Oranges and Steel - A Swing-State Theory of Trade Protection in the Electoral College*

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Abstract

This paper explores how the distribution of industry across political districts influences trade policy choice in the presence of electoral incentives. We develop a political agency model, with a continuum of political districts and political term limits, in which incumbent politicians may implement trade policy strategically to attract voters in swing states. The relative size of industry across political states is shown to interact with industry location, affecting trade policy choice. Our main theoretical finding is that industries with a strong presence in political states that are both swing and important for the election outcome are more likely to be protected. Futhermore, downstream industries are more likely to be protected than upstream industries due to the fact that consumers of final goods tend to me more geographically dispersed than factor owners employed in a particular industry. The empirical analysis using US tariff and NTB data lends support to the theory by showing that a measure of swingness and decisiveness explains a larger percentage of variation in protection levels across US states.

Key Words: Political Economy, Elections, Electoral College, Swing States, Trade Policy

JEL Classification Numbers: D72, D78, F13, R12

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1 Introduction

Political motivations are often thought to underlie government decisions to protect certain industries, especially in the US Electoral College system where victory in swing states is crucial for electoral success. This paper examines how the geographical location of industries and voters influence trade policy choice under the electoral college system. It thus considers the importance of electoral incentives in terms of voters' preferences. We focus on the US Electoral College system where victory in swing states is crucial for a successful election outcome. According to this view of policy choice, electoral incentives drive trade policy decisions in favour of industries that provide employment in pivotal states.With votes attached to political districts, the distribution of voters employed in particular sectors can influences trade policy choice.

Newspaper accounts of the politics behind the recent United States - European Union steel tariffs dispute support this view of trade policy determination. For example, the Guardian (November 17th, 2003) claims "that steel tariffs were introduced for short-term political advantage ...... in order to gain votes in key states like West Virginia, Ohio, Pennsylvania and Michigan where the steel industry is a major employer". With reference to the EU response to the imposition of the steel tariffs, the International Herald Tribune (November 4th, 2003) argues that "the European Union's sanctions are targeted at American products in ways intended to maximise political pain for Bush's Republican Party: Harley Davidson motorcycles manufactured in Wisconsin, citrus products from Florida and textiles from the Southeast". Florida is the state in which Mr. Bush and Mr. Gore virtually tied in the 2000 presidential election, while Mr Gore won the state of Wisconsin by a tiny margin. The EU list of sanctions also targets chemicals that are mainly produced in Tennessee, where Mr. Bush scored a narrow victory in 2000.

It appears that politicians on both sides of the Atlantic are playing a political game in which tariffs and sanctions are targeted at sectors produced mainly in important swing states with the aim of swinging voters towards one political platform or another. Understanding how geography and votes combine in determining trade policy necessitates a political economy framework. The importance of electoral competition in the determination of 'primary' policy issues, such as public spending or income redistribution, is widely accepted. Whether electoral incentives can account for the policy choices in 'secondary' policy issues, such as trade policy or environmental policy, that directly effect only smaller groups of voters in the economy has been under dispute. List and Sturm (2004), use a political agency approach to show that electoral incentives can be an important determinant of environmental policy choice, over which some voters have very intense preferences. These 'single issue voters' vote for the politician most likely to implement their preferred policy, thereby providing incentives for politicians to distort their policy choices to attract these voters. Other recent contributions to this literature include Besley and Case (1995) and Besley and Burgess (2002).

The political agency framework shows how electoral incentives can cause political incumbents to alter their policy choice in early years in power in order to influence voter beliefs about the nature of future trade policy. By building a reputation as a protectionist or free-trader, the incumbent attracts some voters to his platform. In the model presented here, the mechanism for attracting votes is promises by candidates regarding future trade policy. This model is a reduced form of a model with many periods, and hence relies on the commitment of candidates to their promises. The framework lends itself to the analysis of the incentives of different groups within the economy; in particular, protectionists versus free-traders and upstream versus downstream industries. For example, the model can be used to address the political incentives for the protection of industries for different configurations of producers and users across political districts.

In contrast to this apparent vote-swinging political motivation for industrial protection, a large part of the theoretical political economy literature has emphasised the role of lobbies in determining secondary policy issues such as trade or environmental policy, whereby campaign contributions influence policy [Grossman and Helpman (1994), (1996), (2002)]. Baldwin and Robert-Nicoud (2003) examine how entry and asymmetric lobbying can explain why governments support declining industries. Our model does not consider lobbies, focusing instead on a voting framework so as to highlight a parallel mechanism influencing trade policy choice through the existence of swing states and their importance for the election outcome.

The literature to date has explored these issues in single-district political frameworks. In doing so, it fails to capture the wealth of interactions and trade-offs in the presence of multiple political states. This paper contributes to the existing literature by developing a multi-state political agency model that explores how the political concentration of industry (the geographical distribution across political jurisdictions) can influence government trade policy choice. Industry relative size is shown to interact with location and the closeness of electoral competition to determine trade policy. We therefore introduce a spatial dimension to the political economy of trade policy choice thereby highlights the incentives to protect industry in decisive, swing states. This paper offers a theoretical explanation for why governments sometimes push for the protection of industries with certain characteristics, such as the US steel production industry.

The remainder of the paper is organised as follows. The next section lays out a political agency model in the case of a single political state and Section 3 lays out the model with continuum of political districts. In Section 4, the theoretical predictions of the model are tested empirically with US data. Section 5 discusses the research findings and scope for further research. Section 6 concludes.

2 The Political Agency Model: A Single State

In this section we lay out a political agency model to show how electoral incentives can influence trade policy choice. The analysis in the case of a single political district is identical to that of List and Sturm (2004), except that we consider trade policy rather than environmental policy as the secondary policy issue. Our innovation comes from extending the model to a continuum of political states (Section 2.2), which allows for a richer analysis of political incentives.

2.1 Voter Preferences

Consider a country with a single political district with voters of unit mass. Voters have heterogeneous preferences over two issues: public spending (or 'ideology') and trade policy (denoted by parameter r)[1]. Suppose that citizens employed in the industry for which trade policy is being considered are vulnerable to shocks to world activity, and face the risk of unemployment in the event of a negative shock. Trade policy is assumed to take the form of a binary choice, to be made by the incumbent politician, between trade protection ($r = 1$) and free trade ($r = 0$). By choosing to protect the industry, the effects of the shock to citizens are assumed to be neutralised.

There are four types of voters in the model, $k \in \{D, R, F, P\}$: Democrats (D), Republicans (R), Free-traders (F) and Protectionists (P). The fraction of the population of type k is γ_k, thus $\gamma_D + \gamma_R + \gamma_F + \gamma_P = 1$. The D and R voters are assumed to be indifferent about the trade policy issue and vote purely on the basis of their ideology (or public policy preference). Even though tariff protection raises the relative domestic price of the protected good, this negative effect is assumed to be negligible compared to the intensity of their preference for ideology. That is, although a price increase in one good in the consumption basket lowers consumer surplus, it is not a sufficient cost to cause voters to shift their support to another platform.

P and F voters care passionately about the trade policy issue. It is assumed that the intensity of their preference in this issue is such that the payoff of the preferred trade policy dominates any ideological considerations - they are 'single-issue voters'. In this setting, P voters are those whose jobs will be secured with trade protection, and so they support the candidate most likely to implement $r = 1$. For example, P voters could reflect citizens employed in the steel production industry who strongly favour trade protection. F voters strongly oppose trade protection and vote for the candidate most likely to implement $r = 0$. For example, F voters could reflect citizens employed in industries that are major steel users, that would suffer from the higher input costs.

The trade policy is assumed to have negligible financial impact on government revenue, and so the model abstracts from any possible revenue-raising incentives for trade protection.

Let $g^*(D)$ and $g^*(R)$ be the unique preference levels of 'public spending' for D and R citizens, respectively, where $g^*(D) > g^*(R)$. P citizens receive a payoff of $x > 0$ if $r = 1$ and 0 otherwise, while F citizens receive x if $r = 0$ and 0 otherwise[2].

[1] r could denote any national policy about which certain voters have strong views e.g. gun control, environmental policy etc.

