

# Voting for Protection: Does Direct Foreign Investment Influence Legislator Behavior?

By BRUCE A. BLONIGEN AND DAVID N. FIGLIO\*

The political economy of trade protection has long been of interest to economists and policy makers. The idea that levels of protection may be endogenous with trade flows has been a particularly important issue in the literature. In general, the endogenous protection literature postulates that import penetration will cause domestic interests to lobby more intensely for protection. Thus, higher levels of import penetration lead to increased protection. As a result, a number of papers (see, for example, Arye L. Hillman, 1982; Wolfgang Mayer, 1984; Robert E. Baldwin, 1985; Stephen P. Magee et al., 1989; Ronald D. Fischer, 1992) have established that foreign firms will import less under a regime of endogenous protection than one where the level of protection is exogenous to trade flows. On the empirical side, Daniel Trefler (1993) finds that ignoring the endogeneity of trade and protection understates the impact of U.S. protection on imports by a magnitude of ten.

With the large flows of direct foreign investment (DFI) into the United States in the 1980's,<sup>1</sup> economists have begun to examine

the role of DFI in the political economy of trade protection as well. The hypothesis of *quid pro quo* DFI, formally introduced by Jagdish N. Bhagwati et al. (1987), proposes that DFI, unlike imports, may help to defuse protection. In the Bhagwati et al. model, the mechanism through which protection is defused by DFI is also political—DFI creates goodwill with special-interest groups that would tend to lobby for protection. Subsequent papers have further examined the theory of political economy of DFI with sometimes conflicting results. Kar-yiu Wong (1989), Elias Dinopoulos and Wong (1991), Dinopoulos (1992), and Laixun Zhao (1996), explicitly introduce labor unions and model the wage and/or employment levels as endogenous with DFI. While Wong (1989), Dinopoulos and Wong (1991), and Dinopoulos (1992) find an inverse relationship between DFI and lobbying by labor unions (i.e., protectionist pressure), Zhao (1996) constructs a plausible model where higher levels of DFI are connected with greater lobbying efforts for protection. Gene Grossman and Elhanan Helpman (1994) construct a general equilibrium model where monopolistically competitive firms can open plants abroad in response to possible protection by an incumbent government seeking to maximize a political objective function. Their model also finds (p. 25) the possibility of equilibria where there is "no realization of a *quid pro quo*." Finally, Bhagwati et al. (1992) point out that DFI may sometimes be perceived as a threat (like import penetration) and create ill will rather than goodwill.

In contrast to the active theoretical literature on the issue, there have been few empirical papers to date that have explored the political economy of DFI. Paul Azrak and Kevin Wynne (1995) find that the probability of protection positively affects quarterly Japanese manufacturing DFI into the United States. Blonigen and Robert C. Feenstra (1997) use a panel data set of four-digit SIC industries in

\* Blonigen: Department of Economics, University of Oregon, Eugene, OR 97403; Figlio: Department of Economics, University of Florida, Gainesville, FL 32611, and Department of Economics, University of Oregon, Eugene, OR 97403. We appreciate helpful comments and advice from Sam Peltzman, Deborah Swenson, Wes Wilson, three anonymous referees, and seminar participants at the Midwest International Economics Meetings, Spring 1996, and the Research Institute of the Ministry of International Trade and Industry in Tokyo, Japan. We also acknowledge financial support from the University of Oregon Foundation. Any errors or omissions are the sole responsibility of the authors.

<sup>1</sup> Edward M. Graham and Paul R. Krugman (1995) report that the stock of DFI in the United States as a percentage of total net worth of all nonfinancial U.S. firms increased by a factor of four (from 2.6 percent to 11.6 percent) from 1977 to 1992. A large portion of this surge—in our data, over 60 percent—came in the latter half of the 1980's.

the 1980's to test the effect of lagged Japanese DFI on the probability of U.S. protection. Following earlier research examining trade-related variables on the probability of protection,<sup>2</sup> Blonigen and Feenstra (1997) use DFI-related variables as explanatory regressors in a probit regression to predict the probability of protection. While they find strong evidence that DFI responds to protectionist pressure, they find mixed evidence that DFI defuses future probabilities of protection at the industry level.

While these empirical studies shed light on the significance of DFI and political factors on the administration of protection policy, they do not investigate the effect of DFI flows on the policy makers themselves—the representatives in Congress who are lobbied by affected special-interest groups and whose constituencies (and hence, whose reelection probabilities) are affected by DFI. While U.S. protection programs operate without day-to-day influence from Congress and may enjoy a large degree of independence, large trade issues and the overall structure of protectionist programs are ultimately decided by Congress. Thus, an alternative investigation of the effect of DFI on future trade protection involves looking at how the pattern of DFI affects congressional voting patterns on trade issues.

