Electoral Systems and Protectionism: An Industry-Level Analysis[1]

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Abstract:

Trade protection potentially provides a very attractive way for a politician to benefit local constituents. We explore whether or not industry-level variation in the relationship between electoral systems and trade protection provides lessons about the role of protection as a means of benefitting local constituents, grounding our empirics in the theoretical insights of Grossman and Helpman (2005). Using a dataset composed of 6-digit HS-level observations for a cross-section of developed and developing countries between 1988 and 2006, we find that protection is higher in majoritarian systems than in proportional ones for some products, while it is lower in majoritarian systems for other products. This result holds after controlling for a number of possible explanatory factors, including historical country-level characteristics, which could affect political systems. Within manufacturing, we also examine the explanatory power of several underlying factors that may be related to the attractiveness of product-level protection as a means of directing benefits to local constituents. We find that, within majoritarian systems, greater geographic concentration and lower import penetration ratios are linked to higher average tariffs – a finding consistent with the theoretical model and suggesting that protection may indeed be directed in ways most likely to benefit a politician's local constituents.

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"All politics is local."
Thomas P. "Tip" O'Neill[3]

Introduction

Trade protection potentially provides a very attractive way for a politician to benefit local constituents – the local industry profits from higher prices and, in most cases, the cost to consumers there are comparatively small. Further, in most cases, the only arguments against higher tariffs are heard from foreign producers – clearly not members of the domestic voting public. Of course, the attractiveness of using protection in such a way hinges on the structure of a country's political system – this mechanism is only applicable in systems where political districts are tied to distinct geographic areas, as in majoritarian systems, and not to the country as a whole, as in proportional systems.

Previous empirical work shows that broad levels of protection do indeed demonstrate a pattern consistent with the notion that trade policy is being used in certain electoral systems, at least in part, as a way to direct benefits to particular constituencies. More specifically, Evans (2009) finds that countries with majoritarian systems tend to have higher overall average tariffs than do countries with proportional systems. Evans and Obradovich (2009) confirm that countries with majoritarian systems tend to have higher barriers on non-agricultural products, but also find lower levels of support for agricultural products.

Apart from this finding on agricultural protection, however, comparatively less work has explored whether or not industry-level variation in the electoral system "gap" provides lessons about the role of protection as a means of benefitting local constituents. Our paper does so.

We ground our theory in the framework provided by Grossman and Helpman (2005) who suggest legislators' desire to redistribute income to industries in their home districts leads to a protectionist bias in majoritarian systems. We expand their model to account for a broader spectrum of political districts and industries, an exercise that provides insights into the potential importance of several underlying factors that may be related to the attractiveness of product-level protection as a means of directing benefits to constituents.

Then, using a dataset composed of 6-digit HS-level observations for a cross-section of developed and developing countries between 1988 and 2006, we examine the relationship

[3] http://knightpoliticalreporting.syr.edu/quotes.cfm

between electoral system and protection across different product groups. We find that protection is higher in majoritarian systems than in proportional ones for some products, while it is lower in majoritarian systems for other products. This result holds after controlling for a number of possible explanatory factors, including historical country-level characteristics, which could affect political systems. Within manufacturing, we also examine the explanatory power of several underlying factors that may be related to the attractiveness of product-level protection as a means of directing benefits to local constituents. We find that, within majoritarian systems, greater geographic concentration and lower import penetration ratios are linked to higher average tariffs – a finding consistent with the theoretical model and suggesting that protection may indeed be directed in ways most likely to benefit a politician's local constituents.

1 The Existing Literature

Several bodies of literature are relevant to this paper. These include research on electoral systems and trade policy outcomes, on electoral systems and other policy outcomes, and on cross-industry variation in protection and political characteristics.

1.1 Electoral Systems and Trade Policy Outcomes

There is a fairly limited body of research on the link between electoral systems and trade policy.

One of the most closely related papers is Evans (2009), which explores the link between electoral systems and overall average country tariffs. The data include information on electoral systems, trade policies, and a broad set of country characteristics for a mix of developing and developed countries over the period 1981 to 2004. The results suggest that, in comparison to having a proportional system, having a majoritarian electoral system is associated with higher average overall tariffs, a result consistent with the theoretical model proposed by Grossman and Helpman (2005), "A Protectionist Bias in Majoritarian Politics." Evans and Obradovich (2009) confirm that countries with majoritarian systems tend to have higher barriers on non-agricultural products, but also find lower levels of support for agricultural products.

Building on the theoretical framework of Grossman and Helpman (2005), Fredriksson, Matschke, and Minier (2008) also wrap in the literature on lobbying and political organization by industry lobbies. Their data focus on tariffs on U.S. manufactured products in 1993. They find that industries concentrated in majority districts are more likely to receive positive protection,

whether or not they are represented by a lobby.

Other relevant papers include Hatfield and Hauk (2004), who find lower tariffs for majoritarian systems based on data for 34 Latin American and OECD countries in the 1980s and 1990s. Mansfield and Busch (1995) explore the relationship between electoral system and nontariff barriers for 14 countries in 1983 and 1986 and find that proportional systems are associated with higher nontariff barriers.

1.2 Electoral Systems and Other Policy Outcomes

A fairly extensive literature has considered the link between electoral systems and other policy outcomes.

A great deal of the work in this area is by Persson and Tabellini. In Persson and Tabellini (2003), they provide a general overview and summary. They also present their own work on the relationship between both electoral systems (proportional versus majoritarian) and forms of government (presidential versus parliamentary) and various policy outcomes. Their results suggest that electoral system and form of government may be linked to the size of government, the composition of spending, and productivity.

Blume et al. (2007), on the other hand, do not find a link between form of government and the policy outcomes suggested by Persson-Tabellini, but do find a relationship between electoral system and government expenditure, rent seeking, and productivity. Exploring the link between electoral proportionality and shareholder and employment protection, Pagano and Volpin (2005) find greater proportionality is associated with less shareholder protection and more employment protection.

2 The Theoretical Framework

2.1 The Basic Grossman-Helpman Model

The starting point for our theoretical framework is Grossman and Helpman (2005), who present a model with three districts and three industries, each of which is rooted in one of the three districts. Two political parties stand candidates for election, and each of the districts elects a representative to the national legislature, with the party that wins the most seats in the legislature controlling the legislating body.

Each representative hopes to benefit the home district by protecting that district's chief industry from imports. The party in power takes into account the interests of all of its victorious members' districts in setting national trade policy. If that party in power represents all districts (i.e., all districts elect representatives from the same party), the policy outcome is no restrictions on imports, as this policy maximizes the welfare of this small open economy:

$$\bar{t}_{\{j,k,l\}} = t_{\{j,k,l\}} = 0$$

where $\bar{t}_{\{j,k,l\}}$ is the mean tariff when the ruling party represents all three districts *j*, *k*, and *l*.

If, in contrast, the prevailing party represents only two of the three districts, the national policy will protect the interests of the majority districts via tariffs, such that:[4]

$$\bar{t}_{\{j,k\}} > 0$$

where $\bar{t}_{\{j,k\}}$ is the mean tariff when the party in power represents only two (*j, k*) of the three districts.

The Grossman-Helpman framework also makes certain predictions about the level of protection within specific industries. They argue that the majority provides positive protection for industries located in the home districts of their member legislators, as long as the citizens of those districts have a more than proportional ownership interest in those industries. More specifically, equation (7) in the Grossman-Helpman paper notes:

$$t_{\{j,k\}g} = \frac{(1/3 - \alpha_{lg})x^*}{(2/3)(\beta + \gamma) - \gamma(1/3 - \alpha_{lg})}$$

for all *g*, $l \notin \{j, k\}$, where g denotes an industry. β and γ are parameters in the linear supply and demand equations, α_{lg} is the ownership share in the home industry g of the district not represented in the majority party, and x^* is the quantity of the product produced domestically at free trade prices. This expression implies that a given industry *g* receives positive protection only if the voters in the districts *j* and *k* represented by the party in power own more than 2/3 of the shares of that industry. Further, if ownership in a given industry is perfectly evenly distributed across different districts (i.e. α_{lg} =1/3), then an industry receives no protection from imports.[5]

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[4] See Grossman and Helpman (2003) for conditions for this result.

