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Party Competition and the Inter-Industry Structure of US Trade Protection*

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Why do some declining industries receive more compensation through protectionist policies than others, even without actively engaging in lobbying? How does the political representation of industries affect their chances for protectionist relief? This paper argues that political parties seek to optimize electoral returns through the strategic allocation of distributive benefits generated by trade barriers. The inter-industry structure of protection is thus explained by the interaction between industries' trade preferences and political characteristics. Using data on protection and subnational employment for US industries and district-level election outcomes in the 1990s, this paper finds that the concentration of industries in competitive constituencies not only increases their chances of receiving higher tariffs, but also magnifies the marginal effect of comparative disadvantage on tariff and nontariff protection.

Why do some declining industries benefit more than others from trade protection, even without actively engaging in lobbying? How do governments choose which industries to protect among those adversely affected by international competition? To answer these questions, studies on trade policy have typically relied on the assumption that interest groups achieve more favorable policy outcomes to the extent that they are able to resolve their collective action problems. Like all other public goods, collective political action tends to be undersupplied at the group level, because non-excludable benefits generated by group efforts induce individual members to freeride on others' contributions (Olson 1965). Groups advance their special interests more efficiently when transaction costs involved in organizing groups are relatively low, and when group members have a strong likelihood of affecting policy outcomes through high contributions (Alt and Gilligan 1994).

A large body of research on endogenous protection thus maintains that inter-industry variation in trade barriers is explained by industry characteristics associated with the incentives and abilities of those industries to coordinate collective efforts. Whether or not industries receive favorable levels of protection depends on their economic and organizational characteristics, such as import penetration (Trefler 1993; Maggi and Rodríguez-Clare 2000), firm concentration (Anderson and Baldwin 1981; Lavergne 1983), firm heterogeneity (Milner 1988), geographic concentration (Hansen 1990; Busch and Reinhardt 1999), and industry size (Lee and Swagel 1997). The microfoundations of endogenous protection theory are explained through an interest group model in which political contributions and organized lobbying efforts account for differences in levels of protection across industries (Grossman and Helpman 1994; Gawande and Bandyopadhyay 2000).

What the endogenous protection literature overlooks, however, is the fact that governments frequently offer privileged access to protectionist rents to declining industries (e.g., textiles, footwear, apparel, etc.) that lack the monetary resources to devote to lobbying activities (Marvel

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and Ray 1983; Dixit and Londregan 1995; Goodhart 2008). In fact, the effects of lobbying and political contributions on trade policy are more difficult to discern in terms of direction and magnitude than previously thought, since money provided from special interest groups actually constitutes only a small part of overall campaign finance (Ansolabehere, de Figueiredo and Snyder 2003). The implication is that other political factors must play a role in determining which industries benefit from protectionist policies.

This article seeks to clarify those political factors that shape the inter-industry structure of trade protection. Unlike previous research, this study focuses on one important aspect of the political calculations that parties and electoral officials make in setting trade policy: votes. I argue that competing parties choose recipients for protection among numerous industrial sectors, based on the political incentives to optimize their electoral prospects. Tariff and nontariff trade restrictions concentrate particularistic benefits on specific industries but disperse the costs across the entire population. Such distributive benefits yielded by protectionist policies induce parties to strategically target protection to industrial constituents, who will then produce more desirable results in electoral competition. The allocation of protection across industries is thus best explained through the interaction between the political characteristics of industries and their preferences over trade openness.

To test this argument, I examine the effect of industrial location across electoral constituencies on the structure of US trade barriers in the 1990s at the four-digit Standard Industrial Classification (SIC) level. Using data on the industrial composition of congressional districts and district-level election results, I construct a set of indicators measuring the extent to which industries are concentrated in competitive or safe constituencies. I then investigate the degree to which industries' political characteristics and trade preferences interactively influence the structure of protection. I evaluate to what extent the status of industries as "swing voters" affects levels of tariff and nontariff protection, on the one hand, and the relationship between sectoral demands for protection and actual policy outcomes, on the other.

There are several reasons why this paper focuses on the structure of tariff and nontariff protection. First, despite their potential biases as measures of protection, tariff and nontariff barriers (NTBs) are still the most important indicators of protectionist restrictions; they have been extensively used in the literature on trade and trade policy (Rodrik 1995; Rose 2004). Second, protectionist measures are different from other industrial policies in terms of the scope of beneficiaries and income effects. Tariffs and NTBs generate particularistic rents for specific industries by hindering the entry of foreign competitors. Alternative policy instruments, such as tax breaks, subsidies, and infrastructure investment, are mostly seen as part of a development strategy that aims to increase the incentive for industries to innovate and compete for international markets (Block 2008). State-subsidized education and training programs are similarly regarded as public goods that generate positive externalities for domestic labor markets as a whole, since they improve employment prospects and worker productivity (Franzese and Hays 2006).

This article contributes to our understanding of the political economy of trade policy in three ways. First, it builds upon and extends the literature on endogenous protection and distributive politics, focusing on sectoral variation in US trade barriers. While much of the existing research on the structure of protection relies on data from a single year, I employ data on tariffs from 1989 to 1998 and NTBs in 1993, 1994, and 1996 for four-digit SIC industries. I also generate measures of the political characteristics of industries, using subnational data on industrial employment from 1988 to 1997 and district-level returns in presidential, gubernatorial, and congressional elections that occurred between 1984 and 1997. In doing so, this article more accurately captures the effects of electoral competition on the allocation of protectionist rents across the electorate.

Second, the study provides new evidence on the political geography of US trade policy. The results of my analyses suggest that industries concentrated in competitive constituencies are more likely to secure higher levels of tariff protection than industries located in safe constituencies. I also find that the electoral characteristics of industries mediate the impact of their trade preferences on protectionist measures. The extent to which comparative disadvantage raises levels of tariff and nontariff protection itself is much greater for industries concentrated in marginal constituencies than for those concentrated in safe ones. These results may contradict previous findings that sectoral influence on protection is determined by the level of political concentration across electoral districts (Busch and Reinhardt 1999; Rogowski, Kayser and Kotin 1999), and that protectionist policies are least favorable to industries concentrated in marginal districts (McGillivray 1997; McGillivray 2004).

Finally, this paper offers new insights regarding the extent to which domestic politics affects the patterns of protection within a country. While it is frequently argued that international trade institutions, such as the World Trade Organization (WTO) and its predecessor, the General Agreement on Tariffs and Trade (GATT), have significantly reduced trade barriers across countries, the existing empirical research finds mixed evidence for their actual influence on trade liberalization (Rose 2004). The effects of the multilateral trading system on the structure of protection are also difficult to parse out because the GATT/WTO principle of reciprocity in lowering protectionist barriers often works differently across countries, depending on the membership status of trading partners as well as the types of goods covered by trade negotiations (Subramanian and Wei 2007).[1]

The paper proceeds as follows. The next section reviews the literature on the link between industrial geography and protection. Drawing on extant models of distributive politics, I then propose a theoretical framework for understanding electoral targeting of protection and derive a set of testable hypotheses. After describing data and estimation methods, I present the empirical results and perform additional robustness tests. The final section concludes with a discussion of the implications of the main findings.

