Trade, turnover, and tithing

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Abstract

This paper examines the hypothesis that turnover affects trade preferences. High turnover industries are similar to the Stolper–Samuelson assumption of perfect factor mobility, so factor of production drives trade preferences. Among low turnover industries, as in the specific factors model, net export position determines trade preferences. We show that PAC contribution patterns are consistent with this hypothesis. In high turnover industries, capital groups give significantly larger shares of their campaign contributions to free trade supporters than labor groups do. Among low turnover industries, on the other hand, exporting and import-competing groups differ significantly in their financial support for free traders.
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1. Introduction

One of the main themes of international economics is that trade relationships have profound implications for the domestic distribution of income. While there is no question that a change in trade policy creates winners and losers, the identity of the winners and

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losers largely depends on the degree to which factors of production can move between sectors. The two polar extremes are embodied in the in the Heckscher–Ohlin–Samuelson (HOS) model, where factors are assumed to be perfectly mobile between sectors, and the Ricardo–Viner model (also known as specific factors model) where some factors of production are assumed to be completely immobile. One of the fundamental results of the HOS model is the Stolper–Samuelson theorem, which demonstrates that the economy's abundant factor benefits from trade liberalization, even if employed in the declining import-competing sector, and the economy's scarce factor is harmed by trade liberalization, even if employed in the expanding export sector. By contrast, analysis of the Ricardo–Viner model reveals that factors that are trapped in the import-competing sector are harmed by trade reform regardless of relative abundance, while factors fortunate enough to be tied to the export sector benefit.[1]

Attempts to test these two theories have met with limited success. Magee (1980) tested their predictions by exploiting the fact that they have different implications for lobbying activity in the United States. The Stolper–Samuelson theorem predicts that capital, an abundant factor in the United States, should gain from liberalization while low-skilled labor, a scarce factor in the United States, should lose. Consequently, low-skilled labor and capital should have polar opposite views with regard to trade policy even when both are employed in the same industry. On the other hand, if capital and labor are both tied to their sector, then the Ricardo–Viner model predicts that capital and labor groups within each industry should share the same view on trade policy issues. Magee showed that lobbying behavior on the 1973 Trade Reform Act was consistent with the Stolper–Samuelson theorem in only 2 of 21 industries. The Ricardo–Viner model fared much better. In 19 industries, labor and capital lobbied for the same type of trade policy. Irwin (1996) also found evidence favoring the predictions of the specific factors model in the 1923 British election for Parliament, where the main issue was whether or not to adopt tariff protection. He concluded that the main determinants of voting behavior in each district were the industry and occupational characteristic of the county.

Other research has tended to support the Stolper–Samuelson theorem. For example, Rogowski (1987) argues that the theorem can be used to explain the lobbying coalitions that have formed in many developed countries since 1850. Beaulieu (1998, 2000) and Balistreri (1997) find support for HOS in the voting preferences of Canadians with respect to NAFTA, GATT, and the Canadian–US Free Trade Agreement of 1989. Scheve and Slaughter (1998) offer similar evidence based on the view of trade policy held by Americans. Finally, Beaulieu and Magee (2001) find that both the industry and the factor that PACs represented influenced the pattern of their contributions to supporters of NAFTA and GATT in the US. The factor that the group represents appears to be more important than the industry, however, particularly for capital.[2]

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[1] The welfare impact of trade reform on mobile factors is ambiguous, depending on their preferences.

[2] Beaulieu and Magee (2001) argue that since the Magee (1980) and Irwin (1996) studies focus on votes that could have been overturned within a decade, what they are picking up is the voters' short-term concerns. In contrast, the other studies focus more broadly on overall views of trade policy that are likely to be governed by long-run concerns. They conclude, as do Leamer and Levinsohn (1995) that this group of results taken as a whole indicates that the HO model does a good job explaining the link between trade and factor rewards in the long-run while the Ricardo–Viner model is more appropriate for the short run.

The fact that the evidence is so mixed should not be too surprising. These two models embody the two most extreme assumptions that can be made about factor mobility. In reality, factors are quasi-fixed, moving between sectors in response to changes in factor rewards. Recognizing this, a number of authors in the 1970s, most notably Mayer (1974), Mussa (1974, 1978), and Neary (1978), developed models with imperfect factor mobility in which both short-run specific factors and long-run Heckscher–Ohlin labor markets are relevant for worker preferences concerning trade policy. Lobbying behavior then depends on factors that determine which time horizon is most important to each factor in each industry (e.g., time preference and age profile).

Casual observation also suggests that the two models should have difficulty explaining the movement of wages, particularly those of low-wage workers, whose labor market experience bears little resemblance to that modeled in the HOS or RV settings. These workers typically cycle between periods of employment and unemployment, often finding it difficult to obtain new jobs quickly. Moreover, these workers frequently encounter significant adjustment costs when switching sectors due to search costs, the costs of retraining and the non-trivial amount of time they may spend unemployed. This experience contrasts with a fundamental assumption embodied in the HOS and RV models that factors are fully employed at all times. The models developed by Mayer, Mussa, and Neary also maintain the assumption of full employment and ignore the adjustment costs that come hand in hand with resource allocation.[3] Since recent papers by Jacobson et al. (1993a,b), Trefler (2001), Kletzer (2001) and Davidson and Matusz (2001) suggest that these adjustment costs may be significant, it is important to take them into account when assessing the link between trade and the distribution of income.

Building on the tradition established by Mayer, Mussa, and Neary; Davidson, Martin and Matusz (DMM) (1999) recently extended the HOS model to allow for labor market turnover and showed that many of the model's canonical results were altered. In their model, labor and capital are treated as quasi-fixed in the sense that displaced factors must search for new production opportunities once a job dissolves. Thus, factors face employment risk and the rate at which jobs are created and destroyed plays a role in determining the allocation of resources. In such a setting, any change in trade patterns creates unemployment and generates adjustment costs. The result is a more nuanced view of the link between trade and the distribution of income.