This paper focuses on the effect of DFI on U.S. congressional trade votes between 1985 and 1994. We start by briefly examining the literature on the political economy of DFI and trade protection. We then investigate the effect of DFI on congressional votes in a number of different ways, first by examining the effect of DFI, as measured by the ratio of employment by foreign-owned affiliates to total employment in a state, on a panel of Senate votes on trade issues from 1985 to 1994. We also look at House of Representatives votes on two high-profile industries in trade protection issues: automobiles and textiles/apparel. For the House votes, we map changes in the number of foreign plants in these industries to specific congressional

districts and explore the effect of DFI changes at the district level on these specific trade issues occurring in the House. Our results are potentially surprising, but surprisingly robust across these different data sets. DFI makes lawmakers *more* likely to vote for trade protection in the future, particularly those that are protectionist beforehand. Rather than defusing protection, we find that DFI results in individual legislators reinforcing their priors on protection. Thus, the effect of DFI on trade policy is quite heterogeneous across legislators, which may inform future work on modeling the role of DFI in the determination of trade protection policy.

### I. How Does DFI Affect Individual Legislators?

The first paper to formally model DFI in the determination of trade policy is Bhagwati et al. (1987). They set up a two-period, two-country framework in which the home country chooses exports and capital (DFI) outflows to the foreign country each period to maximize its welfare. Second-period trade policy in the foreign country, however, is determined by first-period exports and DFI from the home country. Specifically, the probability of a trade restriction by the foreign country in the second period is the function,  $G = G(E_1^f, K^1)$ , where  $E_1^f$  is level of imports in the first period and  $K^1$  is the level of DFI in the first period. Assuming that  $G_1 > 0$ ,  $G_2 < 0$ , Bhagwati et al. (1987) show that the home country will engage in less exports and more DFI than it otherwise would to lower the second-period probability of protection.

While Bhagwati et al. (1987) formalize the relationship between DFI and trade policy, they do not explicitly model the actual political mechanism through which DFI influences protection; the relationship is asserted. However, they argue that DFI can defuse protectionist pressures because lobby groups from the exporting country can portray the image of DFI as saving jobs in the host country, rather than costing jobs, as in the case of imports. As they state (p. 128), "Such 'image building' can influence Congress to withstand the protectionist pressures from import-competing industry." In a later paper, Bhagwati et al. (1992) discuss

<sup>2</sup> See J. Michael Finger et al. (1982) and Cletus C. Coughlin et al. (1989) for examples of these papers.

other special-interest groups that may be persuaded by DFI to lobby for less protection, including domestic firms that are drawn into joint ventures with the foreign firms engaging in DFI, labor unions that experience employment gains from DFI, and the communities that benefit from the location of DFI. The connection with trade policy is that these affected interest groups will lobby their legislators for free trade, or at least will be less vociferous in their support for protectionism, as they state (p. 188): "The view [of *quid pro quo* DFI] was that the mere act of DFI would serve to reduce the threat by earning goodwill. A grateful community in the area of investment perhaps might provide the political counterweight to protectionism via their Congressmen."

We use this explanation of the *quid pro quo* DFI to motivate our analysis of the effect of DFI on legislators' trade votes. This line of analysis is not a test of the *quid pro quo* hypothesis in the sense that we are not testing the intentions of the firms or governments investing in the United States to defuse protectionism. However, *quid pro quo* DFI has implications regarding voting for protection that can be examined in such an analysis as ours. To the extent that a substantial amount of DFI in the United States is motivated by *quid pro quo* intentions and is successful, we should see increased DFI resulting in lower levels of future trade protection votes across a sample of U.S. legislators. If *quid pro quo* DFI is occurring infrequently (e.g., only in the case of certain crucial legislators) or is largely unsuccessful, one would expect little or no correlation across such a sample.

## II. Empirical Approach

We propose the following empirical investigation of the relationship between flows of DFI into a legislator's district and the legislator's position on protection. We observe every bill voted upon in the U.S. Senate from 1985 to 1994 that had clear pro-trade and protectionist positions—35 in all. Because each senator voted on multiple bills over the course of the decade in question, it is possible to control for unobserved heterogeneity. We use senators, rather than members of the House of Representatives, as our unit of analysis because the

government-collected data on DFI in the United States are reported on the state level. Later in this paper we also make inferences about the effects of DFI on voting behavior in the House of Representatives.

Our choice of dependent variable is a potential source of debate. We considered using whether a senator voted for protection on individual bills as a dependent variable, thereby estimating a panel approach to a dichotomous dependent variable model including up to 35 observations per senator.<sup>3</sup> In this case, the appropriate modeling technique would be the conditional logit model proposed by Gary Chamberlain (1980). However, were we to adopt this technique, we would either be able to control for bill-specific heterogeneity or senator-specific heterogeneity, but we would not be able to condition on both. Given that trade bills can be substantially different in tenor, scope, and effect—and given that a great deal of a senator's unobserved propensity to vote for or against protection is not captured by variables that we observe<sup>4</sup>—we are concerned that any conditional logit model that we estimate will be flawed in that both sources of heterogeneity in the data cannot be captured simultaneously.

Because of this concern, we chose to construct a measure of a senator's general position on protection that we could use in a fixed-effects model. We follow the literature on legislator voting behavior in constructing "voting scores," composites of roll-call votes used to infer a legislator's position on a particular issue.<sup>5</sup> Therefore, our dependent variable is the percentage of trade votes on which the senator took a protectionist position during a two-year

<sup>3</sup> Some senators did not vote on every trade bill.

