

The Political Economy of Commercial Policy.

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Abstract

This chapter surveys research on the demand for protectionism as well as theoretical and empirical work on the (i) electoral mechanisms, the (ii) lobbying institutions, and the (iii) legislative bargaining that affect its supply. A recent trend is mutual feedbacks between commercial policy on the one hand and economic conditions and political institutions on the other. Areas ripe for more exploration include informational lobbying, the role of the media, firm-level analysis of lobbying and more realistic approaches to labor markets.

This chapter surveys the political determinants of commercial policy. The term ‘political’ is broad, and encompasses any mechanism by which commercial policy is forged, but we will be especially interested in any motivation in setting policy that is different from pure social-welfare maximization.¹ Analyzing this question requires

¹In most of what follows, we will treat this term as synonymous with maximization of aggregate real income, as with most of the literature. Where a broader concept of social welfare comes into play, encompassing distributional considerations, it will be noted.

knowledge of what different political agents' demands and preferences are regarding commercial policy, and also how political institutions and political conditions convey those demands and preferences into realized policy. This requires an understanding of electoral rules, lobbying, and legislative bargaining. We will examine these questions in turn, and lastly point out that political institutions and conditions can in turn be shaped by commercial policy, leading to feedback effects that can at times be of great importance.²

Although our main interest is with cases in which policy outcomes depart from the socially optimal, it will be helpful to review as a starting point what optimal policies are in a range of models, which may be used as a benchmark as we study political outcomes down the road.

1 Socially Optimal Policy: A cursory Review.

1.1 Neoclassical models.

Because we will lean so heavily on it in discussing political models, it is worth rehearsing for three minutes the standard neoclassical partial-equilibrium trade model. Consider an economy, Home, that produces shoelaces under conditions of perfect competition. A large number of investors own capital specific to production of shoelaces (in other words, it is not useful in producing anything else), which they combine with labor to produce the output. The capital is in fixed and exogenous supply,

²This chapter builds on the earlier surveys by [Rodrik \(1995\)](#) and [Gawande and Krishna \(2004\)](#). I am indebted to Paula Conconi and Anna Maria Mayda for extremely constructive comments, as well as to the editors of this volume.

and the industry is small enough in the Home economy that wages can be taken as fixed and unaffected by the shoelace industry. For any given price, profit-maximizing shoelace producers will choose a quantity to maximize profit, yielding a supply curve; aggregating these up to the industry level yields the industry supply relation $y(p)$, where p denotes the domestic price of shoelaces and y the quantity produced by the domestic industry, and $y'(p) > 0$. Producer surplus, $\pi(p)$, is then the area between the supply curve and the price, with $\pi'(p) = y(p) > 0$. Shoelaces are a small part of each consumer's budget set, so we can derive a demand curve for each consumer, aggregate them up to a Home demand curve $d(p)$ with $d'(p) < 0$, and compute consumer surplus as the area between the price and the demand curve $s(p) > 0$, with $s'(p) = -d(p) < 0$. Export supply from the rest of the world is given by $XS(p^*)$, where p^* is the world price and $XS'(p^*) \geq 0$. If this export-supply curve is flat, Home is 'small.'

If Home is a net importer of shoelaces, then a specific import tariff³ of t per unit creates a wedge between the world price and the domestic price so that $p = p^* + t$, and equilibrium satisfies $m(p+t) \equiv d(p+t) - y(p+t) = XS(p^*)$, where $m(p)$ denotes Home's imports of shoelaces. An increase in t pushes the world price down and the domestic price up.⁴ If Home's social welfare derived from the shoelace industry is $SW(t) = \pi(p(t)) + s(p(t)) + tm(p(t)) = \pi(p(t)) + s(p(t)) + tXS(p^*(t))$, where the last term represents tariff revenue to be rebated to Home consumers, then:

³A specific tariff is assessed as a fixed charge per unit of goods imported.

⁴In a partial-equilibrium model such as this, it is easy to confirm that the world price falls by less than the tariff, so that the domestic price rises. In general equilibrium, some additional conditions are required to guarantee this; failure is known as the 'Metzler paradox.'

$$\begin{aligned}
SW'(t) &= [y(p) - d(p)] \frac{dp}{dt} + m(p) + tXS'(p^*) \frac{dp^*}{dt} \\
&= [y(p) - d(p) + m(p)] + [tXS'(p^*) - XS(p^*)] \frac{dp^*}{dt}
\end{aligned} \tag{1}$$

since $XS(p^*) = m(p)$ and $\frac{dp}{dt} = 1 + \frac{dp^*}{dt}$. The first expression in square brackets in (1) is equal to zero. The reason is that it represents a simple transfer to domestic producers of shoelaces ($y(p)$) and to taxpayers ($m(p)$) from consumers of shoelaces ($d(p)$) in Home, and all three groups have equal weight. This is crucial; much of the later work in political models will be driven by this term's deviation from zero when these groups have *unequal* weight. The remaining two terms are the distortion caused by the rise in the tariff and the terms-of-trade benefit to Home. Setting (1) equal to zero and rearranging readily yields:

$$\tau = \frac{1}{\epsilon^*}, \tag{2}$$

where $\tau \equiv \frac{t}{p^*}$ is the *ad valorem* tariff⁵ and $\epsilon^* \equiv \frac{p^*XS'(p^*)}{XS(p^*)}$ is the elasticity of export supply. This is the 'inverse elasticity formula.'⁶ In the case of an exported good, the analogue equates the export tax with the inverse foreign import demand elasticity.

This sometimes generalizes to general-equilibrium models. A general n -good competitive model requires a choice of a vector of tariffs/subsidies, say, \mathbf{t} , where a positive i^{th} element indicates a positive import tariff if the i^{th} good is imported and an export subsidy if the i^{th} good is exported. Thus, the domestic price vector, \mathbf{p} , will

⁵An *ad valorem* tariff is assessed as a fraction of value.

⁶Of course it is not a formula. The right hand side is a function of the tariff, so it is a recursive equation in τ which generally requires a recursive procedure to solve. If it were a formula, we could plug known values into the right-hand side to compute the value of the left-hand side.

be equal to $\mathbf{p}^* + \mathbf{t}$, where \mathbf{p}^* is the world price vector. Denote by $\mathbf{XS}(p^*)$ the foreign export supply, a function mapping n -dimensional price vectors to n -dimensional traded quantities. Then, the general first-order condition for the optimal tariff vector is $\mathbf{p}\nabla\mathbf{XS} = \mathbf{0}$, or the condition that the domestic price vector be orthogonal to the gradient of the export supply function for each product (see [Dixit and Norman \(1980\)](#), Ch. 6).

This does not yield anything that can be described as an ‘inverse elasticity formula’ except under very special circumstances, for two reasons. The more technical reason is that in general equilibrium there is always a continuum of trade vectors that yield the same equilibrium.⁷ The more substantive reason is that cross-price effects in the foreign export supply need to be taken into account. However, in the event that $n = 2$, an analogue of the ‘formula’ holds. In addition, if utility is additively separable with one good whose marginal utility is constant, then the tools of partial equilibrium apply in general equilibrium, and the ‘formula’ follows by the same logic as used above. This is used by [Broda et al. \(2008\)](#) to derive testable implications of optimal tariff theory, for which they find considerable empirical support. They estimate inverse export-supply elasticities specific to each country and group of industries, and because the theory applies to unilateral optimal tariffs rather than negotiated tariffs, they focus on tariffs set by countries that have not joined the World Trade Organization (WTO), and for US tariffs against non-WTO members and US non-tariff barriers (NTB’s). They find a quite robust tendency for tariffs to

⁷For any trade policy \mathbf{t}^0 yielding domestic price vector \mathbf{p}^0 and for any positive scalar α , a tariff vector $(\alpha - \mathbf{1})\mathbf{p}^* + \alpha\mathbf{t}^0$ will yield domestic prices equal to $\alpha\mathbf{p}^0$, giving the same outcomes. A corollary is the Lerner symmetry theorem.

be lower against foreign export supply that is more elastic, as the ‘formula’ predicts.

On the other hand, Costinot et al. (2015) study optimal tariffs in a two-country, many-good Ricardian model with Constant Elasticity of Substitution preferences. In that model, *if* Home had no influence on Foreign’s wage, then the inverse-elasticity formula would apply in each industry. The result for optimal trade policy would have three parts: (i) There would be zero tariff on all imports (since their world prices are pinned down by production costs in Foreign). (ii) On exports with a strong comparative advantage, the inverse elasticity ‘formula’ would hold, and since the Foreign import demand for each could would be the same because of the CES structure, this would imply a common export tax for each strong-comparative-advantage exported good. (iii) For exported goods with a weaker comparative advantage, the inverse-elasticity export tax would not be feasible because it would push the price of the good in Foreign high enough that Foreign producers would begin to produce it. For these goods, the optimal export tax would be the highest tax such that Foreign does not produce the good. However, this three-part description is not the optimal trade-tax regime, because the Foreign wage is *not* fixed, and so it is optimal to tighten trade restrictions in order to reduce it, thus reducing the world price of each good imported from Foreign. As a result, the export taxes will be higher than the level that satisfies the inverse-elasticity ‘formula.’ A further complication is that, as noted above, the optimum can be realized with a continuum of different policies. The Home government could equivalently set the export tax on the strongest comparative-advantage goods equal to zero, set positive import tariffs, and set a *subsidy* on weak-comparative-advantage exports, just big enough in each industry to keep Foreign from producing the good.

All of this suggests that the inverse-elasticity approach is only a timid first step, not at all a general optimum. How to apply analysis of a full optimum in a rich model would be a significant challenge for empirical work.

1.2 Imperfect competition.

It is well-known that the presence of imperfect competition complicates social-welfare-maximizing trade policy. [Brander and Spencer \(1985\)](#) showed that in an international Cournot oligopoly, the government of each exporting firm could have an incentive to subsidize the firm's exports (or R&D) in order to transfer rents from competing firms in other countries to its own firm, a conclusion at odds with what perfectly-competitive models prescribe. This conclusion changes when the oligopoly is of the Bertrand variety, in which case optimal policy tends to be an export tax, and is sensitive to other assumptions such as the possibility of entry ([Eaton and Grossman \(1986\)](#)). [Maggi \(1996\)](#) formulated a model that absorbs both Cournot and Bertrand as special cases, so that whether an export subsidy or tax is optimal depends on parameters, but found that in all cases a subsidy to *ex ante* investment that lowers marginal cost raises national welfare. In the case of monopolistic competition, [Demidova and Rodriguez-Clare \(2009\)](#) study a small-open economy with an industry that produces differentiated tradeable goods by firms with heterogeneous productivities. The economy also imports differentiated products from the rest of the world; it is small in the sense that foreign wages and the scope of foreign products produced are unaffected by anything the Home government does, but foreign producers need to incur a fixed cost to export to Home, so the range of foreign products actually available to Home consumers will be affected. It turns out that the optimal pol-

icy is an import tariff; the gap between price and marginal cost means that each domestically-produced product is under-consumed, and the tariff addresses that.

1.3 Foreign asset issues.

Computation of social-welfare-maximizing trade policy can be complicated if some of the domestic productive assets are foreign-owned, or if some foreign-owned assets are domestically owned. [Blanchard \(2007\)](#) shows how the optimal tariff on imports tends to be lower if the exporting sector in the foreign country is partly owned by domestic citizens, and [Blanchard and Matschke \(2014\)](#) shows that these effects have an important effect on trade policy in practice. [Blanchard et al. \(2014\)](#) show that optimal tariffs on a given imported product are in general affected by the amount of domestically-produced content incorporated in the product, and show that these considerations appear to matter empirically.

1.4 Social-welfare-maximizing Policy Without Lump-Sum Transfers.

Most models of optimal trade policy are conditioned on an assumption that lump-sum transfers are available to government, so domestic income distribution concerns are irrelevant to optimal policy. Of course, this is a grotesque oversimplification, and if government does care about inequality in its calculation of social welfare, the absence of lump-sum transfers can have a large effect on optimal policy. [Limão and Panagariya \(2007\)](#) study a class of general-equilibrium models in which, absent domestic lump-sum transfers, inequality aversion creates an anti-trade bias in optimal

policy.

2 What We Know About the Demand for Protection.

Turning now to the *politics* of trade policy, we first consider the demand for protection. The classic theories of political demand for protection were based on an assumption that each political/economic agent would seek trade policies that would maximize his/her real income, and thus politics would be based on the structure of the factor market; thus, for example, a Heckscher-Ohlin (HO) theory of trade would yield a different prediction for trade politics than would a specific-factors (SF) model. Most of the studies that assess voter demand for protectionism, indeed, are cast very narrowly as a ‘horse-race’ (to use [Mayda and Rodrik \(2005, p. 1,413\)](#)’s term) between HO – in which industry of employment does not matter for one’s stand on trade policy, only which factor of production one owns – and SF, where industry of employment is all that matters. More recently, new approaches beyond the factor-market approach have been explored, in which the importance of learning and information in voters’ trade-policy preferences have been emphasized. We will review studies based on the behavior of politicians; based on election results; and based on survey data and then try to draw some general lessons.

It may be worth clarifying first what is meant by ‘HO’ and ‘SF’ in this discussion. Most authors have in mind a very primitive version of HO, with two factors, usually unskilled labor and skilled labor, in fixed and exogenous endowments. Each factor can move from one industry to another costlessly, so the skilled and unskilled wages

are the same throughout the economy. Skill-abundant countries – that is, high-income countries – export skill-intensive goods, and so trade raises the real incomes of skilled workers, while protection reduces those incomes. The effects are opposite for unskilled workers in those economies, and the roles of the two factors are reversed in a skill-scarce country, which is also a low-income country. On the other hand, the SF model that authors usually have in mind is what Magee (1989) called a ‘Cairns-Ricardo-Viner’ model, in which *every* factor of production is specific to its industry.⁸ This is best thought of as a metaphor for a model in which workers face high costs of switching industries, such as Artuc et al. (2010), but for simplicity the standard assumption is that industry-switching costs are infinite. In such a model, all workers in an import-competing industry will benefit from trade protection, while workers in exporting industries will be harmed by it.

2.1 Studies based on behavior of politicians.

Examining the behavior of a politician in order to identify what his or her constituents want is indirect, and has the disadvantage that politicians may be moved by other factors as well, such as their own policy views or by interest groups (about which much more later). On the other hand, this approach has the advantage that it can focus on very specific policy measures, such as a trade bill or free trade agreement, instead of a vague survey question that may have different meanings for different respondents.

⁸The language is sometimes confusing, because outside of the political-economy literature, a ‘specific factors’ model usually means a model in which labor is perfectly mobile across industries, thus receiving the same wage in each industry.