[5] This equation has empirical implications. For one, it suggests that industries that are perfectly distributed across electoral districts will have zero tariffs. In addition, it suggests that there should be a relationship between electoral/geographic concentration and the level of protection –

2.2 Expanding the Framework – The Model with More Than Three Districts and Three Tradable Products

As noted above, we are interested in exploring the relationship between electoral system and trade policy at the more disaggregate level, thus we modify the basic Grossman-Helpman model in order to allow for more then three districts and three tradable products.[6] Fredriksson et al (2008) have also considered this model at a more disaggregate level, and our own approach closely follows their treatment, as well as the original Grossman-Helpman model. Consider an economy composed of *n* districts, each of which is home to one of *n* industries. Each individual citizen has quasi-linear utility, $c_Y + \sum_{g=1}^{n} u(c_n)$ and consumes *n*+1 goods, with one of those goods, *Y*, being the numeraire. Each unit of output of the numeraire is produced with one unit of labor, fixing the wage rate at one.

The indirect utility function of a given individual is represented by $V_{ij} = I_{ij} + \sum_{g=1}^{n} S(p_g)$. I_{ij} is the income of individual *i* residing in district *j*, and $S(p_g)$ denotes consumer surplus derived from consuming good *g* purchased at price p_g. This domestic price p_g is composed of two parts – the presiding world price p^* and the wedge created by a specific import tariff or export subsidy, such that $p_g = p^* + t_g^s$.

Residents in each district may have ownership shares in each of the *n* industries, and α_{jg} represents the share of industry *g* capital owned by residents of district *j*. Thus, individuals have three sources of income – labor income, returns to an industry-specific input factor, and rebated tariff revenue, which is distributed equally across individuals in the population. Summing over all residents within a district *j*, the aggregate income of that district may be expressed as:

$$(1)\; I_j = \beta_j + \sum_{g=1}^{n} \alpha_{jg} \pi(p_g) + \beta_j \sum_{g=1}^{n} t_g^s m(p_g)$$

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a tariff on a given product is increasing in the ownership shares of the represented districts in that industry (since $\alpha_{jg} + \alpha_{kg} + \alpha_{lg} = 1$).

[6] This section relies heavily on Grossman and Helpman (2005), as well as on Fredriksson et al (2008).

where each district j has β_j share of the national population, $\pi(p_g)$ denotes total profits within industry g, and $m(p_g)$ is imports of product g. Indirect utility of a given district is thus represented by:

$$(2)\quad \begin{aligned} V_j &= \beta_j + \sum_{g=1}^{n} \alpha_{jg}\pi(p_g) + \beta_j \sum_{g=1}^{n} t_g^s m(p_g) + \beta_j \sum_{g=1}^{n} S(p_g) \\ &= \beta_j + \sum_{g=1}^{n} \alpha_{jg}\pi(p_g) + \beta_j \sum_{g=1}^{n} [t_g^s m(p_g) + S(p_g)] \end{aligned}$$

As in the three-district, three-product model in Grossman and Helpman (2005), each district sends a representative to the national legislature, who is a member of one of the two political parties. The majority party aims to maximize the overall welfare of the districts represented by its member legislators through the provision of tariff protection. Thus, tariffs are set by maximizing this joint utility function with respect to the tariffs on each of the individual n goods. With k representing the set of legislators in the majority party, this aggregate indirect utility may be expressed as:

$$(3)\qquad V_{j,k} = \sum_{j\in k} \beta_j + \sum_{j\in k} \left[\sum_{g=1}^{n} \alpha_{jg}\pi(p^* + t_g^s) \right] + \sum_{j\in k} \beta_j \left[\sum_{g=1}^{n} \left\{ t_g m(p^* + t_g^s) + S_g(p^* + t_g^s) \right\} \right]$$

Maximizing with respect to these tariffs, and incorporating Roy's Identity and Hotelling's Lemma, we can derive the following expression for the optimal specific tariff in each individual industry g:

$$(4)\; t_g^s = \frac{X_g(p_g^* + t_g^s) \sum_{j\in k} \left[\alpha_{jg} - \beta_j \right]}{-\left\{ m_g'(p_g^* + t_g^s) \right\} \sum_{j\in k} \beta_j} = \frac{\sum_{j\in k} \left[\alpha_{jg} - \beta_j \right]}{\sum_{j\in k} \beta_j} \frac{X_g(p_g^* + t_g^s)}{-\left\{ m_g'(p_g^* + t_g^s) \right\}}$$

In this expression, X_g is output of industry g, and m_g' is the slope of the import demand curve.

It is convenient to rewrite the expression for the equilibrium tariff within an industry g as follows:

$$(5)\; \frac{t_g^{av}}{1 + t_g^{av}} = \frac{\sum_{j\in k} \left[\alpha_{jg} - \beta_j \right]}{\sum_{j\in k} \beta_j} \frac{X_g}{e_g m_g}$$

where t_g^{av} denotes the ad valorem tariff on product g, and e_g is the absolute value of the elasticity of import demand. There are a few points of interest illustrated by this expression. First, it is

positive (i.e., there is protection on imports) as long as the ownership share in a given industry g of the districts represented by the party in power (α_{jg}) is greater than the population share of those districts (β_{jg}). This reflects the fact that, from the perspective of the party in power, gains to returns to the industry-specific factors in those industries outweigh losses to consumer surplus stemming from tariff protection. Second, the optimal level of protection declines with an increase in the elasticity of demand for imports; this reflects the fact that the impact on the volume of imports increases with this demand elasticity. Third, the maximizing tariff increases with an increase in domestic output (X_g) and declines with an increase in imports (m_g) – higher domestic output means that there is a greater opportunity for owners of specific factors to gain from protection, while higher imports means a heavier welfare impact. Finally, note that this tariff is decreasing in $\sum_{j \in k} \beta_j$, i.e. the share of the total population represented by the party in power, holding all other elements of the expression constant. This implies that the larger the share in the population represented by the party in power, the lower the tariff imposed, again reflecting the adverse welfare consequences of protection.[7] This expression will serve as the basis for our empirical work.

Before preceding with a description of the data, it is useful to consider the optimal outcome for the country as a whole. In this case, the appropriate indirect utility function is:

$$\begin{aligned} V &= 1 + \sum_{g=1}^{n} \pi(p_g) + \sum_{g=1}^{n} [t_g m(p_g) + S(p_g)] \\ &= 1 + \sum_{g=1}^{n} \pi(p^* + t_g) + \sum_{g=1}^{n} [t_g m(p^* + t_g) + S(p^* + t_g)] \end{aligned} \tag{6}$$

In contrast to the case when only a subset of the country is taken into account when setting policy, when the nation's welfare is considered, the optimal policy for every product g is to set $t_g^{av} = 0$. We will use this case as the stylized representation of a proportional system. To explain, note that in some proportional systems, the entire country serves as the sole electoral

[7] An additional specification that we will incorporate in our empirical work evolves from simplification of our base equation:

$$\frac{t_g^{av}}{1 + t_g^{av}} = \left(\frac{\sum_{j \in k} \alpha_{jg}}{\sum_{j \in k} \beta_j} - 1 \right) \frac{X_g}{e_g m_g}$$

district. Legislators would thus be expected to take into account the interests of the country as a whole, as in (6). Even in a proportional system with multiple districts, since each district may elect representatives from more than one party, the probability of a given district not having representation by the party in power is reduced, in comparison to the majoritarian system case. Stated another way, there is a higher likelihood that all districts (and, thus all industries) will be represented by the majority party.[8] As a consequence, overall average tariffs, as well as tariffs within each industry, would be expected to be closer to the small-country optimum of no protection.[9]

3 The Data

To implement our empirical investigation of this model at a disaggregate level, we need to use data from a number of different sources, which we describe below. At the broadest level, the final dataset contains information for 81 countries between 1988 and 2006. The data originate from a number of sources. These are described below.

3.1 Trade Protection

We employ effectively applied average tariff data disaggregated at the 6-digit Harmonized System level (i.e. more than 5,000 product categories) from the UNCTAD's TRAINS database, obtained through the UNCTAD/World Bank WITS data system.[10] The TRAINS dataset includes both simple average and trade-weighted tariffs. Our unbalanced panel covers 177 importers spanning the years 1988 to 2007.[11]

[8] See Evans (2008) for more discussion of this point.