<sup>4</sup> In the fixed-effects model that we end up estimating, our observed time-invariant senator and state characteristics explain less than one-quarter of the senator-specific fixed effects. Therefore, we are very concerned about not adequately controlling for senator-specific heterogeneity if we estimate a conditional logit model with only bill-specific heterogeneity. It turns out, however, that the results of such a conditional logit estimation are remarkably similar to those that we find using our panel voting-score approach. These results are reported later in the paper.

<sup>5</sup> Recent examples include John R. Lott, Jr. and Stephen G. Bronars (1993), Gi-Rong Jung et al. (1994), and Figlio (1995).

congressional term.<sup>6</sup> In any given two-year congressional term during our time period of interest (1985–1994), there were six to eight significant Senate votes on free-trade issues. The exception was 1991–1992, in which only one important vote reached the Senate floor; therefore, we omitted this congressional period. Because the variable can only take on values between zero and one, we were initially concerned about the distribution of the dependent variable. However, in practice, very few senators voted exclusively for or against protection in any given two-year period. We therefore treat the dependent variable as an unconstrained continuous dependent variable.<sup>7</sup> Limiting our analysis to the 60 senators who remained in office during the entire period,<sup>8</sup> we have four observations per individual, for a total of 240 observations.

We begin by estimating the equation

$$(1) \quad V_{it} = \beta_1 D_{it} + \gamma_1 P_t + \gamma_2 P_t E_i + \gamma_3 U_{it} \\ + \gamma_4 W_{it} + \gamma_5 R_{it} + \rho_t + \lambda_i + \varepsilon_{it},$$

where the  $\lambda_i$ 's are individual-specific fixed effects, and the  $\rho_t$ 's are time effects.  $D_{it}$  is our DFI variable, measured as the ratio of employment by affiliates of foreign firms to total state nonfarm employment in senator  $i$ 's state in year  $t$ .<sup>9</sup>

<sup>6</sup> Voting on specific Senate bills is reported in the relevant year's issue of the *Congressional Quarterly Almanac*.

<sup>7</sup> Given that each term's voting score is based on different votes, and since clearly every trade bill does not affect a state in the same way, we were concerned about the distribution of the error term. The distribution of the error term is systematically different from the other years only in the case of the 1993–1994 term, but our results are robust to excluding the 1993–1994 observations (or any other Congress, for that matter). In addition, to the extent that the bills differ from Congress to Congress, we control for time-specific differences. We model our errors as heteroskedastic using White's correction.

<sup>8</sup> We make this restriction, rather than estimating an unbalanced panel, because we want to discern a senator's voting record on free trade prior to the marked increase in DFI in the late 1980's.

<sup>9</sup> Data on DFI are reported in the *Survey of Current Business*, published by the Bureau of Economic Analysis, U.S. Department of Commerce.

Equation (1) also includes some plausible control variables. First, the President of the United States may play a role in determining a senator's position on free-trade issues. Therefore, we include a series of variables intended to capture the effects that the President has on a senator's voting patterns.  $P_t$  measures the percentage of votes in which the President took the free-trade position, interacted with a dummy variable indicating whether the President and the senator are in opposing parties. We include this variable directly, as well as interacted with  $E_i$ , a dummy variable indicating that the senator is a member of the Democratic Party.

State economic conditions and constituency characteristics (such as the level of trade-sensitive employment in the state) should have a substantial role in determining a legislator's voting record on trade issues. Many of these factors are time invariant and are subsumed in the estimated senator-specific fixed effects, though others may vary over time and influence a senator's voting record across this dimension of our panel. We include three state characteristics that vary over time: (1)  $U_{it}$ , senator  $i$ 's state unemployment rate in time  $t$ , as reported in the U.S. Bureau of Labor Statistics's *Geographic Profile of Employment and Unemployment*, (2)  $R_{it}$ , the percentage of the congressional delegation from senator  $i$ 's state that are Republican in year  $t$ , calculated from the Inter-University Consortium on Political and Social Research (ICPSR) database, *Voting Scores of Members of the U.S. Congress*, and (3)  $W_{it}$ , the average wages in senator  $i$ 's state in year  $t$ , reported in the U.S. Bureau of Census' *County Business Patterns*, relevant years.<sup>10</sup> This last variable is particularly important to include if one believes that DFI is attracted to lower-wage states, and lower wages tend to increase protectionist tendencies.

Finally, the political atmosphere and group of trade bills voted on may vary by congressional period. For these reasons and to control

<sup>10</sup> We also estimated models including employment changes over time, as well as replacing wages with an employment variable. The results are virtually unchanged from those reported in the paper.

for other unobservable time-specific effects, we include a set of time dummies  $\rho_i$  in our regression.

