0$).

Advance information about sector g provides consumers only with an opportunity to cast a more knowledgeable ballot. This provides no incentives for agents to become informed. Thus any positive cost of information acquisition suffices to hold consumers to their exogenous probability of information $\underline{\theta}_g$, which represents the likelihood of learning about trade policy for the sector via the non-directed consumption of general-interest news.

Conversely, ex-ante information is profitable for every producer, who is willing to pay a strictly positive cost to obtain a perfect price forecast. If the effort required to obtain such knowledge is sufficiently low, the unique equilibrium is for every owner of the specific factor to become perfectly informed. The information asymmetry between producers and consumers is then endogenously maximized.

The structure of protection described by Proposition 4 is essentially the same that a lobby could obtain in Proposition 3 by granting all the represented producers access to an information-sharing network. Here, however, factor owners manage to obtain political clout without solving the collective-action problem and organizing as a lobby. Each producer is privately motivated to acquire information for his own hiring decision. As a by-product of these uncoordinated individual actions, the industry becomes politically influential. Producer capture of trade policy induces greater distortion the less public information is available (the lower $\underline{\theta}_g$). It is complete if consumers are wholly uninformed ($\underline{\theta}_g = 0$): then the trade policy maximized producer welfare, as described by equation 14. Finally, for the same reasons mentioned in the discussion of Proposition 4, tariffs are decreasing in the number of informed producers.

Qualitatively similar results obtain when information acquisition is more expensive, so that even producers shy away from obtaining perfect information. For analytical convenience we adopt linear functional forms. The domestic supply function is

$$x_g(p_g) = \xi_g \left(p_g - \underline{p}_g\right) \text{ with } \xi_g > 0, \tag{26}$$

and every industry is always active domestically under free trade: the support of p_g^* has minimum $\underline{p}_g^* > \underline{p}_g > 0$. The aggregate demand function has slope

$$Nc_g'(p_g) = -\gamma_g \xi_g \text{ with } \gamma_g > 0. \tag{27}$$

For ease of notation, let

$$\bar{\rho}_g = \frac{Cov\left(\kappa_g, \bar{\theta}_g\right)}{\mathbb{E}\kappa_g \mathbb{E}\bar{\theta}_g}. \tag{28}$$

Then Lemma 2 implies that given beliefs $\left(\bar{\rho}_g, \bar{\omega}_g\right)$ about voter information a party proposes

$$p_g = \frac{\gamma_g p_g^* - \bar{\rho}_g \underline{p}_g - \bar{\omega}_g \mathbb{E}\bar{p}_g}{\gamma_g - \bar{\rho}_g - \bar{\omega}_g}, \tag{29}$$

where $\gamma_g > \bar{\rho}_g + \bar{\omega}_g$ ensures an interior equilibrium.

In a rational expectations equilibrium, citizens have correct second-order beliefs about the politicians' expectation $\left(\bar{\rho}_g, \bar{\omega}_g\right)$, and they correctly anticipate $\bar{p}_g\left(p_g^*\right) = p_g\left(p_g^*\right)$. The expected domestic price is

$$\mathbb{E}\bar{p}_g = \mathbb{E}p_g^* + \frac{\rho_g}{\gamma_g - \rho_g}\left(\mathbb{E}p_g^* - \underline{p}_g\right), \tag{30}$$

and equilibrium policy is

$$p_g = p_g^* + \frac{\bar{\rho}_g + \bar{\omega}_g}{\gamma_g - \bar{\rho}_g - \bar{\omega}_g}\left(p_g^* - \mathbb{E}p_g^*\right) + \frac{\bar{\rho}_g}{\gamma_g - \bar{\rho}_g}\left(\mathbb{E}p_g^* - \underline{p}_g\right). \tag{31}$$

The profit function

$$\pi_g(p_g) = \frac{1}{2}\xi_g\left(p_g - \underline{p}_g\right)^2 \tag{32}$$

implies that the expected gain from information acquisition per unit of ownership is

$$v_g = \frac{1}{2}\xi_g Var\left(\bar{p}_g\right) = \frac{1}{2}\xi_g\left(\frac{\gamma_g}{\gamma_g - \bar{\rho}_g - \bar{\omega}_g}\right)^2 Var\left(p_g^*\right), \tag{33}$$

where $\gamma_g \geq \bar{\rho}_g + \bar{\omega}_g\left(\mathbb{E}p_g^* - \underline{p}_g\right) / \left(\underline{p}_g^* - \underline{p}_g\right)$ ensures that no value $p_g < \underline{p}_g$ is in the support of $\bar{p}_g$.

The problem is well-behaved as long as that the slope of the aggregate demand function is sufficiently large compared to that of the domestic supply function. Under this regularity condition, we can establish the following result.

Proposition 5 *Let sector-g producers represent a fraction $\alpha_g > 0$ of the total population and have homogeneous factor ownership $\kappa_g^i = 1/(\alpha_g N) > 0$. Let an investment $\iota_g^i \geq 0$ in*

information acquisition allow agent i to be informed about sector g with probability

$$\theta_g\left(\iota_g^i\right) = \underline{\theta}_g + \left(1 - \underline{\theta}_g\right)\phi_g\left(\iota_g^i\right),$$

with $\underline{\theta}_g \in [0,1)$, $\phi_g'(\iota_g) > 0$ *and* $\phi_g''(\iota_g) < 0$ *for all* $\iota_g \in \mathbb{R}^+$, $\phi_g(0) = 0$, $\lim_{\iota_g \to \infty} \phi_g(\iota_g) = 1$, *and the Inada conditions* $\lim'_{\iota_g \to 0} \phi_g(\iota_g) = \infty$ *and* $\lim'_{\iota_g \to \infty} \phi_g(\iota_g) = 0$.

Then there exists a threshold $\underline{\gamma}_g > 0$ *such that for all* $\gamma_g > \underline{\gamma}_g$, *in equilibrium all consumers with* $\kappa_g^i = 0$ *invest* $\iota_g^i = 0$ *and are informed with probability* $\underline{\theta}_g \in [0,1)$, *while all producers with* $\kappa_g^i > 0$ *invest* $\hat{\iota}_g > 0$ *and are informed with probability* $\hat{\theta}_g \in \left(\underline{\theta}_g, 1\right)$. *The average protectionist bias in enacted policy is*

$$\mathbb{E}\left(p_g - p_g^*\right) = \frac{\rho_g}{\gamma_g - \rho_g}\left(\mathbb{E}p_g^* - \underline{p}_g\right), \text{ with } \rho_g = \frac{1 - \alpha_g}{\alpha_g + \underline{\theta}_g / \left(\hat{\theta}_g - \underline{\theta}_g\right)} \in \left(0, \underline{\gamma}_g\right].$$

Producers are more informed and the average protectionist bias is greater in sectors with more volatile world prices, greater price sensitivity, and fewer producers: the lowest and highest equilibrium values of $\hat{\theta}_g$ *and* $\mathbb{E}\left(p_g - p_g^*\right)$ *are increasing in* $Var\left(p_g^*\right)$ *and* ξ_g *and decreasing in* α_g. *The average protectionist bias is greater in sectors for which public information is scarcer: the lowest and highest equilibrium values of* $\mathbb{E}\left(p_g - p_g^*\right)$ *are decreasing in* $\underline{\theta}_g$.

Investment in information acquisition with a smooth cost function has the potential for multiple equilibria, because the expected value of information to each producer depends ambiguously on his beliefs about other producers' information. A unique equilibrium is ensured if $\alpha_g + \underline{\theta}_g \geq 1$, which implies that price volatility decreases monotonically as politicians expect producers to be more informed ($\partial\left(\bar{\rho}_g + \bar{\omega}_g\right)/\partial\hat{\theta}_g < 0$).

Proposition 5 establishes comparative statics that apply both locally to a unique equilibrium and globally for a set of multiple equilibria, following Milgrom and Roberts's (1994) approach to equilibrium comparisons. The endogenous asymmetry between producers and consumers always leads to an anti-trade bias in policy. The distortion is greater when the incentives for factor owners to acquire information are sharper. Stronger incentives emerge when prices are more variable on international markets, since this volatility is reflected in domestic prices as well. Equally intuitive is that producers are keener on accurate price forecasts when quantities supplied and demanded are more sensitive to price movements. As usual, industries with fewer insiders also receive greater protection. In this setting, this occurs not only because producers are keener on tariffs, but also because they correctly expect greater volatility in the prices that politicians set in response to their preferences. Finally, the proposition confirms again the finding that public information reduces protectionist distortions. Additional evidence supporting this prediction in a cross-section of U.S. manufacturing industries is provided below.