LITERATURE REVIEW

The idea that industrial geography constitutes an important explanation for cross-industry variation in protection is neither new nor surprising. The existing literature considers the effects of industrial location on trade policy in several ways. One line of research connects the geographic concentration of industries to their abilities to organize and lobby as pressure groups. These studies maintain that geographically concentrated industries are more likely to secure favorable levels of protection than dispersed ones, since the former are much better than the latter at organizing costly political action to serve their common interests (Pincus 1975; Hansen 1990). Geographical proximity reduces organizational costs incurred in mobilizing, coordinating, and monitoring the efforts of firms and workers for industry-wide lobbying (Schonhardt-Bailey 1991). The spatial closeness of industries also allows individual members to be more politically active. Workers in geographically concentrated industries articulate policy demands more effectively through voting and campaign contributions, unlike their counterparts in dispersed industries (Grier, Munger and Roberts 1994; Busch and Reinhardt 2000). Such effects are assumed to remain almost constant across different electoral systems, since

[1] Hauk (2011) points out that while pursuing trade liberalization, the United States and other developed countries have maintained relatively high levels of tariff and nontariff protection against agricultural and labor-intensive manufactured imports from developing countries.

geographic concentration is related more to industries' group efficiency in organizing collective action than to the political incentives of policymakers in determining trade policy (Rogowski, Kayser and Kotin 1999; Busch and Reinhardt 2005).

Another line of research posits that industrial location affects not only the lobbying efforts of industries but also their representation in political institutions. While the first line of research considers industrial geography only in terms of the spatial clustering of industrial sectors, these studies are more concerned with political concentration across electoral districts. One of the most common arguments is that in single-member district (SMD) systems, industries that are widely dispersed across districts receive higher protection than those confined to one or few districts. Electoral representatives have strong incentives to build policy coalitions for politically dispersed industries, as they have large groups of voters in many districts (Pincus 1975; Caves 1976). Specifically, Busch and Reinhardt (1999) argue that the effects of geographic and political concentration on protection should be distinguished conceptually and empirically. Even though spatial proximity enhances the ability of industries to lobby effectively, industries in SMD systems still need to be dispersed across as many districts as possible to ensure broad political representation. Rogowski, Kayser and Kotin (1999) maintain, however, that under SMD, political influence is maximized for industries concentrated at a moderate level but declines for those highly concentrated or highly dispersed.

A third set of studies focuses more on the political characteristics of the electoral constituencies in which industries are located. The pioneering work of McGillivray (1997, 2004) examines the relationship between industrial location and protection under different electoral systems. She maintains that in strong majoritarian systems, like Canada, political parties protect industries in marginal, party-competitive districts in order to obtain a legislative majority. However, in weak majoritarian systems, like the United States, industries concentrated in marginal districts are least likely to be protected because powerful, senior legislators representing safe districts concentrate protection on industries in their own constituencies. Muûls and Petropoulou (2013), however, contend that incumbent politicians improve their reelection prospects by targeting protection to swing voters across a continuum of electoral constituencies. Hauk (2011) instead builds a formal model of legislative bargaining and lobbying in which malapportionment affects the ability of industries to lobby for protection. He finds that US industries located in small states are likely to have greater tariff and nontariff protection, as they comprise a relatively large proportion of the state economy.

Despite important insights from each of those perspectives, the existing literature lacks a consistent explanation for the political geography of industry-specific protection. The disagreement across different lines of research stems in part from the fact that researchers conceptualize the political influence of industries from different dimensions of electoral institutions. The generalizability of existing findings is also somewhat limited, as each study bases its analysis on different measures of industrial location and protection during a particular year.[2] Moreover, some particular assumptions underlying the literature warrant further examination. McGillivray (1997) presumes that it is low party discipline that leads US legislators to target protection toward industries in electorally safe districts. The traditional view on the weakness of American political parties, however, has been strongly challenged. A large number of studies

[2] Using data on the distribution of employment for SIC industries across districts for the 102nd Congress, Busch and Reinhardt (1999) and Rogowski, Kayser and Kotin (1999) examine the impact of political concentration on the structure of US NTBs in 1990 and sectoral price differences between the United States and World markets in 1992, respectively. McGillivray (1997) links industry tariffs for 1970 in Canada and for 1979 in the United States to the district-level results of the 1968 Canadian parliamentary election and of the 1976 US House election, respectively. Muûls and Petropoulou (2013) analyze the relationship between the 1983 US NTBs and state-level returns in the 1984 presidential election.

maintain that partisan organizations exert significant influences over the content of legislation, roll-call voting, and the allocation of federal funds (Levitt and Snyder 1995; Ansolabehere, Snyder and Stewart 2001). Some find that public expenditures are disproportionately directed toward areas of strong electoral support for governing parties, suggesting the presence of partisan bias in distributive politics (Ansolabehere and Snyder 2006; Larcinese, Rizzo and Testa 2006). If this is the case, it is difficult to determine whether McGillivray's findings reflect low party discipline or the electoral incentives for parties to favor their core supporters.

Here I test and extend the existing research by examining the effects of industrial geography and electoral competition on the inter-industry structure of US trade barriers. I integrate the literature on endogenous protection and distributive politics to develop a theoretical framework for explaining the allocation of protectionist rents across industrial sectors. Industries articulate different policy preferences over protection, depending on the distributional effects of trade on incomes and employment (Alt and Gilligan 1994). Nevertheless, the protectionist demands of industries and their abilities to coordinate lobbying alone do not fully account for the pattern of protection across industries. Like all other distributive policies, tariffs and NTBs concentrate particularistic benefits on specific industries but disperse costs across the general public. Hence, if industries are different in terms of their willingness to change political preferences in exchange for the promise of targetable benefits, political parties and representative policymakers would have strong incentives to direct protection toward industries that would increase their chances of winning office.

I thus argue that the structure of protection is significantly influenced by the manner in which competing parties implement protectionist measures as an instrument of electoral success. Office-seeking parties choose the beneficiaries of protection among industries in such a way that the allocation of distributive benefits yielded by trade protection maximizes their electoral prospects. The electoral targeting of protection implies that, all else equal, the political characteristics of industries affect not only levels of protection but also government responsiveness to industries' demands for protectionist relief.

The existing models of distributive politics offer competing predictions about the relationship between the political characteristics of industries and their chances of securing favorable levels of protection. The swing voter model put forward by Lindbeck and Weibull (1987) and Dixit and Londregan (1995) suggests that parties concentrate protectionist rents on swing, marginal voters rather than on core partisan supporters, since the former are relatively indifferent to ideological concerns and are more willing to cast their votes for parties that promise higher distributive rewards. In contrast, the core voter model proposed by Cox and McCubbins (1986) maintains that it is more cost-efficient for parties to concentrate protection on their core supporters, as swing voters tend to renege on their commitments to electoral support. To assess the relative validity of these explanations in application to industry protections, I formulate a set of testable hypotheses regarding the political and economic determinants of the structure of protection. I use the swing voter model as a baseline to specify the interactive effects of industries' trade policy preferences and political characteristics on their levels of protection.