[2] The preferences of voters F and P are assumed to be symmetrically opposed. This need not be the case. Further, we could simplify the analysis by assuming that only those directly

2.2 Candidate Preferences

There are two parties from which electoral candidates are chosen: Democrat (D) and Republican (R). During each term of office the incumbent politician must choose the level of public spending, g, and whether to implement trade protection. We assume that although the preferences of the politician over front-line policy issues are public knowledge, preference over r is private to the politician. Politicians whose personal views are in favour of free trade are referred to as 'free-traders', while those in favour of trade protection are referred to as 'protectionists'. Suppose that a randomly selected candidate of either party is a protectionist with probability π.[3]

The "ego-rent" earned by the politician from holding office for a term is λ, while he receives a payoff of 0 when out of office. In addition, a politician faces a utility cost $c = \{c_{L,} c_H\}$[4] when he does not implement his own preferred trade policy, where $c_H > c_{L.}$ The probability of a low cost, $\Pr(c = c_L)$ is p. Let β be the common discount factor by which politicians and voters discount the future. Following List and Sturm (2004), we introduce the restriction that $c_H > \beta\lambda > c_L$. This states that the ego-rent from holding one more term in office lies between the high and low utility costs. This ensures that when utility cost is high, the incumbent politician never implements trade policy that is not in line with his views. This arises because the ego-rent from holding an extra term in office is exceeded by the utility cost of compromising on the trade issue. If the cost realisation is low, however, the politician may find it beneficial to deviate from his preferred trade policy choice in order to gain voters and increase the probability of another term in office. We assume a term limit of two periods. After two terms of holding office candidates leave the political arena, never to return; a new candidate from within the party competes with the rival candidate in the presidential elections.

Let ω represent the 'lead' of party D, i.e. $\omega = (\gamma_D - \gamma_R)$. Randomness in the election outcome is due to a pro-D shock, ε, which could be interpreted as a turnout shock or lost ballots. ε is distributed by a smooth and increasing cumulative distribution function $H(\varepsilon)$. The probability density function, $h(\varepsilon)$, is assumed to be single-peaked and symmetric around 0.

employed in the industry care about protection, i.e. that there are no F voters. Later on in the paper we make the distinction between upstream and downstream firms and consider the implications of having only protectionist voters.

[3] List and Sturm (2004) mention that varying probability π across parties does not alter the key results of the model.

[4] Note that in Besley and Burgess (2002) the cost of implementing the non-preferred policy, c, is per capita and β is the probability of an individual citizen having a negative shock. Following List and Sturm (2004), we assume the cost is fixed rather than per capita. It can be interpreted as the psychological cost of setting a policy in conflict with personal views. Some politicians are more inclined to deviate from their preferred policy choice (low c) than others (high c).

2.3 Timing and the Political Equilibrium

The model has an infinite number of periods and voters are assumed to be infinitely-lived. The politicians face a binding term limit of two periods. Events occur in the following order:

1. Parties choose their period one candidates.
2. Voters choose the period one incumbent
3. Nature determines the period one utility cost $c = \{c_{L,} c_H\}$, which is observed only by the incumbent.
4. The incumbent chooses g and r.
5. Policy choices are observed by voters and the election for the presidency in the next period takes place.
   (a) If the term limit is non-binding, then the election is between the incumbent and a randomly selected rival from the other party.
   (b) If the term limit is binding, the election is between two randomly selected candidates from either party
6. The winner is in office in the next period. The process is then repeated infinitely from step 3 down to step 6.

List and Sturm (2004) characterise the perfect Bayesian equilibria of the game between politicians and voter characteristics. They describe strategies for the incumbent politician and for type k voters, where $k \in \{D, R, F, P\}$. These strategies form an equilibrium if the value functions of voters and the politician are maximised given the other players' strategies.

Since D and R politicians do not act strategically with respect to the level of public spending, g, they set public spending at the optimal levels $g^*(D)$ and $g^*(R)$, respectively. The optimal strategy for D and R voters is to vote for the Democrat and Republican candidate, respectively. Hence only the solution to the question of trade policy choice is required to solve for the political equilibrium. Consider the case where $\gamma_P > \gamma_F$[5], i.e. where more voters are in favour of protection than against it. Using backward induction, we start from the second term of office. With a binding term limit, the politician has no political incentive to choose a policy that conflicts with his personal views as he can never be re-elected. Consequently, politicians always implement their preferred trade policy in the final term of office.

Now consider the incentives in the first term of office. A protectionist incumbent, of either party, always sets $r = 1$ when $\gamma_P > \gamma_F$. This is optimal as his preferred policy choice also corresponds to the majority view on the trade policy issue.

[5] The case where $\gamma_F > \gamma_P$ is symmetric.

A free-trader incumbent, of either party, may be tempted to set $r = 1$ so as to increase his lead over his rival by $(\gamma_P - \gamma_F)$. Given the parameter restriction that $c_H > \beta\lambda > c_L$, no gain in votes could ever justify implementing the non-preferred policy if the utility cost realisation is high. Hence a draw of c_H always induces a policy choice of $r = 0$ from a free-trader. A draw of c_L only induces a free-trader to set $r = 1$ if the gain in re-election probability from votes $(\gamma_P - \gamma_F)$ can generate expected utility gains sufficient to exceed cost c_L. If we assume $c_L = 0$, it is costless to the politician to implement a non-preferred policy, so $r = 1$ will always be set, even if the gain in the political lead is very small. That is, even small gains in the probability of re-election induce strategic behaviour.

To calculate the gain in re-election probability consider the votes a free-trader incumbent stands to gain if he sets $r = 0$ and $r = 1$, respectively. By setting $r = 0$ in his first term, the incumbent signals his free-trader views to the electorate since a protectionist incumbent would never set $r = 0$ when $\gamma_P > \gamma_F$. At the election for the period two presidency, the randomly selected challenger only has a probability $1 - \pi \in (0, 1)$ of being a free-trader. Hence γ_P voters support the challenger in the hope that he may prove to be protectionist and set $r = 1$ in the next period, while γ_F voters support the incumbent, irrespective of ideology. A Democrat free-trader incumbent who sets $r = 0$ in the first term, gains $\gamma_D + \gamma_F + \varepsilon$ votes while the R challenger gains the remaining votes. It follows that for the incumbent to get re-elected, given $r = 0$, the shock ε must exceed $-\omega + (\gamma_P - \gamma_F)$. This occurs with probability $1 - H[-\omega + (\gamma_P - \gamma_F)]$.

A D free-trader incumbent that sets $r = 1$ in the first term does not reveal that he is a free-trader. The observation of trade protection in the first term causes voters to update their beliefs about the the probability that the incumbent is in favour of trade policy. Let $\widetilde{\pi}$ denote the (Bayesian) updated probability, where, for a sufficiently small value for p:[6]

$$\begin{aligned} \widetilde{\pi} &= \Pr(r = 1 \text{ in the second term} \mid r = 1 \text{ in the first term}) \qquad (1) \\ &= \frac{\pi}{\pi + (1 - \pi)p} > \pi + (1 - \pi)p = \Pr(r = 1 \text{ in the first term}) \end{aligned}$$

It follows that voters γ_P will support the incumbent government if trade protection is implemented in the first term, while γ_F voters support the challenger, irrespective of the ideology of the candidates. The incumbent builds a reputation as a protectionist thereby attracting more votes. Hence the votes for the D incumbent are $\gamma_D + \gamma_P + \varepsilon$ while the R challenger gains the remaining votes. It follows that for the incumbent to get re-elected, given $r = 1$, the shock ε must exceed $-\omega - (\gamma_P - \gamma_F)$. This occurs with probability $1 - H[-\omega - (\gamma_P - \gamma_F)]$.

The re-election probability gain of a free trader[7] incumbent setting $r = 1$ can be expressed by:

[6] Note that $\Pr(r = 1 \text{ in the second term} \mid r = 1 \text{ in the first term}) = \frac{\Pr(r=1 \text{ in the second term}) \Pr(r=1 \text{ in the first term} \mid r=1 \text{ in the second term})}{\Pr(r=1 \text{ in the first term})} = \frac{\pi}{\pi + (1-\pi)p}$.

