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What determines individual trade-policy preferences?

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Abstract

This article provides new evidence on the determinants of individual trade-policy preferences using individual-level survey data for the United States. There are two main empirical results. First, we find that factor type dominates industry of employment in explaining support for trade barriers. Second, we find that home ownership also matters for individuals' trade-policy preferences. Independent of factor type, home ownership in counties with a manufacturing mix concentrated in comparative-disadvantage industries is correlated with support for trade barriers. This finding suggests that, in addition to current factor incomes driving preferences as in standard trade models, preferences also depend on asset values.

Keywords: Trade; Policy preferences; Political economy

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1. Introduction

A complete political-economy model of trade policymaking must somehow characterize individuals' preferences over trade policy. Rodrik (1995, p. 1458) claims this is the first essential element of modeling: ''In principle a political-

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economy model of trade policy must have four elements. First, it must contain a description of individual preferences over the domain of policy choices available to policymakers.''

These preferences surely depend on how trade policy affects income for factors of production, as current factor income is a major determinant of individual economic welfare. It is well known from standard trade theory that trade's effect on current factor income depends crucially on the degree of intersectoral factor mobility, i.e. on the degree of factor specificity. In a Ricardo–Viner (RV) framework where some or all factors cannot move to other sectors, factor incomes tend to vary by industry of employment. In contrast, in a Heckscher–Ohlin (HO) framework where factors move costlessly across sectors, factor incomes tend to vary by factor type. But beyond factor income, standard trade theory does not focus on intertemporal consumption choices in which current factor income can be saved and invested for future periods. In reality, people do save and invest in a wide range of assets. Accordingly, trade-policy preferences may hinge not just on factor income but on asset ownership as well.

In this article we provide new empirical evidence on the determinants of individual trade-policy preferences. To date, there is only a small empirical literature on this question, and our work aims to improve on it significantly. We organize our data analysis around the basic HO and RV models, supplemented by a consideration of asset ownership. Our direct measure of trade-policy preferences comes from the National Election Studies (NES, 1993) survey, an extensive survey of current political opinions based on an individual-level stratified random sample of the U.S. population. Our measure is responses to a question asking about support for new U.S. trade barriers. The survey also reports each respondent's occupation, industry of employment, home-ownership status, and county of residence. We construct a data set with several plausible measures of ''exposure'' to freer trade across factor types, industries, asset ownership, and counties. Merging this information with the NES survey, we generate an individual-level data set identifying both trade-policy preferences and potential trade exposure through several channels. We then evaluate how these preferences vary with individual characteristics that trade theory predicts might matter.

We present two main empirical results. First, we find that factor type dominates industry of employment in explaining support for trade barriers. Lower skill, measured by education or average occupation earnings, is strongly correlated with support for new trade barriers. In contrast, employment in industries more exposed to trade, measured by tariff rates or net exports, is not strongly correlated with support for new trade barriers. Our second main empirical result is that, in addition to factor incomes, home ownership also matters for individuals' trade-policy preferences. Assets like housing do not fit into standard trade theory because they are neither currently employed factors nor currently produced goods. We find that independent of factor type or industry of employment, home ownership in counties with a manufacturing mix concentrated in comparative-disadvantage industries is

strongly correlated with support for trade barriers. Both these findings are robust to including in our analysis a large number of other possible determinants of trade-policy preferences.

We do not consider these results to be direct tests among various trade models, but we do think the findings can be interpreted in light of these models. Our first result is consistent with the distributive conflict predicted in a Heckscher–Ohlin model in which the United States is well endowed with skilled labor relative to the rest of the world. It is also consistent with there being relatively high intersectoral labor mobility in the United States over the time horizons relevant to individuals when evaluating trade policy. Our second finding suggests that, in addition to current factor incomes driving preferences, as in standard trade models, in reality preferences also depend on asset values.

There are five additional sections to this article. Section 2 surveys the literature on trade-policy preferences and relates our work to this literature. Section 3 summarizes the trade theory underpinning our empirical work. The following section discusses the data and our model specifications. Section 5 presents the empirical results, while Section 6 concludes.

2. Literature survey

In the political-economy literature, this article is related to work focusing on actual political cleavages over trade policy and what those cleavages imply about the sector-specificity of assets.

Irwin (1994, 1996) and Magee (1978) find evidence consistent with trade-policy preferences being determined primarily by industry. Using county-level data to regress county votes on measures of county factor and industry mix, Irwin (1996) finds that industry interests rather than factor interests best explain voting in the 1923 British general election, an election that hinged primarily on the issue of whether Britain should implement new trade barriers. In a similar paper, Irwin (1994) finds the same result for the 1906 British general election. Magee (1978) reports that of 21 industries testifying before the House Ways and Means Committee on the Trade Reform Act of 1973, in 19 cases trade unions representing labor's interests took the same position as management and industry trade associations representing capital's interests. Magee also documents that neither capital nor labor shared a uniform lobbying position across sectors.

In contrast, Beaulieu (1996, 1998), Balistreri (1997), Rogowski (1987, 1989), Midford (1993), and Kaempfer and Marks (1993) find support for factor types explaining trade-policy preferences. Using an individual-level survey of Canadian voters, Beaulieu (1996) finds that factor type rather than industry of employment best explains votes in the 1988 Canadian federal election, an election widely regarded as a national referendum on the Canadian–U.S. Free-Trade Agreement (CAFTA). Beaulieu (1998) finds similar results using stated preferences rather

than votes. Balistreri (1997) concludes that the same data are consistent with the generalized Stolper–Samuelson theorem. Using data on Canada's relative endowments measured in terms of occupations, he finds that people employed in occupations abundant in Canada relative to the United States — thus the people likely to gain from freer trade — were more likely to favor the CAFTA. Rogowski (1987, 1989) explains several national political coalitions with respect to groups' exposure to international trade as predicted by the Stolper–Samuelson theorem. Midford (1993) expands Rogowski's framework from just three factors — capital, labor, and land — by disaggregating labor and land more finely and by introducing raw materials as well; this allows him to explain some additional real-world political coalitions. Analyzing 1991 Congressional votes on granting presidential ''fast track'' trade-negotiating authority, Kaempfer and Marks (1993) find House votes significantly correlated with the average wage in House districts (but not so for Senate votes and average state wages).