HYPOTHESIS 1: Industries adversely affected by import competition receive higher protection.

HYPOTHESIS 2: Industries concentrated in competitive constituencies receive higher protection than those concentrated in safe constituencies.

HYPOTHESIS 3: The extent to which comparative disadvantage increases the level of protection itself is greater for industries concentrated in competitive constituencies than for those concentrated in safe constituencies.

EMPIRICAL ANALYSIS

The dependent variables of interest are levels of tariff and nontariff protection for US industries. First, I generate *ad valorem* tariffs for 407 four-digit SIC industries from 1989 to 1998 from Schott's (2008) trade data.[3] Following convention (O'Halloran 1994; Irwin 1998), I measure industry *i*'s tariff rates by determining customs duties as a percentage of the value of total imports and as a percentage of the value of dutiable imports, respectively. Tariffs on total imports tend to produce a downward bias in levels of protection, because highly taxed goods are less likely to be imported (Rose 2004). Tariffs on dutiable imports are always greater than those on total imports, as they do not include imported goods receiving duty-free treatment. As a check on this bias, I use both measures of tariff protection.

I also consider NTB protection for 356 four-digit SIC industries as a coverage ratio and as a frequency ratio, respectively. Unlike tariffs, NTBs are at the complete discretion of domestic governments and hence more frequently used as a means of trade restriction (Lee and Swagel 1997; Hauk 2011). The NTB coverage ratio represents an industry's relative share of import values subject to nontariff protection. Similarly, the NTB frequency ratio denotes an industry's proportion of tariff lines affected by nontariff measures. Sectoral data on NTBs are obtained from Kono (2006), which are originally based on the United Nations Conference on Trade and Development's Trade Analysis Information System. Since Kono's data indicate the presence of NTBs (e.g., price, quantity, quality, threat, and advance payment) using six-digit Harmonized System (HS) commodity codes, the NTB coverage ratio for a four-digit SIC industry *i* is computed from the following equation:

$$NTB\ Coverage\ Ratio_i = \sum_{h=1}^{n} m_h \times (v_{hi}/v_i), \tag{1}$$

where m_h is a dummy variable indicating whether commodity *h* at the six-digit HS level is subjected to nontariff measures, and v_{hi}/v_i denotes the ratio of import values of commodity *h* within its corresponding four-digit SIC industry *i*. Equation 1 therefore shows that the NTB coverage ratio is equivalent to the weighted sum of a binary indicator of NTB protection for six-digit HS commodities within a four-digit SIC industry *i*, with the weights given by commodity *h*'s relative share of import values within industry *i*. For industry *i*'s NTB frequency ratio, I calculate the ratio of the number of six-digit HS codes influenced by NTB measures over the total number of HS codes within the four-digit SIC industry.[4] As data on US NTBs are available only for the years 1993, 1994, and 1996, I separately compute NTB coverage and frequency ratios in a given year, and employ the mean value for each measure as dependent variables.

The key independent variable, *Partisan Dominance*, represents the political characteristics of industries from 1988 to 1997, considering the spread of industry across districts and the partisan composition of those districts. Drawing on previous research (McGillivray 1997; Busch and

[3] While Schott's data allow for a calculation of sectoral tariffs for the period 1999–2005, I exclude them from analysis due to the major changes in industrial classifications in the late 1990s. As the North American Free Trade Agreement went into effect, most data on the explanatory variables are aggregated by SIC codes until around 1997–1999, but by the North American Industry Classification System (NAICS) afterwards. The US Census Bureau offers concordance files between four-digit SIC and six-digit NAICS industries, but in many cases, some of the former are merged into a single category in the latter, and vice versa. Extending the analysis through the mid-2000s would therefore require that the researcher address and avoid any bias caused by converting explanatory variables into either SIC or NAICS codes; I leave this for future research.

[4] I use the concordance between HS codes and SIC industries developed by Pierce and Schott (2012).

Reinhardt 1999; McGillivray 2004), *Partisan Dominance* for a four-digit SIC industry i is computed using the following equation:

$$Partisan\ Dominance_i = \sum_{j=1}^{n} \left(E_{ij}/E_i\right)^2 \times Partisan\ Strength_j. \quad (2)$$

Given the assumption that industry i is distributed across n congressional districts in a given year, E_{ij} and E_i denote industry i's number of employees for district j and for the entire nation, respectively. *Partisan Strength*$_j$ measures district j's electoral support for one party over the other using district presidential voting patterns in the most recent election. Existing research on congressional representation suggests that presidential vote shares are quite accurate and reliable indicators of district partisanship and competitiveness (Ansolabehere, Snyder and Stewart 2001; Canes-Wrone, Brady and Cogan 2002; Abramowitz, Alexander and Gunning 2006; Griffin 2006; Levendusky, Pope and Jackman 2008). Following this literature, I compute *Partisan Strength*$_j$ as the absolute difference in the percentage shares of the two-party presidential vote that the Democratic candidate obtained in district j and in the entire nation, in order to increase its comparability across elections. High positive values in *Partisan Strength* suggest that districts strongly support either of the two parties and are electorally safe, whereas values near zero imply the highest level of competitiveness or partisan balance.

Equation 2 thus defines *Partisan Dominance* for industry i as the weighted sum of the squared term of each district's employment share for industry i, with the weights given by the strength of district partisanship.[5] If industries are heavily concentrated in marginal districts, their values for *Partisan Dominance* are closer to zero. For industries concentrated in partisan strongholds, *Partisan Dominance* takes large positive values. Consequently, the *Partisan Dominance* variable indicates the degree to which industries are concentrated in competitive or safe constituencies, or the extent to which industries consist of politically central, swing voters or partisan supporters.

The second important independent variable, *Comparative Disadvantage*, measures the degree of industries' protectionist demands, employing their relative positions on trade and international competition. The variable is measured by the difference between import penetration and export dependence at the four-digit SIC level. Import penetration is the percentage ratio of the value of imports over the sum of imports and domestic shipments, representing the extent to which an industry is threatened by import competition. Export dependence equals the percentage ratio of the value of exports over the sum of exports and domestic shipments, thus capturing the industry's demands for access to international markets. Large positive values of *Comparative Disadvantage* imply that industries have a strong incentive to pursue protectionist policies, as trade would hurt their economic prospects.[6]

The model includes several other variables associated with industries' abilities to lobby for protection. The literature suggests that geographically concentrated industries are more likely to act upon their sectoral interests since they enjoy lower transaction costs in organizing collective action. To control for *Geographic Concentration*, I calculate the Ellison–Glaeser (EG) index for

[5] I construct a data set on the industrial composition of congressional districts for the period 1989–1997, using subnational data on SIC industries from the Census Bureau's *County Business Patterns* and county/district relationships for the 100th–105th Congresses based on the *Congressional District Atlas* and the Missouri Census Data Center's *Mable/Geocorr90 Geographic Correspondence Engine.* Data on presidential elections are from the *Almanac of American Politics, 1984–1996*, which offers district-level outcomes adjusted to congressional redistricting. See Appendix 1 for more details.