[7] Since $h(\varepsilon)$ is symmetric and single-peaked, it follows that the probability gain is identical for a Democrat free-trader and a Republican free-trader.

$$
\begin{aligned}
& H\left[-\omega+\left(\gamma_P-\gamma_F\right)\right]-H\left[-\omega-\left(\gamma_P-\gamma_F\right)\right] \\
= & \int_{-\omega-\left(\gamma_P-\gamma_F\right)}^{-\omega+\left(\gamma_P-\gamma_F\right)} h(\varepsilon) d\varepsilon \equiv \Gamma\left(\gamma_P-\gamma_F\right)>0
\end{aligned} \tag{2}
$$

The expected gain for a D or R free-trader from setting $r = 1$ is therefore $\Gamma\left(\gamma_P-\gamma_F\right)\beta\lambda$, which must exceed c_L for the strategy to be optimal[8]. It follows that for sufficiently small p[9] and if $\Gamma\left(\gamma_P-\gamma_F\right)\beta\lambda > c_L$, there is a unique equilibrium in which politicians faced by a low cost shock deviate from their personal preferences in their first term of office to increase re-election probability through reputation-building, and always follow personal preferences otherwise[10]. Note that in the US, House incumbents win more than 90% of the time while Senate incumbents win more than 70% of the time. Although there are likely to be several explanations for this phenomenon, such as advantages for incumbents in raising campaign funds, higher name recognition, free news coverage etc, it is certainly plausible that one of these factors is voter approval gained through decisions made when in office.

It can easily be shown that an increase in $|\gamma_P-\gamma_F|$ or a decrease in either c_L or $|\omega|$ make the reputation-building equilibrium described above weakly more likely[11]. That is, a large number of swing voters strengthen incumbents' incentives to strategically choose trade policy, provided there is some uncertainty over election outcomes. Conversely, if $\gamma_P = \gamma_F$, i.e $|\gamma_P - \gamma_F| = 0$, there is no benefit from implementing one trade policy over another in terms of votes, and so incumbents always implement their preferred policy. Finally, closer electoral competition magnifies the importance, in probability terms, of gaining a given number of votes $\left(\gamma_P-\gamma_F\right)$[12]. The gain in probability from influencing swing voters is maximised when $\omega = 0$.

3 The Political Agency Model: A Continuum of States

Now consider a country with a continuum of political districts or states on the interval $(0, 1)$. We abstract from differences in state size by assuming all states

[8] If $c_L = 0$, then setting $r = 1$ is always optimal for a free-trader, when $\gamma_P > \gamma_F$.

[9] There are two conflicting effects. First, an incentive effect that follows from the term limit assumption, which makes it less likely for $r = 1$ in period 2 as a free-trader will set $r = 0$ with certainty. Second, a selection effect, which makes it more likely for $r = 1$ since re-elected politicians in their second term of office are more likely to be protectionist. Which effect outweighs depends on the relative size of p and $\left(\gamma_P-\gamma_F\right)$. For a given $\left(\gamma_P-\gamma_F\right)$, the selection effect outweighs the incentive effect for sufficiently small values of p.

[10] Proposition 1 in List and Sturm (2004).

[11] Proposition 2 in List and Sturm (2004).

[12] This is a result of the symmetry and single-peakedness of $h(\varepsilon)$. The smaller is ω,the greater the probability gain from setting $r = 1$. If ε were distributed uniformly, then the re-election probability gain would be unchanging with ω, within the support of $h(\varepsilon)$.

have a unit mass of voters. These states form an electoral college, through which electoral outcomes are determined.

Each state s is like the single state analysed in Section 2.1, with four types of voters, $k \in \{D, R, F, P\}$. Again there are two policy issues: public spending (g) and trade policy (r), which have to be decided on the national level. There are two candidates from rival parties in the presidential election and events occur as in the single-state model. In the electoral college, a state s is won by candidate j if the candidate gains the majority of votes in that state. The candidate then wins the electoral college votes associated with the state (1 in each state). The election is won by the candidate that wins more than half of the electoral college votes. In the current framework, this translates to winning more than half the states in the continuum.

In each state s, $\gamma_D^s + \gamma_R^s + \gamma_F^s + \gamma_P^s = 1$, but the lead of the D candidate, $\omega^s = (\gamma_D^s - \gamma_R^s)$, and the relative size of P and F voters, $(\gamma_P^s - \gamma_F^s)$, vary across states. We rank states such that ω^s is decreasing over the interval $(0, 1)$. Further assume that the resulting negative relationship between $\omega(s)$ is continuous. This is illustrated in Figure 1. States between 0 and s^* correspond to states where the Democrats are in the lead, while the Republicans have the lead in states s^* to 1.

ε^s is now a state-specific pro-D shock. All state shocks are assumed to be distributed identically and independently according to $h(\varepsilon^s)$ over the support $[-\psi, \psi]$. Note that in the US, voter turnout at elections varies across states. Areas with a higher degree of two-party competition (as measured by the lead between parties) have higher levels of voter turnout than do areas with lower levels. This may be due to the fact that voters in states tending clearly towards a particular platform feel their vote 'matters less' for the election outcome. This suggests that the state-specific shock ε^sdepends on ω^s. We abstract from this for the sake of simplicity.

D and R politicians do not act strategically with respect to the level of public spending, g, setting public spending at the optimal levels $g^*(D)$ and $g^*(R)$, respectively. Hence the optimal strategy for D and R voters in all states is to vote for the Democrat and Republican candidate, respectively. With respect to trade policy, the optimal decision of the incumbent depends on the realisation of his utility cost c, and the distribution of $\omega^s$and $(\gamma_P^s - \gamma_F^s)$ across the continuum of states. As in the single-state model, if nature reveals a high utility cost c_H, a free-trader incumbent always sets $r = 0$ (we maintain the restriction that parameters satisfy $c_H > \beta\lambda > c_L$). Reputation building only occurs when nature reveals a low utility cost, c_L if the increase in the probability of successful re-election (in the electoral college) is large enough to justify the utility cost c_L.

For simplicity, assume that $c_L = 0$, such that incumbents deviate from their personal views in their first term even when the gain in expected ego rents from doing so is very small. With no utility cost associated with implementation of a policy in conflict with the politician's personal views, any incumbent (whether a D or R, or F or P) will set trade policy $r = 1$ when trade protection raises the probability of national re-election. It follows that showing a rise in the probability of re-election is a sufficient condition for incumbents to implement

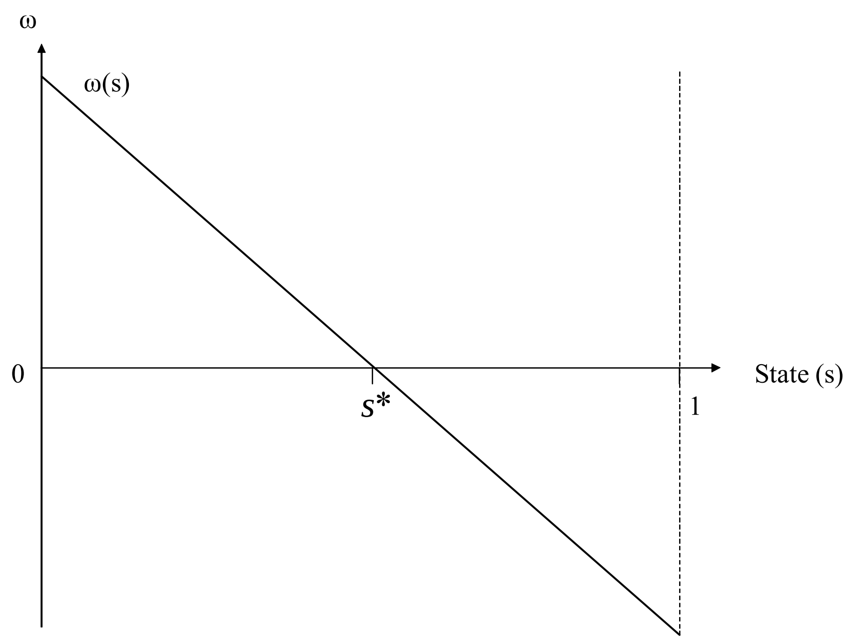


Figure 1: Political states ranked by the lead of the D candidate.

trade policy strategically in the first term.