All these studies provide valuable information on trade-policy preferences and political behavior. However, our work improves upon them in at least three important ways.

First, and perhaps most importantly, our study uses a direct measure of individual trade-policy preferences. In contrast, all studies cited here (except Balistreri, 1997; Beaulieu, 1998) draw inferences about trade-policy preferences from some observed political actions — coalition formation, lobbying, or voting. These indirect preference measures face the important limitation of being endogenous outcomes of the interaction between trade-policy (and possibly other) preferences and political institutions. Policy preferences and institutions together determine policy actions, so the mapping from preferences to actions is not unambiguous.

Rodrik (1995, p. 1459) makes this distinction between preferences and actions when commenting that a complete political-economy model of trade policy ''must contain a description of how these individual [trade-policy] preferences are aggregated and channeled, through pressure groups, political parties, or grass-roots movements, into 'political demands' for a particular policy or another.'' Similarly, Alt et al. (1996, p. 707) highlight the problem with reference to Magee's analysis of Congressional testimony: ''the difficulty in taking this approach beyond a qualitative comparison of patterns into measuring the extent of participation across industries is that one is measuring the dependent variable rather than the independent variable to some extent. That is, this testimony is the behavior that a measure of [factor] specificity should help you predict; therefore, if one is trying to explain policy outcomes, then there is a big risk of rendering one's conclusions circular.'' We avoid this risk by measuring trade-policy preferences directly.

A second important improvement of our study is we consider trade-policy preferences not only in terms of individual income but more broadly in terms of asset ownership as well. Standard trade theory usually assumes that individual welfare depends only on individual factor income. As will be discussed, we

analyze the empirical relevance of assets, too, particularly assets like housing that are neither currently employed factors nor currently produced goods.

Our study's third major improvement is in data quality. We briefly highlight three strengths of our data. First, as just discussed, this study is one of the first to measure trade-policy preferences directly rather than indirectly through policy actions. Second, our units of observation are individuals, not more-aggregated geographic units such as counties or Congressional districts. This accords with many political-economy models where individuals are the basic units whose preferences ultimately motivate any trade policies. Third, we have sufficient data to examine the alternative predictions of both the RV and the HO models. Factor type, industry of employment, and county of residence are all directly measured in our data. In contrast, many of the papers cited above do not have direct measures on factor type and/or industry. Balistreri (1997), Rogowski (1987, 1989), and Midford (1993) all examine whether the data are consistent with an HO story, but they do not benchmark this against the performance of an RV story. Beaulieu (1996, 1998) and Irwin (1994, 1996) infer both factor type and industry from data on occupation alone. These inferences almost surely create substantial measurement error (particularly for industry of employment) which is not systematically accounted for.

Overall, this study contributes to the existing literature in at least three important ways: by measuring trade-policy preferences directly rather than indirectly; by analyzing trade's effect on assets as well as income; and by using higher-quality measures of factor type and industry.

3. Theoretical framework

In the literature on the political economy of trade policy, it is commonly assumed that individuals evaluate trade policy based on how their current factor incomes are affected without regard for aggregate national welfare. In this article we follow the general spirit of this convention by assuming that individuals' policy preferences are determined by how policy affects their personal welfare. Our theory discussion considers two dimensions of welfare: factor income and asset ownership. We intend this discussion to guide our empirical analysis. We do not consider it to be a lead-in for directly testing alternative trade theories. We also do not consider it to exhaust all possible influences on trade-policy preferences; in our data analysis, we will examine influences other than factor income and asset ownership in our robustness checks.[1]

[1] In our analysis we assume that individuals know with certainty the effects of trade policies on individual incomes and asset holdings. This is a common but not universal assumption. Fernandez and Rodrik (1991) model trade-policy formation in an environment where people do not know ex ante how trade policy affects their welfare.

3.1. Trade's effect on factor incomes

The RV and HO models are the two most commonly used models for characterizing trade-policy preferences. In both, changes in trade policy affect the incomes of factors by changing the country's relative product prices. The key difference between the two models is their different assumptions about intersectoral factor mobility. Different degrees of factor mobility imply very different factor-income changes from — and thus preferences about — trade liberalization.

We use the basic predictions of these two models to organize our data analysis of preferences. In doing this, however, we emphasize that preferences may be consistent with both models, not just one. The RV model can be characterized as a short-run version of the more long-run HO model. For example, Mayer (1974) and Mussa (1974) compare wage changes in the two models, and Mussa (1978) formalizes how with intersectoral mobility costs an RV short-run gradually becomes an HO long-run. In reality, each model might be relevant over different time horizons. If individuals evaluate both short-run and long-run effects of trade liberalization, then trade-policy preferences might depend on both factor type and industry of employment.[2]

The HO model assumes that factors can move costlessly across sectors. Trade liberalization which changes relative product prices changes relative (and possibly real) factor prices according to the Stolper–Samuelson theorem: returns tend to rise (fall) for the factors employed relatively intensively in the sectors whose relative product price rises (falls). In this model it is usually assumed that protection is received by the sectors which employ relatively intensively the factors with which the country is poorly endowed relative to the rest of the world. Thus a country's abundant factors support freer trade while its scarce factors oppose it.

At the opposite extreme from the HO model, the RV model assumes that some or even all factors cannot move across sectors. Here, the income of specific factors is linked to their sector of employment. Trade-liberalization-induced changes in relative product prices redistribute income across sectors. Sectors with price declines — presumably comparative-disadvantage sectors — realize income losses for their specific factors while sectors with prices increases — presumably comparative-advantage sectors — realize income gains for their specific factors. So trade-policy preferences are determined by sector of employment. Factors

[2] Another way both models might accurately describe the economy is that within some time frame specificity might vary across units in the economy (such as industries or factor types). Alt et al. (1999) find support for this perspective in their study of firm lobbying behavior in Norway.

employed in sectors with product prices elevated (lowered) by trade protection oppose (support) trade liberalization.[3]

To summarize, in HO models factors evaluate trade policy based on their factor type while in RV models factors evaluate trade policy based on their industry of employment. What do these two models predict about trade-policy preferences in the United States? Many studies (e.g., Leamer, 1984) have documented that the United States is well endowed with more-skilled labor relative to the rest of the world. According to the HO model, then, in the United States more-skilled workers should support freer trade while less-skilled workers should oppose it. In contrast, the RV model predicts that U.S. workers employed in comparative-advantage sectors should support freer trade while those in comparative-disadvantage sectors should oppose it.