[6] Sectoral data on trade flows and domestic shipments are from Schott (2008).

four-digit SIC industries, using subnational data on industrial employment from the *County Business Patterns, 1988–1997*. The EG index measures the spatial clustering of industries, taking into account the distribution of employment across different sizes of plants and geographical areas (see Appendix 1). Large positive values of the EG index indicate high levels of geographic concentration beyond the level expected from randomness (Ellison and Glaeser 1997; Holmes and Stevens 2004). Therefore, if spatial proximity increases industry efficiency in securing protection, *Geographic Concentration* should be positively signed.

Two additional variables capture decision-making costs for protectionist lobbying. *Industrial Concentration* controls for the size distribution of firms' market shares within an industry, employing the Herfindahl–Hirschman index of the value of shipments for the 50 largest firms.[7] Higher concentration might enhance sectoral incentives for protectionist lobbying, since it increases the amount of protectionist rents allocated to individual firms but reduces costs for collective political action (Finger, Hall and Nelson 1982; Lavergne 1983). Concentration, however, may lower sectoral protection if large firms in a concentrated market mitigate protectionist pressures, serving as stable sources of innovation and growth (Gopinath, Pick and Li 2004). The *Size* variable measures an industry's total number of employees in tens of thousands. While large industries could easily mobilize more votes from their employees to pressure policymakers for protectionist relief (Anderson and Baldwin 1981; Lee and Swagel 1997), they might be less efficient than their smaller counterparts at coordinating protectionist lobbying (Trefler 1993; Alt and Gilligan 1994).

Finally, the model includes the lagged tariff rate for industry i in both tariff and NTB regressions. Prior levels of tariffs affect industries' policy demands and government responsiveness to them, since trade policy implies gradual changes from the status quo (Mansfield and Busch 1995; Nielson 2003). Governments could be more resistant to protectionist pressures from industries which have already received substantial levels of tariff protection. The relationship between tariffs and NTBs also matters. Some find that preexisting tariffs put downward pressures on NTBs, as the former serve as substitutes for the latter (Mansfield and Busch 1995). Others find a positive association between tariffs and NTBs, suggesting that they act as complementary measures for protecting industries (Busch and Reinhardt 1999; Kono 2006).

I test the aforementioned hypotheses using data on tariffs from 1989 to 1998 and NTBs in 1993, 1994, and 1996 at the four-digit SIC level. Specifically, the model of tariff protection is summarized by the following equations:

$$\begin{aligned} Tariff_{it} &= \beta_0 + \beta_1\, Comparative\,Disadvantage_{it-1} + \beta_2\, Partisan\,Dominance_{it-1} \\ &+ \beta_3\, Comparative\,Disadvantage_{it-1} \times Partisan\,Dominance_{it-1} \\ &+ \beta_4\, Geographic\,Concentration_{it-1} + \beta_5\, Industrial\,Concentration_{it-1} \\ &+ \beta_6\, Size_{it-1} + \beta_7\, Tariff_{it-1} + \varepsilon_{it}, \end{aligned} \tag{3}$$

$$\begin{aligned} &\partial Tariff / \partial Comparative\,Disadvantage \\ &= \beta_1 + \beta_3\, Partisan\,Dominance. \end{aligned} \tag{4}$$

[7] Data on *Industry Concentration* are from the US Economic Census of 1987 and 1992.

Equation 3 predicts industry *i*'s tariff rate in the current year from its trade preference, political characteristics, and other features related to protectionist lobbying in the previous year. Taking the derivative of Equation 3 with respect to *Comparative Disadvantage*, Equation 4 implies that the degree to which *Comparative Disadvantage* raises the level of tariff protection itself varies with the value of *Partisan Dominance*. If *Partisan Dominance* decreases the tariff rate and the marginal effect of *Comparative Disadvantage* on the tariff rate, β_2 and β_3 should be negatively signed and significant. A model for NTBs is almost identical to Equation 3. However, since the NTB measures do not have consecutive time trends and are available for only three years, I generate purely cross-sectional data by aggregating all the variables into a three-year average.[8]

As the structures of data on tariffs and NTBs are different, I employ a combination of methods that together generates reliable results on the political and economic determinants of the structure of protection. Beck and Katz (1995) suggest that the properties of time-series cross-sectional data make ordinary least squares (OLS) inefficient and produce incorrect standard errors. In the tariff regressions, I thus mainly use OLS with panel-corrected standard errors (PCSE) and feasible generalized least squares (FGLS) with correction for heteroskedasticity. All OLS and FGLS estimations for tariffs include a panel-specific AR1 correction, as the Wooldridge test shows the presence of serial correlation. Additionally, NTB regressions are estimated by OLS with robust standard errors. Summary statistics for all variables used in the analysis appear in Appendix 2, Table A1.

EMPIRICAL RESULTS

Table 1 displays regression estimates for the effect of *Partisan Dominance* on industry-level tariffs, without considering its interaction with *Comparative Disadvantage*. Here I use a variety of estimation techniques to test the sensitivity of the findings. Columns 1 and 2 report fixed-effects and random-effects estimates, respectively, using an AR1 correction for first-order autocorrelation. While the results in these columns demonstrate that *Partisan Dominance* has a negative and statistically significant association with tariffs on total imports both within and across industries, the estimators are not without their limitations. A fixed-effects estimator is likely to be less efficient than a random-effects estimator not only because the data set consists of a large number of industries (407) with a small number of years (10), but also because the main independent variables, including *Partisan Dominance* and *Comparative Disadvantage*, are subject to greater variation across industries than within industries over years. The fixed-effects estimator could also generate biased and inconsistent estimates for the tariff regression that includes a lagged dependent variable, since the data have a relatively small number of time periods. In this particular case, the random-effects estimator does not provide consistent estimates if industry-specific effects are correlated with other explanatory variables, especially the lagged dependent variable (Scheve and Slaughter 2004). To address these problems, column 3 uses the Arellano-Bond generalized method of moments (GMM) estimator which reduces bias caused by the lagged dependent variable and still controls for time-invariant, unobserved characteristics of industries (Forbes 2000). Columns 4 and 5 present the results from FGLS and OLS-PCSE tests, respectively, that include all the independent variables in the model. Following these estimation procedures, columns 6–10 present the results for industry-level tariffs on dutiable imports.

The findings in Table 1 indicate that the coefficients on *Comparative Disadvantage* are mostly positive and significant, suggesting that import-competing industries receive higher

[8] The NTB regressions use averages for independent variables during 1992, 1993, and 1995.