#### A. Panel Results from the U.S. Senate

We estimate the fixed-effects model in equation (1), which we label model 1, and report coefficient estimates in Table 1. An  $F$ -test rejects the hypothesis that the senator-specific fixed effects should not be included in the estimation at the 99-percent confidence level. Most of the regressors (besides DFI) have the expected sign and four of the seven are statistically significant, including a finding that lower wages are associated with an increase in a senator's protectionist position. Conditional on these fixed effects and the other regressors, there is a strong, statistically significant positive relationship between our DFI measure (employment share of foreign affiliates in a state) and the senator's position on protection. Specifically, a one-standard-deviation increase in DFI is associated with 18.6 percentage points' more protectionist voting by senators, all else equal. To gauge whether simultaneity between protectionist voting and DFI is an issue, we also estimated models in which we instrument for DFI; the point estimates from these models are very close to those reported in the paper, suggesting that it is unlikely that protectionist voting induces DFI at the senator level.<sup>11</sup> Therefore, the initial evidence casts doubt on the assumption of quid pro quo DFI that DFI weakens the threat of protection.<sup>12</sup>

<sup>11</sup> It is challenging to find instruments that explain a substantial portion of heterogeneity in DFI while also being exogenous to voting positions on trade issues. We found four statistically valid (but unfortunately, weakly correlated) instruments that individually pass Wald tests of instrument relevance and for which we can fail to reject a Hausman test of instrument exogeneity. Specifically, using four different specifications in which instruments are employed one at a time, these instruments are two-year lagged wages or employment interacted with statewide violent crime rates or a "transportation quality" score developed by Rand McNally.

<sup>12</sup> In previous versions of this paper, we used the percentage change in the share of foreign-affiliate employment in a state as our DFI variable. This specification yields results that are extremely similar to those reported here.

There are several reasons why the contemporaneous level of DFI might not be the ideal measure of DFI for the purposes of explaining legislator voting behavior; i.e., it may take time for DFI to affect senators' voting positions on trade. To explore this, we include DFI lagged one congressional period in equation (1) which we call model 2. As Table 1 reports, there is a statistically significant positive effect of lagged DFI on a senator's protectionist position, but it is small in comparison to the effect of contemporaneous DFI, and its inclusion has little impact on other regressors as well. Thus, we do not include a lagged term in the regressions that follow.

One may be concerned that our finding that DFI tends to strengthen a senator's trade position over time may be simply an artifact of unobserved time-varying senator characteristics. To control for this, we estimate equation (1) in first differences in which the senator-specific effects now capture any senator-specific trends in protectionist voting due to unobservable factors and call this model 3 reported in Table 1. If anything, this approach understates the estimated effect of changes in DFI on changes in protectionist voting, since any component in the senator-specific trend that is actually due to DFI is incorporated into the senator-specific fixed effect. Nonetheless, we still find a strong evidence that DFI is positively correlated with protectionist stance, even though this specification only derives identification from deviations from senator-specific time trends in DFI and voting behavior. As always, there is the possibility of spurious correlation between our DFI variable and senators' voting positions. However, given the results above, this would mean there is some underlying variable besides our measures of local market conditions and other covariates that is related to both deviations from a state's time trend in DFI and a senator's deviation from his or her time trend in protectionist voting.

Does DFI affect all legislators in the same manner? The anecdotal evidence, at least, suggests that this is not so. Consider two viewpoints regarding free trade in South Carolina, for example. While campaigning for the 1996 Republican presidential nomination, Senator Robert Dole lauded the benefits of free trade in

TABLE 1—FIXED-EFFECTS MODELS: DETERMINANTS OF SENATOR PROTECTIONIST POSITIONS  
DEPENDENT VARIABLE: PERCENTAGE OF VOTES IN A CONGRESS WHERE SENATOR SUPPORTED THE PROTECTIONIST  
POSITION (FIRST DIFFERENCES IN MODEL 3)  
(240 OBSERVATIONS; 180 OBSERVATIONS IN MODEL 3)

Variable	Model 1: DFI levels	Model 2: DFI levels plus lagged DFI	Model 3: All variables in differences
(1) Level of contemporaneous DFI	9.555*** (2.178)	9.158*** (2.177)	15.829*** (5.465)
(2) Lagged DFI	—	0.664** (0.301)	—
(3) Percentage of trade votes in which President took pro-trade position $\times$ President in other party	0.124** (0.062)	0.122** (0.062)	0.159** (0.085)
(4) Democrat $\times$ (3)	-0.506*** (0.106)	-0.501*** (0.106)	-0.547*** (0.128)
(5) State unemployment rate	0.004 (0.016)	0.005 (0.016)	0.021 (0.019)
(6) Average wages in state	-0.093*** (0.020)	-0.094*** (0.020)	0.048 (0.041)
(7) Percentage of congressional delegation in Republican Party	-0.056 (0.194)	-0.060 (0.193)	0.131 (0.228)

Notes: Heteroskedasticity-consistent standard errors are in parentheses beneath parameter estimates. Estimates marked \*\*\* are significant at the 1-percent level; those marked \*\* are significant at the 5-percent level; and those marked \* are significant at the 10-percent level. The estimated equations also include full sets of year dummies and senator-specific fixed effects. DFI is defined as the share of total employment by foreign affiliates in a senator's state.

a speech in front of a new foreign automobile plant. However, Senator Ernest F. Hollings, in a *Washington Post* (March 17, 1996 p. C4) opinion piece at about the same time attributed the recent inflow of DFI into South Carolina to protection:

Now we have the spectacle of my home state, South Carolina, being used by some people as an example of the benefits of unquestioned free trade. The opposite is the case . . . . With the threat of trade sanctions, voluntary restraint agreements in steel, cars, televisions and roller bearings were obtained [in the United States]. Ergo, we now have in South Carolina Nucor steel, BMW cars, Hitachi televisions, and Koyo roller bearings . . . . Protectionism not only saves jobs, it creates new ones.