An important caveat to the theory just summarized is nontraded industries. By definition, trade barriers cannot be granted for these industries. Does this matter for the predictions of the HO and RV models? The HO reasoning still applies if there remains costless interindustry factor mobility among all sectors. For the RV model, however, we need to clarify how trade policies affect the product prices of nontraded sectors. Because freer trade tends to raise national income, if we assume positive income elasticities of demand for nontraded goods then freer trade should raise nontraded prices by raising demand for nontraded goods. Thus we predict that in an RV model workers in nontraded sectors should support freer trade. However, because trade policy's effect on nontraded prices works indirectly through nontraded demand, it might be the case that nontraded workers support freer trade less strongly than do comparative-advantage-sector workers. We return to this issue when discussing our industry trade-exposure measures.

3.2. Trade's effect on asset values

In standard trade models individuals spend all current factor income on consumption. In reality, people can have current factor income differ from current consumption by accumulating or decumulating assets. To understand the links between trade-policy preferences and asset ownership, this section discusses how trade affects asset values.

Many kinds of assets fit easily into standard trade models. Some assets are currently employed by firms as factors of production; for example, machine tools and office buildings. These assets earn rates of return determined by the economy's set of zero-profit conditions and, in some cases, the economy's

[3]If some factors remain mobile across sectors in a Ricardo–Viner model, their factor prices are not so clearly linked to product-price changes. Changes in real wages for these mobile factors are ambiguous: it depends on the consumption basket of these mobile factors. In the above discussion we focus only on the specific factors.

endowments as well. In turn, these rates of return are an important determinant of asset prices. There is a well-developed literature analyzing how these productive assets accumulate over time within open economies (e.g., Findlay, 1984; Smith, 1984). Another kind of asset which fits into standard trade models is currently produced goods such as automobiles. Their domestic prices are set just like those of other non-asset products, as some combination of world prices and domestic trade barriers.

Some assets, however, are neither currently employed factors nor currently produced goods. Residential housing is a major example. Firms do not employ houses as factors of production. And at each point in time, nearly all of a region's housing stock is not produced: it is the (appropriately depreciated) accumulation of all previous housing construction in earlier periods. Construction adds a very small amount to the current housing stock both because of the time lags involved and because the flow is very small relative to the housing stock.[4]

Some assets, then, are not clearly linked to the production side of standard trade models. We focus on housing because it is the only asset of this kind reported in the NES data. But it is important to note that housing constitutes a very large share of people's total wealth holdings. For the average U.S. household in 1990, the gross value of the primary residence accounted for nearly 90% of total household assets (Caplin et al., 1997). Among all U.S. homeowners in 1986, for the median homeowner in all age groups housing equity accounted for more than half of his/her total wealth (Skinner, 1994).[5] Though our data cover only housing, this is the single most important asset for a big share of the U.S. population.

To understand how trade policy can affect housing prices, consider a simple supply-and-demand framework. A country has many distinct regional housing markets, each of which faces a perfectly inelastic supply schedule at each point in time. Prices are then set by regional housing demand. Demand depends on considerations such as tax differentials between renting and owning. As discussed by Caplin et al. (1997), it also depends on the level of economic activity in a region. Greater economic activity means more employment, more housing demand.

Trade policy is one of the forces affecting the level of regional economic activity. Freer trade tends to shrink comparative-disadvantage industries and expand comparative-advantage ones. Accordingly, regions with a higher concentration of activity in sectors with a comparative disadvantage are more

[4]The Census Bureau (1997, 1998) estimates that on July 1, 1996 the total U.S. housing stock was 110 million housing units. For all of 1996 approximately 1.3 million new homes were constructed, with approximately 0.3 million existing homes becoming uninhabitable due to demolition, disasters, and other causes. Thus, 1996 net construction was about 1 million new homes — 0.9% of the existing stock. Also that year, an average of 8.33 months passed between issuing a residential permit and construction completion.

[5]Skinner reports median housing equity-to-net worth ratios for six different age groups within the population. These ratios range from 54.5 to 61.3%.

vulnerable to adverse housing-demand shocks from freer trade. As regional economic output declines people leave the local labor force, either for work elsewhere or, at least temporarily, unemployment. This reduces housing demand and thus housing prices. Note this trade-housing linkage operates whether the underlying factor markets are HO or RV.

To summarize: in regions with a high concentration of activity in comparative-disadvantage sectors, homeowners should oppose freer trade because its contractionary effects in the region tend to reduce homeowners' welfare by lowering housing demand and thus housing values.[6]

This link between trade and asset values operates independently of trade's effect on labor incomes. People's economic welfare depends on both income and asset holdings, and freer trade might affect these two channels differently. Consider a more-skilled homeowner in Gary, Indiana, a city with production very concentrated in a comparative-disadvantage sector, steel. This person might support freer trade through the income channel, but oppose it through the asset channel. We will examine both these links in the data analysis.

4. Data description and empirical specification

A convincing empirical analysis of the determinants of individual trade-policy preferences requires measures of policy preferences and trade exposure, consistent with the hypotheses outlined above, all at the level of the individual. We develop such an analysis by combining individual-level data from the 1992 NES survey (1993) with data on average wages, tariffs, trade flows, and county manufacturing activity. Using these data we examine how various measures of trade exposure affect individual trade-policy preferences.

4.1. Data description

We measure policy preferences by responses to this question from the 1992 NES survey:

> ''Some people have suggested placing new limits on foreign imports in order to protect American jobs. Others say that such limits would raise consumer prices and hurt American exports. Do you favor or oppose placing new limits on imports, or haven't you thought much about this?''

[6]Research in the regional-economics literature has documented an empirical link between local industry mix and local housing prices. For the Boston area during the 1980s, Case and Mayer (1996) find that average house prices rose less in housing jurisdictions with a larger share of residents employed in manufacturing in 1980. They hypothesize ''displaced manufacturing workers ... [were] reducing their demand for housing'' (p. 391).