[9] More generally, some previous work on the link between electoral systems and policy outcomes suggests that proportional systems (as compared to majoritarian systems) may be associated with policies characterized by more broad-based benefits. This issue is discussed by Persson, T., & Tabellini, G. (2003). *The Economic Effects of Constitutions.* Cambridge, MA, USA: MIT Press. This issue is also discussed by Grossman and Helpman (2005).

[10] WITS defines effectively applied tariff as the lowest available tariff. The lowest tariff could be the applied MFN tariff or the preferential tariff, if applicable. Simple average effectively applied tariff is the simple average of tariffs at national tariff line (NTL) aggregated to 6-digit HS commodity category.

[11] Since the European Union's members differ across our time span, we consider all countries in the European Union separately to have consistent comparisons across years.

3.2 Classification of Democracies

A meaningful legislature is possible only in the presence of democracy, and we use the *Polity2* measure from the Polity IV project (Marshall & Jaggers (2007)) to select out only democracies. We define all countries with *Polity2* scores greater than 5 as democracies.[12]

3.3 Electoral System

The 2006 version of the Database on Political Institutions (DPI) (Keefer (2007)) contains information on whether countries utilize proportional systems, pluralitarian/majoritarian systems, or a mix of both types of electoral systems, and we incorporate this information into our dataset.[13]

3.4 Characteristics Related to Electoral Systems

We incorporate a number of country-specific characteristics that could be related to a country's electoral system. Most of the country-specific variables source from Persson and Tabellini (2003). Their dataset provides information on 84 countries.

3.4.1 Legal Origins

Modern legal systems have their roots in a discrete number of systems around the world. Thus, we incorporate dummy variables indicating whether a country's legal system has origins in the United Kingdom, France, or former Soviet Union regimes. These definitions are based on Persson and Tabellini (2003).

3.4.2 Colonial History

A country's colonial history could be related to its electoral system, as well as to its trade policy. We incorporate dummy variables indicating whether a country has been a colony of the

[12] In reference to the *Polity* variable, which serves as the base for the *Polity2* variable, the database notes:
"The Polity scores can also be converted to regime categories: we recommend a three-part categorization of "autocracies" (-10 to -6), "anocracies" (-5 to +5 and the three special values: -66, -77, and -88), and "democracies" (+6 to +10);"

[13] Defined by the data as follows: "In "plurality" systems, legislators are elected using a winner-take-all / first past the post rule. "1" if this system is used, 0 if it isn't." (See Keefer (2007).) Note that we refer to the pluralitarian/majoritarian broad class of electoral systems using both the term "pluralitarian" and the term "majoritarian."

United Kingdom or of any other country. These definitions are based on Persson and Tabellini (2003).

3.4.3 Geographic Location

Geographic location could be related to trade policy and also to electoral system. We incorporate dummy variables denoting a country's continental location, as well as information on its distance from the equator. The continental data are based on the United Nations (United Nations Statistics Division (2006)), while the equatorial distance data are from Persson and Tabellini (2003).

3.4.4 Date of Adoption of Constitution

Drawing from Persson and Tabellini (2003), we include dummy variables indicating the year in which a country adopted its constitution.

3.4.5 GDP per Capita and Population

We use data on GDP per capita and population from the World Development Indicators (WDI) available on the World Bank's website.

3.5 Industry Characteristics

We also take into account a number of other factors that could affect the equilibrium tariff and that emerge from our theoretical treatment described above.

3.5.1 Import Demand Elasticity

The Trade, Production, and Protection database (Nicita & Olarreaga (2006)) provides import demand elasticity estimates and their standard errors for 28 3-digit ISIC Revision 2 manufacturing industries for 149 countries. The estimation methodology is described in detail in Lee, Nicita, & Olarreaga (2009).

3.5.2 Import Penetration Ratio

We calculate the import penetration ratio using production and trade data from the Trade, Production, and Protection (TPP) database compiled by Nicita & Olarreaga (2006). The database provides a broad set of production and trade data originating from different sources put

together in a common commodity classification – 3-digit ISIC Revision 2.[14] The source of the production data is the United Nations Industrial Development Organization (UNIDO) in which the country and year coverage is limited. As a result our sample becomes restricted to 14 years (1988 to 2001) for some of our estimates.[15]

3.5.3 Geographic Concentration

The geographic concentration variable originates from Busch and Reinhardt (2000). It measures the concentration of an industry's employment across geographical units. The geographical concentration is based on highly accurate estimates of county-industry (i.e. 4-digit US SIC classification) employment data for 1987 in the United States.[16]

The detailed data necessary to calculate geographic concentration are not available for many countries in our sample. Thus we proxy the geographic concentration of each industry with the U.S.'s calculated geographical concentration index. Although an imperfect measure, it can serve as a good proxy if the geographic concentration ranking of industries depends on underlying factors that are industry specific (i.e. economies of scale in production, use of immobile resources, the share of intermediates in costs, etc.) rather than country specific (i.e. physical geography, endowments of natural resources etc.). Sub-national studies of economic agglomeration for United States, France and United Kingdom find that there are cross-country similarities in the most and least localized industries (Overman et. al (2003)).

4 Summary Statistics

Table 1 provides summary statistics for the simple and trade-weighted average effectively applied tariff for countries that have mixed, majoritarian, and proportional systems. The statistics are for the overall dataset and for the sample of democratic countries. For all of the samples at the aggregate level, the simple and trade-weighted average tariff is lower in countries with proportional systems than in countries with pluralitarian systems. This aggregate finding is consistent with previous work (Evans (2009)).

[14] See table 3 for a list of 3-digit ISIC Revision 2 categories and their description.
[15] See also table 4 for country coverage in TPP database.
[16] The data are available online: http://userwww.service.emory.edu/~erein/data/ - geocon.

Figures 1 and 2 illustrate the gap in ad-valorem tariffs between pluralitarian and proportional systems at two different level of disaggregation: 3-digit ISIC and 6-digit HS. Figure 1 shows a positive tariff gap between pluralitarian and proportional systems at the 3-digit ISIC commodity level, and it also reveals substantial variation in the gap across industries. However, when we calculate the gap at the 6-digit HS commodity level, we observe that some 6-digit HS commodities show a negative tariff gap. To explore the pattern further, Table 4 reports a variety of descriptive statistics, including the mean, for the tariff gap for 3-digit ISIC categories. The commodity categories with a negative tariff gap are mostly in agricultural products but also in manufacturing industries such as food products, beverages, tobacco, printing and publishing, chemicals, plastic products, and non-ferrous metals. Of note, Evans and Obradovich (2009) also find lower levels of protection in majoritarian systems for agricultural products.

5 Empirical Strategy and Results

In implementing our data analysis, we follow previous studies that explore the relationship between protection and electoral system by controlling for country-level factors that could affect both the choice of political system and the level of protection. This issue is crucial since not doing so runs the risk of having a correlation between the error in the regression and the critical right-hand-side variable – a country's electoral system. Put another way, failure to account for these other country specific factors would leave us open to omitted variable bias.

Thus, to deal with this issue, we include in the regression a number of country-specific factors, other than electoral system, that could affect tariffs, and also use a two-stage least-squares/instrumental variables approach to deal with the fact that some of the potentially important country-level characteristics are not directly observable.[17] More specifically, we allow the choice of political system to be endogenous. As instruments, we follow previous empirical work and use country characteristics that are likely to have affected the choice of the political system but they are uncorrelated with trade policy – a set of dummy variables specifying the time period during which a country's constitution was adopted, a country's distance from the equator, and a country's population.[18]

[17] Such an approach has been suggested by Angrist-Krueger (2001) and has been used by Persson and Tabellini.

[18] The choice of instruments relied on previous empirical studies (Persson and Tabellini 2003a and Hall and Jones 1999).

In our first set of estimates, we examine the relationship between protection and political system by pooling across all 6-digit HS categories, using a framework that follows from the theoretical treatment above:

$$(7)\ \frac{\tau_{cht}}{1+\tau_{cht}} = \alpha + \alpha_t + \gamma_1 Pluralit_{ct} + \gamma_2 X_{ct} + \varepsilon_{cht},$$

where *c* is country, *h* is 6-digit HS commodity, *t* denotes year; and τ represents the simple average effectively applied tariff. *Pluralit* – a dummy variable indicating the political system – equals 1 if the country has a majoritarian system in year t and equals 0 if the country has a proportional system in year t. X denotes the country-specific factors described above – a set of dummy variables indicating whether a country has ever been a colony of the UK, Spain, or another country; dummy variables indicating whether a country has its legal origins in the UK, Soviet, or French systems; dummy variables for each continent; and GDP per capita.