In the single-state model, the difference in the number of single-issue voters for and against trade protection is a crucial determinant of trade policy choice. Now it is the level and distribution of $(\gamma_P^s - \gamma_F^s)$ across political states that determine trade policy. Since the distribution of single-issue voters is integral to the trade policy choice, no closed-form solution can be found. Nevertheless, the main insights can be gleaned by looking at certain illustrative cases, where the distribution of $(\gamma_P^s - \gamma_F^s)$ across states has certain features.

Having ranked states by ω^s, it is useful to determine which states the incumbent will win with certainty and which it will lose with certainty. All remaining states are swing states that can be won or lost depending on the shock ε^s in each state, ω^s and the incumbent's trade policy decision. Suppose the incumbent is a Democrat free-trader and that nature reveals $c = c_L = 0$ in his first term. The incumbent examines the probability of being re-elected when $r = 0$ and $r = 1$ and chooses trade policy in order to maximise that probability.

We wish to determine the two threshold levels of ω^s, above and below which states are won or lost, respectively. These are found for both $r = 0$ and $r = 1$, generating four threshold levels for ω^s that are key to understanding the political incentives in the electoral college.

Consider the case where the incumbent sets $r = 0$. As in Section 2.1, the shock ε^s must exceed $-\omega^s + (\gamma_P^s - \gamma_F^s)$ for the incumbent to win state s, the probability of which is $1 - H[-\omega^s + (\gamma_P^s - \gamma_F^s)]$. Winning state s with certainty implies that $H[-\omega^s + (\gamma_P^s - \gamma_F^s)] = 0$ while losing it with certainty implies that $H[-\omega^s + (\gamma_P^s - \gamma_F^s)] = 1$. Let ω_W^o be the minimum Democratic lead, ω^s, for which the D incumbent implementing $r = 0$ wins the state with certainty. It follows that states with $\omega^s \geq \omega_W^o$ are won by the incumbent. Similarly, let ω_L^o be the maximum ω^s for which the incumbent loses the state with certainty, under $r = 0$. Hence any states with $\omega^s \leq \omega_L^o$ are lost by the incumbent. Examination of $h(\varepsilon^s)$ pins down these threshold values.

Where the incumbent sets $r = 1$, the shock ε^s must exceed $-\omega^s - (\gamma_P^s - \gamma_F^s)$ for the incumbent to win state s, the probability of which is $1 - H[-\omega^s - (\gamma_P^s - \gamma_F^s)]$. Winning state with certainty implies that $H[-\omega^s - (\gamma_P^s - \gamma_F^s)] = 0$ while losing with certainty implies that $H[-\omega^s - (\gamma_P^s - \gamma_F^s)] = 1$. ω_W^1 and ω_L^1 are defined analogously to ω_W^o and ω_L^o.

Examination of the distribution $h(\varepsilon^s)$ with support $[-\psi, \psi]$ pins down ω_W^o, ω_L^o, ω_W^1 and ω_L^1. It can be shown that the cut-off levels are:

$$\omega_W^o = \psi + (\gamma_P^s - \gamma_F^s) \tag{3}$$

$$\omega_W^1 = \psi - (\gamma_P^s - \gamma_F^s) \tag{4}$$

$$\omega_L^o = -\psi + (\gamma_P^s - \gamma_F^s) \tag{5}$$

$$\omega_L^1 = -\psi - (\gamma_P^s - \gamma_F^s) \tag{6}$$

The expressions for ω_W^o and ω_W^1 reveal that incumbents can win state s, where $(\gamma_P^s - \gamma_F^s) > 0$,with a lower lead $\omega^s$when trade protection is implemented. Conversely, if $(\gamma_P^s - \gamma_F^s) < 0$, implementing trade protection increases the minumum lead required to win a state s. Similarly, the expressions for ω_L^o and ω_L^1 reveal that, where $(\gamma_P^s - \gamma_F^s) > 0$, implementing trade protection lowers the threshold level below which state s is lost. Conversely, if $(\gamma_P^s - \gamma_F^s) < 0$, implementing trade protection increases the minumum lead required to win a state s

For a given ranking, $\omega(s)$, an increase in the variance of voter turnout shocks increases the minimum lead required to win a state, and lowers the maximum lead below which a state is lost with certainty. That is, the larger the uncertainty surrounding the lead of the incumbent candidate, the greater the proportion of states that are swing states. For a large enough variance, there may be no states that are won or lost with certainty - all states are swing states.

Crucially, the threshold levels depend on $(\gamma_P^s - \gamma_F^s)$. The greater the number of voters in favour of protection relative to those against in a state, the more votes the incumbent stands to gain by setting $r = 1$, and thus the greater the relief in the required lead. If $\gamma_P^s = \gamma_F^s$, however, the choice of trade policy has no impact on the winning and losing threshold levels - equations (3) and (4) collapse to $\omega_W^o = \omega_W^1 = \psi$ and (5) and (6) collapse to $\omega_L^o = \omega_L^1 = -\psi$.

For a given trade policy choice, the probability that the incumbent is re-elected depends on both the distribution of $(\gamma_P^s - \gamma_F^s)$ across states and the ranking $\omega(s)$. These jointly determine which states are won, lost or swing. The interaction of the two is critical for determining the probability of re-election and pinning down the optimal trade policy choice in the first term.

Different distributions of single-issue voters across states generate different political incentives for the incumbent. The key insights and results are determined by examining specific examples.

3.1 Benchmark Case: $(\gamma_P^s - \gamma_F^s)$ Uniformly Distributed

Consider the simplest case where $(\gamma_P^s - \gamma_F^s)$ is positive and uniformly distributed across states. ψ is assumed to be sufficiently small such that some states are won and lost with certainty. This is the benchmark case in which there is no conflict in the political incentives across states. Figure 2 depicts the ranking $\omega(s)$ and the uniform distribution of $(\gamma_P^s - \gamma_F^s)$ across political states. In all states, there are more voters in favour of trade protection than against. The thresholds described by equations (3) to (6) are horizontal lines.

Suppose the D incumbent implements his preferred policy, $r = 0$ in his first term. The threshold lines ω_W^o and ω_L^o pin down the cut-off states $\underline{s}$ and $\overline{s}$. Given $\omega(s)$, states in the interval $(0, \underline{s})$ are won by incumbent Democrat at election time, while states in $(\overline{s}, 1)$ are lost to the Republican candidate. The states in $(\underline{s}, \overline{s})$ are swing states.

If the incumbent implements trade protection in his first term, he gains an advantage by swinging $(\gamma_P^s - \gamma_F^s)$ to his platform. The threshold lines ω_W^1 and ω_L^1 pin down the new cut-off states $\underline{s'}$ and $\overline{s}'$. The policy increases the proportion of states won by the incumbent and lowers the number of states

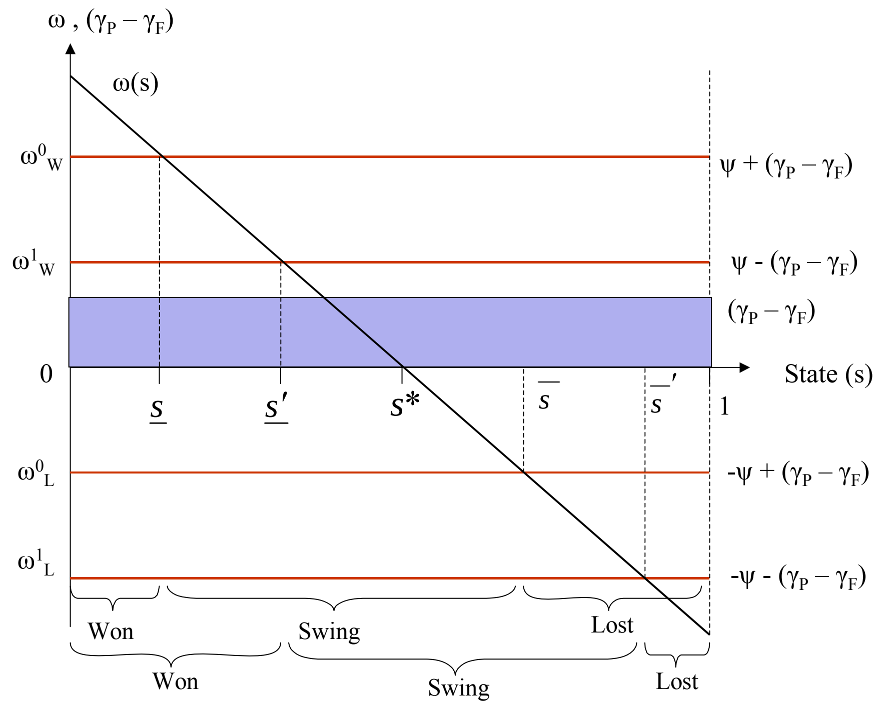


Figure 2: Benchmark Case: $(\gamma_P^s - \gamma_F^s)$ Uniformly Distributed

lost to the Republican candidate. The number of swing states may have risen or fallen, depending on the curvature of $\omega(s)$. Trade protection increases the probability of winning each individual swing state[13].