Senators Dole and Hollings, historically a free-trader and a protectionist, respectively, apparently responded differently to the same "treatment" of DFI in South Carolina. This

suggests that there may a real philosophical difference between legislators on the issue of trade policy and DFI by foreign firms.

Is South Carolina unique, or merely indicative of a general pattern? To explore this further, we first examine voting patterns of pairs of senators from the same state with markedly different initial positions on protection. This is a clean first test of voting responses to DFI in the sense that all state and (to some extent) constituency characteristics are identical for these senators. There are two states where we have data for both senators across the sample, where the two senators had substantially different trade positions in 1985, and where the change in DFI over the sample period was potentially substantial (at least one-quarter of the national average). In the case of Iowa, Senator Charles Grassley, the more initially pro-trade of the two, voted for free trade at about the same level between 1985 and 1990, while Senator Tom Harkin, the more initially protectionist, halved his free-trade support in the five years following 1985. In New Jersey, Senator

Bill Bradley, the more free-trade senator, voted for free trade twice as frequently in the 1989–1990 term as he did in 1985–1986, while initially protectionist Senator Frank Lautenberg reduced his free-trade support from 13 percent to zero percent during the same time period. Therefore, there is suggestive evidence that even senators representing the same state seem to respond in divergent directions to an inflow of DFI into their state.

However, in order to explore the possibility that DFI affects legislators differently across our entire sample, we estimate the equation

$$(2) \quad V_{it} = \beta_1 D_{it} + \beta_2 D_{it} V_{i,85} + \gamma_1 P_i \\ + \gamma_2 P_i E_i + \gamma_3 U_{it} + \gamma_4 W_{it} \\ + \gamma_5 R_{it} + \rho_i + \lambda_t + \varepsilon_{it}$$

in first differences, where we allow for the potential for nonlinear responses to DFI by interacting the DFI variable with the senator's 1985–1986 position on protection,  $V_{i,85}$ .<sup>13</sup> We call this model 4 and report results in Table 2.

The results of model 4 show a strong nonlinear relationship between DFI and a senator's initial voting behavior on protection issues, all else equal. Senators who in 1985–1986 tended to vote in favor of protection became even more likely to vote for protection as their states experienced growth in DFI. On the other hand, senators who were initially predisposed against protection appear to become more likely to vote for free trade when their state experiences growth in DFI. In our model 4 we find the threshold value of the 1985 protectionist position is 30 percent: If the senator took the protectionist position at least 30 percent of the time in the 1985–1986 term, the senator is even more likely to vote for protection when her state experiences growth in DFI. If the senator took the protectionist position less than 30 percent of the time in 1985–1986, the senator is more likely to vote for free trade when her state experiences an increase in DFI.

<sup>13</sup> Results reported in Table 2 use a first-differences specification because of concerns discussed above, but are qualitatively identical to results obtained when estimating (2) in levels.

These results are robust to changing the time frame of the analysis (e.g., eliminating the 1990's or the 1985–1986 congressional term from the analysis), as well as to changing the set of control variables included on the right-hand side of the regression. Under no circumstances that we could find does this threshold change by more than about 9 percentage points, and in all sensitivity tests that we attempted both the direct effect of DFI and the interaction with initial free-trade position maintained their signs and high levels of statistical significance.

How large are the estimated results? The estimated effect of DFI on senator voting behavior depends crucially on the senator's initial voting position on free trade. The senator with the mean initial position on trade increases his percentage of protection support by 4.7 percentage points (significantly different from zero at the 1-percent level in a one-tailed test) if his state experienced a one-standard-deviation increase in the percentage change in DFI. A strong protectionist, say, one who voted for protection one standard deviation more frequently than the mean in 1985–1986, would increase her percentage of protection support by 10.3 percentage points (significantly different from zero at the 1-percent level) when facing the same increase in DFI. On the other hand, consider the case of a strong free-trader, who adopted the protectionist position one standard deviation less frequently than the mean in 1985–1986. The results suggest that she would reduce her percentage of protection support by 0.9 percentage points when her state sees a one-standard-deviation increase in DFI, all else equal. While this result is not significantly different from zero at conventional levels, this estimated response is significantly different from that of a senator with mean protectionist tendencies in 1985–1986.<sup>14</sup>

<sup>14</sup> We also estimated conditional logit models with protectionist voting behavior on 35 specific trade bills in which we controlled for bill-specific heterogeneity but not senator-specific heterogeneity. We did, however, control for some state-specific factors such as the average income, education, and union status in the state, as well as the importance of agriculture and manufacturing in the state.