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TABLE 1 *Partisan Dominance and Tariffs*

	Tariffs on Total Imports					Tariffs on Dutiable Imports				
	Fixed Effects	Random Effects	Arellano–Bond	FGLS	OLS-PCSE	Fixed Effects	Random Effects	Arellano–Bond	FGLS	OLS-PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Comparative disadvantage	0.006	0.054***	0.035**	0.011***	0.043***	−0.016	0.044***	−0.009	0.041***	0.055***
	(0.008)	(0.005)	(0.017)	(0.001)	(0.008)	(0.014)	(0.010)	(0.022)	(0.002)	(0.017)
Partisan dominance	−0.273***	−0.163*	−0.44***	−0.008	−0.384**	−0.488***	−0.31**	−0.638***	−0.148**	−0.327
	(0.097)	(0.095)	(0.168)	(0.055)	(0.195)	(0.165)	(0.150)	(0.201)	(0.059)	(0.317)
Geographic concentration	−0.004	0.007	−0.003	0.007***	0.024***	−0.016**	−0.006	−0.03**	0.006*	0.01
	(0.005)	(0.005)	(0.013)	(0.002)	(0.008)	(0.008)	(0.008)	(0.013)	(0.003)	(0.012)
Size	−0.05	−0.035**	0.07	−0.004***	−0.028***	−0.067	−0.045	0.044	−0.038***	−0.013
	(0.057)	(0.017)	(0.048)	(0.002)	(0.009)	(0.097)	(0.033)	(0.051)	(0.007)	(0.034)
Lagged tariff rate	0.04***	0.221***	0.888***	0.864***	0.471***	0.001	0.004***	0.647***	0.01***	0.005**
	(0.015)	(0.011)	(0.059)	(0.010)	(0.078)	(0.003)	(0.002)	(0.103)	(0.002)	(0.002)
Industrial concentration				−0.554**	−3.03***				−3.648***	−4.396**
				(0.254)	(0.709)				(0.436)	(1.795)
Political concentration				0.439	5.644**				1.798***	5.227
				(0.618)	(2.606)				(0.549)	(3.282)
Constant	3.164***	2.672***	−0.135	0.267***	1.856***	5.702***	5.546***	2.058***	5.363***	5.553***
	(0.081)	(0.142)	(0.266)	(0.047)	(0.366)	(0.137)	(0.262)	(0.792)	(0.063)	(0.497)
Observations	3093	3487	2695	3483	3483	2997	3384	2605	3378	3380
Number of industries	394	394	393	394	394	385	387	382	385	387
R^2	0.295	0.639			0.628	0.027	0.136			0.306

Note: Standard errors in parentheses.
FGLS = feasible generalized least squares; OLS-PCSE = ordinary least squares with panel-corrected standard errors.
*p < 0.10, **p < 0.05, ***p < 0.01.

protection than export-oriented industries. The results also support my argument that the political characteristics of industries affect their levels of protection. Table 1 shows that *Partisan Dominance* has a significant, negative association with industry-level tariffs on total imports and dutiable imports. *Partisan Dominance* increases from zero to positive values as industries are more highly concentrated in partisan strongholds than in competitive constituencies. The significant negative coefficient for *Partisan Dominance* therefore suggests that the level of tariff protection is higher for industries concentrated in competitive constituencies than for those in safe partisan constituencies. In Table 1, these results remain robust across different estimation methods and across alternative specifications of the dependent variable.

I now turn to the joint effects of *Comparative Disadvantage* and *Partisan Dominance* on levels of protection. Table 2 presents FGLS and OLS-PCSE results of the multiplicative interaction model for industry-level tariffs. The coefficient on the interaction term between *Partisan Dominance* and *Comparative Disadvantage* indicates the degree to which the political characteristics of industries condition the relationship between protectionist demands and actual policy outcomes. Column 3 shows that the coefficients for *Comparative Disadvantage* and its interaction term with *Partisan Dominance* are 0.056 and −0.018, respectively. The results imply that the effect of *Comparative Disadvantage* on total import tariffs drops from 0.055 to −0.091 as *Partisan Dominance* moves from its minimum (0.028) to its maximum (8.194). Similarly, the remaining columns of Table 2 indicate that the estimated coefficients on the interaction terms are consistently negative and significant across different specifications of the model. These findings strongly suggest that the marginal effect of *Comparative Disadvantage* on the level of tariffs is maximized when *Partisan Dominance* is closest to zero. The degree to which protectionist demands raise the level of tariff protection increases as industries are more heavily concentrated in competitive constituencies than in safe constituencies, or as industries have more swing, marginal voters than partisan supporters.

Table 3 reports the estimated results for nontariff protection for 356 four-digit SIC industries. The findings do not support the earlier hypothesis that industries concentrated in competitive constituencies receive higher levels of nontariff protection. In columns 1 and 4, the coefficients on *Partisan Dominance* are insignificant, suggesting that the political characteristics of industries have no direct association with the coverage and frequency ratios of NTBs. Yet, Table 3 clearly shows that the competitiveness of industrial constituents magnifies the impact of *Comparative Disadvantage* on the levels of NTBs. The coefficients for the multiplicative interaction term between *Partisan Dominance* and *Comparative Disadvantage* range from −0.469 to −0.343, and all are statistically significant at the 99-percent level. Specifically, columns 2 and 3 demonstrate that, all else equal, the marginal effect of *Comparative Disadvantage* on an industry's NTB coverage ratio decreases from 0.254 to −1.501 and from 0.284 to −1.738, respectively, as *Partisan Dominance* increases from its minimum (0.03) to its maximum (4.341). In columns 5 and 6, the same change in *Partisan Dominance* reduces the marginal effect of *Comparative Disadvantage* on the NTB frequency ratio from 0.174 to −1.305 and from 0.193 to −1.459, respectively.

It should be noted that these findings are robust to controls for *Political Concentration*, which equals the Herfindahl–Hirschman index for an industry's employment across congressional districts. If politically dispersed industries are better at ensuring greater political representation and receiving more favorable levels of protection, *Political Concentration* should be negatively signed (Busch and Reinhardt 1999). Nevertheless, our results show that *Political Concentration* has for the most part no significant effect on protection levels. Only a few exceptions in Table 1 suggest that political concentration might increase industries' chances of securing higher tariffs.

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TABLE 2 *Partisan Dominance and the Marginal Effects of Comparative Disadvantage on Tariffs*

	Tariffs on Total Imports				Tariffs on Dutiable Imports			
	FGLS	FGLS	OLS-PCSE	OLS-PCSE	FGLS	FGLS	OLS-PCSE	OLS-PCSE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Comparative disadvantage	0.016***	0.016***	0.056***	0.055***	0.072***	0.072***	0.091***	0.091***
	(0.002)	(0.002)	(0.009)	(0.009)	(0.003)	(0.003)	(0.018)	(0.017)
Partisan dominance	0.034	0.02	–0.005	–0.213	0.083	0.093	0.259	0.083
	(0.027)	(0.051)	(0.082)	(0.140)	(0.053)	(0.075)	(0.205)	(0.300)
Comparative disadvantage × partisan dominance	–0.006***	–0.006***	–0.018***	–0.016***	–0.016***	–0.016***	–0.037***	–0.036***
	(0.002)	(0.002)	(0.006)	(0.006)	(0.003)	(0.003)	(0.012)	(0.012)
Geographic concentration	0.008***	0.008***	0.028***	0.028***	0.012***	0.012***	0.022	0.022*
	(0.002)	(0.002)	(0.007)	(0.007)	(0.003)	(0.003)	(0.013)	(0.014)
Industrial concentration	–0.705***	–0.777***	–2.144***	–2.564***	–2.635***	–2.674***	–3.371**	–3.699**
	(0.205)	(0.221)	(0.518)	(0.605)	(0.387)	(0.393)	(1.318)	(1.448)
Size	–0.006***	–0.006***	–0.035***	–0.032***	–0.046***	–0.046***	–0.02	–0.018
	(0.002)	(0.002)	(0.009)	(0.008)	(0.006)	(0.006)	(0.029)	(0.028)
Lagged tariff rate	0.843***	0.842***	0.449***	0.446***	0.007***	0.007***	0.005**	0.005**
	(0.011)	(0.011)	(0.080)	(0.080)	(0.002)	(0.002)	(0.002)	(0.002)
Political concentration		0.269		2.865		–0.065		2.626
		(0.56)		(1.824)		(0.778)		(3.085)
Constant	0.507***	0.506***	2.383***	2.365***	5.318***	5.316***	5.654***	5.601***
	(0.052)	(0.053)	(0.425)	(0.424)	(0.064)	(0.065)	(0.318)	(0.29)
Observations	3483	3483	3483	3483	3378	3378	3380	3380
Number of industries	394	394	394	394	385	385	387	387
R^2			0.64	0.638			0.362	0.367