Table 5 provides this first set of estimates. The columns show the results when we perform our analysis for all products (Column 1), and then separately for, respectively, agricultural products (Column 2), minerals (Column 3), and manufactures (Column 4). The aggregate estimates suggest a positive and significant relationship between protection and pluralitarian political systems ($\gamma_1 > 0$), consistent with previous studies. For agricultural products, the effect of the electoral system on ad-valorem tariffs is not statistically significant, while it remains positive and statistically significant for both minerals and manufactures, a finding also consistent with previous work.

In order to explore further the industry-level variation in the relationship between trade protection and electoral systems, we use equation (5) (replicated here) as the basis for our empirical specification.

$$\frac{t_g^{av}}{1+t_g^{av}} = \frac{\sum_{j\in k}\left[\alpha_{jg} - \beta_j\right]}{\sum_{j\in k}\beta_j}\frac{X_g}{e_g m_g}$$

Thus, the model suggests that protection is higher the lower is import penetration (m_g/X_g), the lower is the elasticity of import demand (e_g), and the greater is the ownership share in a given industry *g* of the districts represented by the party in power (α_{jg}) relative to the population share of those districts (β_{jg}). Incorporating these first two industry characteristics is quite straightforward, as we have data on import penetration ratios and elasticities. However, a way in

which to incorporate the ownership relative to population share is less obvious. We choose to use the variation in geographic concentration across industries as an indication of this element. To explain, to the extent that an industry is geographically concentrated, it is more likely that those associated with that industry are more closely located within a political district, thus suggesting that the ownership share within that industry is high relative to the population share. This would contrast with an industry which is very geographically diffuse, in which case we would expect that the ownership share relative to the population share within a particular district would also be lower.

Thus, to examine more closely the industry-level variation in the protectionist bias, we use a two-stage least-squares/instrumental variables approach as in our previous approach, but introduce additional industry-level variables for the manufacturing industries:[19]

$$(8)\quad \frac{\tau_{cht}}{1+\tau_{cht}} = \alpha + \alpha_g + \alpha_t + \gamma_1 Pluralit_{ct} + \gamma_2 X_{ct} + \gamma_3 IDE_{gc} + \gamma_4 Z_{cgt} + \gamma_5 Geocon_s + \varepsilon_{cht}$$

where c is country, h is 6-digit HS commodity, g is 3-digit ISIC Rev. 2 industry, s is 4-digit US SIC industry, t denotes year; and τ represents the simple average effectively applied tariff. As above, $Pluralit$ is a dummy variable indicating the political system (equals 1 if the country has a majoritarian system in year t and equals 0 if the country has a proportional system in year t). IDE_{gc} denotes import demand elasticity, which varies by country and 3-digit ISIC industry; $Geocon$ is geographic concentration of industries at 4-digit US SIC industry level; Z is the ratio of 3-digit ISIC import value and output (i.e. import penetration ratio); and X is the set of country-specific factors.

Note that, according to our theoretical model, both the import demand elasticity and import penetration ratio are a function of price. Empirically, the import demand elasticity could also be measured error. We deal with this issue by bringing the IDE on the left-hand side of equation (8). We are less worried that the import penetration ratio is endogenous because, in our specification, it is measured at 3-digit ISIC level and, thus, it is less likely to be determined by each 6-digit HS ad-valorem tariff.

[19] We employ the same instruments as in the previous regression. Note that the industry-specific variables cover only manufacturing industries (3 digit ISIC: 311-390), thus we only consider manufacturing in this more detailed analysis.

Table 6 reports the estimates both for the specification with IDE on the right-hand side and with IDE on the left-hand side. In all specifications, estimates on the political system variable suggest that majoritarian systems have higher protection than proportional systems. According to our theoretical model, we expect γ_3 (import demand elasticity) < 0 , γ_4 (import penetration ratio) < 0, and γ_5 (geographic concentration) >0, for reasons described above. The estimates of γ_3 , γ_4 , and γ_5 are significant and indeed their signs are consistent with our theoretical predictions. Note that introducing the industry-level import penetration and geographic concentration variables severely trims the set of countries and years in our sample, but it does not alter the statistical significance of our estimates. Bringing IDE on the left-hand side, while changing slightly the magnitudes of the coefficients, leaves the economic implications of our analysis unchanged.

Next, we further augment our empirical model by adding interaction terms between the political system dummy variable and the industry dummies (i.e. 3-digit ISIC dummies). To formalize, we estimate the following specification using our two-stage least-squares/instrumental variables approach:

$$(9)\ \frac{\tau_{cht}}{1+\tau_{cht}} * IDE_{gc} = \alpha + \alpha_g + \alpha_t + \gamma_1 Pluralit_{ct} * I_g + \gamma_2 X_{ct} + \gamma_4 Geocon_s + \gamma_5 Z_{cgt} + \varepsilon_{cht}$$

This specification allows us to estimate the relationship between electoral systems and trade policy at the 3-digit ISIC industry level. The industry-level estimates can reveal whether the industry-level variation in the tariff gap, observed by eyeballing the data, translates into variation of the magnitude of the protectionist bias across industries. Note that, in order to include all the industry dummies, we drop the main effect of the political system dummy. This approach allows us to uncover whether the estimated effect of electoral system on tariffs varies at the industry level, as well as the relative magnitudes of these effects.

Table 7 reports the estimates. The estimates of the effects of the import penetration ratio and geographic concentration on protection are significant and their signs match our theoretical predictions. The industry-specific protectionist biases are significantly positive for 11 industries, significantly negative for 14 industries, and insignificant for the remaining 3 industries. The average protectionist bias across all 28 industries is slightly higher than the estimated aggregate protectionist bias reported in the last column of table 6 (0.0074 compared to 0.0051). The standard deviation of 0.05 reveals a substantial variation across 3-digit ISIC industries.

Furthermore, the mean effect for industries showing a positive (negative) relationship between electoral systems and protection is 0.04 (-0.02) with a standard deviation of 0.06 (0.007). The industries with a negative significant protectionist bias are food products, footwear, wood, paper, chemicals, pottery, metals, machinery except electrical, transport equipment, and professional and scientific equipment. Some of these industries have 6-digit HS commodities with negative tariff gap while for others the inclusion of the industry-level variables explained the higher tariff level for countries with pluralitarian systems. The results emphasize the importance of an industry-level analysis when investigating the relationship between political system and trade policy.

We also estimate (9) with IDE on the right-hand side (Table 8). The industry-specific variables such as import demand elasticity, import penetration ratio, and geographic concentration have significant coefficients with signs consistent with our theoretical model. There are some minor differences in the magnitude of the protectionist bias estimates compared to the ones reported above. Also, 6 industries differ in the sign of the protectionist bias. However, the estimates on both specifications show that the protectionist bias varies substantially across industries.

6 Alternative Empirical Strategy

For our final analysis, we explore the implications of equation (5) for explaining the industry variation of the effect of the electoral system on a country's trade policy. This approach employs the interactive specification dictated by the model. We estimate the following specification using a two-stage least-squares/instrumental variables approach:

$$(10)\quad \frac{t_{cgt}}{1+t_{cgt}} IDE_{cg} = \alpha + \alpha_g + \alpha_t + \gamma_1 Pluralit_{ct} + \gamma_2 Geocon_s + \gamma_3 Z_{cgt} + \gamma_4 Pluralit_{ct} * Geocon_g + \\ + \gamma_5 Pluralit_{ct} * Z_{cgt} + \gamma_6 X_{ct} + \varepsilon_{cgt}$$

The model's predictions are as follows: (i) trade protection should be higher in majoritarian systems ($\gamma_1 + \gamma_4 \overline{Geocon_s} + \gamma_5 \overline{Z_{cgt}} > 0$)[20]; (ii) within the subset of countries with majoritarian systems, trade protection should be higher in industries with a lower import demand elasticity, a lower import penetration ratio (defined as imports divided by output) ($\gamma_3 + \gamma_5 \overline{Pluralit = 1} < 0$)

[20] Median import penetration ratio = 0.61; median geographic concentration is 0.45.

and a higher geographic concentration ($\gamma_2 + \gamma_4 \overline{Pluralit = 1} > 0$); and (iii) geographic concentration should not be a determinant of protection in countries with proportional systems ($\gamma_2 + \gamma_4 \overline{Pluralit = 0} = 0$)

All estimates have signs consistent with the model. Countries with majoritarian systems have a protectionist bias about two times and a half higher than the bias estimated using a specification without interaction terms. Also, the protectionist bias is increasing in geographic concentration and decreasing in the import penetration ratio. In countries with majoritarian systems, geographically concentrated industries have higher protection, while in countries with proportional systems the level of protection in these industries is not significantly different than the level of protection in geographically dispersed industries. Furthermore, our estimates suggest that, within the subset of countries with proportional systems, trade protection is higher in industries with a higher import penetration ratio. To sum up, this alternative approach suggests that both import penetration ratio and geographic concentration can explain the variation in protectionist bias at the industry level.