TABLE 2—HETEROGENEITY IN EFFECTS OF DIRECT FOREIGN INVESTMENT  
FIRST-DIFFERENCE MODELS WITH SENATOR-SPECIFIC TIME TRENDS  
(ALL VARIABLES IN FIRST DIFFERENCES)

Variable	Model 4: Interactions with initial trade position	Model 5: Interactions with initial trade position, asymmetric effect	Model 6: Interaction with liberal position	Model 7: Interaction with liberal position, asymmetric effect	Model 8: Interactions with liberal position and initial trade position	Model 9: Interactions with liberal position and initial trade position, asymmetric effect
(1) Direct foreign investment	-13.604 (11.439)	18.418 (13.577)	7.899 (9.327)	28.980*** (9.649)	-11.490 (11.964)	26.963* (14.611)
(2) Initial protectionist position $\times$ (1)	45.214*** (11.975)	-1.980 (16.117)	—	—	50.006*** (11.757)	6.153 (19.082)
(3) Dummy variable representing DFI increase $\times$ (1)	—	-44.224*** (16.167)	—	-33.653** (15.839)	—	-55.612** (21.843)
(4) Initial protectionist position $\times$ (3)	—	75.489*** (21.640)	—	—	—	67.805*** (22.820)
(5) ADA (liberainess) score in 1985 $\times$ (1)	—	—	0.183 (0.141)	-0.140 (0.159)	-0.121 (0.152)	-0.286* (0.163)
(6) ADA score in 1985 $\times$ (3)	—	—	—	0.444** (0.206)	—	0.309* (0.183)

Notes: Heteroskedasticity-consistent standard errors are in parentheses beneath parameter estimates. Estimates marked \*\*\* are significant at the 1-percent level; those marked \*\* are significant at the 5-percent level; and those marked \* are significant at the 10-percent level. The estimated equations also include full sets of year dummies and senator-specific time trends. DFI is defined as the share of total employment by foreign affiliates in a senator's state.

Another question is whether the response of senators to DFI is symmetric with respect to

We also controlled for the same time-variant variables controlled for in the panel using voting scores. Our results are qualitatively extremely similar to those reported above in model 4. Both the coefficient on the DFI variable and its interaction with initial position on trade are significant at any reasonable significance level, and the coefficient is significant (at any level) and positive in the event of no initial-position interaction term. The results suggest, for instance, that a strong free-trader (who voted for protection 10 percent of the time in 1985) would reduce his probability of voting for protection on any given trade bill by three-quarters of 1 percent for every percentage increase in DFI, while a strong protectionist (who voted for protection 90 percent of the time in 1985) would increase her probability of voting for protection on any given trade

increases or decreases in DFI. Model 5 in Table 2 allows responses to be asymmetric in this fashion by interacting a dummy variable representing a DFI increase with the senator's initial positions and the DFI variable. The results clearly show that senators do not respond symmetrically. While *increases* in DFI apparently lead to increased divergence in the protectionist positions of initial protectionists and free-traders, *decreases* in DFI apparently do not lead to significant convergence. An *F*-test

bill by one-third of 1 percent for every percentage increase in DFI in her state. These estimated elasticities are significant at traditional levels. Additional details of these estimations are available on request.



shows that the response to increases versus decreases in DFI is significant at the 0.014 level.

A final concern with our interaction term is that the senator's initial voting record may just simply be correlated with some other explanatory variable that explains the heterogeneity in senator's responses. Therefore, we tried a number of alternative specifications in which we replaced the senator's initial voting record on protection with such variables as the union concentration, average education level, and median income in the state. (We also looked into models that included both the interaction with the initial voting score and interactions of DFI with subsets of these variables.) In no cases were these additional interactions statistically significant. Therefore, although the senator's initial voting score tends to be correlated with these other constituency variables, the relationship between DFI and subsequent voting on protection issues appears to be much more closely related to initial positions on protection than to specific constituency characteristics.

One interaction that does have significant effects, however, is the degree of liberalness or conservativeness of the senator. In general, one may expect liberal senators to be more protectionist. For example, we find that the senator-specific fixed effects estimated in model 1 have a correlation of 0.55 with the Americans for Democratic Action (ADA) voting score and a correlation of 0.53 with the AFL-CIO COPE score. Model specifications 6 and 7 in Table 2 explore heterogeneity in the effects of DFI on protectionist positions due to the degree of liberalness of a senator as measured by his ADA score in 1985. In particular, allowing for asymmetric responses to increases and decreases in DFI, model 7 shows that more liberal senators are significantly more protectionist with increases in DFI.<sup>15</sup> Models 8 and 9 in Table 2 show that *both* initial voting stance and liberalness have independent effects on how senators react to DFI. Specifically, coefficients in specification 9 show that senators that are more liberal and/or leaning protectionist initially, respond to

DFI increases with a significantly stronger protectionist stance.

#### B. *Probit Results: Voting on Specific Bills in the U.S. House of Representatives*

The results from the preceding subsection present compelling evidence that DFI influences senators' voting behavior on protection issues, but in different ways depending on how protectionist the senator was before the recent wave of DFI. There are, however, several potential weaknesses of the preceding estimation. First, we estimate how a senator's *general* position on protection responds to changes in the *overall* level of DFI in the senator's state. However, it is not immediately obvious that, for instance, a senator in a car-producing state will alter his or her positions on protection *in the automobile market* simply because the state experiences, say, increases in DFI *in textiles*. Second, senators may be less sensitive to DFI than members of Congress may be, given that states are, by definition, much larger than congressional districts. It may be that some senators might not even notice changes in DFI in their states, while members of Congress may be more apt to notice new large plant openings in their district. With these potential shortcomings in mind, we consider the relationship between DFI in a specific industry and votes on particular industry-specific bills in the U.S. Congress. In particular, we consider the two industries that have arguably gotten the most attention over the last 15 years: automobiles and textiles/apparel.

Our strategy for gauging whether the relationship between DFI in specific industries and free-trade votes concerning that industry in the U.S. Congress follows the same apparent pattern as that seen above in the U.S. Senate proceeds in several steps. First, we identify several pairs of bills on similar issues, one before the recent surge in DFI and the other in the early 1990's. In the case of textiles, members of Congress voted on textile tariffs in 1990 [HR 4328, 1990 *Congressional Quarterly Almanac* (CQ) vote 440] and on textile import quotas in 1985 (HR 1562, 1985 CQ vote 320). In the case of automobiles, in 1992 members of Congress voted both on imposing

<sup>15</sup> An *F*-test of this asymmetry suggests that the responses to increases versus decreases in DFI are significant at the 0.036 level.

higher tariffs on minivans (HR 4318, 1992 CQ vote 357) and on limiting Japanese auto imports (HR 5100, 1992 CQ vote 272), while in 1982 they voted on automobile domestic-content requirements (HR 5133, 1982 CQ vote 435). Because we can observe a member of Congress's voting behavior on two related bills, we can gauge whether those who initially voted for protection are even more likely to vote for protection when their district sees increases in DFI while those who initially voted against protection are even more likely to vote for free trade when their district faces increases in DFI.

The second step in our strategy is to identify changes in industry-specific DFI, in particular congressional districts. While no source reports information either on general levels of DFI in a congressional district, as we observe on the state level, and no source reports a continuous measure of changes of DFI across industries even at the state level, we can make some inferences about changes in industry-specific DFI in a congressional district using available data. Specifically, Jeffrey S. Arpan and David A. Ricks (1979, 1990) published a directory of foreign manufacturers in the United States in both 1979 and 1990. This directory provides both four-digit SIC codes (making it possible to match industry) as well as plant addresses (making it possible to identify the congressional district).<sup>16</sup> Unfortunately, we only can count the number of plants in a particular industry in a congressional district, and so we cannot gauge the relative importance of any single plant (as we could if we had employment data). The other drawback is that our DFI observations do not exactly coincide with our vote years. But they are the best data that we could find and should provide a reasonable approximation to whether industry-specific DFI increased in a congressional district through the 1980's. Using these data we construct two dummy variables, one reflecting whether the district experienced an increase in the number of for-

eign textile plants during the 1980's, and the other reflecting whether the district experienced an increase in the number of foreign auto manufacturing/parts plants during the 1980's. These variables are our central variables of interest in this subsection.

We estimate separate equations for three pairs of bills: (1) the 1990 textile tariff and the 1985 textile import quota; (2) the 1992 minivan tariff and the 1982 domestic-content bill; and (3) the 1992 limit on Japanese cars and the 1982 domestic-content bill. We sample those members of Congress who voted on each of the two bills in the relevant pair.<sup>17</sup> This leaves us with 327 observations for the first pair of bills, and 179 and 202 observations for the second and third pairs of bills, respectively. For each pair of bills, the dependent variable is a dichotomous measure of whether the member of Congress voted in favor of the more recent (1990 or 1992) bill. In all cases, a "yea" was a vote for protection.

On the right-hand side of our equations are two variables reflecting the role of DFI in congressional decision-making. We include both the relevant dummy variable reflecting increased textile or automobile manufacturing/parts DFI in the district as well as an interaction between the DFI variable and the congressman's vote on the earlier (1982 or 1985) bill in the pair. Since we cannot control for legislator fixed effects as we could in the preceding section, we include a number of additional variables that may influence a congressman's voting on protection. Specifically, we control for whether the legislator is a Democrat and for the ratio of textile employment in the state to the state's total nonfarm employment in 1987. (For the automobile regressions, we replace this last variable with two ratios—one for steel employment and another for transportation employment.)

<sup>16</sup> We used the *Congressional Quarterly's* publication, *Congressional Districts in the 1980s*, to identify the boundaries of congressional districts and a road atlas to locate plant addresses.

<sup>17</sup> Since a number of congressmembers retired, were elected to other office, or were defeated between the two bills in each pair, we also estimated the textiles and apparel equation with observations that were congressional seat specific, rather than congressman specific. The results remained qualitatively unchanged. This exercise could not be done with the automobile equations, due to the congressional redistricting that occurred in the early 1980's.