To win the presidential election, the free-trader incumbent must win at least half of the states. Incentives to implement $r = 1$ therefore depend on where $\underline{s}, \overline{s}, \underline{s}'$, and $\overline{s}'$ lie in relation to $\frac{1}{2}$.

If $\underline{s} \geq \frac{1}{2}$, then the incumbent has a sufficient lead to get re-elected, irrespective of the trade policy decision. He therefore implements his preferred policy $r = 0$.

If $\underline{s} \leq \frac{1}{2} \leq \underline{s}'$, then implementing trade protection in the first term is sufficient for the incumbent to guarantee re-election. His optimal policy will be $r = 1$.

If $\underline{s}' \leq \frac{1}{2} \leq \overline{s}$, then setting $r = 1$ does not guarantee re-election but unambiguously increases the probability of re-election by increasing the number of states that are secured and improving the probability of winning each of the swing states. As discussed earlier, an increase in the probability of re-election is sufficient to ensure the optimality of setting $r = 1$.

If $\overline{s} < \frac{1}{2} < \overline{s}'$, then under $r = 0$ the incumbent can never win the election, even if all swing states were won. The optimal policy choice is $r = 1$ as this generates a positive probability of winning the election.

Finally, if $\overline{s}' < \frac{1}{2}$, the election can never be won by the incumbent, even by setting $r = 1$. Hence the incumbent's first term is also his last, in which case the optimal policy is to implement the preferred policy choice $r = 0$.

Overall, it is clear that trade policy will be chosen strategically in the first term of office if the election outcome is uncertain. If the incumbent can never win or never lose, there will be free trade. This result is the multiple-state analogue of the List and Sturm (2004) conclusions. Since $(\gamma_P^s - \gamma_F^s) > 0$ for all states in this example, there is no inherant conflict when deciding on trade policy in the case of electoral uncertainty. Setting $r = 1$ has no negative implications for the incumbent in any state. The next examples address the issue of inter-state conflict.

As the next secion discusses, the distribution of $(\gamma_P^s - \gamma_F^s)$ across decisive, swing states is crucial for policy choice. Decisive, swing states are those swing states which, if won, can alter the election outcome. Not all swing states are decisive, and not all decisive states are swing. In the case where $\underline{s} \geq \frac{1}{2}$, states $(0, \underline{s})$ are decisive but not swing states while where $\overline{s}' < \frac{1}{2}$ the swing states are not decisive since winning these states does not change the election outcome.

3.2 Inter-State Conflict

We now consider a three point distribution to examine inter-state conflicts that arise in the electoral college. Single-issue voters for and against trade protection

[13] The gain in the probability of winning a swing state s, that is in the set of swing states under $r = 0$ and $r = 1$, is decreasing in ω^s. As discussed in the single-state model, the probability gain is maximised when $\omega^s = 0$. It follows the probability increase is largest in the region of s^*.

are unlikely to be distributed in an identical fashion across states. For example, employees of industries that use steel heavily as an input may be mainly located in some particular states while employees of steel producers in others. It follows that in some states $(\gamma_P^s - \gamma_F^s)$ is positive and in others negative. The overall effect on political incentives depends on the interaction of $(\gamma_P^s - \gamma_F^s)$ and $\omega(s)$.

Consider a simple example where the $(\gamma_P^s - \gamma_F^s)$ take three possible values: $0, \gamma$, and $-\gamma$. Assume that $(\gamma_P^s - \gamma_F^s) = 0$ in states $(0, \underline{s})$ and $(\overline{s}, 1)$ i.e. in the states with no electoral uncertainty. The swing states are then split into states $(\underline{s}, s^*)$ for which $(\gamma_P^s - \gamma_F^s) = \gamma$, and states in $(s^*, \overline{s})$ for which $(\gamma_P^s - \gamma_F^s) = -\gamma$. This is illustrated (for appropriate ψ) in Figures 3 and 4, where the incumbent implements $r = 0$ and $r = 1$, respectively.

Under $r = 0$, states $(0, \underline{s})$ are won by the incumbent, states $(\overline{s}, 1)$ are lost and states $(\underline{s}, \overline{s})$ are swing states. Under $r = 1$, the set of states won and lost expand to $(0, \underline{s}')$ and $(\overline{s}', 1)$, respectively, while the set of swing states shrinks.

There are now two groups of swing states: one with $(\gamma_P^s - \gamma_F^s) = \gamma > 0$ and the other with $(\gamma_P^s - \gamma_F^s) = -\gamma < 0$. This generates inter-state conflict in that governments choosing protection or free trade in their first term will gain an advantage in some states and lose votes in others. This explains why the move from free trade to trade protection causes more states to be won and lost with certainty. For states $(\underline{s}, s^*)$, protectionism reflects the preferences of the majority of single-issue voters thereby generating a gain in votes for the incumbent. More states are won with certainty, while the probability of winning the remaining swing states is increased.

For states $(s^*, \overline{s})$, the majority of single-issue voters prefer free trade. Trade protection therefore induces a loss of votes for the incumbent in these states. More states are lost with certainty, while the probability of winning the the remaining swing states is reduced.

The incumbent must trade-off voters across states by choosing the policy that offers the highest chance of re-election. As in the benchmark case, the incentives for $r = 1$ depend on where $\underline{s}, \overline{s}, \underline{s}'$, and $\overline{s}'$ lie in relation to $\frac{1}{2}$.

As in the benchmark case, if the incumbent stands to win the presidential election with certainty $(\underline{s} > \frac{1}{2})$ or lose with certainty $\left(\overline{s} < \frac{1}{2}\right)$, $r = 0$ is the optimal policy. In contrast to the benchmark case, under uncertainty regarding the election outcome, there is a conflict between choosing free trade and protection.

If $\underline{s} < \frac{1}{2} < s^*$, all decisive, swing states are characterised by $(\gamma_P^s - \gamma_F^s) = \gamma > 0$ and so the incumbent unambiguously improves his probability of re-election by choosing $r = 1$.

If $s^* < \frac{1}{2} < \overline{s}$, implementing trade protection has conflicting effects. While more states are won with certainty and the probability of winning the swing states to the left of s^* is improved, the probability of winning swing states to the right of s^* is reduced and some states are lost with certainty. The incumbent needs to evaluate the relative cost and benefit of winning some votes at the expense of others. This depends on the curvature of $\omega(s)$ and the distribution of $(\gamma_P^s - \gamma_F^s)$ in the region of decisive, swing states. More generally, the closer s^* is to $\frac{1}{2}$, the more likely it is for the incumbent to choose $r = 1$.