Conconi et al. (2012a) examine all final votes in the US House of Representatives on bills related to trade and immigration policy between 1970 and 2006, and find quite similar behavior on both issues: The most robust determinant of the representative's vote is the skill ratio, or the ratio of skilled to unskilled workers, of the population in that House district. A higher skill ratio leads to more votes for liberalization of both trade and immigration. This can easily be rationalized in HO terms as maximization of district-level welfare. However, for trade policy, the ratio of export industries to import-competing industries in the district, seems to be much more important,⁹ while the latter does not matter at all for immigration votes. This suggests a point for SF. At the same time, unlike trade votes, a vote for immigration liberalization is less likely in a district with more inequality or fewer foreign-born constituents, and overall votes for freer immigration are far less common than votes for freer trade.

Two provocative studies of politician behavior raise questions that cannot be addressed within conventional political-economy models within the economics literature. The first, Blonigen and Figlio (1998), studies how the trade stance of US Senators is affected by FDI inflows to their state. One could write down models that predict either a pro-trade or a pro-protection effect of an FDI inflow; perhaps once a new foreign-owned plant is in place, citizens of the state would want it to be protected and would desire a tariff, leading to a pro-protection effect; or perhaps the new plant managers would make it clear that they need open trade to import needed inputs, and the Senator would respect that, leading to a pro-trade effect. The authors find

⁹From Table 8 and Table 4, the marginal effect of a one-standard-deviation increase in the trade-exposure variable is $0.009 \times 95.04 = 0.855$, while the marginal effect of a one-standard-deviation in the skill-ratio variable is $1.961 \times 0.09 = 0.176$.

that in Senate votes on trade policy from 1985 to 1994, if a senator had tended to make pro-trade votes in the past, and if the state received a big influx of FDI, that same Senator's pro-trade tendency increased; but if the senator had tended to vote anti-trade, the FDI influx increases the anti-trade tendency. Either way, an influx of FDI went along with an *intensification* of whatever stand the Senator had. This is a panel regression with Senator fixed effects, and in the data there are states where the two Senators have opposite positions on trade. It is possible that some kind of learning story might be told, in which voters unsure of how FDI can be attracted update their beliefs in favor of the approach local leaders have been promoting in light of recent success. But explanation of these findings is an open question.

The second, [Conconi et al. \(2014\)](#), studies the effect of a politician's *time horizon* on trade-policy votes. The authors collect every major vote on trade policy in the US Congress from 1973 to 2005 to examine the effect of time remaining until the next election. Systematically, members of the House, who serve 2-year terms, vote for open trade less often than members of the Senate, who serve 6-year terms. The authors show that this difference disappears when a Senator is in the last two years of her term, and thus faces the same time horizon before re-election as a House member. This is true after controlling for a wide range of factors, and true when the sample is restricted to Senators who voted on two or more bills and Senator fixed-effects are included. The implication appears to be that in most states most voters are anti-trade on balance, but that they have imperfect memories: A member of Congress feels the latitude to place a pro-trade liberalization vote if the next election is more than 2 years in the future, but it is risky to do so if the election is sooner than that. Again, voters' information seems to be crucial.

2.2 Studies based on elections.

Given the assumption that politicians' behavior is a signal of voters' wishes because the politician is largely motivated by winning the next election, the natural next step is to look directly at actual voters' behavior by studying election outcomes. For our purpose the main difficulty with this approach is that elections are affected by many factors beyond trade policy, but occasionally an election is fought almost purely on issues of trade policy and thus can serve as a kind of natural experiment.

One such example is the 1923 election in the UK, studied in [Irwin \(1996\)](#). Since the repeal of the Corn Laws in 1846, the UK had long had a low-tariff policy, but in the lingering unemployment following the First World War the Conservative party had been pushing 'tariff reform' (that is, dramatic increases in tariffs) under the argument that it would improve the labor market. The Conservatives gained a majority in parliament in 1922 and began pushing toward new legislation, but decided to dissolve parliament and run an election on the issue in order to be able to claim a mandate. As a result, the 1923 election was explicitly run as a referendum on increases in import tariffs. Irwin examines the vote share for the anti-tariff (Liberal and Labor) parties by county as a function of the occupational breakdown of the and the skill class of the local population, taken from the 1921 census, in various specifications, controlling for the vote share in the previous election to focus on the vote share deviation in the free-trade election. The overall finding is that skill shares do not have any appreciable explanatory power, but occupational shares do. In particular, counties with a large share of workers in the agricultural, textile and mining sectors were the ones most likely to swing toward the Conservatives, indicating a demand for protectionism among those groups. This seems like a point for SF. In-

cidentally, the Conservatives were resoundingly defeated in the election, postponing the next wave of protectionist policy until the Great Depression.

A similar example arose in Canada in 1988, studied by [Beaulieu \(2002\)](#). The Progressive Conservative government, led by Brian Mulroney, had just negotiated a free trade agreement with the United States (Canada-US Free Trade Agreement, or CUFTA), which proved to be extremely controversial. The prime minister called an election, which was fought almost entirely on the issue of the agreement, with the opposition Liberals pledging to rip up the agreement if they came to power. [Beaulieu \(2002\)](#) uses the 1988 Canadian National Election Survey (CNES) to analyze individual Canadian voters' stands on the agreement (the survey provides 2,797 observations). Classifying industries into those that were expected to benefit from CUFTA and those that were expected to be hurt, the results show that both education level and industry of employment have predictive power for support for CUFTA, but education is much more robust. More educated Canadians supported CUFTA and less educated workers tended to oppose it. The paper argues that this is consistent with HO theory even though Canada is not skill abundant relative to the US, because Canadian tariffs tended to be higher on less skill-intensive industries.

2.3 Studies based on survey data.

The most direct way to find out what voters want in trade policy is to conduct a survey and ask them, and a number of surveys have become available for this purpose over the years. A pioneering study of this type is [Scheve and Slaughter \(2001\)](#), which uses the US 1992 National Election Survey (NES), with a sample of 1,736 individuals. The survey collected a wide variety of information about respondents'

personal situation, such as education, industry of employment, county of residence and political views on a range of topics. One of the questions asked about whether or not ‘new limits’ should be placed on ‘foreign imports in order to protect American jobs.’ They find that respondents with more education are significantly less likely to support trade restrictions, but that workers in industries with higher tariffs or in net exporting industries do not have significantly different views than others. They take this as a win for HO. Interestingly, they find that living in a county with a concentration of industries with high trade exposure (either industries with high tariffs or net-importing industries) increases one’s support of trade restrictions, but only for homeowners. The implication appears to be that the effect of trade competition on house prices through its effect on the local economy is a significant concern for those who own a house. This is a channel for distributive effects of trade that does not seem to have been recognized in the theory literature, and seems worth confirmation and more exploration.

[Blonigen \(2011\)](#) offers a critique of the factor-market interpretation of the findings in [Scheve and Slaughter \(2001\)](#), showing that the only robust determinant of voter preferences in the NES data is education, which matters even for retirees who have no obvious state in the factor market. He suggests that education may matter for the voters’ trade preferences far beyond its role as a proxy for skilled labor.

Perhaps the most useful of all survey studies is [Mayda and Rodrik \(2005\)](#), which uses two separate international surveys, the 1995 survey of the International Social Survey Programme (ISSP), which polled 28,000 individuals in 23 countries, and the 1995-7 World Values Survey (WVS), with respondents in 47 countries. The ISSP has information on respondents’ industry of employment along with education level,

whereas the WVS has much better country coverage including a good variety of developing countries, but no occupational data. A dummy variable for a respondent's general support for trade is regressed on a range of controls including the individual's education level and the education level interacted with the country's GDP per capita. This allows for the possibility that, per HO, in skill scarce countries support for trade will be negatively correlated with an individual's skill, while in skill abundant countries the correlation will be positive (since in HO models, trade is good for the abundant factor in each country, and in low-income countries skill is the scarce factor). This prediction comes out strongly in both data sets and in all specifications: In the lowest-income countries, the higher-income individuals are more likely to oppose trade, while in higher-income countries the reverse is true. The ISSP results do show an effect of industry of occupation as well, namely that employees in import-competing industries are less likely to support trade, but the HO effects are generally stronger than the SF effects.

Some survey studies provide some extra insight by comparing attitudes toward trade policy with those toward immigration policy. Economically, the two policy areas present many of the same issues, but they are far from identical. [Mayda \(2008\)](#) examines the ISSP data to examine a striking stylized fact: in every country vastly more respondents favor increased restrictions on immigration compared to restrictions on trade. Indeed, in each country, the correlation between pro-trade and pro-immigration attitudes is positive but very weak, running from 37% for East Germany down to 4% for the Philippines. Running parallel regressions on trade and immigration attitudes similar to the regressions in [Mayda and Rodrik \(2005\)](#), she finds that the one major difference in the responses is the effect of employment in

the non-traded sector. Non-traded workers are strongly more likely to favor trade openness, across countries, than traded-sector workers, but non-traded employment has barely any effect on immigration attitudes. Mayda has no quick and ready theoretical explanation for these features, which should be considered an intriguing puzzle, but it should be underlined that these findings are very inconsistent with an HO model (since in that model a factor's returns would be the same in the non-traded sector as in any other).

In a similar vein, [Hanson et al. \(2007\)](#) study NES data to examine the differences that fiscal effects may have on attitudes towards immigration and trade. They find that a major difference between the two is that more-educated voters in states where the fiscal burden of immigrants is higher are less likely to support immigration, compared to less-educated workers in the same state as well as similarly-educated workers in states with either fewer immigrants or less generous welfare programs. Hanson et al interpret this as a response to progressive taxation; where immigrants will require more payments out of state finances, the burden is more likely to be borne by higher-income residents of that state. These fiscal effects are completely absent for trade policy opinions.

An important innovation in the use of survey data for trade-policy preferences is developed in [Jäkel and Smolka \(2015\)](#), who break away from the two-factor HO prison by deriving a 'correlation' result similar to those developed by [Deardorff \(2000\)](#). Within a multi-factor, many-good framework with perfect competition and comparing free trade with a tariff-affected equilibrium, Jäkel et al use the equilibrium zero-profit conditions for each industry to derive the proposition that within each country, the change in income affecting a factor of production is negatively correlated

with the net export of that factor embodied in the country’s trade. Then, using the ISSP data, they interpret each occupation as a different factor of production, compute quantities of each occupation embodied in each country’s trade (normalized by the size of the economy),¹⁰ and use that as an explanatory variable to explain attitudes toward trade. The results show that factors with larger embodied exports strongly support more open trade than factors with smaller net embodied exports or embodied net imports. A caveat is that in this study a ‘factor of production’ is identified as an ‘occupation’ in the data. This is somewhat troublesome, since the distribution of occupations in a given country is more easily thought of as endogenous compared with more traditional factors. But the approach seems promising.

2.4 General Observations.

Contrary to [Mayda and Rodrik \(2005\)](#)’s ‘horse-race’ metaphor, perhaps the competition between HO and SF implied by many of these studies is better compared to a pre-school soccer tournament, in which everyone is a winner. Both factor ownership as indicated by higher income and education, and the import-vulnerability of industry of employment matter in a range of studies for a voter’s attitude toward trade, although the former is more robust than the latter.

We seemed to have learned that in lower-income countries support for more open trade is negatively correlated with income, while in higher-income countries the op-

¹⁰In practice, they use the relative abundance of each factor, $V_{f,c} - s_c V_{f,w}$, where $V_{f,c}$ is country c ’s endowment of factor f , $V_{f,w}$ is the world’s endowment, and s_c is country c ’s share of world GDP. In equilibrium, in theory, this must be equal to the net embodied exports of factor f according to the Heckscher-Ohlin-Vanek equation.

posite is true. This is broadly consistent with a global HO story. However, it is past time for this literature to graduate from the most primitive neo-classical models. Moving past a two-factor HO model is crucial, and explorations along the lines of [Jäkel and Smolka \(2015\)](#) may be helpful. In addition, instead of using as a benchmark a pair of static models where factor mobility in all directions is either perfectly costless or infinitely costly, one could adopt a benchmark of costly mobility (such as [Dix-Carneiro \(2014\)](#), for example). In such a model, depending on parameters, both industry of employment and human capital status along with age and other factors can determine one's stand on trade policy together. Rather than asking which of the extreme assumptions of HO or SF is consistent with the political-economy data, one could ask what pattern of factor mobility costs fits the data the best, and see how consistent that is with the costs that are measured directly from data on mobility.

More broadly, there are paradoxes that do not seem to fit with conventional political-economy models that may require thinking about voters' information more seriously. [Hall and Nelson \(2004\)](#) point out that between 1991 and 1995, voters' views on the North American Free Trade Agreement (NAFTA), which was negotiated and ratified during that period, changed radically. Particularly between 1991 and 1993, popular support for NAFTA dropped from 70% to the mid-30's, and opposition rose from 15% to the mid-30's. During those two years the material interest of voters surely had not changed drastically; mobility costs or skill endowments had not undergone a radical overhaul. What did happen is that public debate started up, and information about the prospective agreement and its possible effects began to be much more available. The media, and perhaps the efforts of lobbyists or public-interest groups to sway the opinions of the public, likely had a large role. Hall and

Nelson suggest that a rational-herding model might help understand the rapid change in opinion; at any rate, the effect of voters' *information* has no place in the standard models all though this literature. The curious results in [Blonigen and Figlio \(1998\)](#) seem to imply a learning process, and [Blonigen \(2011\)](#)'s findings seem to indicate a role for education as more than a marker for skilled labor. Another paradoxical result that raises the same sort of questions is [Conconi et al. \(2014\)](#), which seem to imply a depreciation rate for voters' information about trade policy, and one of which politicians are acutely aware and which greatly affects their voting decisions. It would be good to have this built into our theory, as well.

These observations suggest, at the very least, the desirability of a serious look at the role of the media (and perhaps education) in the political economy of commercial policy. In other topic areas, television has been shown to have a statistically measurable and quantitatively important influence on partisan voting behavior in the US ([DellaVigna and Kaplan \(2007\)](#)), attitudes toward women's status in India ([Jensen and Oster \(2009\)](#)), and many other issues. In light of these findings and the anomalies just noted, it seems a glaring lack that the literature on the demand for trade policy has barely addressed the effect of the media at all.