Costly learning generates asymmetric knowledge of policy proposals if and only if the expected policy choices influence ex ante private investments in production capacity. Both in Proposition 4 and in Proposition 5, producers choose to learn about platforms because parties propose trade policies that distort economic activity. If instead politicians offered redistribution through non-distortionary lump-sum transfers targeted towards certain groups, there would be no differential incentives for the beneficiaries to learn about them in advance. The model thus provides a microfoundation for Magee, Brock, and Young's (1989) suggestion that trade policy is preferred to efficient transfers for reasons of "optimal obfuscation." More precisely, indirect transfers have the advantage of attracting their recipients' attention, rather than being more obscure than direct hand-outs for the voters who bear their cost. The emphasis on beneficiaries' information instead of victims' allows the theory to account for the political expediency of transfers that are unambiguously inefficient. This provides a more intuitive fit to trade policy than a model in which taxpayers are unsure if an intervention is in fact efficient, and this allows special interests to obtain disguised favors (Coate and Morris 1995).

Endogenous asymmetric information thus suggests an explanation to both empirical regularities that Rodrik (1995) presents as the two main puzzles in the political economy of trade policy. First, deviations from free trade take the form of import tariffs and export subsidies, rather than import subsidies and export taxes, because information about a sector is acquired disproportionately by producers. Second, income is redistributed via inefficient policy instruments because the promised (or threatened) distortion itself is the source of the knowledge asymmetry that endows producers with political influence.

VI. The Dracula Effect

The theoretical analysis above yields two key empirical predictions. First, trade-policy distortions respond to their social cost, according to a modified Ramsey rule: they are lower for sectors with higher import demand elasticity and higher import penetration. Second, protectionism results from information heterogeneity favoring producers over consumers, which induces politicians to support policies redistributing from the latter to the former. Thus protection declines when knowledge is more widespread, reducing the scope for asymmetry.

Using cross-industry data, these predictions can be tested with a simple linear specification:

$$\frac{p_g - p_g^*}{p_g} = \beta_0 + \beta_1 \frac{x_g}{m_g} \left| \frac{m_g}{p_g m_g'} \right| + \beta_2 \underline{\theta}_g \frac{x_g}{m_g} \left| \frac{m_g}{p_g m_g'} \right| + \varepsilon_g, \tag{34}$$

where $\varepsilon \sim N(0, \Sigma)$ represents an additive error term. The testable implications of the model are then that $\beta_0 = 0$ and $\beta_2 < 0$.

This empirical strategy admittedly falls short of providing a test of the model in a strict econometric sense. That would require specifying in detail a more restrictive structure for the informational advantage enjoyed by producers in each industry, estimating the resulting non-linear model, and testing it against a precise alternative hypothesis. The goal of estimating equation 34 is less ambitious. It provides a way of checking if the analytical framework is consistent with empirical evidence, and particularly if the data support the hypothesis of a "Dracula effect" linking media scrutiny with the efficiency of trade policy.

VI.A. Data

Data availability dictates the choice of a sample of U.S. manufacturing industries for 1983. Measures of protection and estimates of import demand elasticities are available for these sectors and this year. All empirical studies of U.S. trade policy inspired by Grossman and Helpman's (1994) lobbying model have used essentially the same sample (Goldberg and Maggi 1999; Gawande and Bandyopadhyay 2000; Eicher and Osang 2002; Matschke and Sherlund 2006; Mitra, Thomakos, and Ulubaşoğlu 2006; Bombardini 2008).

In addition to existing industry data, I create a measure of the level of public information based on coverage of an industry in the five major national newspapers from 1980 to 1983. This approach is consistent with Graber's (1984) finding that at the time Americans predominantly acquired their knowledge of political news from reading the newspaper. Excluding sectors for which a reliable measure of media coverage cannot be constructed, the sample includes 175 industries, defined at the 4-digit SIC level. Table I presents the variables used and their descriptive statistics.

The level of protection is measured by the coverage ratio for non-tariff barriers, τ_g. I use data from Gawande and Bandyopadhyay (2000), constructed from the UNCTAD database on trade control measures using the methodology detailed in Leamer (1990). The definition of non-tariff barriers includes price instruments such as anti-dumping duties, quantity instruments such as quotas and voluntary export restraints, and other instruments such as trade investigations. Following the universal usage in the existing literature, the coverage ratio is taken as a proxy for the equivalent ad valorem tariff, and the dependent variable is taken to be $\tau_g/(1+\tau_g)$.

Gawande and Bandyopadhyay (2000) also provide estimates of the import demand elasticity (e_g) for each 3-digit SIC industry group, which are replicated for each component 4-digit industry. These derive from the original estimates by Shiells et al. (1986), purged of measurement error by means of the correction procedure described in Gawande (1997). Import penetration is computed as the ratio of the value of gross imports (c.i.f.) to the value of shipments (f.o.b.) from all domestic plants.[2] Trade data are from the

[2]In the regressions, the import penetration ratio is scaled by a factor of 10,000 for presentational

NBER Trade Database (Feenstra 1996), and domestic output from the NBER-CES Manufacturing Industry Database (Bartelsman and Gray 1996).

To construct a measure of public information I exploit the ProQuest Historical Newspapers database. This archive provides the full text of the *Chicago Tribune*, *Los Angeles Times*, *New York Times*, *Wall Street Journal*, and *Washington Post*. From the articles published in these newspapers from 1980 to 1983, I select a sample of 10,246 documents containing keywords that denote coverage of trade policy in general; then I use the official SIC title of each industry to generate another set of keywords that further restricts the search to articles covering the sector. With this procedure, described in greater detail in the appendix, I derive an estimate of the number of newspaper articles providing information about each industry, a_g. Although the estimates are inevitably imprecise, it is reasonable to assume that when a search returns more articles conveying information about a sector the average reader is also more likely to receive such information from reading the newspaper. If for each document returned by the search there is a constant probability ι that the average reader is informed, the index of public information is

$$\underline{\theta}_g = 1 - (1 - \iota)^{a_g} . \tag{35}$$

In keeping with the simple linear formulation of equation 34, I do not attempt to treat ι as a structural parameter to be estimated from the non-linearities in the data. Instead, I assume a baseline value $\iota = 0.01$, and show as a robustness check that the results are not sensitive to this parametrization.

Following the existing empirical tests of the "protection for sale" model, I use as instruments for the endogenous variables measures of factor composition, industry structure, and unionization. Capital intensity is measured as the ratio of the total real capital stock to total employment in the industry, from the NBER Manufacturing Industry Database. Gawande and Bandyopadhyay (2000) provide both the breakdown of the workforce by specialization, and the concentration indices for each industry and for the average downstream purchaser of its output. The unionization rates are from the NBER Trade and Immigration Database (Abowd 1991).

VI.B. Estimation

By construction, a non-tariff barrier coverage ratio is an index taking values in the interval $[0, 1]$; on the contrary, the theoretical model admits levels of protection above 100% and below zero. As a consequence, estimating equation 34 in the form

$$\frac{\tau_g}{1 + \tau_g} = \beta_0 + \beta_1 \frac{x_g}{e_g m_g} + \beta_2 \frac{\underline{\theta}_g x_g}{e_g m_g} + \varepsilon_g \tag{36}$$

convenience.

requires a Tobit model with two-sided censoring. In fact, out of 175 industries, 85 observations are left-censored at zero and 3 are right-censored at one, and only half of the sample has an interior value of the coverage ratio.

A second concern is that the right-hand side variables are theoretically known to be endogenous, because import penetration depends on domestic prices. Furthermore, newspaper coverage is intuitively endogenous as well: in particular, it seems natural that higher levels of protection would be more newsworthy, generating reverse causation whose sign counteracts that of the hypothesized direct effect from media attention to policy choices. Therefore, each of the regressors is treated as endogenous, as in previous empirical studies of trade policy based on lobbying.

The first column of table II presents the results from the main specification, using the maximum-likelihood IV Tobit estimator and controlling for clustering at the 3-digit SIC level. The data strongly point to the presence of a "Dracula effect": the estimate of β_2 is negative as predicted, and extremely significant; conversely, both β_0 and β_1 are not significantly different from zero at the 10% confidence level. Wald tests also forcefully reject both the null hypothesis that all coefficients are identically nil, and the exogeneity of the original regressors.