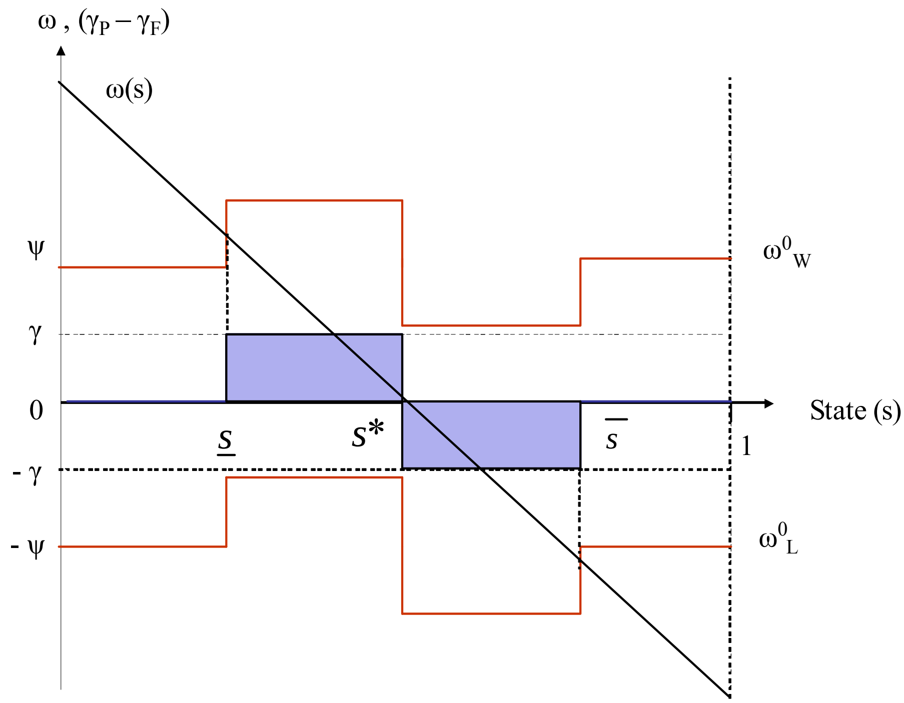


Figure 3: $r = 0$

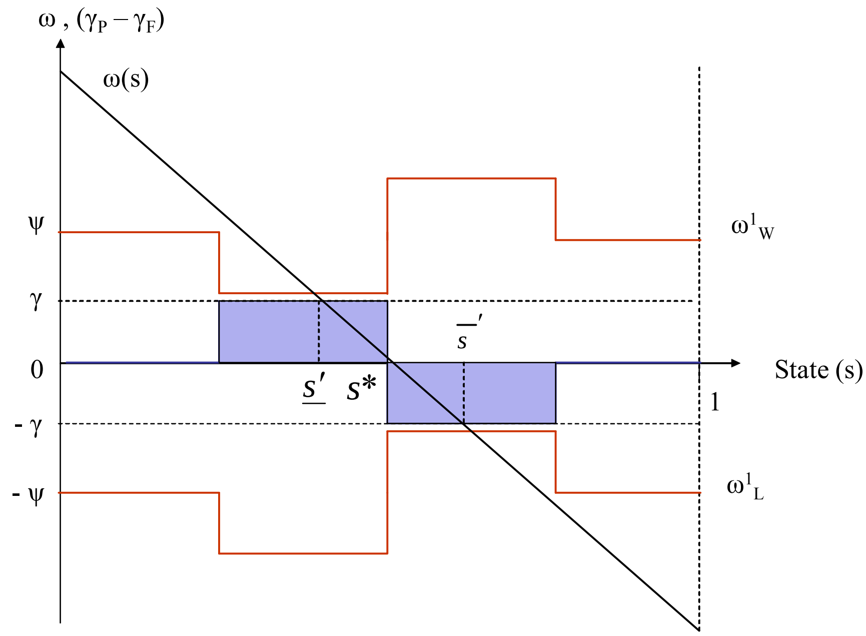


Figure 4: $r = 1$

Now consider Figures 5 and 6, in which the location of states with $(\gamma_P^s - \gamma_F^s) = \gamma$ and $(\gamma_P^s - \gamma_F^s) = -\gamma$ has changed. Heavy users of steel are now mainly located in states $(\underline{s}, s^*)$ rather than $(s^*, \overline{s})$, while steel produces are mainly situated in states $(s^*, \overline{s})$. This change alters the incentives of the incumbent where there is uncertainty in the election outcome.

Implementation of trade protection reduces the range of states that the incumbent wins and loses with certainty, thereby increasing the range of swing states.

If $s^* > \frac{1}{2}$, there is no incentive to deviate from free trade. The probability of re-election is maximised when the incumbent chooses $r = 0$.

If $\overline{s}' < \frac{1}{2}$, the incumbent can never win the election. It is optimal for the incumbent to implement policy in line with his personal preferences in his final term, so $r = 0$.

If $s^* < \frac{1}{2} < \overline{s}'$, implementing trade protection has conflicting effects. While more states are won with certainty and the probability of winning the swing states to the left of s^* is improved when $r = 0$, the probability of winning swing states to the right of s^* is higher with $r = 1$.The probability trade-off between states to the left and right of s^* depends on the curvature of $\omega(s)$ and the distribution of $(\gamma_P^s - \gamma_F^s)$ in the region of decisive, swing states. More generally, the closer s^* is to $\frac{1}{2}$, the more likely it is for the incumbent to choose $r = 0$.

These examples illustrate how the incentives driving policy choice hinge on the distribution of voters in decisive, swing states. Moreover, a change in the location of industry can swing trade policy from free trade to protectionism.

Inter-state conflict in voter preferences may be more or less important depending on whether the industry to be protected is upstream or downstream. In the example of steel producers, the industry being protected is that of a major input in other industries. Protection of upstream industries such as steel is likely to generate considerable dissatisfaction amongst voters employed in downstream industries. That is, γ_F is likely to be high in states in which downstream industries reside, thereby generating inter-state conflict.

Protection of more downstream firms is likely to be met with less objection by employees in other sectors. Although the consumers of the good face higher prices, they are likely to be very dispersed across states compared to industries. Moreover, they are unlikely to be single-issue voters. This situation is more aptly described by assuming $\gamma_F = 0$. With no inter-state conflict, trade protection is more likely to be implemented.

The model assumes that all states are of equal size, thereby abstracting from the possibility that a few large states may dominate election outcomes. It is easier to win electoral college votes associated with a large state than the equivalent number of electoral college votes spread across many smaller states. This arises from the extra restriction that a majority is needed in each small state while an overall majority in the large state is sufficient. The impact large states have on political incentives is still work in progress.