On this issue, two pioneering papers deserve mention. [Ponzetto \(2011\)](#) (which will be discussed as a theoretical contribution in Section 3.1) studies the effect of media coverage of an industry's trade policy on the level of protection that the industry receives. He searches US news sources from 1980 to 1983 for news stories on industries whose names match industries in the data and that pertain to trade policy. This provides an index of how much the news media tended to inform voters about trade policy in each industry. Under the assumption that all voters know

about trade policy in their own industries but few know much about trade policy in other industries, Ponzetto argues that more news coverage of trade policy in a given industry should increase the demand for liberalization of imports in that industry, as consumers become more aware of the issue. This seems to be confirmed by empirical evidence that non-tariff barriers are used less, *ceteris paribus*, in industries that have more media coverage (this is dubbed the ‘Dracula’ effect – the weakening effect of sunlight on pressure for protection).

Facchini et al. (2013) use roll-call votes in the US Congress on trade and immigration bills from 1986 to 2004 to explore how news media affect the responsiveness of a representative to her constituents’ wishes. The paper uses a variable designed by Snyder and Strömberg (2010) to be an exogenous source of variation in media scrutiny – the ‘congruence’ of a congressional district with the local news media market. Essentially, if the natural boundaries of local newspapers’ market areas match up with the congressional district boundaries, the representative faces the maximum possible media coverage. Using NES data on voter preferences regarding trade and immigration policy, Facchini et al. (2013) find that a representative is more likely to vote along the lines preferred by her constituents if she faces more media scrutiny – but only for immigration policy, not for trade. A plausible reason is that trade policy is the most important issue for far fewer voters than immigration is.

Both of these papers show that media coverage can have an important effect on the politics of international policy, and there is much scope to explore these ideas further.

Aside from information and media issues, the literature has been slow to incorporate *firm-level* analysis of the demand for protection. Gulotty (2016) and Osgood

(2012) both study theoretical models of differentiated-goods industries with heterogeneous firms and intra-industry trade, and point out that the effects of trade policy are likely to be very heterogeneous within each industry, implying challenges to effective coalition formation. Gulotty (2016) shows that the more productive firms in each industry can benefit from stricter product standards that raise fixed costs of production and exporting, because these can shake out smaller competitors. This suggests that technical barriers to trade can be a matter of intense intra-industry disagreement. Osgood (2012) shows that while the more productive firms in an industry will tend to benefit from bilateral trade opening, the most productive firms will generally prefer higher tariffs than medium-productivity firms, for similar reasons: Higher bilateral tariffs can reduce entry and thus competition. These raise intriguing questions about the pattern of demand for protection *within* an industry, which could be the subject of very fruitful empirical study.

3 Political conditions shape commercial policy.

To this point, we have grappled with measuring the demand for trade policy. Given the demand for protection, political institutions determine how those demands are channelled into actual trade policies. In a democracy, politicians campaign to win an election and thereby gain power; once they have gained power, they bargain with each other while being influenced by lobbyists, and the result is a realized policy. A full model would involve all three of these mechanisms, (i) electoral competition, (ii) legislative bargaining, and (iii) lobbying; but in practice these three have tended to be studied separately, and so we will do that here as well. First we turn to electoral

competition.

3.1 Electoral competition: Theory.

To isolate electoral effects, let us consider a ‘pure’ model of electoral competition as one in which two parties vie for control of government by publicly committing to a policy before voters place their votes, and after the election, the winning party cannot renege on its policy commitment. Further, let us assume that each party cares only about winning, and has no interest in policy other than as an instrument for winning the election.

Naturally, the electoral rules matter for the nature of electoral competition, and perhaps the most important distinction along these lines is between models of proportional representation and majoritarian systems; see [Persson and Tabellini \(2002, Ch. 8\)](#), for an introduction. If the country is divided into districts, then a majoritarian system is one in which one representative is elected from each district, and then control of the government goes to the party that wins the largest number of districts.¹¹ A proportional system is one in which each district has multiple representatives, who are chosen from each party in proportion to the party vote in that district. A special case is the case in which the whole country is a single district; either way, if there are enough representatives, the nationwide share of each party in total representatives is equal to its nationwide share of votes. Both systems are

¹¹The definition is generally extended to a presidential system such as in the US, where each state has a certain number of electoral votes, and the candidate who wins the most votes in a state receives all of the electoral votes for that state. The winning candidate is the one with the most electoral votes.

common; The US, the UK, and Canada are examples of countries with majoritarian systems; Germany, Brazil and Turkey are examples with proportional systems.

The seminal model of trade policy determination through electoral competition is Mayer (1984), whose main argument is built on a straight HO model injected into the proportional representation paradigm.¹² Home is a small open economy that produces two goods, the imported good 1 and the exported numeraire 2, using labor and capital. Both factors are homogeneous and mobile across industries. There are a continuum of citizens in Home, and each citizen i has a unit endowment of labor and an exogenous endowment k^i of capital. The government must choose a level for the tariff t on imports of good 1. The production income of citizen i is $w + rk^i$, where w is the wage and r is the price of capital services, and so i 's production income relative to the average is $\phi^i = (w + rk^i)/(wL + rK)$, where L and K are the aggregate Home endowments of the two factors. All Home citizens have identical and homothetic preferences represented by the indirect utility function $U(p, y)$ for a good-1 price p and income of y .

Tariff revenue is redistributed to Home citizens lump sum; to clear away nuisances in the algebra, it is assumed that citizen i 's tariff revenue rebate is proportional to her share of production income, so that her total income will be given by $y^i = w + rk^i + \phi^i T$, where T is the aggregate tariff revenue. Consequently, the utility achieved by i can be written as $U^i(t) = \phi^i(t)U(\pi(1 + t), Y(t))$, where π is the world

¹²Strictly speaking, Mayer does not use a model of inter-party competition, but rather makes an argument about equilibrium from cooperative game theory. However, the equilibrium of his model is exactly what would be obtained by a non-cooperative electoral game of the sort described here, which is the standard approach in the literature at this point, and the structure of the model is exactly that of proportional representation, so we slot his model into that category.

price of good 1 and $Y(t)$ is aggregate income in Home evaluated at domestic prices, including tariff revenue. The first factor is i 's share in total welfare, and the second is total welfare. Total welfare is maximized at $t = 0$ because Home is a small open economy, so if $d\phi^i(t)/dt > 0$ at $t = 0$, then citizen i would prefer a positive tariff to free trade, and if $d\phi^i(t)/dt < 0$ at $t = 0$ she would prefer a negative tariff, an import subsidy, to free trade.

The sign of $d\phi^i(t)/dt$ is determined by i 's position in the asset distribution as well as by Home's factor endowment. A change in tariffs affects the factor prices by Stolper-Samuelson logic, since it changes the domestic price of good 1, and this is how it affects ϕ^i . In particular:

$$\frac{d\phi^i}{dt} = \frac{wL}{(wL + rK)^2(1+t)} \frac{r(k - k^i)(\hat{w} - \hat{r})}{\hat{p}}, \quad (3)$$

where $k \equiv K/L$ and a hat indicates a proportional rate of change (so for example $\hat{w} = \frac{1}{w}dw/dt$). Thus, $d\phi^i(t)/dt > 0$ if $\hat{w} > \hat{r}$ and $k > k^i$, or if both inequalities are reversed; otherwise, $d\phi^i(t)/dt < 0$. Since the tariff raises the domestic price of good 1, by Stolper-Samuelson, $\hat{w} > \hat{r}$ iff good 1 is labor-intensive, and since good 1 is imported, that would mean that Home is capital abundant. Thus, *citizen i 's share of national income is increasing in the tariff*, and so i will want a positive tariff, *if the country is capital-abundant and i has below-average capital*, or if the country is capital-scarce and i has above-average capital. Otherwise, citizen i 's share is decreasing in the tariff and she will prefer a negative tariff.

Now, consider the 'pure electoral' game sketched above. Party A and B must each choose a value of t , simultaneously; these choices then become public, as an irrevocable policy commitment; the voters see these choices, and each votes for the party that offers the tariff value that voter prefers; the party with the most votes

wins, and implements the tariff to which it had committed. The winning party receives a positive rent from power, while the losing party receives a payoff of zero. It is easy to see that, provided the utility relation $U^i(t)$ is a single-peaked function of t , there is a unique equilibrium in pure strategies: Both parties commit to the most preferred tariff level t^m of the median voter, the voter whose capital endowment is greater than that of exactly one half of the population.¹³ Couple this observation with the assumption that in each country the median voter has less capital than the average voter (a safe assumption, borne out in every data set on income and asset ownership), and the model yields two crisp predictions. First, *in high-income countries, tariffs will be positive* because the median voter is a worker who wants to raise the price of labor-intensive imports, while *in low-income countries, tariffs will be negative* because the median voter is a worker who wants to lower the price of capital-intensive imports. Second, this will occur only in countries with a skewed income distribution; if the median voter has the average capital endowment, the outcome will be free trade. As a result, *in high-income countries, a rise in the gap between mean and median income will increase the tariff, but in low-income economies it will have the opposite effect*. These predictions are testable, as we will discuss in the next section.

It is worth pausing to reflect the fragility of these conclusions, however. First, the political-economy game really does require the 2×2 structure of the economy.

¹³First, note that in any equilibrium in pure strategies, each party must have at least a 50% chance of winning, since it can always pick the tariff that the other party picks and enjoy a 50% chance. But then in equilibrium each party must win with exactly a 50% probability. Next, suppose that party A chooses a tariff value $t^A > t^m$. In this case, party B will win with certainty, since it can do so with any value $t^B \in [t^m, t^A]$. This yields a contradiction, as does any other deviation.

With more than two goods, there is no meaningful sense in which there is a median voter, and generically no equilibrium (Plott (1967)). Indeed, even in the two-good model the equilibrium makes sense only if the election is held as a referendum on trade policy, with no other issues relevant.

Second, the equilibrium is not robust to adding tiny amounts of noise to voters' preferences. To see this, consider a variant based on Lindbeck and Weibull (1993). This is a model of pure electoral competition in the meaning suggested above, but has the added feature that each voter votes for the party that offers her the highest utility, where utility has two components: (i) a real-income component that is derived from general equilibrium given the policy and the voter's utility function, as above, and (ii) a second component that is an exogenous preference for one party or the other. It could be based on ethnic affinity, the charisma of the party leader, or some element of the party's history. Regardless of the source, suppose that each voter has an exogenous preference for party A given by an idiosyncratic value $\mu \in \Re$. For voters of each economic type, Lindbeck and Weibull (1993) allow for μ to be drawn from a mean-zero distribution. In the Mayer model, the only way voters differ is by capital ownership, so suppose that for each group of voters who share the same value \tilde{k} of capital endowment, the values of μ are distributed by a probability density function $f(\mu; \tilde{k})$ with mean zero. If we restrict attention to densities that imply a very small variance to the μ values, then the model is the same as the Mayer model but with a tiny amount of noise added to voters' preferences. In other words, one can think of letting $f(0, \tilde{k})$ become arbitrarily large for each value of \tilde{k} , so that voters barely care at all about anything other than policy.

Lindbeck and Weibull (1993) show that equilibrium of the electoral competition in

this case results in both parties choosing the same policy, and the policy maximizes the weighted sum of utilities for Home voters, where the weight on voters with endowment \tilde{k} is given by $f(0; \tilde{k})$.¹⁴ Now, if the density does not depend on \tilde{k} (so that $f(\mu; \tilde{k}) = f(\mu; K/L) \forall \tilde{k}$), this clearly indicates social-welfare maximization, which is a stark departure from the median-voter model. Further, by varying the densities to make $f(0; \tilde{k})$ greater for some values of \tilde{k} than for others, the most-preferred tariff corresponding to any \tilde{k} value can be arbitrarily closely approached in equilibrium. The fact that this can be done for an arbitrarily small amount of noise means that the median voter equilibrium fails a basic stability test.

The solution is most plausibly to build idiosyncratic partisan preference shocks into the model from the beginning, as is standard in the rest of the literature (for example, [Persson and Tabellini \(2002, Ch. 8\)](#) and [Strömberg \(2008\)](#)), rather than trying to preserve the median-voter result for its own sake.

An important extension of the pure electoral model is explored by [Ponzetto \(2011\)](#), who focusses on the effect of voters' incomplete information on trade policy. A small open economy has several industries, each using a specific factor and labor; all consumers have identical additively separable utility functions so that partial-equilibrium analysis can be applied (the model is the same as is used by [Grossman and Helpman \(1994\)](#); see Section 3.3.2). Two parties compete for votes by choice of trade policy vector. Each voter who owns a specific factor wants trade protection for her own industry, but prefers free trade in all other industries. Voters also have

¹⁴If $f(0; \tilde{k})$ is very large for some \tilde{k} , then the partisan preferences for individuals in that group are tightly clustered around 0, and so a large fraction of those voters can be won over with a small change in trade policy. As a result, those voters tend to be favored in equilibrium.

partisan preferences in the [Lindbeck and Weibull \(1993\)](#) mold. The trick is that it is difficult for each voter to learn what each policy proposal is; each proposed tariff by each party is learned with a probability less than one by any given voter, with a higher probability for the voter's own industry (this is given a microfoundation based on information networks). Since a voter cannot be swayed by a tariff proposal of which she is unaware, and since each voter is more likely to be aware of tariff proposals for her own industry, each party knows that by offering a tariff to industry i it will win more votes from voters in i than it will lose from other industries. Consequently, all tariffs are positive in equilibrium. Further, if information about an industry becomes more evenly distributed (so that the difference between the rate at which people in that industry and people outside that industry become informed about it declines), then the equilibrium tariff in that industry falls. This effect, dubbed the 'Dracula' effect (meaning the influence of sunlight on protectionism), is interpreted as reflecting the influence of the media on trade policy; as noted in [Section 2.4](#), the evidence suggests that this interpretation holds water in the real world.

We now turn to majoritarian systems, and to discuss these we need a model with at least three districts. The simplest example can be constructed by dividing up the voters in the Mayer model into multiple districts, a majority of which must be won by a party in order to control the government. [Karabay and McLaren \(2004\)](#) point out that in such a model, the equilibrium tariff rate is the most preferred rate of the median voter in the median district (when the districts are ranked by the most-preferred tariff of their median voters). As a result, depending on how voters are allocated to districts, the equilibrium tariff can be anywhere from the national

25th percentile voter's to the 75th percentile voter's most preferred tariff. This, of course, suffers from the problems of the original Mayer model.

Grossman and Helpman (2005) present a three-district majoritarian model with legislative bargaining after the election, which becomes a pure electoral competition model as a special case.¹⁵ There are three industries that produce with specific capital together with labor, plus a numeraire sector that produces only with labor. Each district has some of each industry's capital, and the districts are symmetric in that each district has the largest share of one industry's capital and smaller shares of the other two; the pattern of shares is the same for all three districts, with the identities of the three industries permuted. The outcome of the political game will be a vector of tariffs for these three industries. Voters have idiosyncratic partisan preference shocks, and each district has an aggregate partisan preference shock revealed after the campaigning is over, but the *ex ante* distributions of these shocks is the same for each district. In that setting, the equilibrium of the pure electoral competition is free trade, which is a stark contrast with the same model when post-election legislative bargaining is allowed, as we shall see.