The picture that emerges from the DMM model has features that derive from both the HOS and RV models. In particular, when labor market turnover is modeled, the impact of trade liberalization on factor rewards is made up of a convex combination of Stolper–Samuelson and Ricardo–Viner forces. Stolper–Samuelson forces dominate in sectors with high labor market turnover, while the Ricardo–Viner forces dominate in sectors that are characterized by low turnover. Intuitively, if jobs are difficult to find but durable once obtained (that is, if turnover is low), then a worker's attachment to the sector will be strong. In this case, the difficulty of finding reemployment and the durability of current employment creates an attachment that makes workers act as if they have sector specific

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[3] An exception is Mussa (1978) in which adjustment costs associated with changing the stock of capital in a given sector are taken into account. Labor faces no adjustment costs when switching sectors.

skills. On the other hand, if a sector is characterized by high turnover in the sense that jobs are easy to find or do not last long once secured, then the worker's attachment to that sector will be weak. In this case, the return to those workers will vary with trade policy as if they were perfectly mobile across sectors. One of the main conclusions of the DMM model is that the link between trade and the distribution of income should be dependent on job turnover, which varies widely across industries.[4]

In this paper, we test the link between industry turnover and trade preferences.[5] We combine data on PAC contributions with the Davis et al. (1996) data on job creation and job destruction in US manufacturing industries to examine how the pattern of campaign contributions varies across industries and factors of production. We use the data to undertake non-parametric tests of intuitive propositions that emerge from the Davidson et al. (1999) model. Consistent with the theory, the empirical work suggests that labor market turnover plays an important role in the determination of lobbying activity aimed at influencing trade policy.

The remainder of the paper divides into three sections. The following section presents a simple model of adjustment to trade liberalization and discusses some intuitive empirical predictions. Section 3 then describes the data while Section 4 reveals the empirical links between industry turnover and political preferences. The final section concludes the paper.

2. The model

Suppose that a trade liberalization agreement raises the returns to producing export goods and lowers the returns to producing import-competing goods. If a factor is permanently attached to its sector, then workers and capital in import-competing industries are harmed by the liberalization and those in exporting industries benefit. If factors are perfectly mobile, on the other hand, then the abundant factor gains while the scarce factor loses, as the Stolper–Samuelson theorem shows. Davidson et al. (1999) present a general model encompassing these two extreme cases, in which job matches between capital and labor do not last forever and new matches are difficult to find. As job matches are destroyed in import-competing industries in response to liberalization, the dislocated factors begin searching for (and eventually find) new jobs

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[4] One possible way to view this result is that when the Mayer, Mussa, and Neary approach is extended to allow for employment risk the difference between the short run and long run is blurred and the link between trade and the distribution of income becomes more complex.

[5] Recent empirical work by Goldberg and Maggi (1999) estimates Grossman and Helpman's (1994) theoretical model relating industry characteristics to the cross-industry structure of tariffs. In that analysis, lobbying is an intermediate step in the chain of causation. Our focus is narrower, using observed lobbying activity to infer preferences over trade policies that are held by interest groups. As Mayer (1984) and others have shown, however, different political institutions can lead to very different political behavior for a given set of trade-policy preferences. Thus, as Rodrik (1995) emphasizes, political behavior is the endogenous outcome of the interaction between underlying trade-policy preferences and existing political institutions. Magee et al. (2003) show in a simple political-economy model, however, that the pattern of contributions across candidates can reveal the direction of PAC trade preferences under general conditions.

in exporting industries. Job destruction and creation rates of zero result in the specific factors model while a job creation rate approaching infinity generates the model with perfect mobility.

Assuming that the country is capital abundant, the time paths of real wages and returns to capital that emerge from the DMM analysis are illustrated in Fig. 1, in which Π_{td} (Π_{ft}) represents the tariff-distorted (free trade) price index. Liberalization results in an immediate gain for workers and capital owners in exporting industries and a loss for those in import-competing industries. In the long run, liberalization generates an increased return for capital, the abundant factor, and a loss for the scarce factor labor. The bold line represents the time path of real factor prices for a low turnover industry while the dashed line shows the transition path for a high turnover industry. Intuitively, high turnover industries reach the new equilibrium steady-state in a shorter period of time than low turnover industries.
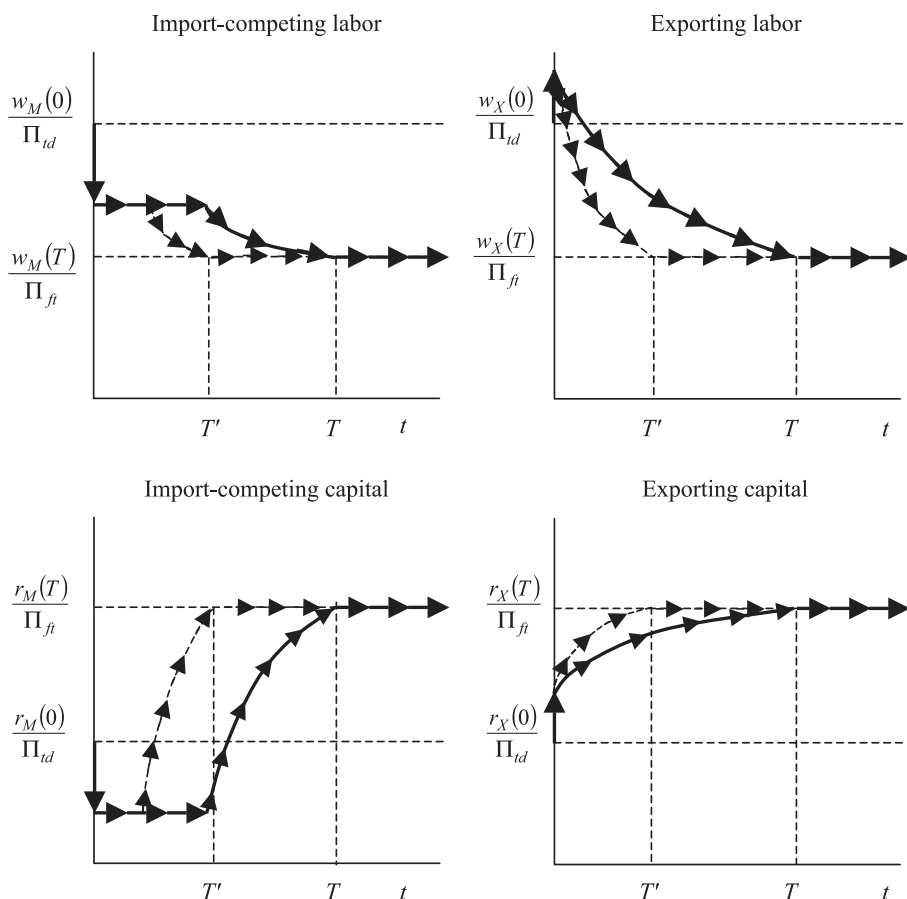