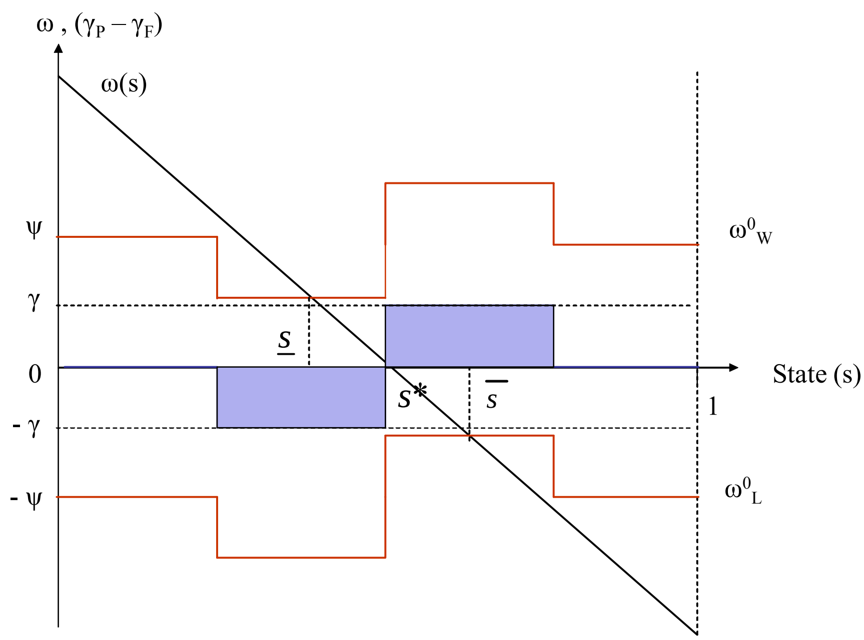


Figure 5: $r = 0$

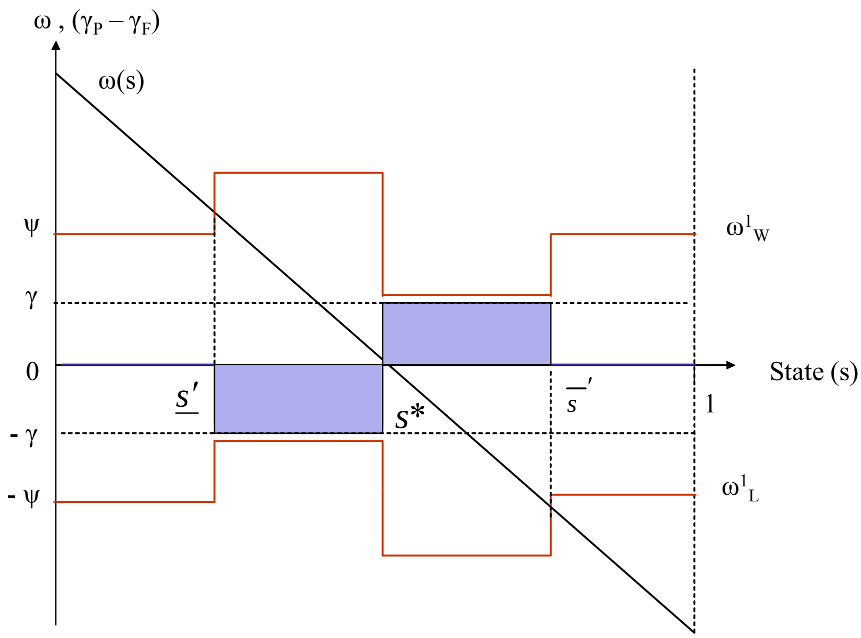


Figure 6: $r = 1$

4 Empirical Analysis

This section tests the theoretical hypothesis that industries with large concentrations in swing and decisive states are more likely to be protected using data on the 'swingness' and 'decisiveness' of US states kindly provided by David Stromberg. In his 2005 paper, Stromberg develops a probabilistic voting approach to presidential election campaigns and estimates an approximate measure Q of the joint probability of a state being both decisive in the Electoral College and a swing state with a very close state-level election. He shows how measure Q depends on several factors, such as the variance of national popularity-swings or the variance of electoral vote distribution.

The Q-values are estimated using national and state-level measures. At the national level, Democratic vote shares of the two-party vote share in trial-heat polls, economic growth, incumbency and incumbent president running for re-election are used, while at the state level, the lagged difference from the national mean of the Democratic vote share of the two-party vote share, the average ADA-scores[14] of each state's Congress members the year prior to the election and the difference between the state and national polls are included.

As is usual in the literature (e.g List and Sturm, 2004) we exclude Alaska and Hawaii and consider only the 48 continental US states. Since the political data, encapsulated by measure Q, is constructed at the state level, while trade protection is measured at the industry level, we use employment data per industry per state to link the two dimensions by creating state-level measures of protection weighted by state-level industrial employment. Besides being necessary for the empirical analysis, it also corresponds to the assumption of our model that each employee in a specific state is also a voter in that state. The US Economic Censuses of 1997 and 2002 provide us with state and 4 digit SIC employment levels.

Different measures of trade protection can be considered for analysis. Tariffs are a more formal and official measure of trade protection but have the inherent limitation of resulting from multilateral agreements where the US cannot solely impose its own agenda. Nevertheless, we employ tariff data in the first subsection as a first step and then use non-tariff barriers (NTBs) as an alternative measure of trade protection in the second sub-section.

4.1 Tariff Protection

Feenstra, Romalis and Schott (2002) construct a database of imports, exports and tariffs in the US ranging from 1989 to 2001. Using this data, we compute the tariff rates by 4-digit SIC category by dividing duties collected by the customs or dutiable value of imports. One of the main advantages of using tariffs is that the data is available across two consecutive presidential periods, which allows us to control for state fixed effects. On the basis of employment data availability, the tariff levels of 1997 and 2001 are employed for analysis.

[14] ADA (Americans for Democratic Action) scores , ranging from 0 to 100, are used as a measure of legislator ideology.

Since we wish to measure whether tariff protection of an industry can, in part, be explained by the presence of that industry in swing and decisive states, we construct a "state level" tariff by weighing industry-level tariffs with the share of employment each industry represents in state s. State level tariffs are denoted by τ_s and calculated using:

$$\tau_s = \sum_{i=1}^{I} \left[\tau_i \times \left(\frac{L_{is}}{\sum_{i=1}^{I} L_{is}} \right) \right] \tag{7}$$

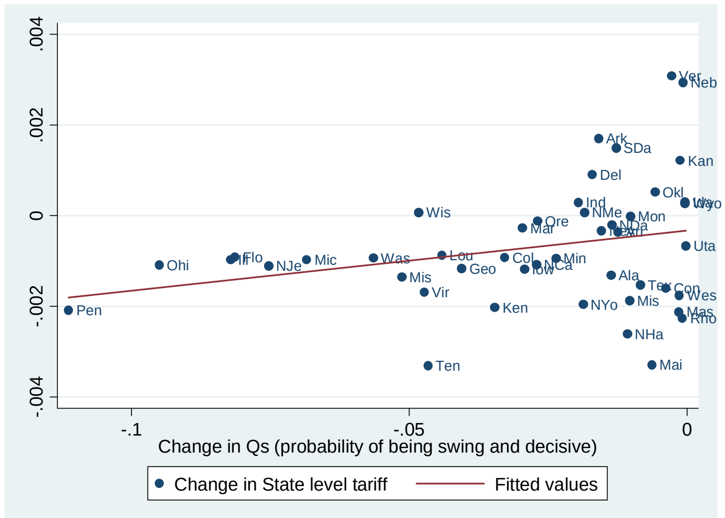
where τ_i denotes industry level tariff for industry i, L_{is} denotes industry i employment in state s and I is the set of 4-digit SIC industries i.

To control for state fixed effects we take the first difference of measure τ_s for each state and regress the change in the state level tariff, $\Delta\tau_s$, between 1997 and 2001 on the change in the state Q-values, ΔQ_s, between the 2000 and 2004 presidential elections. The results of this OLS regression are reported in Table 1 below:

	(1)	(2)
Dependent Variable	$\Delta\tau_s$	$\Delta\tau_s$
ΔQs	0.005	0.013
	[0.004]	[0.006]**
Constant	-0.001	-0.000
	[0.000]**	[0.000]
Outliers	Yes	No
Observations	48	46
R-squared	0.02	0.07

OLS, Robust standard errors in brackets,
** significant at 5%

The coefficient on the change in Qs between the presidential election dates is both positive and significant at the 5% level once we exclude the outliers of California and South Carolina in regression (2). A scatter plot illustrating our results can be seen below:



Scatter plot and fitted line

We contend that the decrease in the joint probability of swingness and decisiveness across states over the period is probably due to 'gerrymandering' after the 2000 census. This is a controversial form of redistricting in which electoral district or constituency boundaries are manipulated for an electoral advantage. It is common in the United-States, especially since every ten-year census is followed by a redesign of districts to reflect demographic' changes. Excluding California, where gerrymandering was used to an extreme after 2000 and South Carolina, which experienced an important fall in tariff protection, the positive relationship between swingness-decisiveness and tariffs is significant.

4.2 Non-Tariff Barriers and Swingness

Since tariff levels are jointly determined from multilateral agreements where the US cannot solely impose its own agenda the political economy of trade protection literature has mainly concentrated on Non Tariff Barriers (NTBs), an instrument that allows governments to exercise more discretion in trade protection since these are not regulated to the extent of tariffs by the WTO or other international agreements. It is therefore easier for politicians to serve their political motivations by targeting NTBs. Moreover, variation in tariff levels for manufacturing products is very low since these have been greatly reduced over last few decades under the GATT and WTO.

Coverage ratios for non-tariff barriers, which represent the share of products in an industry covered by one or more quantitative or qualitative restrictions to trade, is a commonly used measure of trade protection. Gawande and Bandyopadhyay (2000) test the Grossman and Helpman (1994) "Protection for Sale" predictions, using data from 1983, whicy Kishore Gawande has kindly provided for us to test our theoretical hypothesis using NTB data.