The following columns present robustness checks, which are estimated with Newey's (1987) efficient two-step IV Tobit estimator to reduce the computational burden. Column 2 tests the Ramsey-rule specification by adding the level of public information ($\underline{\theta}_g$) as a separate (endogenous) second-stage variable. Consistent with the theoretical predictions, this added regressor is not significant, and does not detract from the significance of the original model. Column 3 assesses the robustness of the specification to the inclusion of an indicator for political organization, which has been the focus of the literature on lobbying for protection. I_g is a dummy variable constructed by Gawande and Bandyopadhyay (2000) to classify which industries are politically organized to lobby for protection. Again the results are unchanged by the inclusion of the additional variable, which is not independently significant in this regression.[3]

A final sensitivity analysis is provided by table III, which considers different definitions of $\underline{\theta}_g$. The results appear qualitatively independent of the choice of a value of ι, since little change is induced by variation on the range from 0.125% to 8%. Even a parameter-free specification of the measure of public information preserves the same results: the last column is based on the alternative definition $\underline{\theta}_g = \log a_g$. This highlights that the operation of the "Dracula effect" is supported by the data, subject only to the assumption that public information reacts to proportional, rather than absolute, increases in the amount of media coverage for a sector.

[3]Gawande and Bandyopadhyay (2000) not only use a different regression model, but can also exploit a larger sample of 242 industries for which data other than newspaper coverage are available.

VII. Party Divergence

The previous sections have focused, both theoretically and empirically, on the cross-sector structure of trade policy. Another notable feature of the real-world political landscape is the presence of sharp partisan divisions. In American politics, the tariff defined party differences for more than a hundred years, from the early nineteenth century to the Smoot-Hawley Act of 1930. First the Whigs and then the Republicans were identified with support for protective tariffs, which the Democratic Party naturally came to oppose. These division resulted in sharp swings in tariff rates as parties alternated in power (Epstein and O'Halloran 1996). Although no longer as acute, partisan divisions over protectionism persist both in the United States and around the world. Dutt and Mitra (2005) document a significant influence of the partisan ideology of governments on the cross-national variation in protection. The differences in the rhetoric between right-wing and left-wing parties tend to be even starker (Milner and Judkins 2004).

The most common explanation for divergence is that different parties represent owners of different factors: specifically, the left represents labour and the right capital. A Heckscher-Ohlin analysis then predicts that protectionism should be favoured by the party representing the domestically scarce factor, which in the United States was capital in the nineteenth century but labour in the second half of the twentieth (Rogowski 1987; Keech and Pak 1995; Milner and Judkins 2004; Dutt and Mitra 2005). However, Grossman and Helpman (1996) show that such an identification between one factor and one party should not occur if politicians are influenced only by the contributions offered by organized lobbies. Political action committees can and do support politicians of either party, targeting their contributions towards incumbents, and even winners who defeated a loser they previously supported (Magelby and Nelson 1990).

Instead, the present model of asymmetric information bears out the notion that party position reflect the different opinions of the respective partisan audiences (Glaeser, Ponzetto and Shapiro 2005). It is consistent with the presence of rational partisanship (Alesina 1987; Alesina and Rosenthal 1995): changes in the identity of the ruling party have real economic consequences because political parties are not mere conduits used by special-interest groups to exercise their influence, but independent determinants of policy variation (O'Halloran 1994; Brady, Goldstein and Kessler 2002). Unlike lobbyists, individual voters have no strategic motive to acquire political information. Thus their ideological preferences may induce them to pay more attention to the proposals of one of the parties, and therefore to become more influential in the determination of its policy choices than in those of its opponent.

An investigation of the determinants of voters' partisanship is beyond the scope of this paper. Party affiliation may simply derive from ideological cleavages inherited from the past (Lipset and Rokkan 1967). However, Proposition 1 points to a suggestive ex-

planation of the changes in the trade-policy stances of American political parties during the twentieth century. After 1970, Republicans and Democrats switched their historic roles, the former becoming the more explicit advocates of free trade (Keech and Pak 1995). Since the 1970s, right-wing identification in the United States has also become increasingly correlated with religious belief (Layman 1997, 1999, 2001). Today, individual religiosity is arguably a better predictor of Republican partisanship than income (Fiorina 2005). On the other hand, the Democratic party has retained its association with organized labour (Dark 2001), and union members remain more likely to affiliate with the Democrats (Freeman 2003). If social conservatism is uncorrelated with ownership of specific factors, the model implies that Republicans should present a free-trade platform, because the preferences of their partisan audience are representative of the whole electorate in so far as trade policy is concerned. On the other hand, Democratic candidates should veer towards protectionism to please workers with industry-specific human capital. This suggestive sketch is consistent with political platforms for the 2008 U.S. presidential election. The Republican ran as a committed free-trader, emphasizing the negative consequences of protection for consumers: "McCain will lower barriers to trade [...] to control the rising cost of living that hurts our families.". Instead the Democrat sounded a skeptical note on free-trade agreements, focusing on the negative effect of foreign competition on workers: "Obama will work [...] to fix NAFTA so that it works for American workers."

VIII. Conclusion

I have presented an analysis of trade policy as the outcome of an electoral competition in which office-seeking politicians seek the support of heterogeneously informed voters. Each policy proposal is chosen to maximize a political support function weighing every person by her likelihood of being informed about the proposal itself. Thus the power of special-interest groups stems from their members' superior knowledge. This micro-foundation has the advantage of explaining simultaneously why welfare-reducing protectionist measures are popular with voters, and why the influence of a group can be concentrated on a specific policy choice.

My model has explained the overall protectionist bias of trade distortions with an endogenous distribution of information that favors producers over consumers, sector by sector. This systematic asymmetry can arise from workplace interactions that provide agents with knowledge of the industry they work in. Organized lobbies can exploit such social networks to manage the flow of political information. By so doing they gain political influence without having to share the resulting gains with politicians by means of pecuniary contributions.

Endogenous information asymmetry also emerges from costly learning. Rational vot-

ers are unwilling to spend resources to gain political knowledge as such. Producers, however, wish to anticipate prices to optimize their production decisions. In equilibrium, they acquire greater knowledge of proposed tariffs for their own industry than the average voter. This mechanism can explain not only why trade policy redistributes from consumers to producers, but also why politicians redistribute through price distortion rather than via efficient transfers, which producers have no need to forecast.

Empirically, my theory predicts that protectionism should decline when more public information is available. I have tested this prediction with cross-sector data for U.S. manufacturing, constructing a measure of newspaper coverage of trade policy for each industry. The findings support the hypothesis of a "Dracula effect": greater media scrutiny of a sector is associated with a lower level of protection.

The results obtained in this paper represent a first step in the study of voters' heterogeneous knowledge as a driving force of the political economy of protection. A more thorough empirical analysis, using a richer and more recent dataset, is clearly desirable. On the theoretical side as well, many sources of asymmetry remain to be explored in addition to occupational bias. In particular, I have shown that the framework can explain the presence of partisan divisions over trade policy. Future research could focus on the mechanisms that underlie the formation of preferential information channels linking some interest groups to a political party.

A Appendix

A.1. Proof of Proposition 1

From Lemma 1, an optimal policy proposal p_g^P interior to the feasible set $\mathcal{F}$ is characterized by the first-order condition

$$\sum_{j=1}^{J} \alpha^j \theta_g^{P,j} \frac{\partial U_g}{\partial p_g} \left(p_g^P, \kappa_g^j\right) = 0. \tag{A1}$$

Substituting equation 10,

$$\sum_{j=1}^{J} \alpha^j \theta_g^{P,j} \left[\left(\kappa_g^j - \frac{1}{N} \right) x_g \left(p_g^P\right) + \frac{1}{N} \left(p_g^P - p^*\right) m_g' \left(p_g^P\right) \right] = 0, \tag{A2}$$

and rearranging,

$$p_g^P - p^* = - \left(N \frac{\sum_{j=1}^{J} \alpha^j \theta_g^{P,j} \kappa_g^j}{\sum_{j=1}^{J} \alpha^j \theta_g^{P,j}} - 1 \right) \frac{x_g \left(p_g^P\right)}{m_g' \left(p_g^P\right)}, \tag{A3}$$

such that by the second-order condition for a maximum $p_g - p^*$ is increasing with the term in brackets.