Clearly, in the pure electoral-competition version of Grossman and Helpman (2005), the majoritarian electoral system has no effect on policy. This is because

¹⁵The way it works is that two national parties compete for votes by committing to policy platforms before the election. After the election, the representatives from the winning party control the legislature and will be able to deviate from their party's platform, but if they do they will be 'fined' by their party in proportion to the size of the deviation, with a parameter δ as the parameter of proportionality. The model becomes a pure electoral competition model with no post-election deviation as δ becomes large. We will discuss the post-election bargaining and the model more fully in Section 3.5.

of the symmetry of the set-up. However, a large part of the interest in majoritarian systems stems from effects that arise when the districts are not *ex ante* identical in their partisan tendencies. The basic model of fiscal and redistributive policy in a majoritarian democracy in [Persson and Tabellini \(2002, Ch. 8\)](#) has two districts with partisan biases, each biased toward one of the two parties, plus a third that is biased toward neither, which we might call a ‘swing’ district. Since the swing district is more likely to be pivotal (in other words, to be the district that determines the outcome of the election), both parties commit to redistribution toward that district. In addition, since neither party derives much electoral benefit from public good provision for the partisan districts, only the benefit from public goods to the swing district matters, and consequently less public good is provided than under proportional representation (and less than optimal). Because districts differ in their partisan bias *ex ante*, majoritarian elections make a big difference to the policy in equilibrium. A rich model of the US electoral contest in [Strömberg \(2008\)](#) allows for probabilistic voting and uncertain outcomes but states with different levels of *ex ante* partisan bias. The analysis shows that a state with a higher probability of being pivotal receives more campaign resources, a prediction confirmed in the empirical portion of the paper.

These differences between partisan states and swing states in a majoritarian system can of course matter for trade policy as well. [Muûls and Petropoulou \(2013\)](#) present a stylized model of the electoral college with four types of voter: those who always vote for Democrats (type D); those who always vote for Republicans (type R); those who vote for the candidate most likely to provide tariff protection (type P); and those who vote for the candidate most likely to provide free trade (type F).

The allocation of these voters can differ across states. In particular, $\omega_p^s \in [0, 1]$ is the difference between D voters' share of state s and R voters' share. If $|\omega_p^s|$ is close to 1, then trade policy will not have much effect on the outcome of state s 's electoral vote, because the state has a strong partisan leaning in one direction or the other, but if $|\omega_p^s|$ is close to 0, trade policy can possibly swing the state's election. (Although each voter's choice is deterministic, the aggregate outcome is still random because the number of voters that turn out to vote can vary randomly.) The model has an unusual feature in that it assumes away any commitment by politicians. A newly-elected president can choose free trade or protectionism in her first term, which can then signal her true trade-policy preferences to voters who must choose whether or not to support her for a second and constitutionally final term. In an incumbent's second term she will simply implement her most preferred trade policy.

If there are enough P -type voters crammed into enough low- $|\omega_p^s|$ states, then in equilibrium a free-trade-preferring president will, with positive probability, choose trade protection in her first term in order to dupe those protectionist voters into supporting re-election. Note that this can be an outcome even if there are more F -type, free-trade-loving voters than the P -type, provided that the F -type voters are concentrated in states that are sufficiently partisan.

[Ma and McLaren \(2015\)](#) study a pure-electoral-competition version that works out more simply. Two parties compete for electoral votes by committing to policy positions; each voter has an idiosyncratic partisan bias, and each state has an aggregate partisan bias, except for one state, the 'swing state,' whose bias is zero. In the baseline model with no aggregate uncertainty, in any equilibrium in pure strategies, both parties commit to the policy vector that maximizes swing-state welfare, placing

a weight of zero on non-swing-state welfare. Adding a probabilistic element to the voting so that the bias of the swing state is not exactly zero and is not known precisely before the election creates a swing-state bias that converges to the extreme of the baseline model as the aggregate uncertainty becomes small, so that the effective weight on non-swing-state welfare converges to zero in the limit. Fitting the model to data on tariffs suggest that US politicians put a weight on non-swing-state welfare about 0.7 as large as on swing-state welfare.

3.2 Electoral competition: Empirics.

The basic prediction of Mayer (1984) is brought to data by Dutt and Mitra (2002). The regression idea is simple: On the left-hand side, a measure of country i 's overall level of trade restrictions. On the right-hand side, along with other controls, the variables of interest are a measure of inequality in country i and the interaction of that variable with a measure of i 's capital abundance. As discussed above, the model predicts that a rise in the gap between mean and median capital ownership should raise tariffs if i is capital rich, but lower it if i is capital poor. Dutt and Mitra measure these effects in a range of ways on a sample of between 49 and 64 countries depending on the specification (there is no time-series component to the data). The main measure of trade restrictions is tariff revenue as a fraction of imports, but a variety of others are used for robustness. Consistently, the authors find that the main prediction is borne out. For each regression, they report the implied capital/labor 'turning point,' or the level of capital abundance above which tariffs are increasing in inequality. The value varies, but in most cases it is close to the capital-labor ratio of South Korea. A related paper, Tavares (2008), relates tariff rates to an index

of political rights. On the theory that improved political rights will allow poorer people to participate more in elections, thereby making the median voter a poorer person (without changing anyone's income), a Mayer-type model would imply that increased political rights would raise tariffs in rich countries and lower them in poor ones. This is indeed what the data show.

So, despite the theoretical problems with the model discussed above, the [Mayer \(1984\)](#) formulation seems to hold up to the data quite well on first blush. However, we should note two crucial problems. First, the model not only predicts the sign of *comparative statics* for the tariff, but also the sign of tariff *level*, and for labor-abundant countries that sign must be negative. Of course there are no countries for which the average tariff, however measured, is negative. This problem is addressed by [Dhingra \(2014\)](#), who notes that in the original model every country was assumed to be small for simplicity. Once that assumption is relaxed, there is a terms-of-trade motive that can in principle push tariffs above zero for all countries, while preserving the original comparative statics prediction. Dhingra derives an estimating equation for the model with large countries, and it indeed resembles the [Dutt and Mitra \(2002\)](#) estimating equation with the addition of a new term, the inverse elasticity of foreign export supply, just as in (2). She has the benefit of a comprehensive set of measures of trade restrictiveness produced by [Kee et al. \(2009\)](#) and estimates of trade elasticities from [Kee et al. \(2008\)](#), and constructs a data set of 35 countries from 1993 to 2004. There are a number of minor changes compared to the earlier study; instead of the physical capital/labor ratio, she proxies 'capital abundance' with a human capital index, the average number of years of schooling in the adult population. However, the spirit of the exercise is the same, and over a wide range of

specifications and robustness checks the [Dutt and Mitra \(2002\)](#) results hold up. As a bonus, the coefficient on the inverse-elasticity term is positive, so the [Broda et al. \(2008\)](#) results referred to in Section 1.1 receive some additional support as well.¹⁶

The other crucial problem with the model is that it is unavoidably a one-dimensional model. Introducing a third factor of production generically means that there is no meaningful median voter and no clear prediction of the model. A reminder of this problem is offered by the historical study of [O'Rourke and Taylor \(2007\)](#). They investigate the relationship between democracy and trade policy in a set of 35 countries from 1870-1914. They use the index of democracy from the Polity database, and ask the question: As democratic reforms spread and each country's democracy index improves over time, does that tend to increase or reduce trade restrictions? Taking their inspiration, again, from [Mayer \(1984\)](#), they first regress a country's average tariff on the country's land/labor ratio, its index of democracy, and the interaction between the two. Reasoning that democratic reform will tend to increase participation in the electoral process, making the median voter a poorer citizen than would have been the case before the reform (as in [Tavares \(2008\)](#)), they suggest that this should lower tariffs in a land-scarce country and raise them in a land-rich country, as would be indicated by a negative coefficient on the democracy index and a positive one on the interaction term. They find an insignificant coefficient on democracy but a positive one on the interaction, once again providing at least partial support for

¹⁶A natural concern is that under the WTO, the inverse elasticity term should no longer matter. [Dhingra](#) does the estimation with an extra dummy for WTO membership and finds that it matters a lot more for non-members. The fact that it does have influence for members as well may be explained by [Ludema and Mayda \(2013\)](#), who show that the free-rider problem that goes with Most-Favored-Nation (MFN) rules in the WTO can lead to exactly this sort of phenomenon.

the Mayer model. (Country fixed effects are present, so the driving force is indeed changes over time within a country.) But then they add capital-labor ratios to the equation, since after all both capital and land are important parts of the economy, and find that the coefficient on the capital-labor term is strongly *negative*. O'Rourke and Taylor suggest that the explanation may have to do with the dynamics of domestic coalition-formation in the 19th century, which likely does not generalize to the present, but the broader point is that the Mayer model simply cannot handle these findings. One cannot simply squeeze capital and labor plus human capital into a lump called 'assets' and pretend that we are living in a two-factor model (and it is fair to ask how the results of [Dutt and Mitra \(2002\)](#) and [Dhingra \(2014\)](#) would hold up to the addition of, for example, land/labor ratios to the equation). The literature awaits a serious theoretical treatment that can accommodate an arbitrary number of factors; the approach of [Jäkel and Smolka \(2015\)](#) may hold some promise in this regard.

Turning to the differences between proportional and majoritarian electoral systems, [Evans \(2009\)](#) looks at a sample of 147 countries to test for the effect of electoral system on average tariffs. Including controls for colonial origins and legal system, she finds a robust and substantial positive effect of majoritarian systems on average tariffs. Controlling for the selection of countries into electoral systems with a two-step procedure, using date of adoption of constitution and distance from equator as instruments, only strengthens the effect, leading to a conclusion that majoritarian systems produce significantly higher tariffs. However, these results are qualified by [Hatfield and Hauk \(2014\)](#), who find that much of the effect is due to the fact that countries with proportional representation tend to be smaller than majoritarian

countries, and smaller countries tend to have low tariffs.

More broadly, a number of authors have found strong correlations between commercial policy and the spread of democracy. [Pandya \(2008, Ch. 4\)](#) finds a strong effect of a country's transition to democracy on its propensity to liberalize FDI inflows, after controlling for country fixed effect and also after using number of years since independence as an instrument for democratization. [Milner and Kubota \(2005\)](#) find a strong tariff-lowering effect of democratization, and [Mansfield et al. \(2002\)](#) find that democracies are more likely than autocracies to form trade agreements with each other. [Eichengreen and Leblang \(2008\)](#), looking at data from 1870 to 2000, find a strong effect of democracy on trade openness and capital-account openness. (A related exploration of trade policy and democracy, [Liu and Ornelas \(2014\)](#), will be discussed in [Section 4](#).)

3.3 Lobbying: Theory.

Once a government has taken power there are many ways for private citizens to try to affect its decisions. We will call any attempt to do so 'lobbying,' a term that can encompass many motives including public interest and humanitarian concerns, but we will focus on the effects of commercial interests to influence policy to increase their own incomes.

One might not realize it from reading the trade literature, but there are a wide variety of approaches to modeling lobbying. One of the earliest attempts to treat lobbying as an equilibrium phenomenon is the introduction to [Krueger \(1974\)](#), which suggests that lobbying should be treated as a competitive industry that uses potentially productive resources (such as the skilled labor of the lobbyists) to transfer rents

from one business to another, so that the size of the rents should be treated as a measure of the deadweight loss from the lobbying sector. Findlay and Wellisz (1983) posit a ‘tariff production function,’ which is an increasing function of lobbyists employed by the import-competing sector requesting a higher tariff, and a decreasing function of lobbyists employed by the export sector requesting a lower tariff. The outcome is a Nash equilibrium in opposing lobbying efforts by the two sectors, and of course it is a pure deadweight loss.

These early attempts treat what lobbyists actually do as a black box. Since then, considerable effort has been expended on deriving lobbying behavior from first principles,¹⁷ which have mostly followed two strands: Informational lobbying and influence peddling, or protection for sale.

3.3.1 Informational lobbying.

The idea of informational lobbying is that lobbyists affect policymakers’ decisions by affecting their beliefs or information. This can take the form of directly informative

¹⁷An interesting use of the black-box approach is Pecorino (1998), which investigates the problem of self-enforcement of collusion in lobbying. If we postulate that lobbyists can obtain a tariff t for their industry through spending S according to an exogenous tariff production function $t(S)$, then any one firm can secure a tariff by lobbying on its own, and in an uncoordinated Nash equilibrium each firm will spend a positive amount on lobbying; but this spending will be less than the optimum because the tariff is a public good for members of the industry. The collusive optimum could be supported in an infinitely-repeated game with the punishment of reversion to the Nash equilibrium if anyone defects, but the discount factor must be high enough for this to work. Pecorino shows that the value of this discount factor does not necessarily rise with the number of firms in the industry, which may help explain the empirical finding that lobbying does not seem to be systematically more effective in more concentrated industries *ceteris paribus*.

lobbying, in which the lobbyist provides precise information about a policy issue (for example, statistical research to show what the likely economic effect of a change in tariff would be), or signaling about how important the issue is to the lobbyists' clients (and thus, for example, how many votes are likely to be gained in the next election from a given change in policy). This type of interpretation of lobbying has been studied in political science but has not been used much in the area of trade policy.

[Austen-Smith \(1993\)](#) pioneered the area with a model of a lobbyist who knows the state of the world (which could take an infinite number of values) and wishes to convey information about it to a politician who does not know the state of the world but would like to know it to set social-welfare-maximizing policy. The lobbyist must first undertake costly signaling in order to convey to the policy-maker that she has valuable information (the policy-maker's time is costly), and then once achieving an audience, she names the state of the world. The policy maker understands that he does not have the same interests as the lobbyist, so the lobbyist may have an incentive to mislead. As a result the information that can be revealed in this 'cheap talk' equilibrium is coarse: The lobbyist can convey that the state of the world is on one of several discrete partitions of the state space, but not exactly which state has been realized. A sequence of much simpler and much more transparent models conveying a similar story is found in [Grossman and Helpman \(2002, Ch. 4\)](#). [Potters et al. \(1997\)](#) show how campaign contributions made in public by an entity with a known public-policy agenda can have an effect on elections if the voters are less well informed about candidates' policy preferences than the donor is.

However, these ideas have barely made an appearance in the trade literature.