As with tariffs, we use the same method to construct a state-level measure of NTB protection by weighting each industry-level NTB by the employment share of the industry in state s. As such, we use industry-level NTB data, NTB_i and employment data to generate state-level measures of NTB protection, denoted by NTB_s for state s. Since a single cross-section is available it is not possible to control for state fixed-effect. Regressing NTB_son Qs, the joint probability of state s being swing and decisive, for the 1984 presidential election, we obtain the results in Table 2:

	(1)
Dependent Variable	NTB_s
Qs in 1984	0.107
	[0.049]**
Constant	0.009
	[0.002]***
Observations	48
R-squared	0.07

OLS, Robust standard errors in brackets,
** significant at 5%
*** significant at 1%

Though highly significant, the regression equation is at the state level and considers only Q_s. In order for our analysis to be comparable to that of Gawande and Bandyopadhyay (2000), a measure of swingness and decisiveness (Q) at the 4-digit SIC level is required in order to test the relationship between Q and industry-level protection. We therefore compute a 4-digit SIC Qs based on the employment in each state.

In order to account for the importance of each industry in each state, we compute a 4-digit SIC 'Q' measure, denoted by q_i and calculated using:

$$q_i = \sum_{s=1}^{S} \left[Q_s \times \left(\frac{L_{is}}{\sum_{s=1}^{S} L_{is}} \right) \right] \tag{8}$$

It follows that industries that constitute a large proportion of employment in states with a relatively high probability of being swing and decisive have a high q_i. If a large proportion of an industry's employment is situated in a given state, but the industry is small so that it constitutes only a small proportion of state total employment, then q_i is low. Moreover, for a given proportion of industry i state employment, q_i is low if the state is relatively unlikely to be swing and decisive.

The original 'Protection for Sale' predictions are tested by Gawande and Bandyopadhyay (2000) by estimating among three other results the following original equation of Grossman and Helpman:

$$\frac{t_i}{1+t_i} = \frac{I_i - \alpha_L}{\alpha + \alpha_L}\frac{z_i}{e_i} \tag{9}$$

Their specification includes a system of three equations of which only one is relevant for our purposes:

$$\frac{t_i}{1+t_i} = \gamma_0 + \gamma_1 I_i \frac{z_i}{e_i} + \gamma_2 \frac{z_i}{e_i} + Z_{1i} + Z_{2i} + s_i \tag{10}$$

where t_i is the coverage ratio for industry i, z_i is the inverse of the import penetration ratio, the share of imports to total production in sector i, e_i is the price elasticity of imports and I_i is a dummy variable that describes whether the sector is politically organized and represented by a lobby. Z_{1i} includes tariffs on intermediate goods and Z_{2i} includes NTBs on intermediate goods.as controls, as in Gawande and Bandyopadhyay.

The data for import penetration ratios are identical to those used by Trefler (1993). Sector-level price elasticity of imports are taken originally from Shiells et al. (1986), whereas I_i was constructed by Gawande and Bandyopadhyay based on data from the Federal Election Commission.

Although our model does not take a probabilistic voting approach and therefore does not include the same variables and results as the "Protection for sale" approach, we test an extended specification in which we include our measure of swingness and decisiveness, q_i.

$$\frac{t_i}{1+t_i} = \gamma_0 + \gamma_1 I_i \frac{z_i}{e_i} + \gamma_2 \frac{z_i}{e_i} + \gamma_3 q_i + Z_{1i} + Z_{2i} + s_i \tag{11}$$

In Table 3, we report both the results of Gawande and Bandyopadhyay, as well as our extended results with q_i as an explanatory variable.

Dependent Variable	(1) NTB	(2) NTB
$I_i x z_i/e_i$	0.945	1.042
	[0.361]***	[0.529]**
z_i/e_i	-1.053	-1.172
	[0.349]***	[0.521]**
Z_{1i} (intermediates tariffs)	1.374	1.484
	[0.266]***	[0.267]***
Z_{2i} (intermediates NTBs)	0.072	0.081
	[0.037]*	[0.037]**
q_i	-	39.832
	-	[12.803]***
Constant	-0.022	-0.050
	[0.019]	[0.021]**
Observations	242	242
R-squared	0.15	0.19

OLS, Robust standard errors in brackets
* significant at 10%
** significant at 5%
*** significant at 1%

Column (1) reports the results as derived by Gawande and Bandyopadhyay. As predicted by the "Protection for Sale" model of Grossman and Helpman, trade protection levels are higher for sectors that are politically organized, who have lower imports penetration and a higher price elasticity of imports decreases the tariff level ($\gamma_2 < 0$).

The results from our specification appear in column (2). Our measure of "industry swingness and decisiveness" does not affect the sign, magnitude and significance of the coefficients on $I_i(z_i/e_i)$ indicating a robustness of the Grossman Helpman model. The point estimate of γ_3 is 39.832 (significant at the 1%, with a robust standard error of 12.803). Sectors that constitute larger employment shares of swing and decisive states receive more protection.

Including a measure of swingness and decisiveness increases the centered $R2$ by 26%, therefore explaining a larger fraction of the variation of protection levels across sectors.

5 Discussion

The political agency model provides a means of analysing the relationship between political concentration of industries and trade policy decisions by governments. This paper innovates in two respects. First, it introduces the importance of industrial geography in the determination of trade policy. It thus formally models a question that has been prevalent in the media: are industries located in swing states more likely to be protected?

In contrast to this apparent vote-swinging political motivation for industrial protection, the theoretical and empirical political economy literature has focused on the role of lobbying in determining trade, whereby campaign contributions influence policy [Grossman and Helpman (1994), (1996), (2002) and Goldberg and Maggi (1999)]. Our second innovation is that we take an alternative approach to the mainstream interest group-contributions approach of the political economy of trade policy literature by disentangling the potential importance of elections in tariff formation, especially in more complex institutional settings. While lobbies' contributions may stongly influence policy formation, the geographical origin of the contributions is inconsequential to the election outcome. In contrast, votes are attached to political districts and the geo-political location of votes may influences policy choice under certain electoral systems. This is our motivation for diverging from the contributions - interest group approach that is conventionally employed in political economy models of trade policy choice.

In the political agency model presented, trade policy is modeled as a (0,1) binary decision, while the tariff rate is a continuous decision variable in the probabilistic voting framework of our companion paper (Muuls and Petropoulou, 2004). The latter offers a richer framework for analysing trade policy choice, in that it allows for a greater or lesser degree of protection across industries. Introducing a continuous trade policy parameter in the single-state political agency, though possible, would greatly increase the level of complexity while offering little advantage in terms of richer results. With a continuum of states, a move away from a binary choice for trade policy increases complexity to the point where it is difficult to draw any clear conclusions even with the simplest of examples.

An important limitation of both approaches is that they cannot explain why some governments choose to use trade instruments to protect certain industries and others choose domestic instruments such as subsidies. For example, the Bush administration could have employed a production subsidy rather than tried to implement high tariff rates on steel. In contrast, the German coal industry is very highly protected through the use of subsidies There are likely to be important revenue and political considerations that our models cannot address. There is thus scope for further research into the choice of protection instrument in a single- and multi-jurisdictional political economy setting.

In terms of empirics, we hope to build on our encouraging results and refine the empirical analysis further.

6 Conclusion

This paper analyses the electoral incentives to manipulate trade policy in a multi-state setting. The approach emphasizes the importance of political concentration of industry, that is, the distribution of industrial employment across political states, for trade policy outcomes.

In general, industries with a large presence in decisive, swing states are more likely to be protected than those with small representation in pivotal states. The importance of relative industry size for trade policy choice is also made explicit in lobbying models and in single-state political agency models.

We innovate by adding a spatial dimension to the political arena by examining political incentives in a multi-state environment. Our key insight is that industry relative size needs to be interacted with location in order to have political weight in trade policy choice. This implies that large industries located in states with less political clout are less likely to be protected than possibly smaller industries in pivotal locations. Relative industry size within pivotal states remains crucial for policy choice.

The empirical analysis using US tariff and non-tariff barrier data lends support to the theory by showing that a measure of swingness and decisiveness explains a larger percentage of variation in protection levels across US states.

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