7 Conclusions

As noted in the introduction, trade protection potentially provides a very attractive way for a politician to benefit local constituents – the local industry profits from higher prices and, in most cases, the cost to consumers there are comparatively small. Previous empirical work has shown that broad levels of protection do indeed demonstrate a pattern consistent with the notion that trade policy is being used in certain electoral systems, at least in part, as a way to direct benefits to particular constituencies, but comparatively less work has explored whether or not industry-level variation in the electoral system "gap" provides lessons about the role of protection as a means of benefitting local constituents.

Using a dataset composed of 6-digit HS-level observations for a cross-section of developed and developing countries between 1988 and 2006, we find that protection is higher in majoritarian systems than in proportional ones for some products, while it is lower in majoritarian systems for other products. This result holds after controlling for a number of possible explanatory factors, including historical country-level characteristics, which could affect political systems. Within manufacturing, we also examine the explanatory power of several underlying factors that may be related to the attractiveness of product-level protection as a means

of directing benefits to local constituents. We find that, within majoritarian systems, greater geographic concentration and lower import penetration ratios are linked to higher average tariffs – a finding consistent with the theoretical model and suggesting that protection may indeed be directed in ways most likely to benefit a politician's local constituents.

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Table 1: Effectively Applied Tariff

Summary Statistics

System	Mean	SD	Min	Max	#Countries
Simple Average Effectively Applied Tariff					
Overall					
Proportional	5.46	8.28	0	555	35
Plurality	11.03	17.49	0	450	27
Mixed	7.33	12.94	0	871.4	22
Total	7.39	12.70	0	871.4	81
Polity2>5[1]					
Proportional	5.34	8.25	0	555	35
Plurality	10.91	17.98	0	450	23
Mixed	7.26	12.99	0	871.4	21
Total	7.22	12.77	0	871.4	77
Weighted-Average Effectively Applied Tariff[2]					
Overall					
Proportional	5.50	7.72	0	555	35
Plurality	10.39	15.90	0	450	27
Mixed	7.12	11.98	0	871.4	22
Total	7.13	11.56	0	871.4	81
Polity2>5					
Proportional	5.39	7.69	0	555	35
Plurality	10.25	16.27	0	450	23
Mixed	7.04	12.02	0	871.4	21
Total	6.98	11.60	0	871.4	77

Notes:

1. All tariff rates are ad-valorem.
2. All statistics are calculated across 6-digit HS commodities, year and country for each political system type.
3. The number of countries across categories do not sum to the number of countries for the total because some countries appear in more than one category, as when a country changes electoral systems over time.

Data Source: UNCTAD's TRAINS (1988-2006)

[1] Polity2>5 restricts countries in the sample to democracies.
[2] Weights are the trade values at national tariff line.

Table 2: ISIC Rev. 2 Description

3-digit ISIC	ISIC Description
111	Agriculture and livestock production
113	Hunting, trapping and game propagation
121	Forestry
122	Logging
130	Fishing
210	Coal Mining
220	Crude Petroleum and Natural Gas Production
230	Metal Ore Mining
290	Other Mining
311	Food products
313	Beverages
314	Tobacco
321	Textiles
322	Wearing apparel except footwear
323	Leather products
324	Footwear except rubber or plastic
331	Wood products except furniture
332	Furniture except metal
341	Paper and products
342	Printing and publishing
351	Industrial chemicals
352	Other chemicals
353	Petroleum refineries
354	Miscellaneous petroleum and coal products
355	Rubber products
356	Plastic products
361	Pottery china earthenware
362	Glass and products
369	Other non-metallic mineral products
371	Iron and steel
372	Non-ferrous metals
381	Fabricated metal products
382	Machinery except electrical
383	Machinery electric
384	Transport equipment
385	Professional and scientific equipment
390	Other manufactured products

Table 3: Country Coverage

Country	Political System	Country Controls	Import Demand Elasticity	Other Industry Controls
Total		58	57	39
Prop.		35	34	24
Pluralit.		23	23	15
ARG	0			
AUT	0			
BEL	0			x
BGD	1			
BGR	0			
BHS	1			x
BLZ	1			x
BRB	1			x
BWA	1			x
CAN	1			
CHL	1			
COL	0			
CRI	0			
CYP	0			x
DNK	0			
ECU	0		X	x
EST	0			x
FIN	0			
FRA	1			
GBR	1			
IRL	0			
ISL	0			
ISR	0			
ITA	0			
JAM	1			x
LKA	0			
LUX	0			x
LVA	0			
MLT	0			
MUS	1			x
MWI	1			
MYS	1			
NAM	0			x
NIC	0			x
NLD	0			
NOR	0			
NPL	1			
NZL	1			

Table 3: Country Coverage – Cont'd

Country	Political System	Country Controls	Import Demand Elasticity	Other Industry Controls
PER	0			x
PHL	1			
PNG	1			X
POL	0			
PRT	0			
PRY	0			X
ROM	0			
SGP	1			
SLV	0			X
SVK	0			X
SWE	0			
THA	1			
TTO	1			
TUR	0			
URY	0			
USA	1			
VEN	0			
ZAF	0			
ZMB	1			X
ZWE	1			X

Notes:

1. "0" indicates a proportional system and "1" indicates a plurality system.
2. "x" indicates the country is missing from the sample.

Table 4: The Gap in Mean Tariff between Pluralitarian and Proportional Systems for each 6-digit HS category

Summary Statistics by 3-digit ISIC categories					
3-digit ISIC	***Mean***	***Median***	***Minimum***	***Maximum***	***Standard Dev.***
111	5.96	5.33	-30.59	15.61	4.84
113	5.20	4.70	1.42	8.92	1.62
121	2.96	2.63	-1.51	6.07	1.77
122	6.81	5.79	2.61	11.17	2.95
130	7.63	7.63	3.13	11.75	2.14
210	3.45	3.40	3.30	3.73	0.16
220	2.96	3.04	2.38	3.29	0.30
230	2.31	2.25	2.02	3.83	0.35
290	4.08	3.60	1.27	10.23	1.63
311	4.35	3.81	-14.50	21.44	4.39
312	5.23	5.53	-5.40	13.97	4.42
313	7.45	7.16	-0.76	14.32	4.76
314	4.08	4.66	-8.99	14.95	8.46
321	6.17	6.44	1.03	16.69	2.42
322	10.76	10.93	2.56	13.23	1.39
323	5.13	5.15	0.77	11.59	3.45
324	9.83	10.44	1.78	15.21	2.63
331	7.53	7.28	3.11	16.55	3.18
332	11.29	11.38	9.95	12.29	0.63
341	4.56	3.67	0.69	10.34	2.17
342	5.12	4.75	-1.28	9.57	3.57
351	2.96	2.83	-1.45	12.28	1.48
352	4.88	3.80	-0.34	13.52	3.11
353	5.30	4.93	3.40	8.39	1.43
354	4.70	3.83	2.81	8.63	2.31
355	5.45	4.86	2.06	11.97	2.19
356	8.15	8.36	-0.32	13.55	2.13
361	6.91	8.70	-0.23	10.00	3.31
362	6.39	6.85	0.83	10.63	2.55
369	7.14	6.70	3.60	12.26	2.26
371	4.28	4.24	0.21	8.96	1.89
372	3.24	3.04	-0.28	8.72	1.33
381	6.02	6.07	0.18	15.91	2.59
382	4.18	3.30	0.27	17.07	2.60
383	6.00	5.10	0.62	19.01	3.08
384	5.37	4.72	0.14	17.48	3.41
385	5.45	4.20	-0.03	13.60	3.06
390	8.08	7.70	2.21	19.27	3.08