One exception is [Karabay \(2009\)](#), who studies a [Brander and Spencer \(1985\)](#) style model in which a Home firm and a Foreign firm compete as a Cournot oligopoly in a third market. The export market has a demand curve with an intercept that is known to the firms but not to the Home government. Social welfare maximization calls for a subsidy, and the optimal size of the subsidy depends positively on the height of the export-market demand curve. The Home firm can make a payment to the government in order to signal that the demand-curve intercept is high, so as to persuade the government to provide a high subsidy; but of course, regardless of the height of the demand curve, the firm would like a higher subsidy, so a separating equilibrium requires that the cost of the transfer be enough that only a firm that knows the intercept is actually high would be willing to incur the cost. It can be in the interest both of the firm and the government for the government to impose a fixed cost to lobbying; Karabay shows (Proposition 1) that there is a range for this cost such that it makes a separating equilibrium possible, and in this case, provided there is not too much deadweight loss in the transfer to the government (λ not too far below $\frac{1}{2}$, in the notation of the paper), the lobbying equilibrium is welfare-enhancing.

The idea of informational lobbying has had very little empirical attention in international economics, but [Ludema et al. \(2010\)](#) provide a very compelling piece of evidence for its importance. They study tariff suspensions in the US Congress. Any firm can request temporary suspension of a tariff, and such requests are routinely made by a firm located in a given congressional district to the representative for that district, to reduce the costs of the firm's inputs. However, Congress provides opportunities for comment by firms opposed to the suspension. [Ludema et al. \(2010\)](#) show that a requested tariff suspension is more likely to pass, the more firms that

express support for it, and less likely to pass, the more firms that object to it; and controlling for statements of support or opposition, it is more likely to pass, the more is spent on trade-policy lobbying by supporting firms, and the less is spent by opposing firms. All of this is consistent with a pure informational theory of lobbying. The firms are not *purchasing* the trade policy in question, and in particular are not providing campaign contributions, but are revealing information to the politicians about how much they value (or oppose) the change in question. This intriguing piece of evidence suggests that the informational role of lobbying in trade policy needs to be explored further.

3.3.2 Influence peddling.

By contrast with informational lobbying, influence peddling models are models in which members of an interest group pay the decision-maker for a policy favor. They have become the dominant paradigm for studying lobbying in international trade policy, led by the seminal Protection-for-Sale model of [Grossman and Helpman \(1994\)](#). We will review this in detail before discussing applications.

This is a model in which owners of specific factors organize themselves to lobby the government over trade policy, by a process of competitive bidding. The economy is extremely simple: There are $n + 1$ goods, of which good 0 is a numeraire, produced with labor only; the marginal product of labor in producing good 0 is equal to 1, due to which the wage is fixed in equilibrium. Each of the remaining n goods are produced with labor together with a specific factor that can be used only for that good and which is available in a fixed and exogenous supply. As a result, we can write an upward-sloping supply function for good i , say $y_i(p_i)$, $i = 1, \dots, n$, where p_i

is the domestic price of good i and y_i is the quantity supplied, and we can write the income to specific factor owners in industry i , which is the same thing as producer surplus, as $\pi_i(p_i)$. On the demand side, the utility of a typical citizen is additively separable: $U = x_0 + \sum_{i=1}^n u_i(x_i)$, where x_i denotes consumption of good i and u_i is an increasing, strictly concave and differentiable function. As a result, we can derive a downward-sloping demand curve, $d_i(p_i)$, $i = 1, \dots, n$, and the utility of a given consumer can be written in terms of consumer surplus $s_i(p_i)$ from each good i , so that total utility of any consumer is equal to $E + s(\mathbf{p})$, where \mathbf{p} is the vector of domestic goods prices, E is the consumer's expenditure, and $s(\mathbf{p}) = \sum_{i=1}^n s_i(p_i)$ is the consumer's total surplus.

The country is small on world markets, so it takes the world prices, p_i^* , of all goods as given. Trade policy is a specific import tariff/subsidy or export tax/subsidy t_i for each non-numeraire good, so that $p_i = p_i^* + t_i$. If i is an imported good, $t_i > 0$ indicates an import tariff that raises the domestic price; if i is an exported good, $t_i > 0$ indicates an export subsidy that raises the domestic price, and so forth. Given that each good has an easily-derived domestic demand and supply curve, we can write the *import* demand curve $m_i(p_i)$ as the difference between the two, and the revenue (perhaps negative) from the i^{th} trade tax as $r_i(p_i) = (p_i - p_i^*)m_i(p_i)$. The sum across goods is total trade-tax revenue per capital, $r(\mathbf{p})$.

Now, to discuss the actual influence peddling. Tariffs are set by a politician who has full discretion. A subset of the industries have their specific-factor owners exogenously organized into an interest group. Interest group i writes a contribution schedule, $C_i(\mathbf{p})$, that specifies how much the politician will be paid as a function of the domestic tariff vector \mathbf{p} (which of course implies a trade tax vector $\mathbf{t} = \mathbf{p} - \mathbf{p}^*$). These

payments are financed by the specific factor owners in industry i , who have somehow solved their internal public good problem and do not suffer from free-riding. Each organized interest group chooses its contribution schedule simultaneously, writes it down, puts it into an envelope and drops it into the politician's mailbox, who then opens them, examines them, and chooses his optimal policy, taking the combined contribution schedules into account. The interest groups are required to honor their contribution schedules *ex post*. For each organized interest group i , the payoff is $W_i(\mathbf{p}) - C_i(\mathbf{p})$, where $W_i(\mathbf{p})$ is welfare gross of the contribution:

$$W_i(\mathbf{p}) = l_i + \pi_i(\mathbf{p}) + \alpha_i N[r(\mathbf{p}) + s(\mathbf{p})], \quad (4)$$

and where l_i is the combined labor supply of the owners of specific factors in the i^{th} interest group, α_i is their share of the population, and N is the total population. Expression (4) is just labor income plus income from the specific factor plus the interest group's share of national tariff revenue and consumer surplus. The politician's payoff is $aW(\mathbf{p}) + \sum_{i=1}^n C_i(\mathbf{p})$, where $a > 0$ is a parameter and $W(\mathbf{p})$ is simply total social welfare:

$$W(\mathbf{p}) = l + \sum_{i=1}^n \pi_i(\mathbf{p}) + N[r(\mathbf{p}) + s(\mathbf{p})]. \quad (5)$$

That sets up the game. Now, this game has a vast number of subgame-perfect equilibria. Much of the original paper is devoted to choice of equilibrium, and the authors argue for a Truthful Equilibrium, meaning an equilibrium in which $\nabla C_i(\mathbf{p}) = \nabla W_i(\mathbf{p})$ everywhere, on the grounds that such an equilibrium is coalition-proof. Such an equilibrium produces a trade policy vector that maximizes:

$$aW(\mathbf{p}) + \sum_{i \in L} W_i(\mathbf{p}), \quad (6)$$

where L is the set of organized industries. However, those details of equilibrium selection are not crucial; as [Goldberg and Maggi \(1999\)](#) pointed out later, for example, (6) is just the sum of the payoffs of all interest groups and the politician, so it is the optimand that would be maximized by any efficient bargaining mechanism between those parties. In effect, the bargaining between lobbyists and the politician maximizes weighted welfare, where every citizen's welfare receives a weight a except for the members of organized lobbies, whose welfare receives a weight $a + 1$.

The outcome of this maximization is a tariff vector that satisfies:

$$\frac{\tau_i}{1 + \tau_i} = \frac{I_i - \alpha_L}{a + \alpha_L} \left(\frac{z_i}{e_i} \right), \quad (7)$$

where τ_i is the *ad valorem* equivalent tariff for industry i ; α_L is the fraction of the population that belongs to an organized interest group; I_i is a dummy variable that takes a value of 1 if industry i has an organized interest group; $z_i \equiv y_i/m_i$ is the inverse import penetration ratio for industry i ; and e_i is the absolute value of the import-demand elasticity for industry i .

Note that (7) implies that (i) Organized industries will receive a positive import tariff or export subsidy as the case may be; (ii) Unorganized industries will suffer a *negative* tariff or a tax on their exports, as the case may be; and (iii) All of these effects are moot, and the equilibrium is free trade, if everyone is part of an organized industry (so that $I_i \equiv 1$ and $\alpha_L = 1$). Further, the more the politician values social welfare, so the higher is the parameter a , the smaller will be the deviations from free trade. Condition (7) has been the basis of a large empirical literature; indeed, one could say that this one equation has been the main driver of empirical research in the political economy of trade policy for the last 20 years. It seems to be routinely misunderstood, however, so it is worth taking a moment to walk through it.

Consider raising the specific tariff on i , an imported good, by 1 dollar, and suppose that i is an organized industry. The income to specific factor owners in i goes up by y_i . The benefit, from the point of view of weighted welfare, is $(1 + a)y_i$.

At the same time, consumer surplus for all citizens goes down by the initial level of consumption of good i , also equal to domestic production plus imports: $d_i = y_i + m_i$. The tariff revenue changes by $m_i + t_i m'_i$ (recall that t_i is the *specific* tariff on good i). Therefore, the net drop in utility for each citizen not in the interest group is $[y_i + m_i] - [m_i + t_i m'_i] = y_i - t_i m'_i$. This lowers the weighted welfare function by $(a + \alpha_L)(y_i - t_i m'_i)$ (remember that the α_L people in organized interest groups each have a weight equal to a plus 1).

The optimal tariff will set this marginal increase in weighted welfare equal to this marginal decrease, or:

$$(1 + a)y_i = (a + \alpha_L)(y_i - t_i m'_i); \tag{8}$$

rewriting slightly:

$$(1 - \alpha_L)y_i = (a + \alpha_L)(-t_i m'_i). \tag{9}$$

The left-hand side of this equation is the benefit from redistribution. A 1-dollar increase in the tariff transfers y_i dollars of real income to organized persons from everyone else. Since organized persons have extra weight in the welfare function, this raises the value of the maximand. Note that this is exactly the term in square brackets at the beginning of (1), where it took a value of zero as a pure transfer; here the value of the redistribution is positive because the recipients have higher weight than the donors. The right-hand side is the distortion cost of the tariff increase.

Solving for the tariff, we obtain:

$$t_i^* = \frac{(1 - \alpha_L)}{(a + \alpha_L)} \left(\frac{y_i}{-m'_i} \right). \quad (10)$$

The last term on the right-hand side is the only part that differs from industry to industry, the ratio of output to the derivative of import demand. In light of the cost-benefit analysis discussed above, we can usefully call this the *redistribution-distortion ratio*. The bigger is this ratio for a given industry, the more politically useful redistribution a politician can achieve with a tariff per unit of costly distortion, and so the more aggressively will the tariff be used. Now, if we divide numerator and denominator by m_i , and then divide the whole equation by p_i to convert to *ad valorem* tariff and elasticity, we obtain the famed condition (7), but now we understand the term z_i/e_i as a measure of the ratio of redistribution to distortion.

This helps understand the primary empirical prediction of the protection-for-sale model: If the industry is organized so that it receives positive protection, it receives more protection, the larger is its redistribution-distortion ratio. On the other hand, if it is unorganized so that it suffers negative protection, it suffers larger negative protection the large is its redistribution-distortion ratio. This will be crucial in discussing the empirical work in the next section.

The literature has mostly developed on empirical lines, but there are some theoretical variations that are worth noting. [Mitra \(1999\)](#) endogenizes the number of organized industries in a protection-for-sale model with symmetric industries. Each industry's specific-factors owners must incur a fixed cost to organize, and the benefit to doing so decreases as more of the industries become organized. As a result, there is an equilibrium number of industries that become organized, and this changes when the economic environment changes. Some striking insights emerge. As the economy

becomes larger, the number of industries that become organized increases; in the limit, they will all be organized. As a result, free trade emerges in the limit either for very small countries (where there is no industry that finds it worthwhile to organize) or for very large ones (where everyone is organized). A similar U-shaped result follows from varying the parameter a . These predictions do not seem to have been exploited at all in empirical work.

Two papers show how protection for sale might help explain the persistence of NTB's. [Limão and Tovar \(2011\)](#) show how the choice of an inefficient policy instrument (such as quantitative restrictions in the presence of rent seeking) can arise because of strategic bargaining between a politician and an interest group. If lump-sum transfers are not possible (for example, the only feasible payment is a campaign contribution, and there are diminishing marginal returns to campaign spending), then the utility-possibility frontier between the politician and the lobbyist is curved. A politician can use a tariff ceiling from a trade agreement to tie the politician's own hands in bargaining with a domestic lobbyist, bending that UPF and thereby improving the politician's bargaining power. If it bends enough, use of a strictly less efficient instrument such as an NTB becomes a possible equilibrium choice. A very different story is told by [Anderson and Zanardi \(2009\)](#), who interpret NTB's as a form of 'political deflection' because of their bureaucratic procedures that allow a politician to wash hands of the decision making. In their model, a lobbyist offers to pay for protection. The politician is aware that providing protection may induce anti-protection interest groups to fund a challenger in the next election, but refusing the favor outright can reveal the politician to be anti-protection by ideological preference, which will generate a *pro*-protection challenger. Delegating to a bureaucratic

process may therefore save the politician from being challenged.

3.3.3 General observations.

The importance of [Grossman and Helpman \(1994\)](#) is obvious, but it is worth pausing to note its limitations, particularly its unsuitability to be an all-purpose workhorse theory of lobbying. Note, first, that the model requires all participants to engage in felonious activity. The contribution schedules that are the heart of the model might be called a ‘reverse Cunningham,’¹⁸ and are surely a very poor representation of what actual lobbyists do day after day. Further, it is essential for the model that the lobbyists make not only offers of bribery contingent on policy, but that these take the form of *enforceable contracts*, despite begin nakedly illegal.

It is also worth pointing out that the structure of the economy is not merely simple, but very special. In particular, any positive import tariffs in this model are guaranteed to raise income inequality. They will raise specific-factor incomes relative to the numeraire, but leave the wage unchanged. This forces, *by construction*, a particular answer to one of the most important questions about trade policy, and it forces an answer that is very much at odds with the way most voters think about the question, based on a great deal of survey data reviewed in [Section 2.3](#). Further, in a model constructed in this way, it is not possible that a blue-collar worker in Detroit could be harmed by the rise of low-cost automotive imports from overseas;

¹⁸Randy ‘Duke’ Cunningham, Republican Congressman, served as representative of California’s 50th Congressional District from 1991 to 2005. To help facilitate the transactions that made him famous, he wrote out a schedule of legislative favors he could offer, and the bribe required for each, on US Congressional stationery, thus providing a rare example of ‘contribution schedules’ in practice. He served seven years in federal prison.

the workers' wage would remain equal to 1, and cars would now be cheaper, so the worker would clearly be better off. There are reasons that this structure has been adopted, and much insight comes out of it, but it should be underlined that much and perhaps most of the interest in the politics of trade policy and income-distribution effects of trade policy that can be observed in the discourse outside of academia has been excised from the discussion before starting.