Note: Standard errors in parentheses. All models include year fixed effects and AR1 correction.
FGLS = feasible generalized least squares; OLS-PCSE = ordinary least squares with panel-corrected standard errors.
*p < 0.10, **p < 0.05, ***p < 0.01.

TABLE 3 *Partisan Dominance and the Marginal Effects of Comparative Disadvantage on Nontariff Barriers (NTBs)*

	NTB Coverage Ratio			NTB Frequency Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
Comparative disadvantage	0.057	0.266**	0.298**	0.008	0.184**	0.204**
	(0.099)	(0.120)	(0.123)	(0.077)	(0.093)	(0.096)
Partisan dominance	5.278	3.846	8.792*	3.63	2.423	5.615
	(3.719)	(2.996)	(5.152)	(3.282)	(2.702)	(4.783)
Comparative disadvantage × partisan dominance		−0.407***	−0.469***		−0.343***	−0.383***
		(0.145)	(0.163)		(0.126)	(0.139)
Geographic concentration	0.23	0.357	0.403*	0.385*	0.493**	0.522***
	(0.235)	(0.228)	(0.229)	(0.205)	(0.199)	(0.199)
Industrial concentration	−14.911	−7.661	0.708	−11.109	−4.998	0.403
	(20.415)	(19.614)	(21.828)	(16.847)	(15.853)	(17.383)
Size	0.32	0.313	0.285	0.121	0.115	0.097
	(0.2)	(0.194)	(0.193)	(0.123)	(0.118)	(0.118)
Lagged tariff rate	3.281***	3.146***	3.093***	2.996***	2.882***	2.847***
	(0.406)	(0.406)	(0.406)	(0.373)	(0.369)	(0.371)
Political concentration			−64.623			−41.701
			(56.457)			(51.7)
Constant	3.872	3.44	3.859	1.052	0.688	0.958
	(2.547)	(2.547)	(2.593)	(2.118)	(2.084)	(2.125)
Observations	356	356	356	356	356	356
R^2	0.25	0.261	0.263	0.301	0.312	0.313

Note: Robust standard errors in parentheses.
*p < 0.10, **p < 0.05, ***p < 0.01.

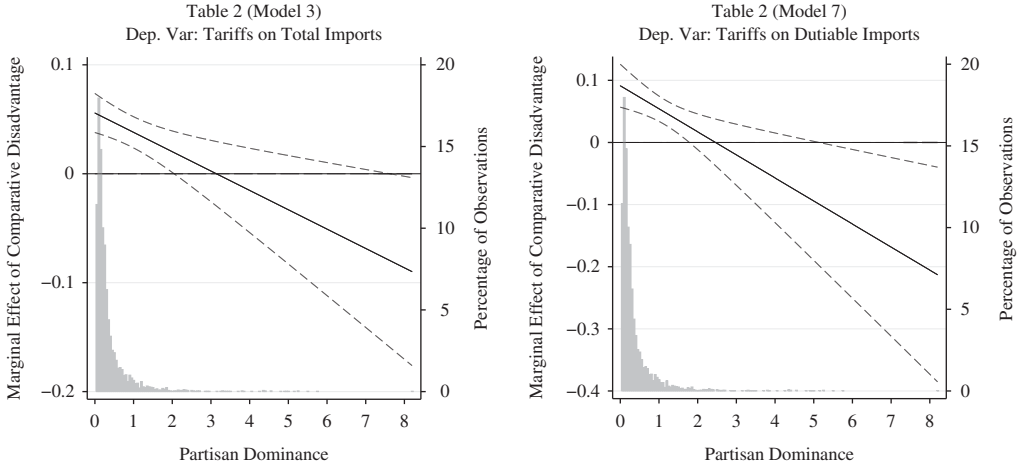

Fig. 1. The marginal effects of comparative disadvantage on tariff protection

Figures 1 and 2, which are based on the results from Tables 2 and 3, graphically illustrate the marginal effects of protectionist demands on sectoral tariffs and NTBs, respectively. The solid line in each graph denotes the effect of *Comparative Disadvantage* on levels of protection, which changes with the value of *Partisan Dominance*, and the dashed lines around the marginal effects line represent 95 percent confidence intervals.

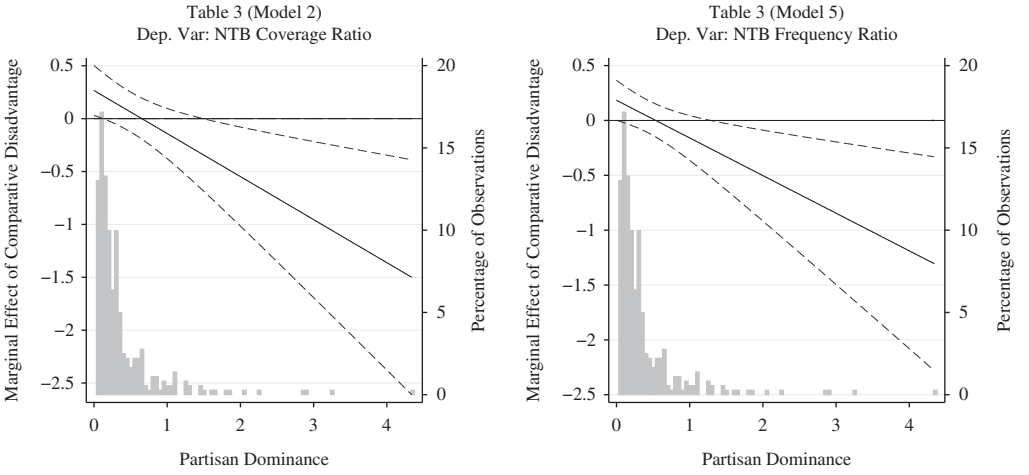

Fig. 2. The marginal effects of comparative disadvantage on nontariff protection

I superimpose over each marginal effect graph a histogram that shows the frequency distribution of *Partisan Dominance* with the right-hand y-axis indicating the percentage of observations. If the minimum and maximum values for *Partisan Dominance* come from outlier observations, the marginal effects of *Comparative Disadvantage* generated by those values are less relevant in testing the hypotheses (Berry, Golder and Milton 2012).