By coding responses 1 for those individuals favoring protection and 0 for those opposing it we constructed the dichotomous variable *Trade Opinion*. This question requires respondents to reveal their general position on the proper direction for U.S. trade policy. Our theoretical framework hypothesizes that trade policy can affect both individuals' factor income, either based on skill levels or on industry of employment, and the value of their housing assets. To apply our framework to this question, we assume that respondents think that import limits will be placed on comparative-disadvantage sectors. This assumption allows us to construct measures of factor and industry trade exposure which follow closely from the theory. The assumption seems reasonable relative to alternatives such as import limits on comparative-advantage sectors.

One of this question's strengths is that it does not refer to a specific country or a particular trade agreement. Consequently, a respondent's answer should reflect trade-policy preferences rather than preferences on other issues such as human-rights violations in China, competition regulation in Japan, or migration controls in Mexico.

To see whether skill levels are a key determinant of trade-policy preferences, for each individual in the 1992 NES survey we construct two measures of skill. First, respondents report their occupation coded according to 1980 Census Occupation Code classifications. We obtained BLS data on 1992 U.S. average weekly wages for these occupations (US Department of Labour, 1992). If the average market returns for each occupation are determined primarily by the skills required for it, these average wages, called *Occupation Wage*, measure respondents' skill levels. As a second skill measure, the NES survey also records the years of education completed by each respondent, *Education Years*. Educational attainment is another commonly used measure of skills. For both measures, by the HO model U.S. less-skilled workers are more likely to benefit from trade restrictions on comparative-disadvantage sectors and thus are more likely to support new trade barriers.

To examine the hypothesis that sector of employment is a key determinant of trade-policy preferences, for each individual in the NES survey we construct two measures of industry trade exposure. Each measure is based on respondents' reported industry of employment coded according to the three-digit 1980 Census Industry Code classification.

Our first industry trade-exposure measure, *Sector Net Export Share*, is the industry's 1992 net exports as a share of output. This variable follows the common assumption that an industry's comparative advantage is ''revealed'' by its net exports: industries with positive (negative) net exports are assumed to be comparative-advantage (disadvantage) industries and thus likely to realize income gains (losses) for their employed factors from trade liberalization. To construct this variable we obtained through the NBER Feenstra's (1996) data on 1992 manufacturing exports, imports, and value of shipments at the four-digit Standard Industrial Classification (SIC, revision two) level. To cover all truly tradable sectors, we obtained similar data for agriculture and tradable services from various

BEA sources (US Department of Commerce). All data were concorded to 1980 CIC industries, and then for each industry we calculated *Sector Net Export Share* as exports minus imports divided by value of shipments. For all nontradable sectors we set this variable equal to zero.

For this industry measure, according to the Ricardo–Viner model individuals employed in industries with greater revealed comparative disadvantages (i.e., more negative *Sector Net Export Shares*) are more likely to support trade protection for these industries. Notice that this measure matches the continuum across sectors of support for trade barriers discussed in Section 3.1: strong opposition for comparative-advantage sectors, possibly weaker opposition for nontraded sectors, and strong support for comparative-disadvantage sectors.

The second measure is of the industry's 1992 U.S. tariff rate. To construct this variable, *Sector Tariff*, from the ITC (United States International Trade Commission, 1997) we obtained data on 1992 tariff duties collected and customs-value imports at the four-digit SIC (revision three) level.[7] We concorded these tariff and import values to the 1980 CIC industries, and then for each industry we calculated an effective tariff rate by dividing tariffs value by imports value. These tariff data cover all tradable industries in agriculture and manufacturing. For all other sectors we set the tariff rate equal to zero.

To use this industry measure we assume that industries with higher current protection have more of a comparative-disadvantage. Given this, according to the Ricardo–Viner model individuals employed in industries with higher tariffs are more likely to support trade barriers for the comparative-disadvantage sectors. Notice that by assigning the same value to both zero-tariff tradables and nontradables, this measure restricts workers in the two groups to have the same trade-policy preference on this margin.

Finally, to examine the hypothesis that housing values are a key determinant of trade-policy preferences, for each individual in the NES survey we construct two measures of how exposed homeowners are to trade liberalization reducing local economic activity. To construct these measures we exploit two dimensions of the NES survey.

One is that the NES reports whether each respondent or his/her family owns his/her home of residence. From this information we create the dichotomous variable *House* coded 1 to indicate ownership and 0 otherwise. The other survey dimension we use is that each respondent reports his/her county of residence. We used the 1992 Census of Manufactures (COM) from the Census Bureau (1992) to construct two measures of county-level trade exposure. Both measures are based upon the COM's disaggregation of county employment and other economic-activity variables into the 20 two-digit SIC manufacturing industries.[8] First, using

[7] We thank Michael Ferrantino for helping us obtain these data.

[8] Unfortunately, comparably disaggregated county-level data for non-manufacturing industries are not readily available. We thank Clark Bensen for providing these data.

the ITC tariff data described above, we identified the 10 two-digit SIC manufacturing industries with above-median tariff rates in 1992.[9] We then calculated *County Exposure 1*, the share of county employment accounted for by these high-tariff industries. Second, using the Feenstra data described above, we identified the net-import industries in 1992 (14 total).[10] We then calculated *County Exposure 2*, the share of county employment accounted for by these net-import industries. These two variables measure each county's comparative-disadvantage employment.

We create our measure of homeowners' exposure to international trade by multiplying the county-exposure measures with *House* to construct two interaction variables, *County Exposure 1*House* and *County Exposure 2*House*. According to the theory presented earlier, homeowners living in counties with a larger share of employment in comparative-disadvantage sectors are more likely to oppose trade liberalization because regional housing values depend, among other things, on the amount of regional economic employment in trade-exposed sectors.

Table 1 reports the summary statistics of our trade-opinion measure and our trade-exposure variables. These estimates and all the statistical analyses in this article rely on multiple imputation to deal with missing-data problems.[11] Notice that about 67% of respondents favored trade restrictions while 33% were opposed. This split is very similar to margins found in many other surveys of American opinions about trade.

4.2. Econometric model

Our empirical work aims to see how different types of trade exposure affect the probability that an individual supports trade restrictions. Again, *Trade Opinion*

[9]These 10 high-tariff industries were 21, 22, 23, 28, 30, 31, 32, 34, 38, and 39.