A last general point about this approach is that by construction, in this model lobbyists are a pernicious influence. With lobbying banned and the ban enforced, the decision-maker in this model would be resigned to mere social-welfare maximization. Lobbyists can only distort the policy outcome away from that optimum. This is a major contrast with informational models such as [Grossman and Helpman \(2002, Ch. 4\)](#) and [Karabay \(2009\)](#), where lobbying can, depending on parameters, raise social welfare by providing a better-informed policy-maker. (This leads to an interesting paradox studied by [Gawande et al. \(2006\)](#) and discussed in [Section 3.4.3](#) below.)

3.4 Lobbying: Empirics.

3.4.1 The First Wave.

The two pioneering papers that first took the equilibrium condition (7) to the data were [Goldberg and Maggi \(1999\)](#) and [Gawande and Bandyopadhyay \(2000\)](#). Their approaches were quite similar in most ways. They both avoided applying the model to tariff data, since for any WTO member tariffs are determined by a process of multilateral negotiation rather than through unilateral action. Both focussed on US

Non-Tariff-Barrier (NTB) coverage ratios from 1983, meaning for each four-digit SIC industry the fraction of disaggregated industries that are affected by some sort of NTB. They both construct z_i from trade data and use e_i from [Shiells et al. \(1986\)](#). Both use contributions by firms in each industry to Political Action Committees (PAC's) to break the sample into organized and unorganized industries.

Both then run a regression with the NTB coverage ratio on the left-hand side and on the right-hand side z_i/e_i as well as z_i/e_i interacted with I_i , the dummy for an 'organized' industry. Following [\(7\)](#), in both papers the hypothesis of interest is that the coefficient on z_i/e_i is negative, the coefficient on $I_i z_i/e_i$ should be positive, and the sum of the two coefficients should be positive, so that the effect of a higher z_i/e_i for an organized industry will be an increase in protection.

Many of the details differ between the two studies. [Goldberg and Maggi \(1999\)](#) actually take the e_i from the denominator of the right-hand side variables and multiply it with the NTB coverage ratio on the left-hand side, since it is an estimated variable. [Gawande and Bandyopadhyay \(2000\)](#), instead, deal with that issue by using the standard error of the regression reported in [Shiells et al. \(1986\)](#) to weight their regression. Further, they augment the protection-for-sale model with traded intermediate inputs, carefully develop instrumental variables for all right-hand-side variables, and add an equation to determine the size of contributions as well as the degree of protection. [Goldberg and Maggi \(1999\)](#) call an industry organized if its recorded PAC donations are greater than a specified threshold, while [Gawande and Bandyopadhyay \(2000\)](#) regress PAC contributions on imports from various countries and classify an industry as organized if its contributions are positively correlated with imports from at least one source country.

The results of the two studies are broadly similar: The NTB coverage ratios are strongly increasing in z_i/e_i for organized industries and strongly decreasing in z_i/e_i for unorganized ones. Further, they are able to estimate the a parameter, and both find it to be huge (an implied value of 61.5 for Grossman-Maggi; 3,175 for Gawande-Bandyopadhyay).¹⁹

The verdict seemed to be that the protection for sale model works, and a tsunami of studies followed using this method and adding to it. However, many observers expressed surprise at the size of the estimated values of a ; even with a value of $a = 61.5$, citizens outside of any organized interest group get a weight in the implied social welfare function (6) that is $\frac{61.5}{61.5+1} = 98.5\%$ as much as the weight on those who are inside an organized interest group – hardly any bias at all. [Gawande and Krishna \(2004\)](#) point out that these estimates call into question the usefulness of political-economy models in explaining trade policy.

3.4.2 The Ederington-Minier Calamity and Other Critiques.

An important paper criticizing this approach, [Ederington and Minier \(2008\)](#), should give further pause to readers of the protection-for-sale empirical literature. This paper looks at some of the gaps between theory and econometric practice.

Two main points are worth focus. First, as the pioneering papers pointed out, the

¹⁹A related contribution is [Eicher and Osang \(2002\)](#), who derive equilibrium first-order conditions from a model of tariff-production-function Nash equilibrium between import-competing-industry lobbies and export-industry lobbies, as in [Findlay and Wellisz \(1983\)](#). They derive a structure similar to (7), which allows a test of [Findlay and Wellisz \(1983\)](#) and [Grossman and Helpman \(1994\)](#) as non-nested alternatives. Both models do reasonably well, but the data provide stronger support for protection for sale.

model requires dividing up the industries into a politically unorganized subset and a politically organized subset, but in practice there are PAC's for each industry in the data with positive contributions from firms, so there appears to be no unorganized industry in the data. The argument that these papers make is that some industries are likely to be organized for other lobbying purposes, not trade, and thus can be treated as unorganized for the purpose of analyzing trade policy. Now, that argument is difficult to begin with, since it is difficult to imagine how one could have incurred the fixed cost of staffing a lobbying operation and then be simply unable to have its members raise the issue of tariffs while talking to politicians. But Ederington and Minier suggest that we take the suggestion seriously: Insert into the model some other policy over which the industry owners may wish to lobby. An easy and natural example is an output subsidy. But if one adds the possibility of an output subsidy to the model, *trade taxes vanish* in equilibrium. The reason is that output subsidies are a more efficient way of transferring income to specific-factor owners in a given industry than tariffs; tariffs distort both production and consumption, while an output subsidy distorts only production. If one argues that this argument is too optimistic about the efficiency of subsidies in practice, one can add to the model some administrative costs that subsidies incur but tariffs do not, and assume that these costs are increasing in the level of subsidy provided. This returns tariffs to the equilibrium, as the policymaker trades off the consumption inefficiency of tariffs against the administrative inefficiency of subsidies in redistribution. But now the equilibrium condition looks very different from (7): The optimal tariff for industry i is proportional to the marginal administrative cost of the subsidy for industry i relative to the slope of the demand curve for i . Both instruments create a production

distortion; the tariff will be used to equate the marginal ‘extra cost’ of the subsidy (administration) to the marginal ‘extra’ cost of the tariff (consumption distortion).

Imports and the import-demand elasticity are irrelevant.

Second, all papers on the protection-for-sale model face the problem that the model predicts negative tariffs for unorganized sectors, a feature never discovered in the data. The standard argument in the literature is to suggest that the theory is not about the *level* of tariffs as much as the *variation* in tariffs; one can add to the model, for example, a political motive for giving some positive tariff to the unorganized sectors, and shift the intercept up, but the slopes of the protection as a function of z_i/e_i will not be affected. Once again, Ederington and Minier suggest that we stop waving our hands and actually add such a factor to the model. Suppose that there are a number of sectors that are not organized but the politician feels a need to keep them happy; perhaps their voters have high turnout rates in elections; perhaps they care less about partisanship than other voters (so that, in Lindbeck and Weibull (1993) terms, they have a high value of $f(0, \tilde{k})$; recall Section 3.1.). In this case (simplifying their argument somewhat), one could have a politician who puts a weight of a on social welfare from other sectors, but a higher weight, say $a' > a$, on the set of sectors that are unorganized. (Indeed, perhaps that is why they are not organized — they do not need to be.) Maximize weighted welfare with a weight of a on workers, a weight of $a + 1$ on specific-factor owners in the organized industries, and a weight of a' on specific-factor owners in the unorganized industries, derive the first-order condition, and rearrange it to yield the analogue of (7).

$$\frac{\tau_i}{1 + \tau_i} = \frac{(I_i - \alpha_L) + (a' - A)}{A + \alpha_L} \left(\frac{z_i}{e_i} \right), \quad (11)$$

where A is the average value of a and a' , weighted by the proportion of the population who own specific factors in the organized and unorganized industries respectively. Condition (11) looks very much like (7), and it has the feature that if a' is bigger than a by enough, all tariffs will be positive. However, a devastating problem has emerged: *When the tariffs for unorganized industries are positive, they will be increasing, not decreasing, in z_i/e_i .* This is readily understood if we recall the interpretation of z_i/e_i as the redistribution/distortion ratio. When it is optimal to redistribute income *away* from owners of unorganized industries with a negative tariff, it is optimal to do so most aggressively in industries with big values of z_i/e_i , since the redistribution can be done at low cost. That is where the original model provided a negative effect of z_i/e_i on unorganized tariffs: Low-cost redistribution implies a big negative tariff for those industries. However, if there are additional political considerations that make it optimal to distribute income *toward* the owners of unorganized industries with a *positive* tariff, then it is optimal to do so most aggressively in industries with big values of z_i/e_i . That provides a *positive* effect of z_i/e_i on unorganized tariffs.

In other words, once one adds elements to the model to rationalize the positive unorganized tariffs, the sign of the coefficient flips from the sign actually observed in the data to the opposite sign. It appears that these various empirical studies that are held up as verifying the protection-for-sale model have actually been rejecting it. Now, this is not to criticize the theory model, because without it we would not even know what to look for. One possible interpretation is that the protection-for-sale regressions have helped identify a robust empirical puzzle, to which theorists can now usefully apply themselves – somewhat in the spirit of the equity-premium puzzle or the statistical rejection of Euler-equation models in macroeconomics, which have

generated very rich research literatures.²⁰

A related critique is offered by Imai et al. (2013), who point out a number of problems with the way existing studies have divided up industries into ‘organized’ and ‘unorganized’ – which always requires some arbitrary decisions, since as discussed above in practice all industries are usually politically organized. Imai et al. (2013) suggest an alternative derived from the theory: In the protection-for-sale model, conditional on the level of z_i/e_i , all organized industries will receive higher protection than any unorganized industry, so the conditional upper quantiles of the tariff distribution should represent organized industries and the lower ones unorganized industries. As a result, a quantile regression of the x -percentile tariff on z_i/e_i should yield a positive coefficient if x is close enough to 1 and a negative coefficient if x is close enough to zero. In fact, the estimation demonstrates the opposite – suggesting both that previous studies had seriously misclassified industries and that the data are inconsistent with the protection-for-sale model.

Apart from these issues of theoretical interpretation, many authors have become skeptical of the empirical formulation based on NTB coverage ratios. In effect, the first wave of empirical work pretended that the coverage ratios could be plugged

²⁰Another way of thinking about the absence of negative tariffs is to recall, as discussed in footnote 7, that there is a continuum of different tariff vectors that yield the same equilibrium, and for any trade policy it is easy to formulate an equivalent policy with no negative tariffs. However, for that interpretation to work, one must identify the numeraire industry (which must exist in order for the model to work, and must be unorganized), and verify that it also has a positive tariff, which is below the tariffs of the industries with predicted positive tariffs but above the tariffs of the industries with predicted negative tariffs. Further, if that interpretation is correct, (7) can not longer be used as an estimating equation. I am grateful to Arnaud Costinot for suggesting this question.

into the first-order condition for choice of tariffs to maximize weighted welfare, and the condition be interpreted as a first-order condition for the coverage ratio instead. But this is a fiction; [Matschke \(2008\)](#), for example, points out that an important feature of the analysis is the effect on tariff revenues, but many NTB's generate no revenues at all. [Gawande and Krishna \(2004\)](#) point out broader logical problems with interpreting the coverage ratios as measures of the intensity of protection. More recent work has tended to use Most-Favored-Nation (MFN) tariffs ([Matschke \(2008\)](#)), which offers a detailed rationalization for the use of MFN tariffs; [Fredriksson et al. \(2011\)](#)), or preferential tariffs where multilateral rules allow national discretion, such under as the Generalized System of Preferences ([Blanchard and Matschke \(2014\)](#)), [Blanchard et al. \(2014\)](#)).

3.4.3 Other Contributions.

Leaving these critiques to one side, a number of interesting and useful wrinkles have been added to the basic model. Here we review a few noteworthy examples.

1. *Dictatorship and lobbying.* [Mitra et al. \(2002\)](#) estimate a protection-for-sale model for Turkey for four separate years of data, beginning in 1983. Of course, extending the model to ever more countries is of interest in itself, but what makes the choice of location and years here highly significant is that 1983 was the last year of a military dictatorship. This allows the authors to ask, for example, whether the dictatorship appears to be more or less susceptible to influence-peddling than the subsequent democracy – a question with great relevance to understanding policy formation in the developing world, and one to which no obviously compelling answer springs out of theory. The model

qualitatively follows the features estimated on US data, but the estimate of the parameter a turns out to be 76.3 during the dictatorship year and on average 87 during the democratic years, suggesting that – at least in this example – the dictatorship was somewhat *less* concerned about social welfare and somewhat *more* susceptible to the influence of the lobbyists than the democracy that followed.

2. *Labor-market institutions and lobbying.* [Matschke and Sherlund \(2006\)](#) augment the basic protection-for-sale model with important features of the labor market: A portion of the industries have workers who are not mobile across industries, and a number of industries are unionized, and so have wages that are determined by bargaining between the employers and the union. This corrects, in a stylized way, one of the most glaring weaknesses of the classic protection-for-sale model: The fact that nothing that happens in trade policy has any effect on wages. In the [Matschke and Sherlund \(2006\)](#) model, a rise in a tariff to an industry raises not only profits but also wages, if the industry either has immobile labor or is unionized. Further, in each unionized industry, not only the employers but also the union has the option of lobbying the government. Not surprisingly, this adds an enormous amount of complication to the model, but in the end the authors derive a variant of the original protection-for-sale estimating equation, with an added term to take account of how labor-market conditions vary from industry to industry. The empirical results show that this term is highly significant, and helpful in explaining the pattern of trade barriers. For example, in industries that the authors classify as having immobile labor, industry lobbies on their own seem to be unable to obtain protection;

they need the assistance of union lobbying.²¹

3. *Firm-level approaches to lobbying.* [Bombardini \(2008\)](#) presents a protection-for-sale model in which *individual firms* make the contributions as a Nash equilibrium. Any firm can pay a fixed cost and present a contribution schedule to the government. Firms differ in their size (because of exogenously heterogeneous ownership of industry-specific human capital), and, conditional on an equilibrium selection assumption elaborated in the paper, only the larger firms choose to make contributions. Further, more heterogeneous industries, other things equal, receive more trade protection. In the extreme case, if the industry has one giant firm and a fringe of tiny competitors, the large firm will internalize more of the benefits of the tariff, and the public-goods under-provision problem will be minimized.²² The paper uses industry data as in [Gawande and Bandyopadhyay \(2000\)](#) to test the hypothesis that more heterogeneous industries receive more protection, after controlling for the usual protection-for-sale variables, and finds a strong affirmative answer, as well as the finding that the heterogeneity helps the explanatory power of the standard protection-for-sale regression quite a bit. It then uses firm-level data on political contributions from COMPUSTAT to confirm the hypothesis that larger firms participate with higher probability.

²¹This result can be seen in Table 2, in the case $m_i = 0$ (immobile industry), with $k_i = 1$ (employers are lobbying) and $n_i = 0$ (union is not lobbying). The dramatic negative value indicates a much lower rate of protection compared to other, otherwise similar industries.

²²The model raises the question of why the firms do not try to collude as in [Pecorino \(1998\)](#). This might be a worthwhile extension.

This is closely related to [Gawande and Magee \(2012\)](#), who specify a model with only the largest firm contributing as a contrast to the perfect-cooperation model. They derive the protection-for-sale estimating equation in this model and show that it depends on the *share* of the largest firm in total industry output. In the preferred econometric specifications, they find that this coefficient comes out as positive and significant, and they can robustly reject the hypothesis of perfect industry cooperation. Thus, both this paper and [Bombardini \(2008\)](#) provide strong evidence for the existence of a free-riding problem.

[Bombardini and Trebbi \(2012\)](#) observe that under US law, firms that lobby the government must file public reports that specify what the broad subject area of the lobbying effort is. This, unlike PAC contributions, allows a researcher to identify trade-policy-related influence activities directly. They examine firm-level data on lobbying reports and find that many firms lobby government over trade policy unilaterally, while many also join forces with other firms to lobby as a team. A simple model of an industry with multiple firms producing related products that are imperfect substitutes is solved, and predicts that industries with less differentiated products will tend to lobby jointly (since a tariff to firm i will tend to send customers to rival firm j ; they team up to internalize the positive externality). On the other hand, firms with highly differentiated products will tend to lobby individually (to avoid the free-riding problem). These predictions are supported by the data.

4. *Interactions with public finance.* [Matschke \(2008\)](#) augments the original protection-for-sale model with government revenue needs. Much of policy analysis in

the public-finance field is motivated by the lack of non-distortionary revenue sources for government, so that the value of \$1 in the government's hands is typically greater at the margin than the value of that same \$1 in private hands. If we take this into account, then the revenue that results from tariffs should be valued with a premium, often called the 'cost of funds,' and this needs to be taken into account in tariff-setting. Matschke derives the equilibrium condition with this feature added to the model, and recovers a version of (7) with an extra term proportional to the imported quantity of good i divided by the derivative of import demand, where the constant of proportionality is a function of the premium to public funds.²³ Applied to US data, the results for the standard protection-for-sale terms are similar to what other authors have obtained, including estimates of a , but the revenue-cost term is also significant, and yields an estimate of the cost of funds equal to 1.06. This figure is quite close to what public-finance researchers have tended to find. A significant feature of this study is that (along with [Fredriksson et al. \(2011\)](#) and scattered others) it uses tariff data instead of NTB coverage ratios. Obviously, most NTB's do not generate revenue, so the model would not make much sense with them, and strikingly the results that emerge are quite similar to findings in other papers despite this difference in dependent variable.

5. *Foreign lobbyists.* [Gawande et al. \(2006\)](#) is a lovely wrinkle on the protection-for-sale literature: It points out that not only domestic industries but foreign ones as well might try to influence a country's trade policy, to reduce barriers

²³This is Matschke's equation (8). A different version, equivalent but somewhat less intuitive, is used as the estimating equation.

to its own exports into the country. The paper uses the US registry of foreign agents to identify foreign lobbyists and finds strong evidence that they do indeed lower trade barriers on their own country's products. The authors point out that it implies a kind of paradox: The influence of foreign lobbyists working on behalf of foreign clients can raise domestic social welfare, by counteracting the pernicious influence of *domestic* lobbyists. In a somewhat similar spirit, [Gawande et al. \(2012\)](#) expands the protection-for-sale model to account for lobbying by (i) final-goods producers for higher tariffs on their own products and low tariffs on the imported inputs that they use, and (ii) input producers, for *high* tariffs on those same products. The authors show that this tug of war between lobbyists may help explain the high values of the social-welfare weight a estimated by other authors: Many tariffs are low not because the government cares about social welfare, but because it is being bribed to keep them low.

6. *Surging industries and declining industries.* Observers of trade policy in practice will notice a paradox in the protection-for-sale theory: It tends to reward more productive industries, and industries whose products are more in demand, with higher tariffs. Recalling (7), if the world price of industry i goods or the productivity of the domestic industry i rises with no change in the elasticity of import demand, then domestic output will rise and imports will fall, so that the tariff on industry- i goods will increase. Of course, in general the import elasticity will generally change; [Karacaovali \(2011\)](#) rigourously derives a condition under which an industry's tariff will be an increasing function of its productivity. However, in practice it is often *declining* industries that receive protection. Both [Freund and Özden \(2008\)](#) and [Tovar \(2009\)](#) show that incor-

porating loss aversion into the preferences of interest groups can help explain this. Under loss aversion, an economic agent experiences disutility from income falling below a target income, in addition to utility from consumption. If the target income is based in part on past income, owners of specific factors in a declining industry will be willing to pay more for protection at the margin than those in other industries. The standard formulation of loss aversion includes an assumption of a diminishing sensitivity to loss; if the realized income is slightly below the target, the marginal disutility is large, but if it falls far below the target, the marginal effect tapers off to zero. As a result, the declining industry receives enhanced protection up to a point, but when its output or world prices fall sufficiently far, the effect disappears. Both [Freund and Özden \(2008\)](#) and [Tovar \(2009\)](#) provide empirical support for these propositions, so loss aversion may be helpful in explaining trade protection patterns.²⁴ At the same time, there is a serious tension between these findings and the evidence presented by [Karacaovali \(2011\)](#) that, in Colombian data, industries with surging productivity tend to have tariffs that decline more slowly than stagnant or declining industries.²⁵

²⁴An alternative interpretation is that surging industries attract entry, and so any rents from protection for those industries would be dissipated by entry. [Baldwin and Robert-Nicoud \(2007\)](#) formalize this argument, in a closed-economy model in which each industry is subject to demand shocks over time, and each industry can lobby for a subsidy in each period. In equilibrium, only industries hit with an adverse demand shock lobby for a subsidy.

²⁵His main point is that this endogeneity of tariffs implies a downward bias in estimates of the productivity effect of trade liberalization, but it is important in and of itself for the present discussion.

3.4.4 General observations.

The literature on lobbying has become obviously very rich, but at the same time is still strikingly narrow. In World War I thousands of lives would be spilled over a few feet of land, and in this literature thousands of pages are written to examine and debate a single equation.

It is striking how little empirical work there is on lobbying expenditures *per se* as opposed to PAC contributions, since as [Bombardini and Trebbi \(2012\)](#) point out, the former exceed the latter by an order of magnitude. It is puzzling how little there is either theoretically or empirically in the trade literature on informational theories of lobbying, which are important in political science and appear to represent a large portion of what lobbying does in practice. For example, one option open to lobbyists is to use the media to provide information or persuasion directed at voters (recall the discussion in [Section 2.4](#)), to change the electoral incentives of politicians. At the time of this writing, for example, the US Chamber of Commerce is running radio ads on the importance of continued Congressional support of the Ex-Im bank. But these channels do not seem to be explored in the trade literature.

Even within the realm of PAC contributions, the literature is focussed entirely on a model in which the only purpose of a contribution is to influence an incumbent politician's trade-policy decisions, while a second major purpose of PAC contributions is likely to be to influence *which politicians compose the government*. The latter is explored and shown to be important by [Magee \(2007\)](#) in a non-trade-policy context, but this motive is ripe for exploration within trade as well (and it was already noted in [Section 3.3](#) that this is a well-known motive in the general political-economy theory literature; see [Potters et al. \(1997\)](#)).

An additional avenue that could be promising is to take government revenue effects more seriously. An approach similar to [Matschke \(2008\)](#) might profitably be applied in a range of medium- and low-income economies, where often trade taxes are a large fraction of central government finances and tax levers are limited. It would be of interest to see if the effect of revenue constraints on the pattern of trade policy would be even more acute than it appears to be in the US.

Finally, as noted above, some studies have indicated that free-rider problems are important in this area in practice (see comments above on [Bombardini \(2008\)](#) and [Gawande and Magee \(2012\)](#)). It seems that much more could be done to identify the conditions under which such *organizational* barriers to successful influence can be overcome. Intriguing results by [Busch and Reinhardt \(1999\)](#) show that industries that are more geographically concentrated – in a very specific sense – tend to have more trade protection, *ceteris paribus*. Specifically, for each industry in the US, one can identify the point on the map that is the center of gravity of the industry, and then calculate the average square distance of that industry’s employment from that center. (This is very different from the Herfindahl index of geographic concentration, which is much easier to compute.) The fact that this measure shows up so strongly suggests that more concentrated industries have an advantage in organizing in order to achieve influence, but exactly why is unclear. Notice that protection-for-sale models typically assume that the industry can either coordinate perfectly or not at all, but evidently there is much more to the story.

3.5 Legislative bargaining.

In the event that commercial policy is determined by a legislative assembly, once the legislators have been seated, the realized policy can be determined by coalition-formation within the legislature.

The seminal paper is [Grossman and Helpman \(2005\)](#), previously discussed in Section 3.1, since it has an *ex ante* electoral component as well as an *ex post* legislative bargaining component. In that model, two national parties compete for votes by committing to policy platforms before the election. After the election, the representatives from the winning party control the legislature and will be able to deviate from their party's platform, but if they do they will be 'fined' by their party in proportion to the size of the deviation, with a parameter δ as the parameter of proportionality. The model becomes a pure electoral competition model with no post-election deviation as δ becomes large, and a model of pure post-election legislative bargaining (with representatives randomly determined) as $\delta \rightarrow 0$. In Section 3.1 we focussed on the case with δ large, and here we will focus on the case with δ close to 0.

There are three legislative districts. The party that wins two or more of them controls the legislature. There are also three industries, each of which produces tradeable output by combining a specific factor with labor, plus a fourth numeraire industry that produces with labor only, with a constant marginal product. As in [Grossman and Helpman \(1994\)](#), utility is additively separable in all goods and linear in the numeraire good, so that utility can be evaluated in terms of consumer surplus. The model is symmetric: Each non-numeraire industry has an identical supply and demand curve. Further, crucially, each legislative district has a portion of the specific factor owners of all three industries, but they are not evenly distributed: Each district

has a fraction α_1 of one industry, α_2 of another and α_3 of the third, with $\alpha_1 > \alpha_2 > \alpha_3$. Of course, $\alpha_1 + \alpha_2 + \alpha_3$ must equal 1 (so α_1 must be bigger than $\frac{1}{3}$ and α_3 must be smaller than $\frac{1}{3}$). Number the industries so that District 1 has the biggest piece of industry 1, and so on: Each industry has a disproportionate amount of its capital in the district with the same number.

This is a small open economy, with a world price p^* for each of the non-numeraire goods. Government can set tariffs (assuming for concreteness that the three non-numeraire goods are imported), so that the domestic price of good i will be $p_i = p^* + t_i$, where t_i is the tariff on good i .

The legislator representing each district wishes to pursue policy that will maximize the welfare of the residents of that district. If party A wins all three districts, its members negotiate among themselves and choose a tariff vector to maximize total social welfare. Since this is a small open economy, this amounts to free trade. The same outcome occurs if party B wins all districts. The interesting possibility occurs if one party (say A) wins two districts (say 1 and 2) but not the third. In this case, party A controls the assembly, and can pass whatever bill it wants without help from party B. Now, the two legislators from party A conspire to maximize the welfare of districts 1 plus 2, without regard for welfare of the enemy territory held by party B. This leads to a positive tariff for industries 1 and 2 and a negative tariff for industry 3, for reasons analogous to the tariff setting in [Grossman and Helpman \(1994\)](#). The welfare function being maximized has $\frac{2}{3}$ of the consumers and taxpayers of the economy, but more than $\frac{2}{3}$ of the capital of industries 1 and 2, and less than $\frac{2}{3}$ of the capital for industry 3.

But Grossman and Helpman take us one step further: One might expect that the

sign of the *average* tariff is undetermined, with two positive values and one negative value, but it turns out that in the special case of linear supply and demand curves, with the assumed symmetry of the model, *the average tariff is strictly positive* as long as the supply curves slope upward. Given that there is an equal probability of either party capturing either legislative district *ex ante*, this implies that *the expected value of each of the three tariffs is strictly positive*.

It is worth taking a moment to unpack where this result comes from. Take the special case in which $\alpha_2 = \alpha_3 = 0$, so each industry's specific factor is located in only one district. Consider raising the specific tariff on Good 1 by 1 dollar. The income to specific factor owners in 1 goes up by the output of industry 1, y_1 . This is the benefit to party A. Consumer surplus to all citizens goes down by: $d_1 = y_1 + m_1$, where d_i is the domestic consumption of good 1 and m_i is the quantity of i that is imported, and tariff revenue goes up by: $m_1 + t_1 m'_1$. Therefore, the net drop in utility for each citizen who is not a Good-1 producer is $y_1 - t_1 m'_1$. Since a fraction $\frac{2}{3}$ of consumers and taxpayers live in the territory controlled by Party A, the cost to party A is then $\frac{2}{3}(y_1 - t_1 m'_1)$.

The optimal tariff then sets this marginal benefit equal to the marginal cost, so:

$$y_1 = \frac{2}{3}(y_1 - t_1 m'_1).$$

$$y_1 = 2(-t_1 m'_1).$$

The left-hand side is the benefit from redistribution, analogous to the left-hand side of (9), and the right-hand side is the cost from distortion, analogous to the right-hand side of (9), with different weights as appropriate. This yields the optimal tariff on good 1:

$$t_1^* = \left(\frac{1}{2}\right) \left(\frac{y_1}{-m'_1}\right) > 0. \tag{12}$$

Of course, good 2 is exactly analogous. Now, for the disfavored good, if party A members consider raising the specific tariff on good 3 by 1 dollar, the income to specific factor owners in 3 goes up by y_3 but that is not relevant to the interests of Party A so we ignore it. On the other hand, the consumer surplus of all citizens goes down by $d_3 = y_3 + m_3$ and tariff revenue goes up by $m_3 + t_3 m'_3$. The net drop in utility for each citizen not a good-3 producer is then:

$$y_3 - t_1 m'_3$$

Given that two-thirds of these citizens are included in the Party A welfare function, the cost to party A is:

$$\frac{2}{3}(y_3 - t_3 m'_3). \quad (13)$$

The first term in parentheses is once again the redistributive benefit, but this time the benefit of transferring income *from* producers of good 3 *to* consumers and taxpayers in Party-A territory. The optimal tariff sets this equal to zero:

$$t_3 = \left(\frac{y_3}{m'_3} \right) < 0, \text{ so the equilibrium tariffs satisfy:}$$

$$t_1 = \left(\frac{1}{2} \right) \left(\frac{y_1}{-m'_1} \right) > 0.$$

$$t_2 = \left(\frac{1}{2} \right) \left(\frac{y_2}{-m'_2} \right) > 0.$$

$$t_3 = \left(\frac{y_3}{m'_3} \right) < 0.$$

In the special case of linear supply and demand: $m'_1 \equiv m'_2 \equiv m'_3$. If the output levels in the three industries had been equal, we would have $(t_1 + t_2 + t_3) / 3 = 0$, but given the symmetry in the model and the fact that the domestic price of goods 1 and 2 are raised above the world price but the domestic price of good 3 is pushed down below the world price, we have $y_1 = y_2 > y_3$. Therefore *the average tariff is positive*.