Figures 1 and 2 both show that the degree to which protectionist demands raise the level of protection itself depends on the political characteristics of industrial constituents. In these figures, the marginal effects lines for *Comparative Disadvantage* on four different measures of protection have negative slopes. These results suggest that the extent to which comparative disadvantage increases levels of tariffs and NTBs is maximized when *Partisan Dominance* is near zero, or when industries show the highest level of competitiveness. Nevertheless, as industries have more core partisan supporters and takes large positive values for *Partisan Dominance*, the marginal effect of *Comparative Disadvantage* on protection gradually declines.

The findings also indicate that protectionist demands ceased to be positively associated with NTBs, once *Partisan Dominance* passes a certain threshold. In Figure 2, the effect of *Comparative Disadvantage* on NTB coverage and frequency ratios turns negative as *Partisan Dominance* exceeds 0.654 and 0.536, respectively. These findings imply that representative policymakers are more responsive to protectionist pressures from industries in competitive constituencies than from industries in partisan strongholds.

ROBUSTNESS TESTS

As a robustness check, I reexamine the effects of the political characteristics of industries on the inter-industry structure of trade protection. To retest the model elaborated earlier, I generate three alternative indicators of *Partisan Dominance* using the results of other types of elections with different time frames. These indicators are again computed by Equation 2, in which the squared share of district employment for a given industry is weighted by each of the following measures: *Average Presidential Vote*, *Distance from 50–50*, and *House Marginality*. *Average Presidential Vote* equals the mean of *Partisan Strength* in the two most recent elections, each of which is the absolute value of the district presidential vote measure normalized around the national mean. This variable allows for an examination of the relationship between *Partisan*

Dominance and levels of protection over the long run. Following Ansolabehere and Snyder (2006), *Distance from 50–50* measures the absolute difference between 50 percent and the average share of the two-party vote that Democratic candidates won in presidential, Senate, and gubernatorial elections over the past four years. In using this measure, I assume that industry-level tariffs in 1990 and 1997 are linked to their political characteristics observed from all of these elections during the period 1986–1989 and the period 1993–1996, respectively. *House Marginality* represents the absolute difference between 50 percent and the two-party vote share received by House candidates in the most recent election. These three measures increase from zero to positive values as district partisan composition changes from an even balance of electoral support between the two parties to strong support for one party over the other. Thus, all of the alternative indicators of *Partisan Dominance* derived from these measures take large positive values if industries are highly concentrated in safe constituencies supporting either of the two parties. The indicators should be much closer to zero, however, if industries are more heavily concentrated in competitive constituencies with narrow vote margins.

Tables 4 and 5 report the results of these re-estimations of the model. The estimated coefficients for the multiplicative interaction terms between *Comparative Disadvantage* and each alternative indicator of *Partisan Dominance* are consistently negatively signed and significant. These findings support the argument that the political characteristics of industries affect the relationship between their trade policy preferences and levels of protection. The degree to which protectionist demands increase the level of protectionist barriers itself is greater for industries concentrated in competitive constituencies than for those in partisan constituencies. Drawing on the results in Tables 4 and 5, Figures 3 and 4 graphically show that the effect of *Comparative Disadvantage* on each measure of tariff and nontariff protection changes according to the values of alternative indicators of *Partisan Dominance*. The negative slope of the solid line in each plot suggests that the marginal effect of *Comparative Disadvantage* on protection levels declines substantially as industries are highly concentrated in safe constituencies and have more partisan supporters. These findings remain consistent and robust across alternative indicators of industries' protectionist demands and their concentration in marginal (or safe) districts, as shown in Appendix 3, Tables A2–A7.

CONCLUSION

This article extends the existing research on the inter-industry structure of protection, focusing on protectionist measures for US industries in the 1990s. Overall, the results presented here support theories of endogenous protection, demonstrating that protection levels are significantly associated with a set of industry characteristics. While comparative disadvantage drives industries to seek protection from imports, their chances of receiving favorable treatment are conditioned by other features of industries that affect their efficiency in coordinating protectionist lobbying and the political incentives of parties to represent their sectoral interests.

In this vein, this article provides further evidence that industrial location serves as another important factor in explaining the structure of protection, as it shapes various political characteristics of industries that induce competing parties to engage in electoral targeting of protection. I find no support for the previous claims that emphasize political concentration across districts or the level of party discipline as explanations for sectoral variation in US trade barriers. The results of this analysis consistently show that, compared with declining industries concentrated in safe constituencies, those concentrated in competitive constituencies are much more likely to receive favorable levels of tariff and nontariff protection.

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TABLE 4 *Alternative Estimations: Partisan Dominance and Tariffs*

	Tariffs on Total Imports			Tariffs on Dutiable Imports		
	(1)	(2)	(3)	(4)	(5)	(6)
Comparative disadvantage	0.052***	0.054***	0.048***	0.078***	0.085***	0.072***
	(0.009)	(0.009)	(0.007)	(0.016)	(0.015)	(0.016)
Partisan dominance (average presidential vote)	–0.015			0.103		
	(0.087)			(0.193)		
Comparative disadvantage × partisan dominance (average presidential vote)	–0.021***			–0.028**		
	(0.006)			(0.013)		
Partisan dominance (distance from 50–50)		0.015			0.035	
		(0.091)			(0.185)	
Comparative disadvantage × partisan dominance (distance from 50–50)		–0.016***			–0.023**	
		(0.004)			(0.01)	
Partisan dominance (House marginality)			0.152**			0.155
			(0.07)			(0.121)
Comparative disadvantage × partisan dominance (House marginality)			–0.003			–0.014**
			(0.003)			(0.006)
Geographic concentration	0.029***	0.028***	0.025***	0.019	0.016	0.022
	(0.008)	(0.008)	(0.008)	(0.015)	(0.013)	(0.017)
Industrial concentration	–2.135***	–2.36***	–2.567***	–3.173**	–3.207**	–4.39***
	(0.546)	(0.536)	(0.56)	(1.375)	(1.289)	(1.384)
Size	–0.035***	–0.036***	–0.034***	–0.024	–0.02	–0.03
	(0.009)	(0.01)	(0.01)	(0.028)	(0.028)	(0.032)
Lagged tariff rate	0.45***	0.451***	0.448***	0.005**	0.005**	0.005**
	(0.08)	(0.08)	(0.08)	(0.002)	(0.002)	(0.002)
Constant	2.387***	2.4***	2.351***	5.787***	5.739***	5.911***
	(0.426)	(0.433)	(0.433)	(0.321)	(0.324)	(0.316)
Observations	3483	3483	3483	3380	3380	3380
Number of industries	394	394	394	387	387	387
R^2	0.639	0.64	0.639	0.348	0.341	0.372

Note: Panel-corrected standard errors in parentheses. All models include year fixed effects and AR1 correction.
*p < 0.10, **p < 0.05, ***p < 0.01.