[10]The 14 net-import sectors were 22, 23, 24, 25, 26, 29, 30, 31, 32, 33, 34, 36, 37, and 39.

[11]A complete description of the imputation procedures is available in the unpublished appendix to this article at http://www.fas.harvard.edu/~scheve. The missing-data problems in the analysis ranged from modest to substantial. Overall, when we simply dropped observations with any missing data we lost between 4.4 and 73.4% of all observations, depending on which model was estimated. This listwise-deletion approach to inference with incomplete data is always inefficient and risks bias unless the data are missing completely at random. Multiple imputation (King et al., 2000; Schafer, 1997; Little and Rubin, 1987; Rubin, 1987) is consistent and generates correct uncertainty estimates under the less-restrictive assumption that the data are missing randomly conditional on the data included in the imputation procedures. The imputation model used in this application was multivariate normal and was implemented using the data augmentation method known by the acronym ''IP'' because it involves two key iterative steps: the imputation step and the posterior step. The imputation procedures generated 10 completed data sets each containing 1736 observations equal to the actual number of individuals in the 1992 NES survey either supporting or opposing more trade restrictions. Each data set was analyzed using the logit specifications described in Section 4.2, with the results across the datasets combined using the standard multiple imputation formulas. All the main findings reported in this article are qualitatively the same for the case where imputations are also made by treating as missing data the fact that some respondents did not express a trade-policy opinion. In addition, all main results are qualitatively the same using the listwise-deletion method.

Table 1
Summary statistics[a]

Variable	Mean	Standard error
Trade Opinion	0.671	0.470
Occupation Wage	0.532	0.187
Education Years	13.288	2.610
Sector Tariff	0.006	0.019
Sector Net Export Share	−0.004	0.091
County Exposure 1	0.096	0.093
County Exposure 2	0.191	0.334
House	0.679	0.467

[a] These summary statistics are multiple imputation estimates based on the 10 imputed data sets with 1736 observations for each variable in each data set. The variable *Occupation Wage* reports the actual wage divided by 1000.

equals 1 when an individual supports trade restrictions and 0 when opposed. Then $E(Trade\ \ Opinion_i) = \Pr(Trade\ \ Opinion_i = 1|\pi_i) = \pi_i$ where i indexes each observation and π_i equals the probability that an individual supports trade restrictions. We model the variation in π_i according to the logistic form with $\pi_i = 1/(1 + \exp(-x_i\beta)$. In this expression, x_i is a vector of individual-specific explanatory variables hypothesized to affect the probability of supporting trade restrictions and β is a vector of effect parameters. We estimate these effect parameters using logistic regressions.

The theory discussed in Section 3 suggests alternative sets of explanatory variables to include in the x_i vector. Altogether we estimate 16 different models. The first four models include just the factor-income regressors individually. Models 5 through 8 include pairs of explanatory variables, one measuring skills and the other industry. Finally, the last eight specifications, Models 9 through 16, replicate the specifications in Models 5 through 8 but also include our asset regressors. Specifically, we include a homeowner interaction variable and its related county-exposure variable. We include the county-exposure variable itself to

Table 2
Hypothesized sign for the regressors

Regressor	Hypothesized sign
Occupation Wage	Negative
Education Years	Negative
Sector Tariff	Positive
Sector Net Export Share	Negative
*County Exposure 1*House*	Positive
County Exposure 1	Zero
*County Exposure 2*House*	Positive
County Exposure 2	Zero

verify that it is not living in a trade-exposed county per se that matters: only homeowners should care about industry mix and its effect on housing values. Overall, Models 1 through 8 examine the role of factor income only in explaining trade-policy preferences. These specifications follow the previous literature most closely. Models 9 through 16 examine both factor-income and asset-value effects as well. All 16 models also include a constant. Table 2 shows the hypothesized sign for the regressors in x_i.

5. Empirical results

5.1. Factor type, industry of employment, and trade-policy preferences

The results of our logistic regressions for Models 1 through 8 strongly support the hypothesis that individuals' skill levels determine trade-policy preferences. Little evidence is found consistent with the hypothesis that industry of employment influences policy preferences.

The actual coefficient estimates and standard errors from Models 1 through 8 using the multiple-imputation methodology are reported in Table 3 (listwise-deletion estimates yielding qualitatively similar results are available from the authors). But these coefficient estimates alone do not answer our key substantive question of how *changes* in skill levels and industry trade exposure affect the probability that an individual supports trade restrictions. To answer this question we used the estimates of Models 1 through 8 to conduct simulations calculating the effect of changing one variable of interest from average to above-average values while holding the other variables constant at their means.

Our simulation procedure is best described with reference to a specific model and variable of interest. Consider Model 5 and *Occupation Wage* (this model's other regressor is *Sector Tariff*). Recognizing that the parameters reported for this model are estimated with uncertainty, we drew 1000 simulated sets of parameters from their sampling distribution defined as a multivariate normal distribution with mean equal to the maximum likelihood parameter estimates and variance equal to the variance–covariance matrix of these estimates. For each of the 1000 simulated sets of coefficients we then calculated two probabilities. First, we calculated the estimated probability of supporting trade restrictions when *Occupation Wage* and *Sector Tariff* are equal to their means. Second, we calculated the estimated probability of supporting trade restrictions when *Occupation Wage* is one standard deviation above its mean while *Sector Tariff* is held at its mean. The difference between these two estimated probabilities is the estimated difference in the probability of supporting trade restrictions between an individual with average skills and someone with (one standard deviation) above-average skills. We calculated this difference 1000 times, and then to show the distribution of this

Table 3
Determinants of individual opinion on international-trade restrictions: factor-income models[a]

Explanatory variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	1.642	3.648	0.696	0.711	1.625	1.642	3.651	3.650
	(0.168)	(0.350)	(0.054)	(0.051)	(0.170)	(0.168)	(0.355)	(0.351)
Occupation Wage	−1.716				−1.711	−1.720		
	(0.288)				(0.288)	(0.288)		
Education Years		−0.217					−0.217	−0.217
		(0.025)					(0.025)	(0.025)
Sector Tariff			2.730		2.420		−0.137	
			(2.994)		(3.089)		(2.976)	
Sector Net Ex Share				−0.697		−0.720		0.027
				(0.612)		(0.614)		(0.615)
# of observations	1736	1736	1736	1736	1736	1736	1736	1736

[a] Notes: these results are multiple-imputation estimates of logistic regression coefficients based on the 10 imputed data sets. Each cell reports the coefficient estimate and (in parentheses) its standard error. The dependent variable is individual opinions about U.S. trade policy. The measure is coded a 1 for those individuals favoring new restrictions and 0 for those opposed.

difference we calculated its mean, its standard error, and a 90% confidence interval around the mean.