Fig. 1. Transition paths of real factor prices in response to trade liberalization. Dashed lines represent high turnover industries. Bold lines show low turnover industries.

Fig. 1 reveals that labor initially employed in the import-competing sector (the upper left graph) is harmed by liberalization, while capital initially employed in the export sector (the lower right graph) clearly benefits. In contrast, the impact of liberalization on the real incomes of labor initially employed in the export sector and on capital originally employed in the import-competing sector is ambiguous. At first, labor employed in the export sector is better off since the real wage in this sector increases while losses do not occur until later. The situation is reversed for capital initially employed in the export sector, where the losses are up front and the gains are delayed.

Given a particular discount factor, the net impact on the real incomes of labor groups in exporting industries and capital groups in import-competing industries hinges on how fast the economy reaches the new steady state. Higher turnover rates speed the adjustment to the new steady state, shortening the time that labor initially employed in the export sector enjoys higher real incomes, and reducing the time that capital initially employed in the export sector suffers lower real incomes. For a sufficiently high turnover rate, workers in both import-competing and exporting sectors oppose trade liberalization while capital owners in both sectors support it, as in the Stolper–Samuelson theorem. For a sufficiently low turnover rate, workers and capital owners in import-competing industries oppose liberalization while factors in exporting industries support it.

We investigate these predictions empirically in this paper by examining the campaign contributions of political action committees. These PAC contributions reveal interest groups' trade preferences as long as the PAC cares about affecting election outcomes. In that case, interest groups favoring NAFTA give money primarily to candidates expected to vote for trade liberalization while groups against NAFTA give money to likely NAFTA opponents.

3. Data

Table 1 presents the definitions, sources, and means of the variables used in the empirical tests performed in Section 4, while Table 2 provides detail on the number of PACs and average contributions classified by degree of turnover and net trade status.[6] The measure of industry turnover used in this study was compiled by Davis and Haltiwanger (1992), and Davis et al. (1996). These authors calculated the change in the number of jobs lost in shrinking establishments (for job destruction) and the change in the number of jobs gained in growing establishments (job creation) relative to the employment base within the industry. The job destruction measure for sector s in time period t is

$$JD_{st} = \sum_{\substack{e \in E_{st} \\ y_{et} < y_{et-1}}} \left| \frac{y_{et} - y_{et-1}}{\frac{Y_{st} + Y_{st-1}}{2}} \right|, \tag{1}$$

where y_{et} is employment in establishment e, Y_{st} is total employment in sector s, and E_{st} is the set of establishments in sector s at time t.[7]

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[6] The data set for this paper is available at http://www.facstaff.bucknell.edu/cmagee/.

[7] The job destruction rate has a value of −2 for plant deaths. Plant births are not incorporated in this measure because it is a measure of job loss, not job gains.

Table 1
Variable definitions, sources, and summary statistics

Variable	Definition	Source	Mean	Std. Dev.	Median
Contributions to NAFTA supporters (Tables 2, 3, 6, 7)	1991–1992 contributions to NAFTA supporters/ contributions to NAFTA supporters and opponents	Federal Election Commission	0.60	0.28	0.63
Contributions to GATT supporters (Tables 2, 3, 6, 7)	1991–1992 contributions to GATT supporters/ contributions to GATT supporters and opponents	Federal Election Commission	0.73	0.22	0.75
Contributions to supporters of both (Tables 2, 3, 6, 7)	1991–1992 contributions to supporters of NAFTA and GATT/contributions to reps voting on both bills	Federal Election Commission	0.51	0.26	0.52
Contributions to NAFTA supporters (Tables 4 and 5)	1993–1994 contributions to NAFTA supporters/ contributions to NAFTA supporters and opponents	Federal Election Commission	0.57	0.28	0.49
Contributions to GATT supporters (Tables 4 and 5)	1993–1994 contributions to GATT supporters/ contributions to GATT supporters and opponents	Federal Election Commission	0.69	0.25	0.73
Contributions to supporters of both (Tables 4 and 5)	1993–1994 contributions to supporters of NAFTA and GATT/contributions to reps voting on both bills	Federal Election Commission	0.46	0.27	0.61
Turnover	Average job destruction rate in industry, 1988–1992	Davis et al. (1996)	8.63	2.62	8.38
Capital	=1 if PAC is corporate, =0 if labor	Federal Election Commission	0.90	0.30	1
Export industry	=1 if PAC industry exports is greater than imports over the period 1988–1992	NBER Trade Databases	0.46	0.50	1
NAFTA supporter	=1 if representative voted for NAFTA	Congressional Quarterly Almanac	0.54	0.50	1
GATT supporter	=1 if representative voted for GATT	Congressional Quarterly Almanac	0.67	0.47	1
Both trade bills supporter	=1 if representative voted for NAFTA and GATT	Congressional Quarterly Almanac	0.46	0.50	0

While these data are referenced in the literature as measuring gross job flows, they are in fact measures of the net change in establishment size over 1 year. Davis and Haltiwanger (1992) discuss several different measures of job turnover based on their data on changes in establishment size. This paper uses the average job destruction rate as defined in Eq. (1) between 1988 and 1992 as the measure of industry turnover since the job destruction rate is closely tied to the notion of job security in our model, though we experiment with alternative specifications of turnover discussed in Davis and Haltiwanger (1992) in order to explore the robustness of our results.