Table 5: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6-digit HS

Tariff/ (1+Tariff)	***All***		***Agriculture***		***Minerals***		***Manufactures***		***Manufactures – Restricted Sample***[1]	
Pluralit	0.0734***	0.0095***	0.0719***	0.0013	0.0468***	0.0116***	0.0742***	0.0101***	0.0605***	0.0052***
	(0.0002)	(0.0002)	(0.0009)	(0.0009)	(0.0009)	(0.0008)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
colUK		-0.0085***		-0.0081***		0.0011		-0.0089***		-0.0314***
		(0.0002)		(0.0009)		(0.0009)		(0.0002)		(0.0004)
colESP		-0.0107***		-0.0195***		0.0018		-0.0102***		0.0040***
		(0.0004)		(0.0016)		(0.0016)		(0.0004)		(0.0008)
colOTHER		0.0076***		0.0100***		0.0067***		0.0073***		0.0021***
		(0.0002)		(0.0007)		(0.0007)		(0.0002)		(0.0004)
legorUK		0.0025***		0.0004		-0.0044***		0.0029***		0.0022***
		(0.0002)		(0.0009)		(0.0007)		(0.0002)		(0.0004)
legorSOV		0.0182***		0.0104***		0.0016		0.0193***		0.0067***
		(0.0003)		(0.0016)		(0.0012)		(0.0004)		(0.0008)
legorFRA		-0.0066***		-0.0032***		-0.0073***		-0.0068***		-0.0212***
		(0.0001)		(0.0005)		(0.0003)		(0.0001)		(0.0003)
GDP/cap		-0.0000***		-0.0000***		-0.0000***		-0.0000***		-0.0000***
		(0.0000)		(0.0000)		(0.0000)		(0.0000)		(0.0000)
R-squared	0.05	0.27	0.06	0.22	0.09	0.29	0.05	0.28	0.04	0.36
Obs.	1,995,531	1,990,347	147,134	146,745	44,749	44,639	1,803,648	1,798,963	750,091	750,091

Notes:

1. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
2. The regression includes year dummies (1988-2006). ColUK, ColESP, and ColOTHER are dummy variables indicating whether a country has ever been a colony of the UK, Spain, or another country, respectively. LegorUK, legorSOV, and legorFRA are dummy variables indicating whether a country has its legal origins in the UK, Soviet, or French systems, respectively. Dummy variables for each continent are also included.

[1] We restrict the manufacturing sample to countries for which output data is available. See table 4 for country coverage with other industry controls.

Table 6: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6–digit HS with Industry Controls – Manufacturing

LHS variable	Tariff / (1+Tariff)			Tariff / (1+Tariff)*IDE		
Pluralit	0.0099***	0.0053***	0.0052***	0.0129***	0.0051***	0.0051***
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
colUK	-0.0089***	-0.0313***	-0.0313***	-0.0139***	-0.0365***	-0.0365***
	(0.0002)	(0.0004)	(0.0004)	(0.0003)	(0.0005)	(0.0005)
colESP	-0.0097***	0.0037***	0.0037***	-0.0190***	-0.0019*	-0.0019*
	(0.0004)	(0.0007)	(0.0007)	(0.0005)	(0.0009)	(0.0009)
colOTHER	0.0069***	0.0020***	0.0019***	0.0095***	0.0037***	0.0036***
	(0.0002)	(0.0004)	(0.0004)	(0.0002)	(0.0005)	(0.0005)
legoUK	0.0029***	0.0025***	0.0026***	0.0037***	0.0058***	0.0058***
	(0.0002)	(0.0004)	(0.0004)	(0.0002)	(0.0004)	(0.0004)
legorSOV	0.0195***	0.0074***	0.0074***	0.0180***	0.0085***	0.0086***
	(0.0003)	(0.0007)	(0.0007)	(0.0004)	(0.0009)	(0.0009)
legorFRA	-0.0067***	-0.0205***	-0.0205***	-0.0079***	-0.0198***	-0.0198***
	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0003)	(0.0003)
GDP/cap	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
IMP/OUT		-0.0002***	-0.0002***		-0.0001***	-0.0001***
		(0.0000)	(0.0000)		(0.0000)	(0.0000)
GEOCON			0.0057***			0.0097***
			(0.0008)			(0.0009)
IDE	0.0008	-0.0060***	-0.0062***			
	(0.0006)	(0.0007)	(0.0007)			
R-squared	0.37	0.45	0.45	0.33	0.42	0.43
Obs.	1,755,749	750,091	735,043	1,755,749	750,091	735,043

Notes:
1. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)
2. The regression includes 3-digit ISIC and year dummies (1988-2001). Dummy variables for each continent are also included.
3. IDE is the absolute value of the estimated 3-digit ISIC import demand elasticity. The IDE estimates vary across 3-digit ISIC industries and countries.
4. IMP/OUT is the ratio of imports to output.
5. GEOCON is industry's geographic concentration. The ratios vary by 4-digit US SIC industries.

Table 7: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6-digit HS

LHS Variable	Tariff/(1+Tariff)*IDE		
Isic311	0.0046***	-0.0293***	-0.0316***
	(0.0010)	(0.0015)	(0.0015)
Isic313	0.4719***	0.2217***	0.2214***
	(0.0351)	(0.0247)	(0.0247)
Isic314	-0.0671***	-0.1332***	-0.0567
	(0.0179)	(0.0286)	(0.0382)
Isic321	0.0810***	0.0925***	0.0941***
	(0.0007)	(0.0011)	(0.0011)
Isic322	0.0347***	0.0063***	0.0063***
	(0.0008)	(0.0012)	(0.0012)
Isic323	0.0380***	0.0324***	0.0323***
	(0.0022)	(0.0032)	(0.0032)
Isic324	-0.0114***	-0.0312***	-0.0313***
	(0.0022)	(0.0032)	(0.0032)
Isic331	-0.0054***	-0.0184***	-0.0185***
	(0.0012)	(0.0015)	(0.0015)
Isic332	0.0768***	0.0283***	0.0282***
	(0.0030)	(0.0038)	(0.0038)
Isic341	0.0208***	-0.0059**	-0.0050**
	(0.0015)	(0.0019)	(0.0019)
Isic342	0.0350***	0.0122*	0.0139*
	(0.0034)	(0.0056)	(0.0057)
Isic351	-0.0362***	-0.0272***	-0.0273***
	(0.0004)	(0.0006)	(0.0006)
Isic352	-0.0076***	-0.0148***	-0.0149***
	(0.0008)	(0.0011)	(0.0011)
Isic353	-0.0244***	-0.0148***	-0.0141***
	(0.0016)	(0.0024)	(0.0024)
Isic354	-0.0142***	-0.0076	-0.0077
	(0.0035)	(0.0068)	(0.0069)
Isic355	0.0236***	0.0051*	0.0059**
	(0.0016)	(0.0021)	(0.0021)
Isic356	0.0357***	0.0063*	0.0061*
	(0.0018)	(0.0025)	(0.0025)
Isic361	-0.0068**	-0.0239***	-0.0240***
	(0.0025)	(0.0034)	(0.0034)
Isic362	0.0196***	0.0101***	0.0100***
	(0.0015)	(0.0021)	(0.0021)
Isic369	-0.0016	-0.0180***	-0.0181***
	(0.0012)	(0.0017)	(0.0017)
Isic371	-0.0130***	-0.0137***	-0.0137***
	(0.0006)	(0.0008)	(0.0008)