Table 4 reports the results of this simulation for Models 1 through 8. Each column reports a different model. Within each column, each row reports the estimated effect on the probability of supporting trade restrictions of increasing that row's variable from its sample mean to one standard deviation above its mean, holding fixed all other variables at their means. For example, Model 1 indicates that increasing *Occupation Wage* from its mean to one standard deviation above its mean reduces the probability of supporting trade restrictions by 0.074 on average. This estimated change has a standard error of 0.012 and a 90% confidence interval of $[-0.095, -0.053]$.

Models 1 through 4 present these results one regressor at a time. Models 5 through 8 examine directly the factor-type versus industry-of-employment hypotheses. This second group of models aims to determine whether one hypothesis better explains the data. In evaluating these results, however, it is important to recall from Section 3 that if individuals evaluate both short-run and long-run effects of trade liberalization then their trade-policy preferences might be explained by both factor type and industry of employment.

Across all models in Table 4, higher skills is strongly correlated with lower probabilities of supporting trade restrictions. The mean estimates of probability changes are much larger than those for the industry measures. These mean estimates are virtually identical whether the specification includes just a skill measure or a skill measure and an industry measure. Moreover, they all are precisely estimated: all have 90% confidence intervals strictly less than zero.

In contrast, higher industry trade exposure has much more ambiguous effects. In Models 3 and 4, greater industry trade exposure is correlated with the hypothesized increase in probability of supporting trade restrictions. But neither of these changes is precisely estimated: both 90% confidence intervals bracket zero. In Models 5 and 6 these results are basically unaffected by including *Occupation Wage*. However, in Models 7 and 8 the inclusion of *Education Years* both reverses the estimated change in probabilities and makes these estimated changes much less precise. Comparing the industry results for Models 5 and 6 with Models 7 and 8, we cannot even conclude with a high degree of confidence that individuals employed in relatively trade-exposed sectors are more likely to support trade restrictions once we control for skill levels.

The key message of Table 4 is that an individual's skill level rather than industry of employment is strongly correlated with the probability of supporting trade restrictions. The effects of skill trade exposure are large and precise; the effects of industry trade exposure are small and uncertain. This suggests that individuals care about trade policy in a manner consistent with the HO model, and that there is relatively high intersectoral labor mobility in the United States over time horizons relevant to individuals evaluating trade policy.

Table 4
Determinants of respondent opinion on international trade restrictions: factor-income models[a]

Variable	Change in probability of supporting trade restrictions as a result of a one standard deviation increase in the independent variable for each model[b]							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Occupation Wage	−0.074 (0.012) [−0.095, −0.053]				−0.074 (0.012) [−0.094, −0.055]	−0.074 (0.013) [−0.097, −0.054]		
Education Years		−0.132 (0.015) [−0.158, −0.107]					−0.132 (0.016) [−0.158, −0.106]	−0.133 (0.016) [−0.161, −0.106]
Sector Tariff			0.012 (0.012) [−0.010, 0.032]		0.011 (0.013) [−0.011, 0.032]		−0.001 (0.012) [−0.021, 0.019]	
Sector Net Export Share				−0.014 (0.013) [−0.035, 0.008]		−0.014 (0.013) [−0.035, 0.008]		0.000 (0.013) [−0.021, 0.021]

[a] For each of the eight factor only models, we estimated using multiple imputation with a logit specification the effect of factor and industry exposure to international trade on individuals' trade policy opinions. The parameter estimates from this analysis are reported in Table 3. Here we interpret those results by presenting the impact of a one standard deviation increase in each independent variable, holding other variables constant, on the probability that the respondent supports trade restrictions.

[b] Each triple of entries in the table begins with the mean effect from 1000 simulations of the change in probability of supporting trade restrictions due to an increase of one standard deviation from the independent variable's mean, holding all other variables constant at their means. The standard error of this estimate is reported in parentheses. Finally, a 90% confidence interval for the probability change is presented in brackets.

5.2. Asset ownership and trade-policy preferences

Tables 5 and 6 report results for the hypothesis that individuals care about how trade liberalization affects housing values independent of how it affects factor incomes. Similar to the earlier set of results in Table 3, Table 5 reports the multiple-imputation coefficient estimates from Models 9 through 16. Table 6 reports the results from simulations calculating the effect of changing one variable of interest from average to above-average values while holding the other variables constant at their means. Before discussing the housing results, we note that the results in Table 6 for skills and industry of employment are substantially the same as the results in Table 4. Even with the inclusion of housing regressors our key conclusion that factor type dominates industry of employment remains unchanged.

In all eight models reported in Table 6, our estimates of the effect of county trade exposure on individual homeowners' trade preferences are consistent with our theoretical expectations. We estimate that, for homeowners, an increase in county trade exposure from its sample mean to one standard deviation above its mean increases the probability of supporting trade restrictions by between 0.029 and 0.039. The results are very similar whether we use *County Exposure 1* or *County Exposure 2*. And in all eight models the probability changes are precisely estimated, with 90% confidence intervals all above zero. These results support our hypothesis that homeowners living in counties with a larger share of employment in comparative-disadvantage sectors are more likely to oppose trade liberalization because regional housing values depend, among other things, on the amount of regional economic employment in trade-exposed sectors.

5.3. Robustness checks

We checked the robustness of the empirical results in several ways. First, the theory motivating our analysis assumes all individuals work and earn factor income. Accordingly, we limited our data set to individuals currently in the labor force (either working or unemployed but actively seeking work). Like the United States overall in 1992, in the NES survey only about two-thirds of respondents were in the labor force. The results for the working-only sample were qualitatively similar to the full-sample results.[12]

Similar to this, we considered the possibility that the proper unit of observation is the household rather than the individual. The NES survey reports education, occupation, and industry of employment for spouses of respondents, so in some specifications we used regressors reporting a combination of respondent and

[12]Sixty-five percent of the sample reported being in the labor force, versus the 1992 actual national share of 66.6%. Respondents not currently in the labor force are asked in the NES survey to report as ''industry of employment'' the industry last worked in.