In order to link political action committees to the industry they represent, we use a data set from the Center for Responsive Politics (CRP) that places 217 manufacturing

Table 2
Average contributions from PACs to representatives

High turnover	Capital	Labor	Subtotal
Export	$57,034 (70)	$186,699 (5)	$65,678 (75)
Import	$22,406 (114)	$110,389 (20)	$35,538 (134)
Subtotal	$35,580 (184)	$125,651 (25)	$46,354 (209)
Low turnover			
Export	$29,897 (111)	$145,655 (7)	$36,764 (118)
Import	$28,794 (82)	$82,203 (10)	$34,599 (92)
Subtotal	$29,428 (193)	$108,330 (17)	$35,816 (210)
Grand total	$32,431 (377)	$118,640 (42)	$41,072 (419)

The numbers of PACs in each cell are in parentheses.
Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988–1992.

PACs into groups of 4-digit SIC industries. Using descriptions of each company and union available on the internet, we are able to identify the 2-, 3-, and 4-digit SIC industry affiliations of 202 other corporate and labor PACs that gave money to House members who voted on the bills enacting the NAFTA or Uruguay Round agreements. These political action committees are identified as representing either capital or labor interests based on the Federal Election Commission classification of each PAC as a corporate or labor group. In total, the data set consists of 42 labor and 377 corporate PACs.

Each interest group is classified as representing import-competing or exporting interests based on the net trade position of the PAC's industries of origin. The PAC net export position equals one if the industry's total exports were greater than imports over the period 1988–1992, and it equals zero otherwise. Under this definition, the data set includes 226 import-competing interest groups and 193 exporting PACs. The trade flow data used to make these calculations are taken from the NBER US imports and exports data sets (www.nber.org) that are described in Feenstra (1996, 1997).

The Federal Election Commission provides information on the contributions each PAC gives to every candidate in the House of Representatives. In this paper, we examine three different measures of whether the contributions were given primarily to supporters of trade liberalization. These measures are the share of contributions that were given to representatives who voted for NAFTA, the share given to candidates voting to approve the GATT Uruguay Round, and the share given to supporters of both NAFTA and the GATT bills. About 54% of representatives voted for NAFTA, 67% voted for the GATT bill, and 46% voted for both trade bills. Because the literature is divided on the issue of whether contributions are given to help elect favorable candidates or after the congressional votes the PACs are interested in, we examine contributions from both 1991–1992 (the election cycle immediately prior to the trade votes) and from 1993–1994, when the votes were being cast.

4. Empirical evidence

Table 3 provides non-parametric evidence on the predictions of the model described in Section 2. In high turnover industries, we should observe a large difference between capital and labor groups in the fraction of contributions given to NAFTA supporters. Low turnover industries should reveal a much smaller difference between capital and labor groups as the Stolper–Samuelson effects are less important. Low turnover industries, however, should reveal a much larger difference between import-competing and exporting PACs in the fraction of contributions given to NAFTA supporters. Table 3 presents the fraction of PAC contributions given to congressional representatives who voted for NAFTA, for GATT, and for both bills. Lobby groups representing the interests of capital owners in low turnover industries, for example, gave almost 61% of their contributions in 1991–1992 to representatives who ultimately voted in favor of NAFTA. The table splits groups into low and high turnover PACs based on whether the turnover rate in the industries represented by the PAC was below or above the median in the data set.

The results in Table 3 provide strong support for the model's predictions. In high turnover industries, capital groups gave a significantly larger fraction of their contributions to NAFTA supporters, to GATT supporters, and to supporters of both trade bills, than did labor groups. In low turnover industries, however, the difference between capital and labor groups in their support for free traders was much smaller and insignificant by all three measures of representatives' trade policy stances.

Table 3 also supports the model's prediction that the industry net export position will be important in determining interest group support for trade liberalization only in low turnover industries. In low turnover industries, PACs representing exporting industries gave a significantly greater portion of their contributions to supporters of trade liberalization than did import-competing PACs. In high turnover industries, however, the difference between import-competing and exporting PACs in their contribution patterns was negligible, as the model predicts.

The hypothesis examined in this paper can be most directly tested using a difference in differences approach. The DMM model prediction is that Stolper–Samuelson forces will be stronger in industries that correspond to the assumption of perfect factor mobility. Thus, the difference between capital and labor groups' support for free trade should be larger among high turnover industries than among low turnover industries. The bottom part of Table 3 presents this difference in differences comparison. Within high turnover industries, there is a 33 percentage point difference between capital and labor PACs' share of contributions going to NAFTA supporters, while in low turnover industries, this difference is only about 8 percentage points. The *t*-statistic in the final column reveals that we can reject the null hypothesis that these two differences are equal at the 1% level. The high turnover difference between capital and labor groups' support for free traders is also significantly greater than the low turnover difference using both trade bills as a measure of representatives' support for liberalization.