Recalling that net imports are monotone decreasing in the domestic price of the good ($m_g' \left(p_g\right) < 0$) and that the shares of factor ownership add up to one over the whole population ($N \sum_{j=1}^{J} \alpha^j \kappa_g^j = 1$), we can rewrite

$$\frac{p_g^P - p^*}{p_g^P} = \frac{\sum_{j=1}^{J} \alpha^j \theta_g^{P,j} \kappa_g^j - \sum_{j=1}^{J} \alpha^j \theta_g^{P,j} \sum_{j=1}^{J} \alpha^j \kappa_g^j}{\sum_{j=1}^{J} \alpha^j \theta_g^{P,j} \sum_{j=1}^{J} \alpha^j \kappa_g^j} \frac{x_g \left(p_g^P\right)}{\left| m_g \left(p_g^P\right) \right|} \frac{\left| m_g \left(p_g^P\right) \right|}{\left| m_g' \left(p_g^P\right) \right| p_g^P}, \tag{A4}$$

and denoting more compactly the moments of the population distribution of factor ownership and the probability of information acquisition,

$$\frac{p_g^P - p^*}{p_g^P} = \frac{Cov \left(\theta_g^P, \kappa_g\right)}{\mathbb{E}\theta_g^P \mathbb{E}\kappa_g} \frac{x_g \left(p_g^P\right)}{\left| m_g \left(p_g^P\right) \right|} \frac{\left| m_g \left(p_g^P\right) \right|}{\left| m_g' \left(p_g^P\right) \right| p_g^P}. \tag{A5}$$

A.2. Proof of Proposition 2

The eventual information structure is $\theta_g^{P,i} = \underline{\theta}_g^P$ for all agent who are not employed in sector g, and $\theta_g^{P,i} = \hat{\theta}_g^P$ for sector-g employees, with

$$\hat{\theta}_g^P = 1 - \left(1 - \underline{\theta}_g^P\right)^{n_g} \in \left(\underline{\theta}_g^P, 1\right) \tag{A6}$$

such that

$$\frac{\partial \hat{\theta}_g^P}{\partial n_g} = - \left(1 - \underline{\theta}_g^P\right)^{n_g} \log \left(1 - \underline{\theta}_g^P\right) > 0 \tag{A7}$$

and

$$\frac{\partial \hat{\theta}_g^P}{\partial \underline{\theta}_g^P} = n_g \left(1 - \underline{\theta}_g^P\right)^{n_g - 1} > 0 \tag{A8}$$

Hence Proposition 2 implies an equilibrium structure of protection described by

$$p_g^P - p_g^* = \frac{1 - \alpha_g}{\alpha_g + \Theta_g} \frac{x_g\left(p_g^P\right)}{\left|m_g'\left(p_g^P\right)\right|} > 0, \tag{A9}$$

with

$$\Theta_g^P = \frac{\underline{\theta}_g^P}{\hat{\theta}_g^P - \underline{\theta}_g^P} \tag{A10}$$

such that

$$\frac{\partial \Theta_g^P}{\partial n_g} = -\frac{\underline{\theta}_g^P}{\left(\hat{\theta}_g^P - \underline{\theta}_g^P\right)^2} \frac{\partial \hat{\theta}_g^P}{\partial n_g} < 0 \tag{A11}$$

and

$$\begin{aligned} \frac{\partial \Theta_g^P}{\partial \underline{\theta}_g^P} &= \frac{\hat{\theta}_g^P}{\left(\hat{\theta}_g^P - \underline{\theta}_g^P\right)^2} - \frac{\underline{\theta}_g^P}{\left(\hat{\theta}_g^P - \underline{\theta}_g^P\right)^2} \frac{\partial \hat{\theta}_g^P}{\partial \underline{\theta}_g^P} = \\ &= -\frac{1}{\left(\hat{\theta}_g^P - \underline{\theta}_g^P\right)^2} \left[\left(1 + \frac{\underline{\theta}_g^P}{1 - \underline{\theta}_g^P} n_g\right)\left(1 - \underline{\theta}_g^P\right)^{n_g} - 1\right] > 0 \end{aligned} \tag{A12}$$

for all $n_g > 1$.

By the second-order condition for a maximum, p_g^P is increasing in $(1 - \alpha_g) / (\alpha_g + \Theta_g)$, and therefore $\partial p_g^P / \partial n_g > 0$ and $\partial p_g^P / \partial \underline{\theta}_g^P < 0$.

A.3. Proof of Proposition 3

The aggregate welfare of the sector-g lobby depends on the industry price according to the function

$$W_g^g\left(p_g\right) = \pi_g\left(p_g\right) + \alpha_g N\left[r_g\left(p_g\right) + s_g\left(p_g\right)\right] \tag{A13}$$

such that

$$\frac{\partial W_g^g}{\partial p_g}\left(p_g\right) = \left(1 - \alpha_g\right) x_g\left(p_g\right) + \alpha_g \left(p_g - p_g^*\right) m_g'\left(p_g\right) \tag{A14}$$

and the preferred policy satisfies

$$\hat{p}_g - p_g^* = \frac{1 - \alpha_g}{\alpha_g} \frac{x_g\left(\hat{p}_g\right)}{\left|m_g'\left(\hat{p}_g\right)\right|}. \tag{A15}$$

A network with a continuum of agents has perfect information about the policy proposal. If its members represent a fraction α of the population and κ of sector-specific capital, the equilibrium choice of both parties is

$$p_g^P = \max_{p_g} \left\{\left[\underline{\theta}_g + \left(1 - \underline{\theta}_g\right)\kappa\right]\pi_g\left(p_g\right) + \left[\underline{\theta}_g + \left(1 - \underline{\theta}_g\right)\alpha\right] N\left[r_g\left(p_g\right) + s_g\left(p_g\right)\right]\right\} \tag{A16}$$

which satisfies

$$p_g^P - p_g^* = \frac{\kappa - \alpha}{\frac{\underline{\theta}_g}{1-\underline{\theta}_g} + \alpha} \frac{x_g\left(p_g^P\right)}{\left|m_g'\left(p_g^P\right)\right|} \tag{A17}$$

so that naturally $\partial p_g^P/\partial\kappa > 0$ and $\partial p_g^P/\partial\alpha < 0$.

By controlling access to the network, the lobby can manipulate κ and α to induce a protectionist policy proposal. Its only constraint is given by the distribution of specific capital. Let capital ownership among the members of the sector-g lobby have cumulative distribution function $F_g(\kappa_g)$, such that $F_g\left(\underline{\kappa}_g\right) = 0$ and $\int_{\underline{\kappa}_g}^{\infty} \kappa_g dF_g(\kappa_g) = (\alpha_g N)^{-1}$. If it admits all individuals with a share of at least k, it obtains

$$\kappa = 1 - \alpha_g N \int_{\underline{\kappa}_g}^{k} \kappa_g dF_g(\kappa_g) \tag{A18}$$

and

$$\alpha = \alpha_g \left[1 - F_g(k)\right] \tag{A19}$$

Thus if and only if

$$\int_{\underline{\kappa}_g}^{\frac{1}{\alpha_g N}} \left(1 - \alpha_g N \kappa_g\right) dF_g(\kappa_g) \geq \frac{1-\alpha_g}{\alpha_g} \frac{\underline{\theta}_g}{1-\underline{\theta}_g} \tag{A20}$$

the lobby can obtain its preferred price $\hat{p}_g$ by setting a cut-off $\hat{k}_g$ such that

$$\int_{\underline{\kappa}_g}^{\hat{k}_g} \left(1 - \alpha_g N \kappa_g\right) dF_g(\kappa_g) = \frac{1-\alpha_g}{\alpha_g} \frac{\underline{\theta}_g}{1-\underline{\theta}_g} \tag{A21}$$

Otherwise, the maximum price achievable in the sector corresponds to

$$\hat{k}_g = \arg\max_{k>0} \frac{1 - \alpha_g N \int_{\underline{\kappa}_g}^{k} \kappa_g dF_g(\kappa_g) - \alpha_g \left[1 - F_g(k)\right]}{\frac{\underline{\theta}_g}{1-\underline{\theta}_g} + \alpha_g \left[1 - F_g(k)\right]} \tag{A22}$$

The maximand is increasing in k if and only if

$$\frac{1}{1-\underline{\theta}_g} - \left(\frac{\underline{\theta}_g}{1-\underline{\theta}_g} + \alpha_g\right) N k + \alpha_g N \int_{\underline{\kappa}_g}^{k} \left(k - \kappa_g\right) dF_g(\kappa_g) > 0 \tag{A23}$$

and the left-hand side of this expression is monotone decreasing in k.

Hence

$$\underline{\kappa}_g \geq \frac{1}{N\left[\underline{\theta}_g + \left(1-\underline{\theta}_g\right)\alpha_g\right]} \Rightarrow \hat{k} = \underline{\kappa}_g \tag{A24}$$

and in this case the optimal policy for the lobby is to include all its members in the network and obtain

$$p_g^P - p_g^* = \frac{1-\alpha_g}{\frac{\underline{\theta}_g}{1-\underline{\theta}_g} + \alpha_g} \frac{x_g\left(p_g^P\right)}{\left|m_g'\left(p_g^P\right)\right|} \tag{A25}$$

If instead $\underline{\kappa}_g < \left\{N\left[\underline{\theta}_g + \left(1-\underline{\theta}_g\right)\alpha_g\right]\right\}^{-1}$, then $\hat{k} > \left\{N\left[\underline{\theta}_g + \left(1-\underline{\theta}_g\right)\alpha_g\right]\right\}^{-1}$ is de-

fined by

$$\frac{1}{1-\underline{\theta}_g} - \left(\frac{\underline{\theta}_g}{1-\underline{\theta}_g} + \alpha_g\right) N\hat{k} + \alpha_g N \int_{\underline{\kappa}_g}^{\hat{k}} \left(\hat{k} - \kappa_g\right) dF_g\left(\kappa_g\right) = 0 \tag{A26}$$

which implies a maximum

$$\max_{k>0} \frac{1 - \alpha_g N \int_{\underline{\kappa}_g}^{k} \kappa_g dF_g\left(\kappa_g\right) - \alpha_g\left[1 - F_g\left(k\right)\right]}{\frac{\underline{\theta}_g}{1-\underline{\theta}_g} + \alpha_g\left[1 - F_g\left(k\right)\right]} = N\hat{k} - 1 \tag{A27}$$

For a Pareto distribution with dispersion coefficient $\eta_g > 1$ the cumulative distribution function

$$F_g\left(\kappa_g\right) = 1 - \left(\frac{\underline{\kappa}_g}{\kappa_g}\right)^{\eta_g} \tag{A28}$$

implies mean

$$\int_{\underline{\kappa}_g}^{\infty} \kappa_g dF_g\left(\kappa_g\right) = \frac{1}{\alpha_g N} = \frac{\eta_g \underline{\kappa}_g}{\eta_g - 1} \tag{A29}$$

Thus the optimal network includes all factor owners if and only if

$$\eta_g \geq 1 + \frac{\alpha_g}{\underline{\theta}_g\left(1 - \alpha_g\right)} \tag{A30}$$

and the lobby can achieve its preferred price if and only if

$$\frac{\left(\eta_g - 1\right)^{\eta_g - 1}}{\eta_g^{\eta_g}} \geq \frac{\underline{\theta}_g}{1-\underline{\theta}_g} \frac{1-\alpha_g}{\alpha_g} \tag{A31}$$

which requires $\alpha_g > \theta_g$ and can be written $\eta_g \leq \bar{\eta}_g\left(\underline{\theta}_g, \alpha_g\right)$ for a threshold

$$\bar{\eta}_g\left(\underline{\theta}_g, \alpha_g\right) \in \left(1, 1 + \frac{\alpha_g}{\underline{\theta}_g\left(1 - \alpha_g\right)}\right) \tag{A32}$$

such that $\partial\bar{\eta}_g/\partial\underline{\theta}_g < 0$ and $\partial\bar{\eta}_g/\partial\alpha_g > 0$.

When neither condition is satisfied, the maximum price is obtained by including in the network only individuals whose capital ownership is at least λ_g times the population average $1/N$; the optimal threshold

$$\lambda_g\left(\underline{\theta}_g, \alpha_g, \eta_g\right) \in \left(\frac{1}{\underline{\theta}_g + \left(1 - \underline{\theta}_g\right)\alpha_g}, \frac{1}{\alpha_g}\right) \tag{A33}$$

is defined by

$$\frac{\underline{\theta}_g}{1-\underline{\theta}_g}\left(1 - \lambda_g\right) + \frac{\left(\eta_g - 1\right)^{\eta_g - 1}}{\eta_g^{\eta_g}} \left(\alpha_g \lambda_g\right)^{-\left(\eta_g - 1\right)} = 0 \tag{A34}$$

so that $\partial\lambda/\partial\underline{\theta}_g < 0$, $\partial\lambda/\partial\alpha_g < 0$ and $\partial\lambda_g/\partial\eta_g < 0$.

A.4. Proof of Lemma 2

Let $\mathcal{G} = \{1, ..., G\}$ be the set of all sectors, and $2^{\mathcal{G}}$ its power set. Let $\Gamma^i \in 2^{\mathcal{G}}$ be the set of sectors for which an agent i has received information, which fully describes the agent's information. Agent i with information Γ^i and factor ownership $\boldsymbol{\kappa}^i$ votes for party R if his idiosyncratic partisanship shock has a realization

$$\psi^i < \sum_g \left\{ \begin{array}{l} \left(\mathbb{E}_{\Gamma^i} p_g^R - \mathbb{E}_{\Gamma^i} p_g^L\right) \left[\kappa_g^i \pi_g' \left(\mathbb{E}_{\Gamma^i} p_g\right) - \frac{1}{N} \mathbb{E}_{\Gamma^i} x_g\right] \\ + \mathbb{E}_{\Gamma^i} \left[\left(p_g^R - p_g^*\right) c_g \left(p_g^R\right) + s_g \left(p_g^R\right) - \left(p_g^L - p_g^*\right) c_g \left(p_g^L\right) - s_g \left(p_g^L\right)\right] \end{array} \right\} - \Psi, \tag{A35}$$

If agents of type j follow the information-acquisition strategy $\bar{\boldsymbol{\iota}}\left(\boldsymbol{\kappa}^j\right)$, the fraction having information Γ is

$$\bar{\theta}_\Gamma^j = \prod_{g \in \Gamma} \bar{\theta}_g^j \prod_{g \notin \Gamma} \left(1 - \bar{\theta}_g^j\right) \text{ for all } \Gamma \in 2^{\mathcal{G}}, \tag{A36}$$

such that $\sum_{\Gamma \in 2^{\mathcal{G}}} \bar{\theta}_\Gamma^j = 1$. Given the independent realizations of the uniform idiosyncratic shock ψ^i, the fraction of citizens of type j who vote for party R equals

$$\begin{array}{l} \phi_R^j = \dfrac{1}{2} - \dfrac{\Psi}{2\bar{\psi}} \\ + \dfrac{1}{2\bar{\psi}} \displaystyle\sum_{\Gamma \in 2^{\mathcal{G}}} \bar{\theta}_\Gamma^j \sum_g \left\{ \begin{array}{l} \left(\mathbb{E}_\Gamma p_g^R - \mathbb{E}_\Gamma p_g^L\right) \left[\kappa_g^j \pi_g' \left(\mathbb{E}_\Gamma p_g\right) - \frac{1}{N} \mathbb{E}_\Gamma x_g\right] \\ + \mathbb{E}_\Gamma \left[\left(p_g^R - p_g^*\right) c_g \left(p_g^R\right) + s_g \left(p_g^R\right) - \left(p_g^L - p_g^*\right) c_g \left(p_g^L\right) - s_g \left(p_g^L\right)\right] \end{array} \right\}, \end{array} \tag{A37}$$

as a function of the common shock Ψ. For all sectors $g \notin \Gamma$, a voter retains the original belief that the two parties make identical proposals. Thus party R wins the election if the aggregate shock is

$$\Psi < \sum_{j=1}^I \alpha^j \sum_{\Gamma \in 2^{\mathcal{G}}} \bar{\theta}_\Gamma^j \sum_{g \in \Gamma} \left\{ \begin{array}{l} \left(p_g^R - p_g^L\right) \left[\kappa_g^j \pi_g' \left(\mathbb{E}_\Gamma p_g\right) - \frac{1}{N} \mathbb{E}_\Gamma x_g\right] \\ + \left(p_g^R - p_g^*\right) c_g \left(p_g^R\right) + s_g \left(p_g^R\right) - \left(p_g^L - p_g^*\right) c_g \left(p_g^L\right) - s_g \left(p_g^L\right) \end{array} \right\}. \tag{A38}$$

For each good g, the first-order condition for party R's optimization problem is

$$\sum_{j=1}^I \alpha^j \sum_{\Gamma \in 2^{\mathcal{G}} | g \in \Gamma} \bar{\theta}_\Gamma^j \left\{ \begin{array}{l} \kappa_g^j \pi_g' \left(\mathbb{E}_\Gamma p_g\right) - \frac{1}{N} \mathbb{E}_\Gamma x_g + \left(p_g^R - p_g^*\right) c_g' \left(p_g^R\right) \\ + \sum_{h \in \Gamma} \left(p_h^R - p_h^L\right) \left[\kappa_h^j \pi_h'' \left(\mathbb{E}_\Gamma p_h\right) \frac{\partial \mathbb{E}_\Gamma p_h}{\partial p_g^R} - \frac{1}{N} \frac{\partial \mathbb{E}_\Gamma x_h}{\partial p_g^R}\right] \end{array} \right\} = 0, \tag{A39}$$

while the one for party L is

$$\sum_{j=1}^I \alpha^j \sum_{\Gamma \in 2^{\mathcal{G}} | g \in \Gamma} \bar{\theta}_\Gamma^j \left\{ \begin{array}{l} \kappa_g^j \pi_g' \left(\mathbb{E}_\Gamma p_g\right) - \frac{1}{N} \mathbb{E}_\Gamma x_g + \left(p_g^L - p_g^*\right) c_g' \left(p_g^L\right) \\ + \sum_{h \in \Gamma} \left(p_h^R - p_h^L\right) \left[\kappa_h^j \pi_h'' \left(\mathbb{E}_\Gamma p_h\right) \frac{\partial \mathbb{E}_\Gamma p_h}{\partial p_g^L} - \frac{1}{N} \frac{\partial \mathbb{E}_\Gamma x_h}{\partial p_g^L}\right] \end{array} \right\} = 0. \tag{A40}$$

In an interior, symmetric equilibrium, both parties propose p_g such that

$$\sum_{j=1}^I \alpha^j \bar{\theta}_g^j \left[\kappa_g^j \pi_g' \left(p_g\right) - \frac{1}{N} \mathbb{E}_\Gamma x_g + \left(p_g - p_g^*\right) c_g' \left(p_g\right)\right] = 0. \tag{A41}$$

Given shared beliefs $\bar{\boldsymbol{\theta}}^j$ about everyone's information acquisition,

$$\mathbb{E}_\Gamma x_g = N \sum_{j=1}^{I} \alpha^j \kappa^j \left[\bar{\theta}_g^j \pi_g' \left(p_g \right) + \left(1 - \bar{\theta}_g^j \right) \pi_g' \left(\mathbb{E} \bar{p}_g \right) \right] \text{ for all } \Gamma \in 2^{\mathcal{G}} \text{ such that } g \in \Gamma. \tag{A42}$$

Thus an interior and symmetric equilibrium is uniquely defined by

$$\frac{\left(1 - \sum_{j=1}^{I} \alpha^j \bar{\theta}_g^j \right) \sum_{j=1}^{I} \alpha^j \bar{\theta}_g^j \kappa_g^j}{\sum_{j=1}^{I} \alpha^j \bar{\theta}_g^j} \pi_g' \left(p_g \right) + \left(\sum_{j=1}^{I} \alpha^j \bar{\theta}_g^j \kappa^j - \frac{1}{N} \right) \pi_g' \left(\mathbb{E} \bar{p}_g \right) + \left(p_g - p_g^* \right) c_g' \left(p_g \right) = 0, \tag{A43}$$

which can be rewritten

$$\left[\frac{Cov \left(\kappa_g, \bar{\theta}_g \right)}{\mathbb{E} \kappa_g \mathbb{E} \bar{\theta}_g} + \omega_g \right] \pi_g' \left(p_g \right) - \omega_g \pi_g' \left(\mathbb{E} \bar{p}_g \right) + \left(p_g - p_g^* \right) N c_g' \left(p_g \right) = 0, \tag{A44}$$

and also

$$\frac{p_g - p_g^*}{p_g} = \left\{ \frac{Cov \left(\kappa_g, \bar{\theta}_g \right)}{\mathbb{E} \kappa_g \mathbb{E} \bar{\theta}_g} + \bar{\omega}_g \left[1 - \frac{x_g \left(\mathbb{E} \bar{p}_g \right)}{x_g \left(p_g \right)} \right] \right\} \frac{x_g \left(p_g \right)}{\left| m_g \left(p_g \right) \right|} \frac{\left| m_g \left(p_g \right) \right|}{\left| \tilde{m}_g' \left(p_g \right) \right| p_g}. \tag{A45}$$

for all $n_g > 1$.

A.5. Proof of Proposition 4

For any $\hat{\iota}_g > 0$, agents with $\kappa_g^i = 0$ choose $\iota_g^i = 0$ and are informed with exogenous probability $\underline{\theta}_g$, since they derive no utility from acquiring information.

All agents with $\kappa_g^i > 0$ strictly prefer to acquire perfect knowledge if

$$\hat{\iota}_g < \left(1 - \underline{\theta}_g \right) \underline{\kappa}_g \left[\mathbb{E} \pi_g \left(\bar{p}_g \right) - \pi_g \left(\mathbb{E} \bar{p}_g \right) \right]. \tag{A46}$$

Rational expectations $\bar{p}_g$ cannot be deterministic: lemma 2 establishes that p_g varies with p_g^* regardless of the politicians' beliefs about voters' information. Thus every candidate equilibrium is associated with a positive value of $v_g = \mathbb{E} \pi_g \left(\bar{p}_g \right) - \pi_g \left(\mathbb{E} \bar{p}_g \right)$. For sufficiently low but strictly positive values of $\hat{\iota}_g$, the unique equilibrium has $\kappa_g^i > 0 \Leftrightarrow \bar{\theta}_g^i = 1$.

Then

$$\frac{Cov \left(\kappa_g, \bar{\theta}_g \right)}{\mathbb{E} \kappa_g \mathbb{E} \bar{\theta}_g} = \frac{1 - \alpha_g}{\alpha_g + \underline{\theta}_g / \left(1 - \underline{\theta}_g \right)} \text{ and } \bar{\omega}_g = 0. \tag{A47}$$

A.6. Proof of Proposition 5

All agents with $\kappa_g^i = 0$ make no investment and have exogenous information $\theta_g^i = \underline{\theta}_g$. All agents with $\kappa_g^i = 1 / \left(\alpha_g N \right)$ make an identical investment

$$\iota_g^i = \phi_g'^{-1} \left(\frac{\alpha_g N}{\left(1 - \underline{\theta}_g \right) v_g} \right) \tag{A48}$$

and thus acquire information with probability

$$\theta_g^i = \underline{\theta}_g + \left(1 - \underline{\theta}_g\right) \phi_g \left(\phi_g'^{-1} \left(\frac{2\alpha_g N}{\left(1 - \underline{\theta}_g\right) \xi_g Var\left(p_g^*\right)} \left(1 - \frac{\bar{\rho}_g + \bar{\omega}_g}{\gamma_g} \right)^2 \right) \right), \tag{A49}$$

provided that $\gamma_g \geq \bar{\rho}_g + \bar{\omega}_g \left(\mathbb{E}p_g^* - \underline{p}_g \right) / \left(\underline{p}_g^* - \underline{p}_g \right)$.

If producers are expected to acquire information with probability $\hat{\theta}_g$ and consumers with probability $\underline{\theta}_g$, then

$$\bar{\rho}_g = \frac{1 - \alpha_g}{\alpha_g + \underline{\theta}_g / \left(\hat{\theta}_g - \underline{\theta}_g \right)} \text{ and } \bar{\omega}_g = 1 - \hat{\theta}_g. \tag{A50}$$

For ease of notation, define

$$\Sigma_g = \frac{1}{2} \xi_g \mathbb{E}\kappa_g^i Var\left(p_g^*\right) > 0 \tag{A51}$$

and

$$V_g\left(\hat{\theta}_g, \underline{\theta}_g, \alpha_g\right) = \frac{1 - \alpha_g}{\alpha_g + \underline{\theta}_g / \left(\hat{\theta}_g - \underline{\theta}_g \right)} + 1 - \hat{\theta}_g, \tag{A52}$$

such that

$$\frac{\partial V_g}{\partial \alpha_g} = \frac{\partial \bar{\rho}_g}{\partial \alpha_g} = -\frac{\hat{\theta}_g \left(\hat{\theta}_g - \underline{\theta}_g \right)}{\left[\alpha_g \hat{\theta}_g + \left(1 - \alpha_g\right) \underline{\theta}_g \right]^2} < 0, \tag{A53}$$

$$\frac{\partial V_g}{\partial \underline{\theta}_g} = \frac{\partial \bar{\rho}_g}{\partial \underline{\theta}_g} = -\frac{\hat{\theta}_g \left(1 - \alpha_g\right)}{\left[\alpha_g \hat{\theta}_g + \left(1 - \alpha_g\right) \underline{\theta}_g \right]^2} < 0, \tag{A54}$$

and

$$\frac{\partial V_g}{\partial \hat{\theta}_g} = \frac{\partial \bar{\rho}_g}{\partial \hat{\theta}_g} - 1 = \frac{\left(1 - \alpha_g\right) \underline{\theta}_g}{\left[\alpha_g \hat{\theta}_g + \left(1 - \alpha_g\right) \underline{\theta}_g \right]^2} - 1. \tag{A55}$$

Given second-order beliefs that politicians expect $\hat{\theta}_g$ and $\underline{\theta}_g$, producers' expected gain from information acquisition per unit of ownership equals

$$v_g = N \Sigma_g \left[\frac{\gamma_g}{\gamma_g - V_g\left(\hat{\theta}_g, \underline{\theta}_g, \alpha_g\right)} \right]^2, \tag{A56}$$

and their optimal probability of information acquisition is

$$\Phi_g\left(\hat{\theta}_g\right) = \underline{\theta}_g + \left(1 - \underline{\theta}_g\right) \phi_g \left(\phi_g'^{-1} \left(\frac{\alpha_g}{\Sigma_g \left(1 - \underline{\theta}_g\right)} \left[1 - \frac{V_g\left(\hat{\theta}_g, \underline{\theta}_g, \alpha_g\right)}{\gamma_g} \right]^2 \right) \right). \tag{A57}$$

provided that

$$\gamma_g > V_g\left(\hat{\theta}_g, \underline{\theta}_g, \alpha_g\right) + \left(1-\hat{\theta}_g\right)\frac{\mathbb{E}p_g^* - \underline{p}_g^*}{\underline{p}_g^* - \underline{p}_g}. \tag{A58}$$

This condition is satisfied for all $\hat{\theta}_g \in \left[\underline{\theta}_g, 1\right]$ if γ_g is greater than

$$\underline{\gamma}_g = \begin{cases} \frac{1-\alpha_g}{\alpha_g + \underline{\theta}_g/\left(1-\underline{\theta}_g\right)} & \text{if } \frac{\mathbb{E}p_g^* - \underline{p}_g}{\underline{p}_g^* - \underline{p}_g} \leq \frac{(1-\alpha_g)\underline{\theta}_g}{\left[\alpha_g\left(1-\underline{\theta}_g\right)+\underline{\theta}_g\right]^2} \\ \frac{1}{\alpha_g}\left[1 - \sqrt{(1-\alpha_g)\,\underline{\theta}_g \frac{\mathbb{E}p_g^* - \underline{p}_g}{\underline{p}_g^* - \underline{p}_g}}\right]^2 + \frac{\mathbb{E}p_g^* - \underline{p}_g^*}{\underline{p}_g^* - \underline{p}_g} & \text{if } \frac{\mathbb{E}p_g^* - \underline{p}_g}{\underline{p}_g^* - \underline{p}_g} \in \left[\frac{(1-\alpha_g)\underline{\theta}_g}{\left[\alpha_g\left(1-\underline{\theta}_g\right)+\underline{\theta}_g\right]^2}, \frac{1-\alpha_g}{\underline{\theta}_g}\right] \\ \left(1-\underline{\theta}_g\right)\frac{\mathbb{E}p_g^* - \underline{p}_g}{\underline{p}_g^* - \underline{p}_g} & \text{if } \frac{\mathbb{E}p_g^* - \underline{p}_g}{\underline{p}_g^* - \underline{p}_g} \geq \frac{1-\alpha_g}{\underline{\theta}_g} \end{cases}. \tag{A59}$$

A rational-expectations equilibrium is then given by a fixed point of $\Phi_g\left(\hat{\theta}_g\right)$. Its existence is guaranteed by Brouwer's fixed-point theorem, since Φ_g is a continuous function of $\hat{\theta}_g$ that maps $\left[\underline{\theta}_g, 1\right]$ into itself. The derivative

$$\frac{\partial \Phi_g}{\partial \hat{\theta}_g} = -\frac{2\alpha_g\left(1 - V_g/\gamma_g\right)}{\gamma_g \Sigma_g}\frac{\phi_g'}{\phi_g''}\frac{\partial V_g}{\partial \hat{\theta}_g} \tag{A60}$$

need not be always smaller than unity, so there can be multiple equilibria.

Milgrom and Roberts's (1994) Corollary 1 implies that:

1. The lowest and highest equilibrium values of $\hat{\theta}_g$, and therefore ρ_g, are increasing in Σ_g because
$$\frac{\partial \Phi_g}{\partial \Sigma_g} = -\alpha_g\left[\frac{1 - V_g/\gamma_g}{\Sigma_g}\right]^2 \frac{\phi_g'}{\phi_g''} > 0. \tag{A61}$$

2. The lowest and highest equilibrium values of $\hat{\theta}_g$, and a fortiori ρ_g, are decreasing in α_g because
$$\frac{\partial \Phi_g}{\partial \alpha_g} = \frac{1 - V_g/\gamma_g}{\Sigma_g}\left(1 - \frac{V_g}{\gamma_g} + 2\alpha_g - \frac{1}{\gamma_g}\frac{\partial V_g}{\partial \alpha_g}\right)\frac{\phi_g'}{\phi_g''} < 0. \tag{A62}$$

Inverting the definition of ρ_g, we can instead express $\hat{\theta}_g$ as a function

$$\hat{\theta}_g\left(\rho_g, \underline{\theta}_g\right) = \frac{(1-\alpha_g)\left(1+\rho_g\right)\underline{\theta}_g}{1 - \alpha_g - \alpha_g\rho_g} \text{ for } \rho_g \in \left[0, \frac{(1-\alpha_g)\left(1-\underline{\theta}_g\right)}{\alpha_g + (1-\alpha_g)\,\underline{\theta}_g}\right], \tag{A63}$$

such that

$$\frac{\partial \hat{\theta}_g}{\partial \rho_g} = \frac{(1-\alpha_g)\,\underline{\theta}_g}{\left(1 - \alpha_g - \alpha_g\rho_g\right)^2} > 0 \tag{A64}$$

and

$$\frac{\partial \hat{\theta}_g}{\partial \underline{\theta}_g} = \frac{\hat{\theta}_g}{\underline{\theta}_g} > 1. \tag{A65}$$

An equilibrium of the information-acquisition game is then given by a root of

$$\Omega_g\left(\rho_g\right) = \Phi_g\left(\hat{\theta}_g\left(\rho_g, \underline{\theta}_g\right), \underline{\theta}_g\right) - \hat{\theta}_g\left(\rho_g, \underline{\theta}_g\right), \tag{A66}$$

such that

$$\frac{\partial \Omega_g}{\partial \partial \underline{\theta}_g} = \left(\frac{\partial \Phi_g}{\partial \hat{\theta}_g} - 1\right)\frac{\partial \hat{\theta}_g}{\partial \underline{\theta}_g} + \frac{\partial \Phi_g}{\partial \underline{\theta}_g}, \tag{A67}$$

and since

$$\frac{\partial \Phi_g}{\partial \underline{\theta}_g} = \frac{1-\Phi_g}{1-\underline{\theta}_g} + \frac{\alpha_g\left(1-V_g/\gamma_g\right)}{\Sigma_g}\left(\frac{1-V_g/\gamma_g}{1-\underline{\theta}_g} - \frac{2}{\gamma_g}\frac{\partial V_g}{\partial \underline{\theta}_g}\right)\frac{\phi_g'}{\phi_g''} < \frac{1-\Phi_g}{1-\underline{\theta}_g}, \tag{A68}$$

the sign is unambiguously negative:

$$\frac{\partial \Omega_g}{\partial \partial \underline{\theta}_g} = \frac{1-\Phi_g}{1-\underline{\theta}_g} - \frac{\partial \hat{\theta}_g}{\partial \underline{\theta}_g} - \frac{2\alpha_g\left(1-V_g/\gamma_g\right)}{\gamma_g \Sigma_g}\frac{\phi_g'}{\phi_g''}\left[\frac{\partial V_g}{\partial \hat{\theta}_g}\frac{\partial \hat{\theta}_g}{\partial \underline{\theta}_g} + \frac{\partial V_g}{\partial \underline{\theta}_g} - \frac{\gamma_g - V_g}{2\left(1-\underline{\theta}_g\right)}\right] < 0, \tag{A69}$$

because

$$\frac{\partial \hat{\theta}_g}{\partial \underline{\theta}_g} = \frac{\hat{\theta}_g}{\underline{\theta}_g} > 1 > \frac{1-\Phi_g}{1-\underline{\theta}_g} \tag{A70}$$

and simultaneously

$$\frac{\partial V_g}{\partial \hat{\theta}_g}\frac{\partial \hat{\theta}_g}{\partial \underline{\theta}_g} + \frac{\partial V_g}{\partial \underline{\theta}_g} = -\frac{\hat{\theta}_g}{\underline{\theta}_g} < 0 < \frac{\gamma_g - V_g}{2\left(1-\underline{\theta}_g\right)}. \tag{A71}$$

Milgrom and Roberts's (1994) Theorem 1 establishes that the lowest and highest roots of $\Omega_g\left(\rho_g\right)$ are decreasing in $\underline{\theta}_g$, for a fixed domain of potential values for ρ_g. Here the maximum of that range varies with $\underline{\theta}_g$ according to:

$$\frac{\partial}{\partial \underline{\theta}_g}\frac{\left(1-\alpha_g\right)\left(1-\underline{\theta}_g\right)}{\alpha_g + \left(1-\alpha_g\right)\underline{\theta}_g} = -\frac{1-\alpha_g}{\left[\alpha_g + \left(1-\alpha_g\right)\underline{\theta}_g\right]^2} < 0. \tag{A72}$$

Since the domain shrinks as $\underline{\theta}_g$ increases, the decline in the minimum and maximum equilibrium values of ρ_g can at most be reinforced.