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TABLE 5 *Alternative Estimations: Partisan Dominance and Nontariff Barriers (NTBs)*

	NTB Coverage Ratio			NTB Frequency Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
Comparative disadvantage	0.189*	0.318***	0.38***	0.121	0.219**	0.302***
	(0.111)	(0.121)	(0.123)	(0.086)	(0.094)	(0.094)
Partisan dominance (average presidential vote)	3.789			2.95		
	(2.507)			(2.424)		
Comparative disadvantage × partisan dominance (average presidential vote)	–0.439***			–0.374***		
	(0.145)			(0.13)		
Partisan dominance (distance from 50–50)		3.166			0.711	
		(4.789)			(4.217)	
Comparative disadvantage × partisan dominance (distance from 50–50)		–0.574***			–0.462***	
		(0.169)			(0.146)	
Partisan dominance (House marginality)			–1.28			–1.676
			(2.031)			(1.579)
Comparative disadvantage × partisan dominance (House marginality)			–0.505***			–0.461***
			(0.125)			(0.092)
Geographic concentration	0.437**	0.465*	0.515***	0.543***	0.594***	0.623***
	(0.215)	(0.247)	(0.193)	(0.192)	(0.215)	(0.164)
Industrial concentration	–8.123	–8.723	6.591	–6.348	–5.109	7.906
	(20.419)	(19.907)	(20.355)	(16.719)	(16.606)	(16.239)
Size	0.298	0.298	0.26	0.11	0.093	0.071
	(0.193)	(0.192)	(0.188)	(0.119)	(0.118)	(0.114)
Lagged tariff rate	3.143***	3.129***	3.119***	2.874***	2.866***	2.846***
	(0.403)	(0.406)	(0.401)	(0.368)	(0.37)	(0.357)
Constant	3.87	3.558	3.809	0.946	0.992	0.958
	(2.522)	(2.56)	(2.538)	(2.047)	(2.08)	(2.031)
Observations	356	356	356	356	356	356
R^2	0.26	0.263	0.269	0.313	0.313	0.326

Note: Robust standard errors in parentheses.
*p < 0.10, **p < 0.05, ***p <0.01.

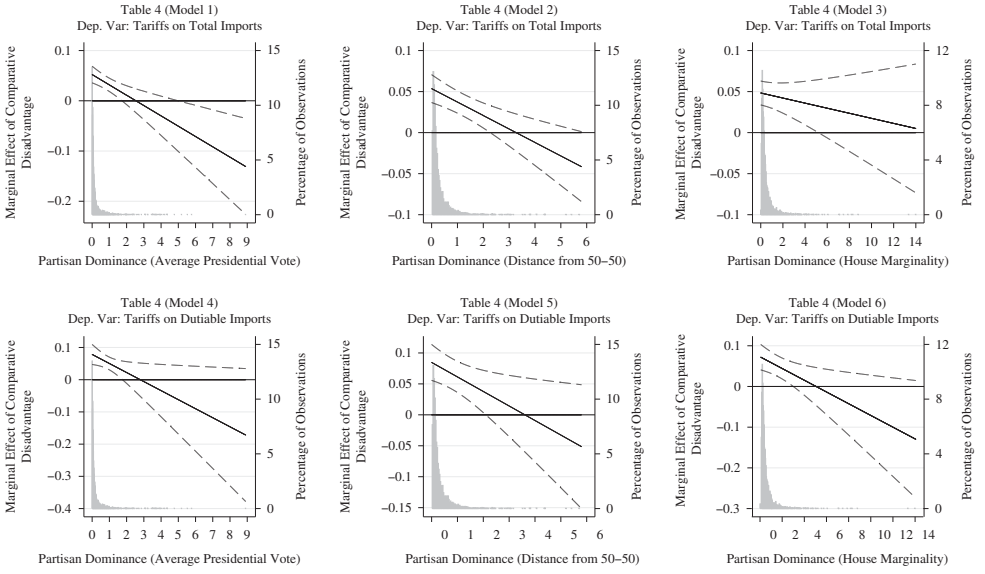

Fig. 3. Political characteristics of industries and the marginal effects of comparative disadvantage on tariffs

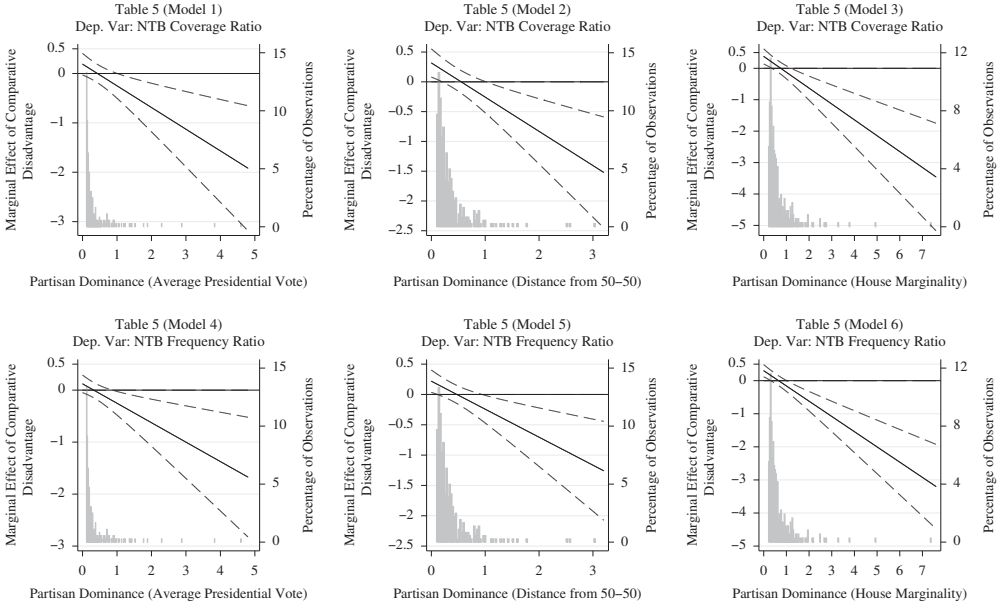

Fig. 4. Political characteristics of industries and the marginal effects of comparative disadvantage on nontariff barriers (NTBs)

Consequently, the analysis provides support for extant models of distributive politics which suggest that the political characteristics of groups of voters constitute the basis of strategic allocation of targetable transfers. I show that industries' incentives and abilities to pursue protectionist measures do not necessarily translate into sectoral protection, because in order to optimize their electoral prospects, parties concentrate protectionist rents on industrial

constituents who could be more desirable as recipients of those rents. These findings are consistent with Dixit and Londregan's (1995) argument that parties are more likely to grant protectionist privileges to industries concentrated in competitive and politically pivotal constituencies, as their members are less attached to parties' ideological positions and more easily bought off by economic rewards. The results may also imply that parties protect US industries concentrated in marginal districts to maximize the number of legislative seats that they control, which would be the case in strong majoritarian systems (McGillivray 1997). Given that the present study focuses only on industry-level factors, however, this latter possibility would need to be tested further by analyzing the distribution of protectionist rents across geographical constituencies.

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