If specific factors forces are strongest in low turnover industries, meanwhile, we should observe a larger difference between exporting and import-competing groups' support for free trade in low turnover sectors than in high turnover sectors. The bottom half of Table 3 reveals some support for this hypothesis. All three difference in differences comparisons

Table 3
Fraction of 1991–1992 PAC contributions given to free trade proponents

	Capital	Labor	Capital–labor difference *t*-statistic
Low turnover			
NAFTA	0.609	0.531	1.188
GATT	0.728	0.672	1.021
Both	0.515	0.456	0.929
High turnover			
NAFTA	0.636	0.307	5.726***
GATT	0.746	0.635	2.294**
Both	0.543	0.265	5.047***

	Export industry	Import-competing industry	Export–import-competing difference *t*-statistic
Low turnover			
NAFTA	0.624	0.577	1.286*
GATT	0.748	0.692	1.867**
Both	0.531	0.484	1.339*
High turnover			
NAFTA	0.586	0.602	−0.381
GATT	0.759	0.718	1.248
Both	0.516	0.506	0.259

Difference in differences

	High turnover Capital–labor difference	Low turnover Capital–labor difference	High-low turnover difference *t*-statistic
NAFTA	0.329	0.079	4.04***
GATT	0.111	0.056	1.07
Both	0.278	0.059	3.70***

	High turnover Export–import difference	Low turnover Export–import difference	High–low turnover difference *t*-statistic
NAFTA	−0.016	0.047	−1.60*
GATT	0.042	0.056	−0.45
Both	0.010	0.046	−0.97

Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988 to 1992.
  * Means or differences are significantly different at the 10% level in one-sided *t*-tests.
  ** Means or differences are significantly different at the 5% level in one-sided *t*-tests.
  *** Means or differences are significantly different at the 1% level in one-sided *t*-tests.

have the correct sign, and the export–import gap is significantly greater than zero using NAFTA as a measure of representatives' trade policy stance.

While Table 3 presents results for combined data on PACs representing capital and labor, there are reasons to expect these groups to behave in different ways. For example, capital income is presumably easier to diversify than labor income and such diversification may dilute the sector-specific interests of capital owners (Feeney and Hillman, 2001).[8] To see if there are any important differences in the behavior of PACs representing the two factors and to make sure that each group independently behaves as the DMM model predicts, Table 4 splits PACs into four categories: import-competing capital and labor groups and exporting capital and labor groups. The upper half of the table reveals that in low turnover industries, there is no significant difference between capital and labor groups (either in exporting or in import-competing industries) in their support for representatives voting in favor of trade liberalization. Using the GATT vote, however, there is a significant difference between exporting and import-competing PACs. Both within capital PACs and within labor unions, exporters gave significantly larger shares of their contributions to representatives voting in favor of the GATT Uruguay Round.

In high turnover industries, the data reveal a very different pattern. In this case there are large and statistically significant differences between capital and labor groups, both within exporting and within import-competing industries. Capital PACs consistently favored free traders for their contributions much more strongly than labor groups did. In contrast, net exporting groups did not concentrate their contributions on free traders more highly than import-competing groups did. These results are again supportive of the idea that high turnover industries conform to the predictions of the free mobility Heckscher–Ohlin model whereas low turnover industries exhibit contribution patterns more consistent with the specific factors model.

In order to provide a robustness check on these results, Table 5 duplicates Table 3 using contributions made during 1993–1994, when the NAFTA and GATT Uruguay Round bills were being voted on in the Congress. Notice that during this period, capital groups gave significantly larger shares of their money to NAFTA and GATT supporters than did labor groups, in both high and low turnover industries. As the theory predicts, however, the Stolper–Samuelson forces are stronger in the high turnover industries. The difference between capital and labor in the fraction of their contributions going to free traders is greater within high turnover industries than within low turnover industries by all three measures, significantly so for the NAFTA comparison.

Comparing exporting and import-competing industries, Table 5 tells the same story as Table 3. For two of the three measures of representatives' positions on trade policy, low turnover exporting PACs gave significantly greater fractions of their contributions to free traders than did low turnover import-competing PACs. Among high turnover groups, however, there was no significant difference between import-competing and exporting PACs in their contribution patterns. Although the gap between export and import-competing groups' support for free trade is larger in low turnover industries by

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[8] DMM treat labor and capital turnover symmetrically. While a natural extension of static trade models, this is inconsistent with richer models of capital accumulation such as the putty clay model of Phelps (1963).

Table 4
Fraction of 1991–1992 PAC contributions given to free trade proponents

		Capital	Labor	*t*-Statistic H_0: fraction given by capital equals fraction by labor
Low turnover industries				
Net exporter	NAFTA	0.630	0.524	1.159
	GATT	0.749	0.729	0.262
	Both	0.531	0.518	0.155
Net importer	NAFTA	0.582	0.535	0.472
	GATT	0.699	0.632	0.844
	Both	0.493	0.414	0.860
t-statistic	NAFTA	1.260	−0.083	
H_0: fraction given by net	GATT	1.542*	1.723*	
exporters equals fraction	Both	1.048	1.024	
by net importers				
High turnover industries				
Net exporter	NAFTA	0.607	0.294	2.507***
	GATT	0.771	0.601	2.079**
	Both	0.535	0.252	2.431***
Net importer	NAFTA	0.653	0.310	5.241***
	GATT	0.731	0.643	1.426*
	Both	0.547	0.268	4.369***
t-Statistic	NAFTA	−1.143	−0.106	
H_0: fraction given by	GATT	1.139	−0.375	
net exporters equals	Both	−0.317	−0.136	
fraction by net importers				

Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988 to 1992.

   * Means are significantly different at the 10% level in one-sided *t*-tests.
  ** Means are significantly different at the 5% level in one-sided *t*-tests.
 *** Means are significantly different at the 1% level in one-sided *t*-tests.

all three measures, none of the difference in differences is significantly greater than zero.

Table 6 shows that the difference between exporting and import-competing PACs in their 1993–1994 contribution patterns comes primarily from within capital groups. Among corporate PACs in low turnover industries, ones representing exporters gave significantly greater contributions to free trade supporters (by all three measures) than did those representing import-competing interests. The difference between exporters and import-competing groups is not evident within high turnover industries, however. Examining only labor groups reveals no significant differences in the contribution patterns of exporting and import-competing PACs, for either high or low turnover industries. As in Table 5, while there are some significant differences between capital and labor groups in low turnover industries, the Stolper–Samuelson forces emerge much more clearly within the high turnover industries.