A.7. Construction of the Estimates of Media Coverage

My search is limited to documents that the ProQuest Historical Newspapers database classifies as "articles", "editorial articles" or "front pages". First, I identify articles that discuss international trade by searching for

("international trade" OR export* OR (import* AND NOT important*)),

which returns 94,306 documents. Then I select those articles that discuss trade policy, by adding the restriction

AND ("trade pol*" OR protectionis* OR tariff* OR quota OR anti-dump*
OR (trade W/3 barrier*) OR (import* W/3 dut* AND NOT duty-free)
OR ((import* OR export*) W/3 (restrain* OR subsid*)));

"Duty-free" is excluded because, predictably, it identifies articles about travel rather than trade policy. The resulting 10,246 documents constitute the starting universe for all my sector-specific searches.

For each of the 242 industries included in the Gawande and Bandyopadhyay (2000) dataset, I refer to the 1972 *Standard Industrial Classification Manual* and record both the short title and the official SIC title. I search documents that mention in the same paragraph all the words describing at least one of the products composing the SIC title. The ProQuest interface automatically expands queries to include both the singular and the plural of nouns, and recognized alternate spelling (viz., the American and British spellings). In addition, I consider both the gerund and the past participle of verbs. E.g., industry 2033 – Canned Fruit and Vegetables corresponds to the search restriction:

AND ((canning OR canned) W/PARA (fruit OR vegetable))

and its full official title Canned Fruits, Vegetables, Preserves, Jams and Jellies to:

AND ((canning OR canned) W/PARA (fruit OR vegetable)
OR preserve OR jam OR jelly)

The SIC titles do not allow the recovery of information about 46 sectors that are defined as remainders, including products "Not Elsewhere Classified" (or in the case of industry 3079, in the sing "Miscellaneous" products). These industries are dropped from the sample. An additional problem is imprecision induced by words with multiple meanings. Word-sense ambiguity is a well-known source of difficulty in computational linguistics (Stevenson and Wilks 2005).

In the present application, 21 industries have to be dropped from the sample because the words composing their titles have competing meanings that are overwhelmingly more common than the name of the industry's product. The affected sectors are: 2077 – Animal and Marine Fats and Oils; 2291 – Felt Goods, Exc. Woven Felts and Hats; 2311 – Men's and Boys' Suits and Coats and 2337 – Women's and Misses' Suits and Coats; 2391 – Curtains and Draperies; 2842 – Polishes and Sanitation Goods; 2844 – Perfumes, Cosmetics, and Other Toilet Preparations; 3011 – Tires and Inner Tubes; 3275 – Lime; 3466 – Crowns and Closures; 3493 – Steel Springs, Except Wire; 3561 – Pumps and Pumping Equipment; 3564 – Blowers and Fans; 3565 – Industrial Patterns; 3566 – Speed Changers, Drives, and Gears; 3576 – Scales and Balances, Except Laboratory; 3621 – Motors and Generators; 3624 – Carbon and Graphite Products; 3944 – Games, Toys, and Children's Vehicles; 3991 – Brooms and Brushes; and 3993 – Signs and Advertising Displays.

For the remaining 175 sectors, the average number of documents retrieved by the two searches—for the short and the official title—provides my estimate of the number of articles providing newspaper coverage of the industry.

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TABLE I – *DESCRIPTIVE STATISTICS*

Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Non-tariff barrier coverage ratio, τ_g	0.1326	0.2485	0	1
$\tau_g/(1+\tau_g)$	0.0868	0.1411	0	0.5
Absolute import demand elasticity, e_g	1.4989	0.3631	0.54911	2.1379
Value of imports, m_g (\$Bn)	0.6767	2.7177	0.0002	29.7426
Value of shipments, x_g (\$Bn)	5.8237	16.3166	0.0731	182.5918
Import penetration	0.1931	0.3769	0.0001	37.4560
$(x_g/m_g)/e_g$ (scaled by 10,000)	0.0078	0.0469	0.0000	0.6084
Newspaper coverage, a_g	14.6886	45.4631	0	354
Public information, $\underline{\theta}_g$	0.0871	0.1829	0	0.9715
$\underline{\theta}_g (x_g/m_g)/e_g$ (scaled by 10,000)	0.0003	0.0011	0	0.0092
Capital intensity (real \$ Thou. / worker)	87.0872	94.3330	5.3835	607.4155
Share of employees classified as scientists	0.0392	0.0410	0	0.1667
Share of employees classified as managers	0.0976	0.0411	0	0.1807
Share of employees classified as unskilled	0.0658	0.0512	0	0.3333
Share of shipments used as intermediates	0.5415	0.2999	0.0122	0.9641
Intermediate-output buyer concentration	0.2647	0.1928	0.0448	0.7065
Herfindahl index of firm concentration	0.0863	0.0712	0.0014	0.2970
Four-firm concentration ratio	0.4328	0.2096	0.0598	0.9375
Share of employees unionized	0.2762	0.1272	0.0691	0.6497
Share of production workers unionized	0.3638	0.1558	0.0926	0.7901

Sources: NBER-CES Manufacturing Industry Database; NBER Trade Database; NBER Trade and Immigration Database; Gawande and Bandyopadhyay (2000); author's estimates based on the ProQuest Historical Newspapers database.

TABLE II – *ESTIMATION RESULTS*

IV Tobit model – dependent variable: $\tau_g/(1+\tau_g)$

	(1)	**(2)**	**(3)**
Constant	0.0562	0.0028	0.0470
	(0.0348)	(0.0454)	(0.0298)
$(x_g/m_g)/e_g$	3.4737	2.5066	0.8411
	(3.8296)	(2.6608)	(14.030)
$\underline{\theta}_g (x_g/m_g)/e_g$	-307.237^{***}	-280.030^{***}	-169.667^{**}
	(41.913)	(103.859)	(79.138)
$\underline{\theta}_g$		0.7480	
		(0.4781)	
$I_g (x_g/m_g)/e_g$			-0.6308
			(14.6568)
Wald χ^2	55.03	8.38	8.16
	[0.0000]	[0.0388]	[0.0428]
Wald exogeneity	14.13	1.84	1.03
	[0.0009]	[0.6062]	[0.7934]
Estimator	ML	Two-step	Two-step

Notes: Standard errors in parentheses; p-values from Wald tests in brackets.

TABLE III – *SENSITIVITY ANALYSIS*

IV Tobit model – dependent variable: $\tau_g/(1+\tau_g)$

	$\iota = 0.125\%$	$\iota = 0.25\%$	$\iota = 0.5\%$	$\iota = 1\%$
Constant	0.0480^{*}	0.0490^{*}	0.0504^{*}	0.05132^{*}
	(0.0278)	(0.0279)	(0.0283)	(0.0292)
$(x_g/m_g)/e_g$	-2.4563	-2.2468	-1.8105	-1.0174
	(2.4736)	(2.5140)	(2.6040)	(2.7791)
$\underline{\theta}_g (x_g/m_g)/e_g$	-574.373^{**}	-154.856^{**}	-222.179^{**}	-156.915^{**}
	(273.178)	(154.856)	(95.35)	(63.9527)
Wald χ^2	7.03	7.28	7.92	8.41
	[0.0298]	[0.0262]	[0.0190]	[0.0149]
Wald exogeneity	2.25	2.34	2.57	2.79
	[0.3345]	[0.3103]	[0.2772]	[0.2478]

	$\iota = 2\%$	$\iota = 4\%$	$\iota = 8\%$	$\log a_g$
Constant	0.0512^{*}	0.0512	0.0525	0.0548
	(0.0307)	(0.0322)	(0.0339)	(0.0335)
$(x_g/m_g)/e_g$	0.0214	1.0761	2.1477	1.8943
	(3.0256)	(3.2768)	(2.9440)	(2.7754)
$\underline{\theta}_g (x_g/m_g)/e_g$	-112.060^{**}	-80.6591^{**}	-61.2561^{**}	-12.4238^{**}
	(44.980)	(32.8249	(25.7970)	(5.5453)
Wald χ^2	8.29	7.72	6.92	6.31
	[0.0159]	[0.0211]	[0.0314]	[0.0426]
Wald exogeneity	2.88	2.79	2.50	2.00
	[0.2374]	[0.2474]	[0.2862]	[0.0367]

Notes: Newey (1987) two-step estimator. Standard errors in parentheses; p-values from Wald tests in brackets