Table 5
Determinants of individual opinion on international-trade restrictions: factor-income and asset-ownership models[a]

Variable	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Constant	1.567	1.552	1.596	1.578	3.586	3.590	3.594	3.593
	(0.174)	(0.176)	(0.172)	(0.174)	(0.355)	(0.358)	(0.355)	(0.359)
Occupation Wage	−1.766	−1.759	−1.746	−1.738				
	(0.292)	(0.292)	(0.291)	(0.290)				
Education Years					−0.218	−0.218	−0.216	−0.216
					(0.025)	(0.025)	(0.025)	(0.025)
Sector Tariff		1.828		2.275		−0.573		−0.128
		(3.189)		(3.132)		(3.056)		(3.004)
Sector Net Ex Share	−0.624		−0.653		0.084		0.044	
	(0.609)		(0.609)		(0.615)		(0.615)	
County Exposure 1	−0.334	−0.301			−0.570	−0.567		
	(0.849)	(0.852)			(0.881)	(0.880)		
*County Exp 1*House*	2.195	2.182			2.183	2.185		
	(0.951)	(0.951)			(0.966)	(0.964)		
County Exposure 2			−0.146	−0.136			−0.183	−0.184
			(0.296)	(0.298)			(0.311)	(0.311)
*County Exp 2*House*			0.780	0.779			0.675	0.676
			(0.375)	(0.376)			(0.392)	(0.391)
# of observations	1736	1736	1736	1736	1736	1736	1736	1736

[a] These results are multiple-imputation estimates of logistic regression coefficients based on the 10 imputed data sets. Each cell reports the coefficient estimate and (in parentheses) its standard error. The dependent variable is individual opinions about U.S. trade policy. The measure is coded a 1 for those individuals favoring new restrictions and 0 for those opposed.

Table 6
Determinants of respondent opinion on international trade restrictions: factor-income and asset ownership models[a]

Variable	Change in probability of supporting trade restrictions as a result of a one standard deviation increase in the independent variable for each model[b]							
	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Occupation Wage	−0.074 (0.013) [−0.095, −0.052]	−0.075 (0.012) [−0.095, −0.055]	−0.074 (0.012) [−0.094, −0.053]	−0.074 (0.013) [−0.094, −0.052]				
Education Years					−0.130 (0.016) [−0.156, −0.104]	−0.131 (0.017) [−0.158, −0.104]	−0.130 (0.016) [−0.157, −0.105]	−0.131 (0.016) [−0.157, −0.103]
Sector Tariff		0.008 (0.013) [−0.015, 0.029]		0.010 (0.012) [−0.011, 0.030]		−0.003 (0.013) [−0.024, 0.017]		−0.001 (0.013) [−0.022, 0.020]
Sector Net Export Share	−0.013 (0.012) [−0.033, 0.008]		−0.013 (0.012) [−0.034, 0.008]		0.002 (0.012) [−0.019, 0.021]		0.001 (0.012) [−0.020, 0.021]	
Cty Exp 1	0.034	0.034			0.029	0.030		
*Cty Exp 1*House*[c]	(0.013) [0.011, 0.055]	(0.014) [0.012, 0.057]			(0.013) [0.007, 0.051]	(0.013) [0.006, 0.051]		
Cty Exp 2			0.039	0.038			0.029	0.029
*Cty Exp 2*House*[c]			(0.015) [0.014, 0.063]	(0.016) [0.012, 0.064]			(0.017) [0.000, 0.056]	(0.017) [0.001, 0.056]

[a] For each of the eight factor and asset models, we estimated using multiple imputation with a logit specification the effect of factor, industry, and asset exposure to international trade on individuals' trade policy opinions. The parameter estimates from this analysis are reported in Table 5. Here we interpret those results by presenting the impact of a one standard deviation increase in each independent variable, holding other variables constant, on the probability that the respondent supports trade restrictions.

[b] Each triple of entries in the table begins with the mean effect from 1000 simulations of the change in probability of supporting trade restrictions due to an increase of one standard deviation from the independent variable's mean, holding all other variables constant at their means. The standard error of this estimate is reported in parentheses. Finally, a 90% confidence interval for the probability change is presented in brackets.

[c] The one-standard-deviation increase for the county-exposure variable is calculated assuming the individual is a homeowner. This means that the change affects two independent variables: the county variable itself and its interaction with homeownership.

spousal information. These household results were generally consistent with the individual ones.

To verify the strength of our data we tried other measures of factor type, industry exposure, and county exposure. For factor type we tried the respondents' reported 1991 annual income. The results were qualitatively similar to those obtained for average occupation wages and education. For industry trade exposure we tried imports as a share of output. Although imports do not measure revealed comparative advantage, so often imports are considered to be harmful that we thought many individuals might focus on imports only when evaluating trade policy. This import measure did not work as hypothesized, however. To examine the robustness of our county-exposure measures, we tried wage bill instead of employment as the indicator of county economic activity. The wage-bill results were qualitatively similar to those for employment.

Similar to this, we also estimated specifications including both *Occupation Wage* and *Education Years* and then specifications including both *Sector Tariff* and *Sector Net Export Share*. This allowed us to check whether each regressor has explanatory power independent of its substitute. When regressed together, both *Occupation Wage* and *Education Years* are significantly less than zero. In contrast, when regressed together both *Sector Tariff* and *Sector Net Export Share* are not significantly different from zero.

Finally, we controlled for many other possible determinants of trade-policy preferences that are not derived from trade theory but that might bias our estimates. First, we reran Models 9 through 16 including *House*, the other separate component of our interaction term. Like *County Exposure 1 (2)*, *House* never entered significantly. Most importantly, with either or both separate regressors the results for our interaction term were qualitatively unchanged (although with *House* the significance of our interaction term fell slightly). This suggests that neither home ownership alone nor residence in a trade-exposed county alone is sufficient to affect trade-policy preferences: it is the combination of the two that matters. Note that the insignificance of *County Exposure 1 (2)* is inconsistent with altruistic stories in which people oppose trade liberalization because of its perceived negative effects on their local community overall.

In addition to robustness checks involving homeownership and geography, we also tried a number of other demographic, political, and economic variables. For example, we reestimated Models 1 through 8 adding in the following regressors: age, gender, race, party identification, and union membership. In these specifications, age and race have no consistently significant effect while women, those who identify more strongly with the Democratic party, and union members are significantly more likely to support trade barriers. Controlling for all these variables, however, does not significantly change our key result that factor exposure explains trade preferences much more than sector exposure. In other similar robustness checks, we also found that our home ownership result holds up to the inclusion of additional regressors. Finally, we estimated Models 1 through

16 adding a variable indicating the average 1992 unemployment rate in the state in which the respondent lives. Including this variable had no systematic effect on our substantive inferences. If anything, including the unemployment measure tends to strengthen the magnitude of the estimated factor-type effects. Average state unemployment is positively correlated with restrictionist trade opinions in most specifications.[13]

5.4. Relating our empirical results to the political-economy literature

One may ask how our findings relate to the existing theory literature on trade policy. Many important political-economy models have assumed, by construction, an RV economy in which individual preferences fall along industry lines. Examples of this modeling strategy include Findlay and Wellisz (1982), Hillman (1982), and Grossman and Helpman (1994). Our finding that factor type, not industry of employment, is robustly correlated with trade-policy preferences suggests there is a high degree of intersectoral factor mobility over time horizons relevant to individuals when evaluating trade policies. This is more consistent with an HO perspective than an RV perspective (again, with the caveat that these results are not direct tests of various trade models, and that nothing in our analysis ruled out both factor and industry interests mattering).

One message of our findings is that important political-economy models like these could be re-worked with an HO assumption about the underlying economic structure. This would follow the example of Mayer (1984), who solves his full political-economy equilibrium for both HO and RV economies. It would also be consistent with the central empirical conclusion of Baldwin (1985, p. 176) that the trade-policy actions of U.S. government officials are explained by many types of political-economy models. Indeed, Breecher's (1982, p. 236) suggested extensions of Findlay and Wellisz (1982) call for precisely this kind of re-working: ''Although the [Findlay–Wellisz] paper draws the battle lines between owners of land and of capital [specific factors], other sorts of conflict are worth considering. For example, ... the familiar division between capital and labor ... with no sector-specific factors.'' And the Grossman and Helpman (1994) analysis could be re-worked for an HO setting. Their introduction (p. 834) states, ''In our model, lobbies represent industry interests.'' It seems the model could be recast for factor lobbies.

[13]Might the estimated effects of *Occupation Wage* and *Education Years* on trade-policy preferences reflect something other than returns to skill? One empirical result supporting our interpretation is our robustness check that both *Occupation Wage* and *Education Years* are significant when regressed together. If one variable captures something other than returns to skill, the significance of the other variable conditional on the first supports our interpretation. A second empirical finding supporting our interpretation is that our main results are attenuated when we analyze the sub-sample of individuals not currently in the labor force. If our variables were not measuring skills then presumably their explanatory power would not be attenuated among non-working individuals.

In suggesting that standard political-economy models could be reworked from an HO economic structure, it does not follow that equilibrium policy actions cannot fall along industry lines. Again, we regard as very important Rodrik's (1995) argument that policy actions are the equilibrium outcome of preferences interacting with political institutions. Mayer (1984, p. 983) is a classic reference on this point, arguing that a full model contains both an ''economic link'' and a ''political link.'' He endogenizes tariffs as the outcome of economic preferences channeled into some domestic voting structure, and different voter eligibility rules and participation costs lead to different tariff equilibria from the same preferences. Both Epstein and O'Halloran (1996) and McGillivray (1997) provide theoretical and empirical analyses of how political parties can affect the aggregation of interests. More generally, Alt and Gilligan (1994) analyze how given trade-policy preferences can lead to a wide range of political cleavages based on the institutional framework within which preferences are aggregated. Given the appropriate set of political institutions, preferences falling on factor lines could lead to actions taken on industry lines.

The other message of our empirical analysis is that political-economy modelers might consider asset ownership. Our empirical analysis suggests that individuals care about trade's effect on the price at which their homes can be transacted. In the standard models discussed in this section, the ''assets'' of sector-specific inputs are always assumed to be nontradable across individuals. Additional insights might be gained by extending these models to consider intertemporal considerations with ownership of tradable assets (for example, individuals might trade off short-run welfare declines from trade liberalization for long-run welfare increases).

6. Conclusion

In the literature on the political economy of trade policy it has been long known that individuals' preferences over trade policy play a central role. Theory shows quite clearly that different preferences can lead to different trade-policy outcomes. But a major limitation of this literature has been the small number of empirical studies of these preferences.

In this article we have provided some new evidence on the determinants of individual trade-policy preferences. To do this we constructed a new data set covering the United States in 1992. This is an individual-level data set identifying both stated trade-policy preferences and potential trade exposure through several channels. The data's comprehensiveness allowed us to organize our data analysis around the factor-income predictions of the Heckscher–Ohlin and Ricardo–Viner models. We were also able to go beyond the factor-income focus of these models to examine whether asset ownership matters as well. We generated two main empirical results.

First, we found that factor type dominates industry of employment in explaining

support for trade barriers. Lower skill is strongly correlated with support for new trade barriers; employment in industries more exposed to trade is not. This result is consistent with a Heckscher–Ohlin model in which the United States is well endowed with skilled labor relative to the rest of the world. It suggests there is high intersectoral labor mobility over the time horizons relevant to individuals when evaluating trade policy. Our second main result is that home ownership also matters for individuals' trade-policy preferences. Independent of factor type or industry, home ownership in counties with a manufacturing mix concentrated in comparative-disadvantage industries is strongly correlated with support for trade barriers. This finding suggests that, in addition to current factor incomes, preferences also depend on asset values.

Our findings are based on people's opinions about trade policy. But many other government policies such as exchange-rate and antitrust policies also affect citizens by changing relative product prices. As with trade policy, precisely how individuals form preferences over these other policies has long been a subject of controversy. Our findings suggest preferences over these other policies might also vary with factor type and asset ownership.

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