Table 5
Fraction of 1993–1994 PAC contributions given to free trade proponents

	Capital	Labor	Capital–labor difference t-statistic
Low turnover			
NAFTA	0.580	0.461	1.781**
GATT	0.709	0.614	1.630*
Both	0.477	0.291	2.975***
High turnover			
NAFTA	0.599	0.272	4.871***
GATT	0.705	0.539	2.690***
Both	0.495	0.227	4.044***
	Export industry	Import-competing industry	Export–import-competing difference t-statistic
Low turnover			
NAFTA	0.586	0.550	0.963
GATT	0.738	0.653	2.655***
Both	0.497	0.416	2.322**
High turnover			
NAFTA	0.573	0.556	0.370
GATT	0.717	0.668	1.199
Both	0.501	0.444	1.237

Difference in differences

	High turnover capital–labor difference	Low turnover capital–labor difference	High-low turnover difference t-statistic
NAFTA	0.327	0.119	3.11***
GATT	0.166	0.095	1.18
Both	0.268	0.186	1.28
	High turnover export–import difference	Low turnover export–import difference	High-low turnover difference t-statistic
NAFTA	0.017	0.036	−0.43
GATT	0.050	0.085	−0.95
Both	0.056	0.081	−0.60

Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988 to 1992.

    * Means are significantly different at the 10% level in one-sided t-tests.
   ** Means are significantly different at the 5% level in one-sided t-tests.
  *** Means are significantly different at the 1% level in one-sided t-tests.

Table 6
Fraction of 1993–1994 contributions given to free trade proponents

		Capital	Labor	t-Statistic H_0: fraction given by capital equals fraction by labor
Low turnover industries				
Net exporter	NAFTA	0.601	0.331	2.776***
	GATT	0.739	0.718	0.257
	Both	0.508	0.306	2.098***
Net importer	NAFTA	0.552	0.539	0.133
	GATT	0.667	0.51	1.401*
	Both	0.434	0.282	1.818**
t-Statistic	NAFTA	1.320*	−1.150	
H_0: fraction given by	GATT	2.222**	1.143*	
net exporters equals	Both	2.104**	0.158	
fraction by net importers				
High turnover industries				
Net exporter	NAFTA	0.597	0.201	2.890***
	GATT	0.738	0.387	3.143***
	Both	0.523	0.142	2.898***
Net importer	NAFTA	0.601	0.289	3.906***
	GATT	0.683	0.574	1.440*
	Both	0.478	0.247	2.902***
t-Statistic	NAFTA	−0.094	−0.460	
H_0: fraction given by	GATT	1.275	−1.350	
net exporters equals	Both	0.988	−0.661	
fraction by net importers				

Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988 to 1992.
　* Means are significantly different at the 10% level in one-sided *t*-tests.
　** Means are significantly different at the 5% level in one-sided *t*-tests.
　*** Means are significantly different at the 1% level in one-sided *t*-tests.

Table 7 examines the PAC contribution patterns after controlling for industry fixed effects. Since the PACs are defined at the 4-digit industry level, there is variation between the turnover rates of different PACs within the same 2-digit industry, and it is possible to identify the relationship between turnover and contribution patterns even after removing the more aggregate industry effects. The numbers in the table show the average residual from a regression of the fraction of contributions going to free trade supporters on a series of 2-digit SIC industry dummy variables. Capital PACs in low turnover industries, for instance, gave about a 1 percentage point greater share of their contributions to NAFTA supporters than the average PAC in those industries, while labor groups gave about a 7 percentage point smaller share. The table shows that controlling for industry means does not alter the result that there is a larger difference between capital and labor group contribution patterns in high turnover industries than in low turnover industries. On that score, the results are nearly identical to Table 3.

Table 7
Fraction of 1991–1992 PAC contributions given to free trade proponents, 2-digit SIC industry means removed

	Capital	Labor	Capital–labor difference *t*-statistic
Low turnover			
NAFTA	0.010	−0.069	1.213
GATT	0.002	−0.030	0.583
Both	0.006	−0.046	0.823
High turnover			
NAFTA	0.029	−0.240	4.754***
GATT	0.011	−0.076	1.867**
Both	0.024	−0.193	4.147***

	Export industry	Import industry	Export–import-competing difference *t*-statistic
Low turnover			
NAFTA	0.015	−0.011	0.714
GATT	0.008	−0.012	0.683
Both	0.012	−0.011	0.662
High turnover			
NAFTA	−0.018	0.005	−0.552
GATT	0.018	−0.009	0.865
Both	0.004	−0.006	0.271

Difference in differences

	High turnover capital–labor difference	Low turnover capital–labor difference	High–low turnover difference *t*-statistic
NAFTA	0.269	0.079	3.10***
GATT	0.087	0.031	1.11
Both	0.216	0.052	2.82***

	High turnover Export–Import difference	Low turnover Export–Import difference	High–low turnover difference *t*-statistic
NAFTA	−0.022	0.026	−1.25
GATT	0.028	0.020	0.24
Both	0.010	0.023	−0.37

Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988 to 1992.
  ** Means are significantly different at the 5% level in one-sided *t*-tests.
  *** Means are significantly different at the 1% level in one-sided *t*-tests.

Controlling for industry fixed effects does, however, weaken the result that exporting PACs give significantly greater shares of contributions to free trade supporters in low turnover industries.

Table 8
Fraction of 1991–1992 PAC contributions given to free trade proponents, by party

	Republicans only			Democrats only		
	Capital	Labor	Difference t-statistic	Capital	Labor	Difference t-statistic
Low turnover						
NAFTA	0.766	0.616	1.992**	0.486	0.459	0.361
GATT	0.749	0.555	2.769***	0.736	0.673	1.005
Both	0.656	0.501	1.979**	0.415	0.425	−0.142
High turnover						
NAFTA	0.812	0.503	4.991***	0.514	0.240	4.068***
GATT	0.758	0.554	3.373***	0.758	0.624	2.438***
Both	0.692	0.462	3.503***	0.452	0.200	3.765***
	Export industry	Import industry	Difference t-statistic	Export industry	Import industry	Difference t-statistic
Low turnover						
NAFTA	0.786	0.710	1.904**	0.482	0.487	−0.121
GATT	0.772	0.680	2.461***	0.752	0.705	1.374*
Both	0.682	0.591	2.195**	0.416	0.415	0.035
High turnover						
NAFTA	0.766	0.796	−0.775	0.482	0.478	0.081
GATT	0.770	0.720	1.379*	0.746	0.739	0.195
Both	0.681	0.665	0.396	0.409	0.428	−0.398

Difference in differences

	Republicans only			Democrats only		
	High turnover	Low turnover	High–low difference t-statistic	High turnover	Low turnover	High–low difference t-statistic
	Capital–labor difference			Capital–labor difference		
NAFTA	0.309	0.150	2.30**	0.273	0.027	3.46***
GATT	0.203	0.194	0.14	0.134	0.063	1.21
Both	0.230	0.155	1.04	0.252	−0.010	3.76***
	Export–import difference			Export–import difference		
NAFTA	−0.030	0.076	−2.70***	0.004	−0.005	0.20
GATT	0.050	0.092	−1.14	0.007	0.047	−1.10
Both	0.016	0.091	−1.85**	−0.019	0.001	−0.46

Low turnover PACs are in industries with lower than the median job destruction rate.
High turnover PACs are in industries with greater than the median job destruction rate.
Export industries are those in which net exports are positive on average from 1988 to 1992.
Import-competing industries have negative net exports on average from 1988 to 1992.
  * Means are significantly different at the 10% level in one-sided *t*-tests.
 ** Means are significantly different at the 5% level in one-sided *t*-tests.
*** Means are significantly different at the 1% level in one-sided *t*-tests.

Table 8 investigates whether differences in support for each political party between capital and labor groups are driving the results. The first three columns of numbers in the table show the fraction of contributions going to free trade supporters among contributions to Republicans only, while the last three columns examine contributions to Democrats only. The results remain quite supportive of the hypothesis presented in this paper. Among contributions to Republicans, capital groups favored free traders more strongly than labor groups did in both high and low turnover industries. The mean difference between the two groups was consistently larger in the high turnover industries, however. Among Democrats, the results are even stronger, with large and statistically significant differences between capital and labor groups' support for free traders in high turnover industries but no significant differences between capital and labor's contribution patterns in low turnover industries.

The hypothesis that low turnover industries will exhibit a more stark difference between exporting and import-competing PACs than high turnover industries is also supported in Table 8. In low turnover industries, exporters gave significantly greater support to free traders than did import-competing PACs using all three measures among Republican recipients and for the GATT measure among Democrats. In high turnover industries, only the GATT measure among Republicans reveals any significant difference between exporting and import-competing PAC contribution patterns.

Furthermore, the bottom half of Table 8 reveals that the difference between capital and labor groups' support for free trade is significantly larger among high turnover industries than among low turnover industries for three of the six comparisons: NAFTA within both parties, and both trade bills within Democrats. The other three capital–labor difference in differences comparisons are correctly signed but not significantly greater than zero. The gap between export and import-competing groups' support for free trade is significantly larger within low turnover industries than within high turnover industries for the NAFTA and both trade bill comparisons among Republicans.

A brief overview of the results in Tables 3–8 illustrates the support in the data for the hypothesis from DMM examined here. In these tables there are 27 variations of the comparison between the contribution patterns of capital and labor PACs. Among the high turnover industries, capital PACs gave a significantly larger fraction (at the 10% significance level or better) of their contributions to free trade supporters than labor groups did in all 27 comparisons. Among low turnover industries, capital groups gave significantly more money to free traders in only 10 of the 27 comparisons. Examining import-competing and exporting industries provides a different story. Among high turnover industries, exporting PACs never donated a significantly larger fraction of their contributions to free traders than did import-competing PACs. Among low turnover industries, exporting groups gave significantly more support to free traders than import-competing groups in 14 of the 27 comparisons.

We also find broad support for the prediction that the difference between capital and labor groups' support for free traders will be larger in high turnover industries than in low turnover industries. This difference in differences is correctly signed in 26 of the 27 comparisons in Tables 3–8, with 12 significant at the 1% level, three at the 5% level and one at the 10% level. The data provide only slightly weaker support for the

prediction that low turnover interest groups will demonstrate a larger difference between exporters and import-competing industries in their support for free traders. This difference in differences comparison is correctly signed in 24 of the 27 comparisons, with eight significant at the 10% level or better (three of these at the 1% level).

In previous versions of this paper we ran a variety of tests to check the robustness of the results presented in Tables 3–8. For example, using alternative measures of turnover, such as the sum of job creation and job destruction or the minimum of these two variables, yields essentially the same results. We also ran regressions in which representatives' votes were treated as endogenous. These regressions incorporated measures of workers' skill levels in an industry, PAC, candidate, and industry fixed effects and controlled for representatives' party affiliation, committee membership, terms in office, and leadership positions. In each case, the results provided broad support for the hypothesis advanced in this paper. Finally, we also included a measure of the industry capital–labor ratio and interacted this variable with PAC factor and net export variables in order to make sure that the PACs were not reacting to factor intensities. As with the other robustness checks, this did not alter the results presented in Tables 3–8. These alternative tests can be found in Magee et al. (2003).[9]

5. Conclusion

Goldberg and Maggi (1999) suggest that "factors linked to unemployment may affect protection through channels different than the ones suggested by the Grossman and Helpman, 1994 theory." Goldberg and Maggi speculate that it would be empirically rewarding to incorporate sector-specific unemployment rates into the Grossman–Helpman framework. Davidson et al. (1999) provide a theoretical basis for linking industry turnover and international trade, and they show that high turnover industries will be ruled by Stolper–Samuelson forces while the specific factors model is more applicable to low turnover industries. This paper empirically examines the hypothesis that industry turnover can be used to divide interest groups into those whose trade preferences should be determined primarily by their factor of production and those whose preferences depend mainly on the industry's net export position. While both short-run specific factors and long-run Heckscher–Ohlin considerations will affect interest group trade preferences, this paper reveals that industry turnover influences the relative importance of these considerations.

We use data on campaign contributions to supporters and opponents of NAFTA and GATT in the U.S. House of Representatives to investigate the link between industry turnover and political groups' trade policy preferences. The empirical results support the predictions in Davidson et al. (1999) and are quite intuitive. There is strong and robust evidence that the factor (either capital or labor) a PAC represents exerts a very large effect on the share of its contributions flowing to free trade supporters for high turnover

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[9] The only exception is the results of the regression in which we interacted capital intensity with PAC factor and net export variables. These results are available from the authors upon request.

industries but has a much smaller impact for low turnover industries. There is also evidence in favor of the hypothesis that the industry net trade position has a large impact on lobbying behavior only in low turnover industries. The empirical results strongly suggest that industry turnover affects the determinants of interest group trade preferences in an intuitive manner.

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References

Balistreri, E., 1997. The performance of the Heckscher–Ohlin–Vanek model in predicting policy forces at the individual level. Canadian Journal of Economics 30, 1–17.

Beaulieu, E., 1998. Factor or industry cleavages in trade policy? An empirical test of the Stolper–Samuelson theorem. Department of Economics, University of Calgary Discussion Paper 98-12.

Beaulieu, E., 2000. The Stolper–Samuelson theorem faces Congress. University of Calgary Working Paper.

Beaulieu, E., Magee, C., 2001. Campaign contributions and trade policy: new tests of Stolper–Samuelson. University of Calgary Working Paper.

Davidson, C., Matusz, S., 2001. On adjustment costs. Michigan State University Working Paper.

Davidson, C., Martin, L., Matusz, S., 1999. Trade and search generated unemployment. Journal of International Economics 48, 271–299.

Davis, S., Haltiwanger, J., 1992. Gross job creation, gross job destruction, and employment reallocation. Quarterly Journal of Economics 107 (3), 819–863.

Davis, S., Haltiwanger, J., Schuh, S., 1996. Job Creation and Destruction. MIT Press, Cambridge.

Feeney, J., Hillman, A., 2001. Trade liberalization and asset markets. SUNY-Albany Working Paper.

Feenstra, R., 1996. NBER Trade Database, Disk 1: U.S. Imports, 1972–1994: Data and Concordances. NBER Working Paper no. 5515.

Feenstra, R., 1997. NBER Trade Database, Disk 3: U.S. Exports, 1972–1994, with State Exports and Other U.S. Data. NBER Working Paper no. 5990.

Goldberg, P., Maggi, G., 1999. Protection for sale: an empirical investigation. The American Economic Review 89, 1135–1155.

Grossman, G., Helpman, E., 1994. Protection for sale. American Economic Review 84, 833–850.

Irwin, D., 1996. Industry or class cleavages over trade policy? Evidence from the British General Election of 1923. In: Feenstra, R., Grossman, G., Irwin, D. (Eds.), The Political Economy of Trade Policy: Papers in Honor of Jagdish Bhagwati. MIT Press, Cambridge, pp. 53–76.

Jacobson, L., LaLonde, R., Sullivan, D., 1993a. The Costs of Worker Dislocation. W.E. Upjohn Institute, Kalamazoo, MI.

Jacobson, L., LaLonde, R., Sullivan, D., 1993b. Earnings losses of displaced workers. American Economic Review 83, 685–709.

Kletzer, L., 2001. What are the Costs of Job Loss from Import-Competing Industries? Institute for International Economics, Washington, DC.

Leamer, E., Levinsohn, J., 1995. International Trade Theory: The Evidence. In: Grossman, G., Rogoff, K. (Eds.), Handbook of International Economics vol. 3. North-Holland, Amsterdam, pp. 1339–1394.

Magee, S., 1980. Three simple tests of the Stolper–Samuelson theorem. In: Oppenheimer, P. (Ed.), Issues in International Economics. Oriel Press, London, pp. 138–153.

Magee, C., Davidson, C., Matusz, S., 2003. Trade, turnover, and tithing. GEP Working Paper 2003/38, University of Nottingham.

Mayer, W., 1974. Short-run and long-run equilibrium for a small open economy. Journal of Political Economy 82, 820–831.

Mayer, W., 1984. Endogenous tariff formation. American Economic Review 74 (5), 970–985.

Mussa, M., 1974. Tariffs and the distribution of income: the importance of factor specificity, substitutability and intensity in the short and long run. Journal of Political Economy 82 (6), 1191–1203.

Mussa, M., 1978. Dynamic adjustment in the Heckscher–Ohlin–Samuelson model. Journal of Political Economy 86 (5), 775–791.

Neary, P., 1978. Short-run capital specificity and the pure theory of international trade. Economic Journal 88, 488–510.

Phelps, E., 1963. Substitution, fixed proportions, growth and distribution. International Economic Review 4 (3), 265–288.

Rodrik, D., 1995. Political economy of trade policy. In: Grossman, G., Rogoff, K. (Eds.), Handbook of International Economics vol. 3. North-Holland, Amsterdam, pp. 1457–1494.

Rogowski, R., 1987. Political cleavages and changing exposure to trade. American Political Science Review 81 (4), 1121–1137.

Scheve, K., Slaughter, M., 1998. What Determines Individual Trade Policy Preferences? National Bureau of Economic Research Working Paper no. 6531.

Trefler, D., 2001. The long and the short of the Canada–U.S. Free Trade Agreement. University of Toronto Working Paper.