Note that this results hangs on both the linear supply and demand curves and on

the symmetry. It would not be difficult to construct an example with varying slopes or asymmetries across industries such that the average tariff would be negative. However, the observation that the authors make that the positive effect is due to ‘the convexity of the profit function’ does seem to be a very general one: This is simply the point that supply curves slope up. As a result, when one raises the domestic price of a favored good with a tariff, the redistributive benefit – which as in (12) is proportional to the industry’s output – rises, and when one lowers the domestic price of a disfavored good, the redistributive benefit – as in (13) – falls. This tends to raise the magnitude of the positive tariffs and lower the magnitude of the negative tariffs, yielding the protectionist bias.

Two more recent contributions to this area combine lobbying with legislative bargaining: [Hauk \(2011\)](#) and [Fredriksson et al. \(2011\)](#). Both feature lobbyists in the [Grossman and Helpman \(1994\)](#) mold who present contribution schedules to members of the legislature before the legislative bargaining occurs, with the result that the legislators’ objective function becomes a weighted welfare of the constituents’ welfare, with extra weight on the organized industries. [Fredriksson et al. \(2011\)](#) is closest to [Grossman and Helpman \(2005\)](#) in that the legislators belong to distinct parties, and members of the majority party collude to maximize their joint welfare, excluding the minority. They derive an estimating equation that resembles the original protection-for-sale equation (7) but with an extra term indicating that industries concentrated in districts represented by the majority party²⁶ receive extra protection. Applying this to data on US tariffs (along with [Matschke \(2008\)](#)), they use tariff data instead

²⁶Precisely, if the districts controlled by the majority party contain a larger share of an industry’s capital than of the nation’s population, that industry receives extra protection.

of NTB data) and partisan control of the US House of Representatives, they find that this term has a consistently significant coefficient, but with interesting variation over time. In data for 1993 and 1995, it is positive as expected, but in 1997 it is *negative*. The authors point out that 1995 was the year in which the Republican party took over Congress after a long reign by the Democrats, and so the values of the ‘majority’ variable flipped dramatically, but tariffs change infrequently. Thus, in the 1997 data, tariffs enacted by a prior Democratic majority are regressed on political measures that come from a new Republican majority.²⁷ The authors have done a great service by introducing time variation into a literature that is based almost entirely on cross-sectional data, but the inertia in tariff data also shows the difficulty in doing so.

On the other hand, [Hauk \(2011\)](#) has a model with no partisan politics. In his model, a proposer is chosen randomly from among the seated legislators; following this, lobbyists present their contribution schedules; and then the proposer must propose a tariff bill. If a majority of legislators vote for the bill, it becomes law. If not, the bill fails and free-trade prevails. As a result, the agenda-setter must choose a minimum winning coalition, a bare majority of fellow legislators, and choose a tariff vector combined with other redistributive policies that will maximize her own weighted constituent welfare,²⁸ taking into account the organized industry if any,

²⁷This explanation does not seem to explain why the 1995 regression has a positive coefficient for the majority variable, since the Republican congress was seated in January 1995.

²⁸It is assumed that lobbyists lobby only the legislator representing the district in which their client’s capital is located. The consequences of relaxing this assumption seem worth exploring. By contrast, in [Fredriksson et al. \(2011\)](#), any industry in the country, wherever located, can lobby the majority coalition.

subject to the constraint that enough other legislators are willing to vote for the bill to pass it, meaning that those legislators receive at a least as high a payoff from the proposed tariff as from free trade. (In the three-person legislature of the theory model, this of course means that one other legislator must be persuaded to support the bill.) The main focus of this study is on the effects of ‘malproportionment,’ namely, disproportionate allocation of voters across legislative districts. In the US, this is an issue with the Senate, since each state is represented by two Senators, regardless of the population of the state (districts comprising the House, on the other hand, are quite similar in size). Equilibrium tariffs for industries in the winning coalition are affected by malproportionment in two ways. First, holding industry size constant, the larger is a state’s share in an industry’s capital relative to its share of national population, the more likely is its Senator to prefer protection for that industry. Second, and more subtly, holding all other variables constant, an industry concentrated in a *smaller state* will tend to receive more protection. This is because the Senator will value consumer surplus and tax revenue much less in a state with few consumers and taxpayers, and so will support aggressive protection for the local industry. More subtly still, a smaller state is more likely to be chosen as a coalition partner by a proposer. Support for these propositions is found in data on Senate votes between 1880 and 1930, and on modern NTB data.

Despite their similarities, the assumption of pure partisan unity in [Fredriksson et al. \(2011\)](#) and purely opportunistic legislative coalition formation in [Hauk \(2011\)](#) give them extremely different predictions. Both papers provide good empirical support for their approaches, but it would be desirable to be able to determine if one of them fits the data better than the other, if perhaps one approach can be rejected if

the two are incorporated in the same estimation procedure. (Of course, that would require focussing both on Senate data, unlike the empirical work in [Fredriksson et al. \(2011\)](#)).

A final legislative bargaining approach is the dynamic bargaining approach pioneered in public finance by [Baron and Ferejohn \(1989\)](#), who study the allocation of public funds by a legislature. Applied to trade policy, it allows for the possibility that if a tariff bill is not accepted at any date, a new bill can be introduced down the road, a small detail that can be seen to make a large difference in how the model works. An example of this approach is [Celik et al. \(2013\)](#). Here, once again, there are three members of a legislature, each representing a district that is home to the specific capital for one industry. In each period, a proposer is chosen by Nature and has the ability to propose a tariff vector. If a majority of representatives vote for the proposal, it becomes law and the game ends. Otherwise, the status-quo tariff vector remains in place and a new proposer is chosen randomly (which could turn out to be the same one again). As in the static models discussed above, the proposer's optimal strategy is to choose one other member and offer a tariff vector that makes that other member just willing to support the proposal,²⁹ disregarding the welfare of the excluded member. However, the dynamic nature of the game results in very different equilibria. First, the equilibrium is typically in mixed strategies, in the sense that each member randomizes between coalition partners when she has a chance to propose.³⁰ As a result, the set of favored, high-tariff industries within the coalition

²⁹Unlike in [Hauk \(2011\)](#), the model allows no redistributive policy aside from tariffs.

³⁰To cut down on the number of equilibria under consideration, the paper focusses on stationary sub-game perfect equilibrium, in which a player will always take the same (random) action when faced with the same circumstances.

cannot be predicted from industry and district characteristics alone; there is an irreducible random element to it. Further, the proposer at times may rationally propose a tariff vector that makes even the proposer's district worse off than the status quo tariff, and it will be passed and become law. The reason is that the proposer may be terrified of what will happen if her bill is not passed and with $\frac{2}{3}$ probability another proposer will have a chance to propose. The danger of being left out of the coalition and facing high tariffs on other industries but a negative tariff on one's one may make the proposer eager enough to pass a bill that, to avoid disaster tomorrow, she will accept a worsening compared to the status quo today. This outcome is impossible in a static bargaining model such as those discussed above. It is not clear how to bring these possibilities to data for econometric tests, but the model does seem to fit some anecdotal evidence from late-19th-century US tariff-setting. Further, the inefficiency of the equilibrium can provide a motivation for Congress to try to delegate its tariff-setting through institutions such as 'Fast Track Authority' (Celik et al. (2015); see Conconi et al. (2012b) for an alternative interpretation). A richer model in the same general framework is explored by Bowen (2011), who shows that tariff ceilings imposed through the WTO and floors that result from administered protection can have surprising effects on the legislated tariff outcomes.

4 Feedback Effects: Political Conditions Are Also Endogenous.

All of the above discussion takes the political and economic environment and institutions as exogenous, but of course commercial policy also *shapes* these conditions.

This feedback can result in inefficiencies and multiple equilibria that cannot even be contemplated when the political and economic environment are taken as exogenous. Here we will discuss some suggestive examples.

(i) For example, in all work cited so far (take [Grossman and Helpman \(1994\)](#) as a quintessential case), the existing pattern of industry-specific capital has been taken as given, and is a key driver of the demand for protection. However, this pattern of capital can be endogenous to the political game; if a given industry has political clout and can gain protectionism as a political favor, the *expectation* of that favor can encourage investment in that industry, which increases its political clout and the resulting protectionism even more. Both the investment in the industry and the protectionism wind up greater than optimal, even taking into account the government's preferences with its built-in bias toward the industry in question ([Staiger and Tabellini \(1987\)](#)). This type of time-inconsistency problem can help rationalize the use of devices to reduce the government's discretion, and has been shown to be a possible motivation for free-trade agreements as a way a government can lock in a low tariff and thus tie its own hands ([Maggi and Rodriguez-Clare \(1998\)](#)).

(ii) The *international* pattern of capital can also be endogenous to the political game, creating feedback effects that can result in surprising insights unimaginable in a static model. For example, multinational firms deciding whether or not to commit to foreign direct investment (FDI) in a given economy need to take into account what future commercial policy in that economy and in their home economy will be; but FDI also affects the political conditions so that commercial policy will be affected by FDI in the aggregate. [Grossman and Helpman \(1996\)](#) focus on the case of imperfectly competitive firms in Home, which consider horizontal FDI in an

import-competing sector in Foreign. Foreign's import tariff on the industry, which protects both Foreign firms and subsidiaries of Home multinationals, will be affected by the number of Home firms who have invested in Foreign; the more firms that have invested, the smaller will be the imports to which the tariff applies. However, each Home firm takes the Foreign tariff as given. In a benchmark case, the Foreign tariff is decreasing in the amount of FDI, and FDI is increasing in the expected Foreign tariff, so there is a unique equilibrium. The more political weight the Foreign government puts on its own firms, the higher will be the equilibrium tariff, and the more crowded will the local industry be with subsidiaries from Home.

On the other hand, (Blanchard (2007)) focusses on Home capital moving to the *export* sector in Foreign, and the effect this has on the Home tariff. Under standard assumptions, the more Home capital has moved into Foreign, the lower will be the optimal tariff for Home to impose on its imports from Foreign since the tariff lowers income on Home's own capital abroad. Equilibrium FDI thus lowers tariffs, and can even eliminate them entirely; further, Foreign has an incentive to *subsidize* inward FDI to manipulate Home's tariff setting. Empirical support for these effects is provided by Blanchard and Matschke (2014), who show that the US tends to give more of a tariff preference on imports from a given industry in a given country if subsidiaries of US firms there produce a large fraction of those imports. Further, Blanchard et al. (2014) shows that in a panel of 14 countries, country i 's tariffs tend to be lower on products of a given industry from country j , the larger is i 's share of value added in that industry in j , and the smaller is j 's share of value added in that industry in i .

(iii) As another example, the pattern of *human* capital, taken as given in most

analyses of the demand for protection (see Section 2.3), can very much be endogenous to the political-economy game. In [Blanchard and Willmann \(2011\)](#), an overlapping-generations model of voting over commercial policy can lead to a low-tariff steady state or a high-tariff ‘protectionist rut,’ due to the fact that expectations of future high tariffs can discourage the current young from investing in human capital needed for the export sector. Over time, this pattern of human capital creates political conditions that are not favorable to trade liberalization, so protectionism becomes a self-fulfilling prophecy. An implication is that a short-term political push for liberalization can also be self-sustaining in the long run.

(iv) Beyond these examples, there is accumulating evidence of possible important feedbacks between commercial policy and democratic institutions that could turn out to be quite important in developing countries – far beyond the Harberger-triangle losses from protectionism that are the bread and butter of traditional commercial-policy welfare analysis. [Liu and Ornelas \(2014\)](#) shows that politicians in a country with a new and fragile democracy can use a trade agreement to eliminate rents that could be a motivation for a military coup, thus raising the probability that democracy will survive. Without the trade agreement to tie its hands, a future government could offer protection for sale, which makes political power a profitable business and therefore provides a motivation for an armed clique to try to gain power by force. The authors present empirical evidence that suggests that in many cases free-trade agreements signed by governments of developing economies have such a role. At the same time, with a long-span historical panel, [Eichengreen and Leblang \(2008\)](#) show that democracy tends to be followed by increased trade openness, and increased trade openness tends to be followed by more democracy, suggesting a virtuous spiral.

It may be that these feedback effects from protection back to political and economic conditions will be regarded as the really important features of the political economy of commercial policy, involving welfare effects that dwarf the distortions that are the subject of models where the causation runs in one direction only.

5 Conclusion.

Perhaps the most useful concluding comment is to sum up the directions that have been noted along the way as the most promising for future work.

1. *Informational lobbying.* [Ludema et al. \(2010\)](#) showed that in one particular form of trade policy adjustment, informational lobbying is crucial, and effective. This is very likely to be the tip of the iceberg. Informational approaches may wind up more important for understanding lobbying than protection for sale.
2. *The role of the media.* [Facchini et al. \(2013\)](#) and [Ponzetto \(2011\)](#) are two pioneering approaches that merge media data with data on trade and trade policy. The role of the media as a way of shaping the demand for protectionism as well as commercial policy outcomes, and perhaps as a tool of lobbying, is a very under-researched topic.
3. *A richer treatment of labor markets.* [Matschke and Sherlund \(2006\)](#) is a start in incorporating labor frictions and labor unions into lobbying analysis, working from the [Grossman and Helpman \(1994\)](#) model, which makes labor issues difficult to tease out. It would be desirable to begin with a much richer model of the labor market to begin with, so that issues such as unemployment and

job-creation, so much a part of the public discourse, can be a central part of the political-economy analysis.

4. *Firm-level analysis of lobbying.* [Bombardini \(2008\)](#), [Bombardini and Trebbi \(2012\)](#), and [Ludema et al. \(2010\)](#), for example, have shown that firm-level empirical work can be fruitful. Given the likelihood that incentives for lobbying are heterogeneous even within each industry, this direction needs to be pursued.
5. *Feedback effects.* More generally, the two-way feedbacks between underlying economic and political conditions on the one hand and commercial policy on the other are likely to become more central over time.

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