TABLE 3—PROBIT ESTIMATION: VOTING FOR THE PROTECTIONIST POSITION ON SPECIFIC BILLS IN THE U.S. HOUSE OF REPRESENTATIVES

Variable	Textile tariffs (1990)	Minivan tariffs (1992)	Limit Japanese autos (1992)
(1) Increased DFI in district in textiles (or automobiles/parts) from 1979 to 1990	-1.133* (0.639)	-0.225 (0.401)	-0.337 (0.425)
(2) Congressman voted for textile tariffs in 1985 × (1)	1.927** (0.733)	—	—
(3) Congressman voted for automobile domestic-content requirement in 1982 × (1)	—	1.488** (0.653)	1.187** (0.527)
(4) Democrat	1.175** (0.165)	1.300** (0.243)	1.649** (0.225)
(5) Ratio of textile employment in state to all nonfarm employment in 1987	38.493** (9.198)	—	—
(6) Ratio of steel employment in state to all nonfarm employment in 1987	—	50.719** (23.190)	32.974* (19.220)
(7) Ratio of transportation employment in state to all nonfarm employment in 1987	—	-8.830 (7.700)	-7.923 (5.943)
Number of observations	327	179	202

Notes: Standard errors are in parentheses beneath coefficient estimates. Estimates marked \*\* are statistically significant at the 5-percent level; those marked \* are significant at the 10-percent level. The estimated equations also include a constant term.

The results of the three probit regressions are reported in Table 3. In all three cases, the same relationships as were observed in the U.S. Senate specification are present when focusing on industry-specific DFI, industry-specific trade voting, and congressional districts rather than states as the unit of analysis. In all three cases, the sign of the direct effect of DFI is negative, suggesting that for those congressmembers who voted against protection in the 1980's, an increase in industry-specific DFI is associated with a decreased likelihood of voting for protection in that industry (although the coefficient is only significant for textiles). Furthermore, the coefficients on the interaction terms are all positive and significant, and indicate that an increase in industry-specific DFI is associated with an increased likelihood of voting for protection if the congressmember voted for protection in the 1980's. Therefore, the nonlinear relationship between increases in DFI and voting for protection remains robust when industry-specific DFI and voting in the U.S. Congress replaces general DFI and voting in the U.S. Senate.

### III. Conclusion

Does DFI influence protectionism policy, and if so, how? The existing theory presents conflicting conclusions. We believe that the most appropriate way to address this question is to empirically observe the behavior of the individuals who determine the degree of protectionism in the United States—the members of Congress. We find compelling evidence that suggests that DFI indeed influences legislator behavior, although not necessarily in the ways that might be posited by the current theory of quid pro quo DFI. Specifically, we find that for some legislators—in particular, those who already had leanings towards free trade—there is evidence of softening of a legislator's protectionist stance, provided that the legislator has already established at least a moderate free-trade position. But for initially protectionist legislators, we find that DFI could work in exactly the opposite way: Our results suggest that legislators who were initially protectionist will toughen their protectionist positions in the

wake of increased DFI in their jurisdictions. The qualitative finding that DFI results in divergent behavior remains when we switch from the Senate to the House of Representatives, and look at the relationship between DFI in specific industries and votes on specific bills. Thus, while our results do not rule out the possibility of quid pro quo DFI, they suggest that it is an infrequent occurrence and/or largely unsuccessful. Of course, it may be the case that quid pro quo DFI does occur and is successful—but it is aimed at a small group of pivotal legislators. Our current approach is not equipped to confirm or rule out this possibility. We intend to formally test the theory of quid pro quo DFI by investigating the potential for and outcomes of targeted quid pro quo DFI in future research.

While we have established that the response of trade policy votes varies across legislators in a systematic way, it is less clear what explains these differences. That both protectionist and free-trade politicians can point to the substantial DFI in a state such as South Carolina as evidence for the success of their trade policy stances is perhaps revealing. The anecdotal evidence suggests that legislators perceive that DFI brings localized benefits through increased employment and local taxes. However, politicians may not be certain about what motivates foreign firms' decisions to DFI and where to locate DFI, but their constituents (and hence, the legislator) may have a prior belief about which trade stance will be most successful in bringing DFI to their area. A protectionist legislator like Senator Hollings from South Carolina may view trade protection as a policy to force DFI into the United States, and hopefully, South Carolina as well. A legislator who leans toward free trade, on the other hand, may see DFI flows into his or her constituency group as the payoff from promoting greater trade flows, and hence globalization. Both arguments may have economic merit. It is well known that protectionist barriers can lead to tariff-jumping DFI, which supports the protectionist legislator's view of the trade policy world. However, numerous studies have found strong complementarity between trade and DFI, which would suggest that a free-

trade stance would lead to more DFI.<sup>18</sup> Thus, realization of DFI may just reinforce the prior about which trade stance will bring DFI and make the legislator more likely to vote this way in the future.

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<sup>18</sup> Robert E. Lipsey and Merle Yahr Weiss (1981, 1984) show at both the industry and firm level, respectively, that there is a strong positive correlation between higher levels of DFI in a foreign country and exports to that country.

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