Table 7: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6-digit HS – cont'd

LHS Variable:	Tariff/(1+Tariff)*IDE		
Isic372	-0.0258***	-0.0240***	-0.0230***
	(0.0008)	(0.0010)	(0.0010)
Isic381	0.0138***	0.0001	-0.0000
	(0.0007)	(0.0009)	(0.0009)
Isic382	-0.0204***	-0.0170***	-0.0170***
	(0.0005)	(0.0006)	(0.0006)
Isic383	0.0814***	0.0368***	0.0367***
	(0.0018)	(0.0021)	(0.0021)
Isic384	0.0013	-0.0176***	-0.0174***
	(0.0010)	(0.0012)	(0.0012)
Isic385	-0.0092***	-0.0132***	-0.0132***
	(0.0007)	(0.0010)	(0.0010)
Isic390	0.0459***	0.0201***	0.0203***
	(0.0011)	(0.0016)	(0.0016)
colUK	-0.0140***	-0.0363***	-0.0363***
	(0.0003)	(0.0005)	(0.0005)
colESP	-0.0188***	-0.0014	-0.0015
	(0.0005)	(0.0009)	(0.0009)
colOTH	0.0093***	0.0044***	0.0043***
	(0.0002)	(0.0005)	(0.0005)
legoUK	0.0035***	0.0063***	0.0062***
	(0.0002)	(0.0004)	(0.0004)
legorSOV	0.0184***	0.0117***	0.0117***
	(0.0004)	(0.0008)	(0.0009)
legorFRA	-0.0081***	-0.0192***	-0.0193***
	(0.0001)	(0.0003)	(0.0003)
GDP/cap	-0.0000***	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)
IMP/OUT		-0.0002***	-0.0002***
		(0.0000)	(0.0000)
GEOCON			0.0103***
			(0.0009)
R-squared	0.30	0.40	0.40
Obs.	1,755,749	750,091	735,043

Notes:
1. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)
2. The 3-digit ISIC estimates are the estimates of interaction terms with plurality. The regression includes 3-digit ISIC and year dummies (1988-2001). Dummy variables for each continent are also included.
3. IDE is the absolute value of estimated 3-digit ISIC import demand elasticity. The IDE estimates vary across 3-digit ISIC industries and countries.
4. IMP/OUT is the ratio of imports to output.
5. GEOCON is industry's geographic concentration ratios. The ratios vary by 4-digit US SIC industries.

Table 8: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6-digit HS

LHS variable	Tariff/(1+Tariff)			
Isic311	0.0021*	-0.0268***	-0.0270***	-0.0294***
	(0.0009)	(0.0013)	(0.0013)	(0.0014)
Isic313	0.0548***	0.0288***	0.0316***	0.0312***
	(0.0046)	(0.0058)	(0.0057)	(0.0057)
Isic314	-0.0530**	-0.1177***	-0.1195***	-0.0424
	(0.0188)	(0.0289)	(0.0289)	(0.0387)
Isic321	0.0332***	0.0330***	0.0358***	0.0361***
	(0.0006)	(0.0008)	(0.0010)	(0.0010)
Isic322	0.0669***	0.0390***	0.0359***	0.0358***
	(0.0009)	(0.0014)	(0.0014)	(0.0014)
Isic323	0.0367***	0.0365***	0.0353***	0.0351***
	(0.0019)	(0.0026)	(0.0026)	(0.0026)
Isic324	0.0691***	0.0240***	0.0212***	0.0210***
	(0.0036)	(0.0039)	(0.0039)	(0.0039)
Isic331	0.0338***	0.0139***	0.0116***	0.0114***
	(0.0017)	(0.0017)	(0.0018)	(0.0018)
Isic332	0.0870***	0.0432***	0.0416***	0.0414***
	(0.0033)	(0.0041)	(0.0041)	(0.0041)
Isic341	0.0051***	-0.0109***	-0.0101***	-0.0096***
	(0.0011)	(0.0013)	(0.0013)	(0.0014)
Isic342	0.0114***	-0.0069*	-0.0059	-0.0049
	(0.0022)	(0.0034)	(0.0034)	(0.0035)
Isic351	-0.0282***	-0.0166***	-0.0183***	-0.0185***
	(0.0004)	(0.0005)	(0.0005)	(0.0005)
Isic352	0.0006	-0.0027*	-0.0043***	-0.0045***
	(0.0008)	(0.0011)	(0.0011)	(0.0011)
Isic353	-0.0001	0.0069	0.0094*	0.0103**
	(0.0019)	(0.0036)	(0.0037)	(0.0038)
Isic354	-0.0060	0.0020	0.0015	0.0013
	(0.0035)	(0.0066)	(0.0067)	(0.0067)
Isic355	0.0253***	0.0135***	0.0119***	0.0126***
	(0.0015)	(0.0019)	(0.0019)	(0.0020)
Isic356	0.0496***	0.0240***	0.0224***	0.0221***
	(0.0020)	(0.0027)	(0.0027)	(0.0027)
Isic361	0.0333***	0.0132***	0.0111**	0.0109**
	(0.0035)	(0.0038)	(0.0039)	(0.0039)
Isic362	0.0263***	0.0207***	0.0193***	0.0191***
	(0.0015)	(0.0020)	(0.0020)	(0.0020)
Isic369	0.0335***	0.0203***	0.0168***	0.0165***
	(0.0014)	(0.0019)	(0.0020)	(0.0020)
Isic371	-0.0052***	-0.0018*	-0.0034***	-0.0036***
	(0.0006)	(0.0007)	(0.0007)	(0.0007)

Table 8: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6-digit HS – cont'd

LHS variable	Tariff/(1+Tariff)			
Isic372	-0.0178***	-0.0128***	-0.0135***	-0.0127***
	(0.0008)	(0.0009)	(0.0009)	(0.0009)
Isic381	0.0273***	0.0172***	0.0155***	0.0153***
	(0.0007)	(0.0010)	(0.0010)	(0.0010)
Isic382	-0.0112***	-0.0050***	-0.0052***	-0.0053***
	(0.0004)	(0.0005)	(0.0006)	(0.0006)
Isic383	0.0137***	0.0046***	0.0049***	0.0047***
	(0.0007)	(0.0009)	(0.0008)	(0.0008)
Isic384	0.0079***	-0.0049***	-0.0068***	-0.0067***
	(0.0010)	(0.0012)	(0.0012)	(0.0012)
Isic385	0.0023**	0.0023*	-0.0004	-0.0006
	(0.0008)	(0.0010)	(0.0010)	(0.0010)
Isic390	0.0453***	0.0254***	0.0234***	0.0235***
	(0.0010)	(0.0014)	(0.0014)	(0.0014)
colUK	-0.0096***	-0.0310***	-0.0317***	-0.0317***
	(0.0002)	(0.0004)	(0.0004)	(0.0004)
colESP	-0.0097***	0.0044***	0.0042***	0.0042***
	(0.0004)	(0.0007)	(0.0007)	(0.0007)
colOTH	0.0069***	0.0021***	0.0022***	0.0021***
	(0.0002)	(0.0004)	(0.0004)	(0.0004)
legoUK	0.0034***	0.0023***	0.0032***	0.0033***
	(0.0002)	(0.0004)	(0.0004)	(0.0004)
legorSOV	0.0196***	0.0082***	0.0088***	0.0089***
	(0.0003)	(0.0007)	(0.0007)	(0.0007)
legorFRA	-0.0066***	-0.0205***	-0.0200***	-0.0200***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)
GDP/cap	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
IDE			-0.0096***	-0.0097***
			(0.0009)	(0.0009)
IMP/OUT			-0.0001**	-0.0001**
			(0.0000)	(0.0000)
GEOCON				0.0062***
				(0.0008)
R-squared	0.36	0.45	0.45	0.45
Obs.	1,798,963	750,091	750,091	735,043

Notes:
1. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)
2. The 3-digit ISIC estimates are the estimates of interaction terms with plurality. The regression includes 3-digit ISIC and year dummies (1988-2001). Dummy variables for each continent are also included.
3. IDE is the absolute value of estimated 3-digit ISIC import demand elasticity. The IDE estimates vary across 3-digit ISIC industries and countries.
4. IMP/OUT is the ratio of imports to output.
5. GEOCON is industry's geographic concentration ratios. The ratios vary by 4-digit US SIC industries

Table 9: Simple Average Effectively Applied Tariff – Pooled 2SLS across 6–digit HS– Manufacturing

LHS variable	**Tariff/(1+Tariff)*IDE**
Pluralit	-0.0051
	(0.0026)
colUK	-0.0354***
	(0.0005)
colESP	-0.0029***
	(0.0009)
colOTHER	0.0040***
	(0.0005)
legoUK	0.0037***
	(0.0005)
legorSOV	0.0070***
	(0.0009)
legorFRA	-0.0208***
	(0.0003)
GDP/cap	-0.0000***
	(0.0000)
IMP/OUT	0.0001***
	(0.0000)
GEOCON	-0.0008
	(0.0020)
IMP/OUT*Pluralit	-0.0007***
	(0.0001)
GEOCON*Pluralit	0.0275***
	(0.0053)
R-squared	0.43
Obs.	735,043

Notes:
1. Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)
2. The regression includes 3-digit ISIC and year dummies (1988-2001). Dummy variables for each continent are also included.
3. IDE is the absolute value of the estimated 3-digit ISIC import demand elasticity. The IDE estimates vary across 3-digit ISIC industries and countries.
4. IMP/OUT is the ratio of imports to output.
5. GEOCON is industry's geographic concentration. The ratios vary by 4-digit US SIC industries

Figure 1a:

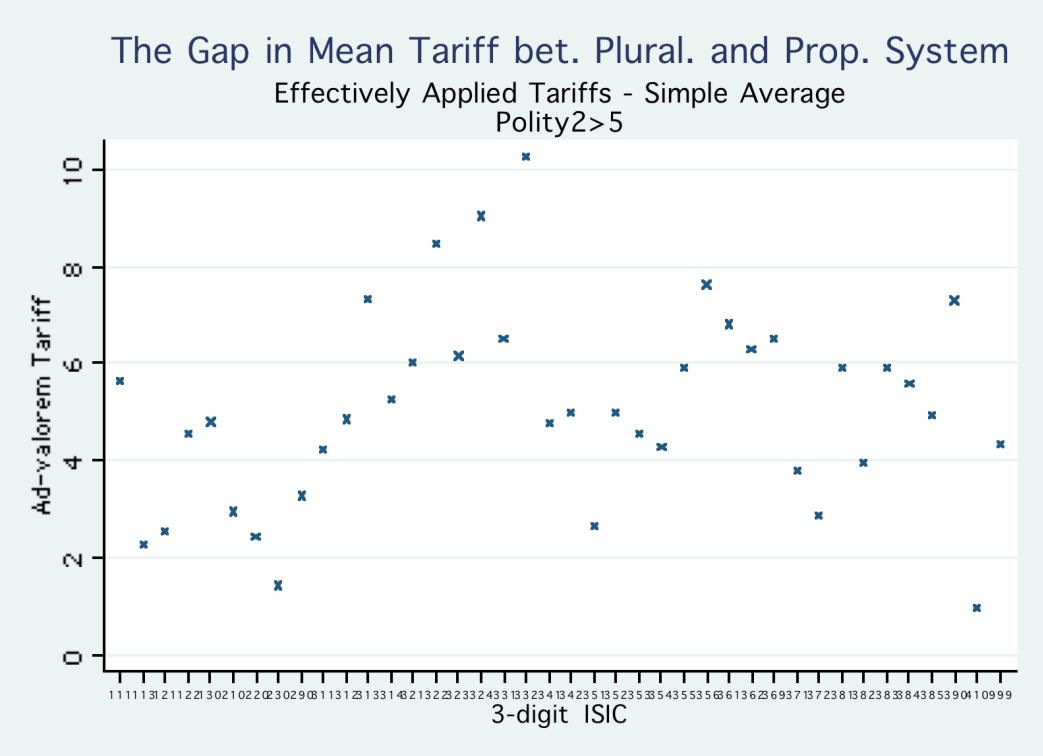

Figure 1b:

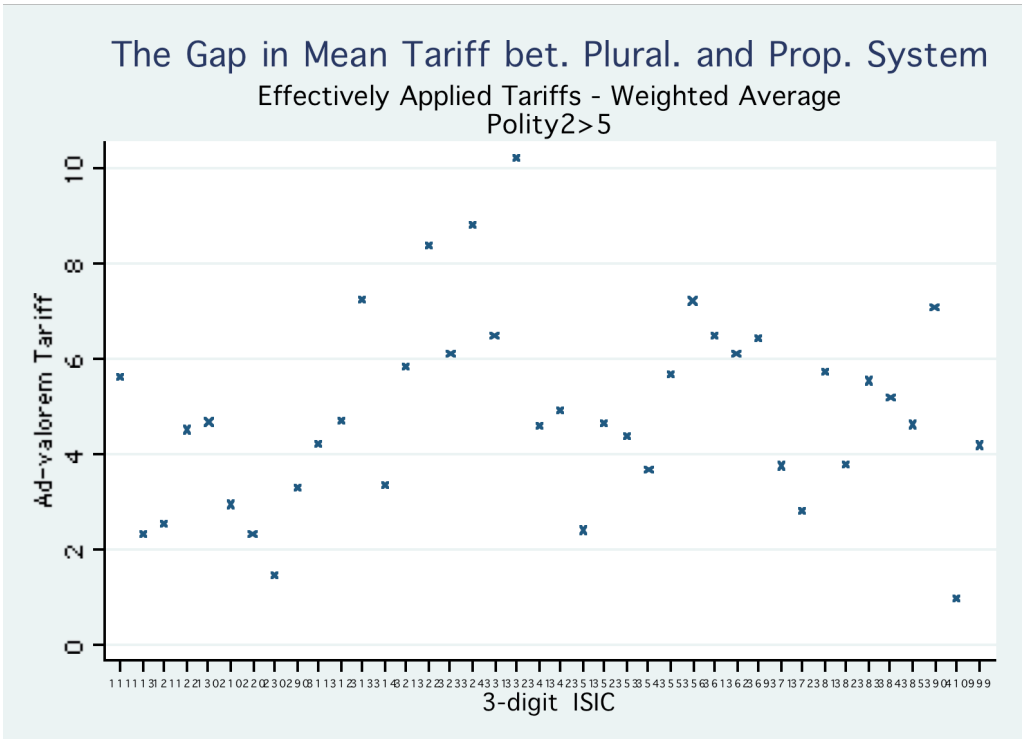

Figure 2a:

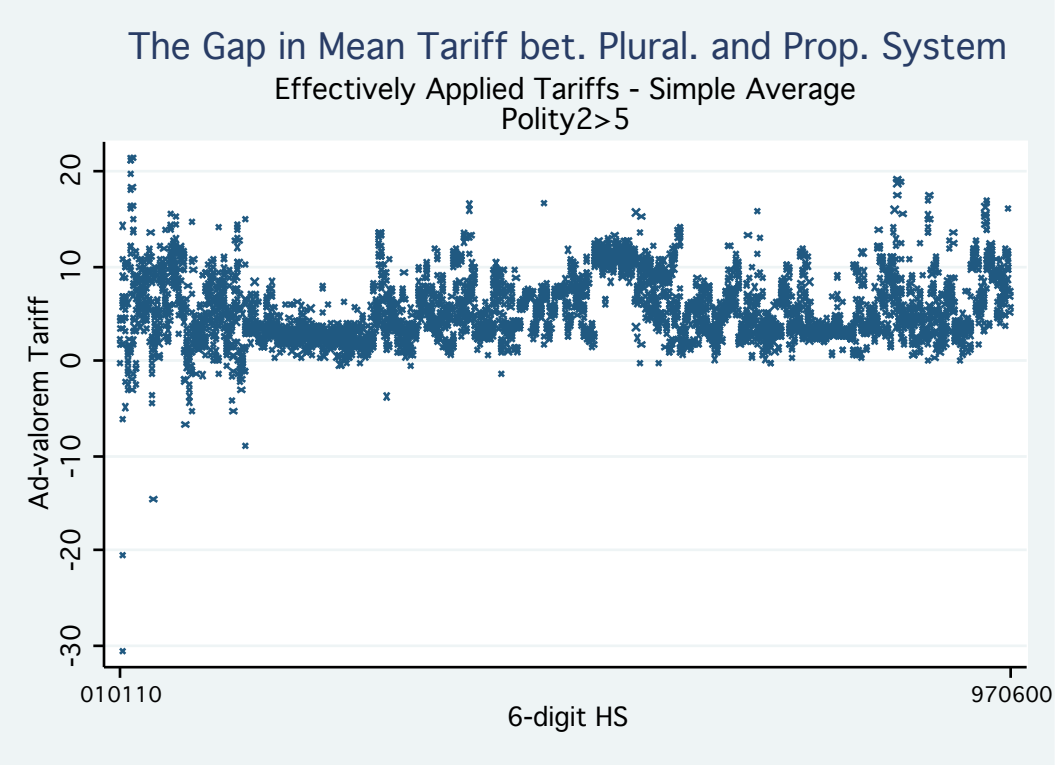

Figure 2b: