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Trade Policy Preferences and the Factor Content of Trade

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Abstract

This paper provides a theoretical and empirical analysis of public opinion towards free trade, investigating cleavages both between and within countries. We study the distributional effects of trade policy in a neoclassical economy with not just two, but many input factors in production. We demonstrate that the factor price changes induced by trade policy are negatively correlated with the factor content of free trade (and therefore factor abundance). Using large-scale international survey data, we test whether these predicted distributional effects are reflected in the trade policy preferences of workers with different labor market skills. In order to isolate the effects of factor abundance from other skill-related confounding factors, we employ a within-skill-group estimator that exploits the cross-country variation in the factor content of free trade. In line with theory, the data show that individuals whose skills are in more abundant domestic supply (i.e. those with a higher factor content of free trade) are significantly more likely to be pro-trade.

JEL-Classification: F11, F13

Keywords: Trade policy preferences · neoclassical trade theory · survey data

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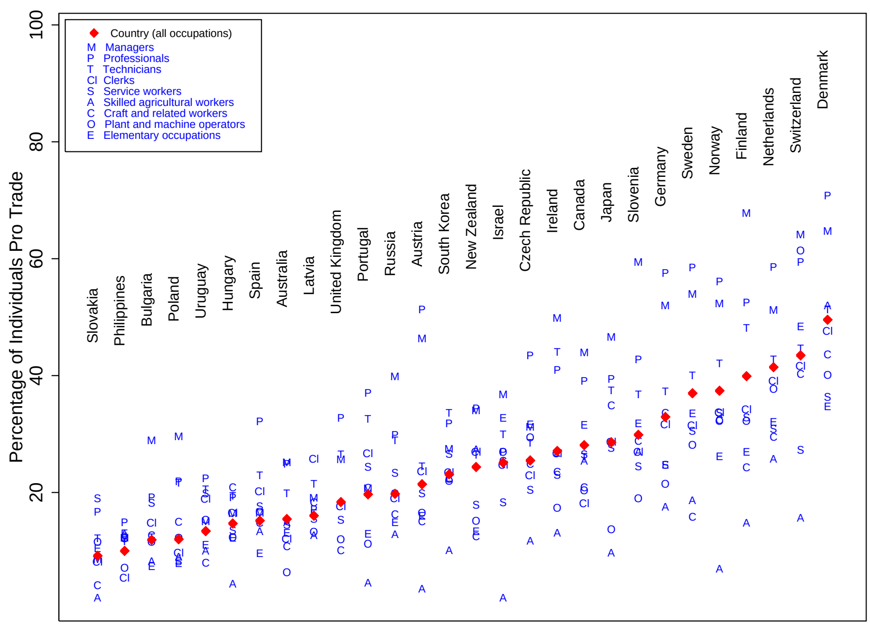
1 Introduction

Public opinion towards free trade is strongly divided *between* countries. In Eastern European countries such as Bulgaria, Poland and Slovakia, the share of people supporting free trade was less than 15% in 2003. In Western European countries such as Denmark, the Netherlands or Switzerland, this share was more than 35%; see Figure 1. Public opinion is also divided *within* countries. In Germany, for example, long celebrated as the world champion of exports, only 15% of skilled agricultural workers were supporting free trade in 2003, while this share was as much as 55% among professionals.

Figure 1: Differences in Public Opinion Towards Trade Between and Within Countries†



†Source: Based on data from the 2003 National Identity module of the International Social Survey Program. An individual is said to support free trade if he/she disagrees (or disagrees strongly) with the following statement: "[Respondent's country] should limit the import of foreign products in order to protect its national economy."

Why are some individuals more positive about free trade than others? What role does individual heterogeneity (e.g. educational background and occupation) play? To what extent are public attitudes shaped by the distributional effects of trade policy? These questions are part of a larger debate among economists, political scientists, and psychologists that tries to shed light on the formation of public opinion towards important international policy issues.

In this paper, we provide a theoretical and empirical analysis of public opinion towards free trade, relating cleavages both between and within countries to the distributional effects of trade policy. On the theoretical side, we study the factor price effects of trade policy in a neoclassical economy with not just two, but many input factors in production. Going beyond the simple two-factor model opens up a more satisfactory perspective on the formation of attitudes towards trade than provided in the related literature. We demonstrate that the factor price changes induced by trade policy are *negatively correlated* with the factor content of free trade. Hence, a departure from free trade creates a tension that resembles well-known Stolper-Samuelson arguments: it tends to be more harmful to factors that are exported in larger amounts.

On the empirical side, we analyze large-scale international survey data on public opinion across a broad number of countries. We translate our theoretical result into an empirical model that explains individual trade policy preferences by the distributional effects of trade policy in the neoclassical trade model. For this purpose, we sort individuals into different skill groups, interpreted as different input factors in production. In order to compute the factor content of free trade – our main explanatory variable of interest in the empirical model – we invoke the Heckscher-Ohlin-Vanek (HOV) equation linking factor contents with factor endowments.

A salient feature of the data, as Figure 1 shows, is that individual attitudes towards trade include a strong skill-specific component: managers and professionals, for example, are generally more positive towards trade throughout all countries; see Hainmueller & Hiscox (2006) and Mansfield & Mutz (2009) for a discussion. In the empirical analysis, we must control for this skill-specific component, as it would otherwise be confounded with the factor price effects of trade policy. To address this identification problem, we develop and apply a within-skill-group estimator which exploits variation in the factor content of free trade across countries within a skill group.

We estimate the model on two different survey data sets: the 2003 National Identity module from the International Social Survey Program (ISSP) and the 2007 survey of the Global Attitudes Project (GAP). We find in both data sets that workers in more abundantly supplied skill groups (i.e. those with a higher factor content of free trade) are significantly more likely to support free trade. This finding demonstrates that individual trade policy preferences are partially explained by the distributional effects of trade policy predicted by theory. However, the magnitude of these effects is modest in comparison with other sources of individual heterogeneity (such as education, income, and affiliation with certain skill groups).

Our paper adds to the literature on the political economy of trade policy in terms of theory, empirical application and methodology. First, we provide a rigorous theoretical discussion of the factor price effects of trade policy in the neoclassical trade model, without imposing any restriction on the number of input factors or goods (HOV model). The correlation result we derive from this model builds on Ethier (1982, 1984) and extends previous findings in Deardorff & Staiger (1988) and Deardorff (2000). Secondly, we confront this correlation result (and thus the HOV model) with international survey data on public opinion from a large number of countries. Empirical work based on the HOV model has a long tradition in international economics, starting with Leamer (1980) and gaining renewed momentum with Trefler (1993, 1995).[1] Balistreri (1997) invokes the HOV model in a single-country study on Canadian trade policy preferences. Finally, we propose a simple within-skill-group estimator that exploits the cross-country dimension of our survey data and allows isolating the factor price effects of trade policy from other effects that are specific to the individual's skill group. This issue has troubled the early studies examining trade policy preferences (Scheve & Slaughter, 2001; O'Rourke & Sinnott, 2001; Mayda & Rodrik, 2005) as well as their many follow-up papers.[2]

The remainder of this paper is structured as follows. Section 2 provides a theoretical discussion of the factor price effects of trade policy in the HOV model, and derives a testable prediction for individual preferences towards trade policy. Section 3 introduces the data and presents our identification strategy. Section 4 discusses the empirical results.

[1] More recent contributions include inter alia Davis & Weinstein (2001), Romalis (2004), Lai & Zhu (2007) and Trefler & Zhu (2010).

[2] Studies using cross-country survey data include Beaulieu et al. (2005), O'Rourke (2006), Scheve & Slaughter (2006), Mayda et al. (2007), and Jäkel & Smolka (2013). Hoffman (2009), Blonigen (2011), and Blonigen & McGrew (2014) report evidence on trade policy preferences for the United States.

The final section concludes.

2 Theory

There are many countries, indexed by $c = 1, \ldots, C$; many production factors, indexed by $m = 1, \ldots M$; and many goods, indexed by $n = 1, \ldots, N$. Countries are open and small in the sense that they trade goods (but not factors) and take prices on world markets as given. Consumers have identical and homothetic preferences. Both goods and factor markets are perfectly competitive and factors are perfectly mobile across industries, but not all factors are necessarily employed in all industries. The production technology is linearly homogeneous and allowed to differ between countries. Each individual living in country c is endowed with $\delta_c \in (0, 1]$ efficiency units of exactly one of the production factors. The parameter δ_c thus reflects the technology level of country c.[3] In the following, we refer to a country's endowment with some factor m as its *effective* endowment with that factor. Factor price equalization in terms of effective factor prices is assumed to prevail under free trade.

In the analysis that follows, we derive relative factor price changes for owners of different factors. Specifically, we compare the free trade equilibrium of some country c with a policy equilibrium in which domestic goods prices may differ from world market prices. We assume that the government consumes the entire tariff revenue in the policy equilibrium. This assumption allows us to abstract from the effects of trade policy other than those on factor prices.[4]

Assume that all goods are produced in both the policy and the free trade equilibrium. Let $\mathbf{p}_c = (p_{1c}, \ldots, p_{Nc})$ and $\mathbf{w}_c = (w_{1c}, \ldots, w_{Mc})$ denote the vectors of goods and (effective) factor prices, respectively. We write $c(\mathbf{w}_c) = \mathbf{w}_c \mathbf{A}(\mathbf{w}_c)$ for the vector of minimum unit-cost functions where $\mathbf{A}$ is the $(M \times N)$ technology matrix with individual elements

[3] Trefler (1993) allows for all factors to differ in their productivities in every country relative to a benchmark country. Alternatively, technology differences can be modeled via differences in unit input coefficients across countries; see Trefler (1995).

[4] Alternatively, we could assume that the government redistributes any tariff revenue with a poll subsidy.

a_{mn} giving the (effective) amount of factor m needed to produce one unit of good n. The market structure implies zero profits in both equilibria. Hence, $\mathbf{p}_c^p = \mathbf{w}_c^p \mathbf{A}(\mathbf{w}_c^p)$ and $\mathbf{p}^f = \mathbf{w}^f \mathbf{A}(\mathbf{w}^f)$ in the policy equilibrium and the free trade equilibrium, respectively. Let $\mathbf{T}_c^f = (T_{1c}^f, \ldots, T_{Nc}^f)$ denote the vector of net exports in the free trade equilibrium. Since we are interested in the factor price effects of trade protection (rather than trade promotion), in the remainder of this paper we assume that trade policy takes the form of import restrictions:

Assumption 1. $p_{nc}^p - p_n^f \geq 0 \; \forall n : T_{nc}^f < 0$ *and* $p_{nc}^p - p_n^f = 0 \; \forall n : T_{nc}^f > 0$.

It follows from Assumption 1 that $(\mathbf{p}_c^p - \mathbf{p}^f)(\mathbf{T}_c^f)^{\mathrm{T}} \leq 0$, which implies

$$[c(\mathbf{w}_c^p) - c(\mathbf{w}^f)](\mathbf{T}_c^f)^{\mathrm{T}} \leq 0 \tag{1}$$

due to zero profits. This inequality states that the cost of producing the vector of free trade net exports is higher when evaluated at free trade factor prices.

Define $b(\mathbf{w}_c) \equiv c(\mathbf{w}_c)(\mathbf{T}_c^f)^{\mathrm{T}}$ as the cost of producing the vector of free trade net exports evaluated at some factor price vector $\mathbf{w}_c$. Assume that $b(\mathbf{w}_c)$ is continuous and differentiable over the relevant parameter space. By virtue of the mean value theorem, there exists some intermediate vector $\widetilde{\mathbf{w}}_c$ for which $b(\mathbf{w}_c^p) - b(\mathbf{w}^f) = (\mathbf{w}_c^p - \mathbf{w}^f)\,\mathrm{d}\,b(\widetilde{\mathbf{w}}_c)$. Noting the definitions of $b(\mathbf{w}_c)$ and $c(\mathbf{w}_c)$, we have

$$[c(\mathbf{w}_c^p) - c(\mathbf{w}^f)](\mathbf{T}_c^f)^{\mathrm{T}} = (\mathbf{w}_c^p - \mathbf{w}^f)[\mathbf{A}(\widetilde{\mathbf{w}}_c) + \widetilde{\mathbf{w}}_c \mathrm{d}\mathbf{A}(\widetilde{\mathbf{w}}_c)](\mathbf{T}_c^f)^{\mathrm{T}}, \tag{2}$$

where cost minimization implies $\widetilde{\mathbf{w}}_c \mathrm{d}\mathbf{A}(\widetilde{\mathbf{w}}_c) = 0$. If the changes in goods prices are small enough, we may set $\widetilde{\mathbf{w}}_c = \mathbf{w}^f$, so that Equation (2) becomes

$$[c(\mathbf{w}_c^p) - c(\mathbf{w}^f)](\mathbf{T}_c^f)^{\mathrm{T}} = (\mathbf{w}_c^p - \mathbf{w}^f)\mathbf{A}(\mathbf{w}^f)(\mathbf{T}_c^f)^{\mathrm{T}}. \tag{3}$$

Define $\mathbf{F}_c^{\mathrm{T}} \equiv \mathbf{A}(\mathbf{w}^f)(\mathbf{T}_c^f)^{\mathrm{T}}$ as the vector of country c's factor content of trade in the free trade equilibrium. It takes on positive values for some factor m, F_{mc}, if the amount of that factor embodied in production exceeds the amount embodied in consumption. Define $\Delta_p \mathbf{w}_c \equiv \mathbf{w}_c^p - \mathbf{w}^f$ as the vector of factor price changes when switching from the free trade equilibrium to the policy equilibrium. Then, Equation (3) can be written as

$$[c(\mathbf{w}_c^p) - c(\mathbf{w}^f)](\mathbf{T}_c^f)^{\mathrm{T}} = \Delta_p \mathbf{w}_c \mathbf{F}_c^{\mathrm{T}} \leq 0, \tag{4}$$

where the inequality derives from (1).

In the following, we normalize factor prices in country c to lie on the unit simplex, $\sum_m w_{mc}^f = \sum_m w_{mc}^p = 1$. Prices are thus measured in terms of a factor bundle containing one unit of each factor.

Proposition 1. *Factor price changes and the factor content of free trade are negatively correlated when moving from the free trade equilibrium to the policy equilibrium.*

Proof. A negative correlation between the two variables exists if $\mathrm{Cov}(\Delta_p \mathbf{w}_c, \mathbf{F}_c^{\mathrm{T}}) \leq 0$. By definition of the covariance, $\mathrm{Cov}(\Delta_p \mathbf{w}_c, \mathbf{F}_c^{\mathrm{T}}) = \Delta_p \mathbf{w}_c \mathbf{F}_c^{\mathrm{T}} - M \ \overline{\mathbf{F}}_c \ \overline{\Delta_p \mathbf{w}}_c$, where bars indicate vector means. We know from Equation (4) that the first term is negative. Hence, if either of the two vectors has zero mean, we have $\mathrm{Cov}(\Delta_p \mathbf{w}_c, \mathbf{F}_c^{\mathrm{T}}) \leq 0$; see also Deardorff (1980). From the normalization of factor prices, $\sum_m \Delta_p w_{mc} = 0$ and thus $\overline{\Delta_p \mathbf{w}}_c = 0$. □

Proposition 1 is the principal result of our theoretical analysis, and describes the distributional effects of trade policy. It says that departures from free trade tend to increase the relative prices of factors with higher net (free-trade) factor exports. These factor price changes are indirectly linked to the specific pattern of goods price changes. In this sense, Proposition 1 resembles the higher-dimensional version of the Stolper-Samuelson theorem in Ethier (1982, 1984).

Our exposition is based on previous contributions by Deardorff & Staiger (1988) and Deardorff (2000). These authors show that *changes* in the factor content of trade between any two (non-specialized) trading equilibria are indicative of changes in relative factor prices. Different from their work, Proposition 1 relates factor price differences between the free trade equilibrium and the policy equilibrium to the *level* of the factor content of trade prevailing under free trade.

Due to identical and homothetic preferences, Proposition 1 leads directly to a statement about changes in utility. Let $U(\mathbf{p}, w_{mc})$ be the indirect utility of the owner of factor m, and let $\Delta_p U_{mc} \equiv U(\mathbf{p}_c^p, w_{mc}^p) - U(\mathbf{p}^f, w_{mc}^f)$ be the corresponding utility difference when switching from the free trade equilibrium to the policy equilibrium.

Corollary 1. *Trade policy leads to utility changes of factor owners which are negatively correlated with the factor content of free trade.*

Proof. Let $\mathcal{M}_c$ and $\mathcal{M}'_c$ denote the sets of factors whose factor content of free trade is above and below the country average, respectively. Corollary 1 states that, on average, the owners of factors with an above-average factor content of free trade are made worse off through trade policy relative to the owners of other factors: $\overline{\Delta_p U}_{\mathcal{M}c} \leq \overline{\Delta_p U}_{\mathcal{M}'c}$. This inequality can be rewritten as $\overline{U}_{\mathcal{M}c}(\mathbf{p}^f, w_c^f) - \overline{U}_{\mathcal{M}c}(\mathbf{p}_c^p, w_c^p) \geq \overline{U}_{\mathcal{M}'c}(\mathbf{p}^f, w_c^f) - \overline{U}_{\mathcal{M}'c}(\mathbf{p}_c^p, w_c^p)$. Due to homothetic preferences, the indirect utility function $U(\mathbf{p}, w)$ is homogeneous of degree one in w: $U(\mathbf{p}, w) = wU(\mathbf{p}, 1) = w\widetilde{U}(\mathbf{p})$. Hence, we have $\widetilde{U}(\mathbf{p}^f)\left(\overline{w}^f_{\mathcal{M}c} - \overline{w}^f_{\mathcal{M}'c}\right) \geq \widetilde{U}(\mathbf{p}_c^p)\left(\overline{w}^p_{\mathcal{M}c} - \overline{w}^p_{\mathcal{M}'c}\right)$. Assumption 1 implies $\widetilde{U}(\mathbf{p}^f) \geq \widetilde{U}(\mathbf{p}_c^p)$. To prove Corollary 1, it is thus sufficient to show that $\overline{\Delta_p w}_{\mathcal{M}c} \leq \overline{\Delta_p w}_{\mathcal{M}'c}$. This follows from $\mathrm{Cov}(\Delta_p \mathbf{w}_c, \mathbf{F}_c^{\mathrm{T}}) \leq 0$, as shown in Proposition 1, and the definitions of $\mathcal{M}_c$ and $\mathcal{M}'_c$. □

Because a country's factor content of free trade is never actually observed, Corollary 1 as such is not amenable to empirical testing. However, the HOV theorem tells us that, in the fully integrated world equilibrium, we can predict this variable from observable data, namely from country and world factor endowments:

$$\mathbf{F}_c = \delta_c \mathbf{V}_c - s_c \sum \delta_c \mathbf{V}_c, \tag{5}$$

where s_c is country c's share in world consumption and $\delta_c \mathbf{V}_c = (\delta_c V_{1c}, \ldots, \delta_c V_{Mc})$ denotes the vector of effective factor endowments of country c. When referring to the factor content of free trade in the following, we relate to its predicted value according to Equation (5).

Based on Corollary 1, we can now derive a testable prediction of how trade policy preferences vary in a cross-section of individual factor owners. In particular, the negative correlation between utility changes and $\mathbf{F}_c$ implies:

Prediction 1. *Owners of factors with a higher factor content of free trade tend to be more positive towards free trade.*

Important for our empirical analysis, the prediction applies to the *within-country* variation in the factor content of free trade. Because we exploit variation both between and within countries in the data, the empirical approach we develop in the following section accounts for the fact that the first and second moments of the distribution of $\mathbf{F}_c$ differ across countries.

3 Empirical Approach

This section describes our empirical approach to bringing Prediction 1 to the data. First, we introduce the survey data and explain how we measure individual attitudes towards trade.[5] Next, we describe our methodology to identify individual factor ownership, and to predict the factor content of free trade as given by Equation (5).[6] Finally, we present our empirical model and identification strategy.

3.1 International Survey Data

Our empirical analysis explores two large-scale, internationally comparable survey data sets, viz. the 2003 National Identity module from the International Social Survey Program (ISSP) and the 2007 wave of the Pew Global Attitudes Project (GAP). In so doing, we examine the robustness of our results across two data sources that exhibit important differences in terms of framing of survey questions, country coverage, and information on individual factor ownership.

Our baseline estimation sample from the ISSP includes roughly 26,000 individuals from 26 countries, the majority of which are located in Europe with middle or high incomes per capita. We use the following survey question on trade policy preferences in our empirical analysis:

> "How much do you agree or disagree with the following statement? [Respondent's country] should limit the import of foreign products in order to protect its national economy."

We construct an individual-specific pro-trade indicator variable taking on the value one for individuals who hold positive views towards trade (answer categories "disagree strongly" and "disagree") and zero otherwise (answer categories "neither agree nor disagree", "agree",

[5]We provide detailed information about the key survey variables used (including coding and summary statistics) in Tables A.2 through A.5 in the Data Appendix.

[6]We offer a detailed description of the factor content data in the Data Appendix.

and “agree strongly”). The binary coding of the variable mutes country-specific tendencies towards extreme or moderate responses (extreme-response bias).[7]

Our baseline estimation sample from the GAP includes more than 19,000 individuals from 28 countries. It offers a salient coverage of economies at different stages of development, including developing countries in Africa, Asia, Latin America, and the Middle East. We exploit answers to the following survey question on individual attitudes towards trade:

> “What do you think about the growing trade and business ties between [respondent's country] and other countries? Do you think it is a very good thing, somewhat good thing, somewhat bad thing or a very bad thing for your country?”

Again, we construct a pro-trade indicator variable coded one for individuals who answered “very good thing” or “somewhat good thing” and zero otherwise (answer categories “very bad thing” or “somewhat bad thing”).[8]

The framing of the two survey questions differs markedly between the ISSP and the GAP. The framing in the ISSP favors skeptical views towards free trade since the domestic economy is meant to be *protected* through import restrictions: less than 50% of respondents in each country are pro-trade. This number contrasts sharply with favorable views towards trade in the GAP where the framing is more neutral. In this survey, a large majority of people in all countries are pro-trade, ranging from 60% in the United States to 95% in Bulgaria, Malaysia and Pakistan. Importantly, particular groups of individuals – such as less educated workers – may be more responsive to the framing of survey questions (Hiscox, 2006). The resulting endogeneity problem needs to be addressed in the empirical analysis; see below.

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[7]Based on other (unrelated) survey items we calculate country-specific indexes of extreme response (Van Herk et al., 2004) and find that they vary considerably across countries. We also find cross-country differences in the tendency to agree rather than disagree with certain statements (acquiescence-bias). These differences are absorbed into country fixed effects in the empirical model; see below.

[8]We also find cross-country differences in extreme-response bias in the GAP. For example, across multiple, unrelated survey items individuals from African countries are more likely to give extreme responses than people from Europe.

3.2 Factor Ownership and Factor Content Data

We define production factors as well as factor ownership along the lines of individual labor market skills. Production factors (henceforth called skill groups) are represented in terms of either occupations (ISSP) or educational attainment (GAP). The ISSP reports individuals' occupations corresponding to the three-digit level of the ISCO-88 classification of the International Labor Organization (ILO) ($\approx$ 150 occupations). At the one-digit level, these occupations are aggregated into nine major occupation groups based on the similarity of skills required to fulfill the tasks and duties of the jobs. We treat each major occupation group as a unique skill group. In the GAP, we distinguish between six strictly hierarchical levels of educational attainment that are largely compatible with the ISCED-76/ISCED-97 classification of the UNESCO. We sort individuals into three different skill groups: those with primary education or less (low-skilled labor), those with secondary education (medium-skilled labor) and those with tertiary education (high-skilled labor).

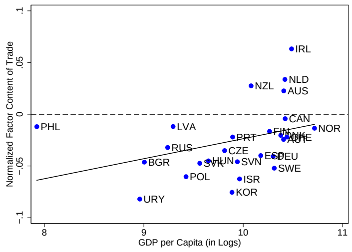
In order to predict the factor content of free trade, $\mathbf{F}_c = \delta_c \mathbf{V}_c - s_c \sum_c \delta_c \mathbf{V}_c$, we use ILO data on country and world endowments that can be accommodated with the definition of occupations in the ISSP and educational attainment in the GAP, respectively.[9] We construct the country-specific technology parameter $\delta_c \in (0, 1]$ on the basis of information on GDP per capita from the World Bank's World Development Indicators (WDI).[10] Finally, we use trade and GDP data from the WDI to compute country-specific consumption shares in world output s_c.

The factor content of free trade for country c and factor m, F_{mc}, is given by the m-th element of the vector $\delta_c \mathbf{V}_c - s_c \sum_c \delta_c \mathbf{V}_c$. Empirically, F_{mc} tends to be much higher (in absolute value) in large countries, implying a higher variance of $\mathbf{F}_c$. Therefore, $\mathbf{F}_c$ is not readily comparable across countries. To be able to exploit its cross-country variation, we normal-

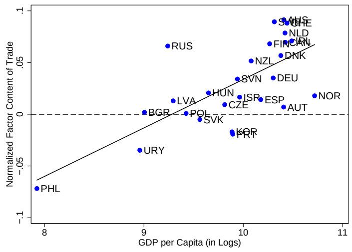
[9]The factor content of free trade for any factor m only depends on the effective country and world endowments of that specific factor. It is therefore insensitive to the presence of additional (unobserved) factors, such as different types of capital or land. In that sense, our approach does not restrict the number of production factors to the number of skill groups that we use in the estimation.

[10]We normalize δ_c to unity for the country with the highest GDP per capita. Trefler (1995) employs the HOV equation to estimate the technology parameter. The correlation coefficient between the estimated parameter and a country's GDP per capita is close to 0.9.

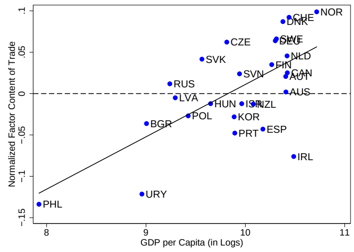
Figure 2: Factor Content of Free Trade, $\widetilde{F}_{mc}$, and GDP Per Capita, ISSP



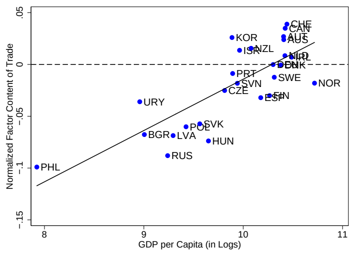
(a) Legislators, senior officials and managers



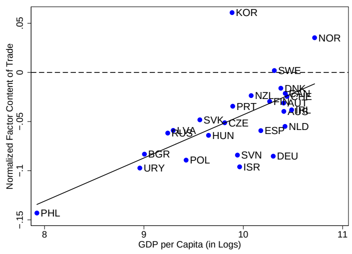
(b) Professionals



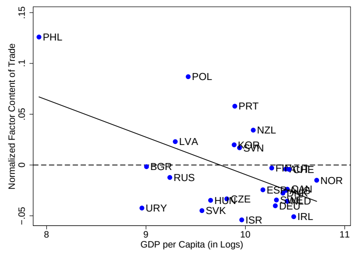
(c) Technicians and associate professionals



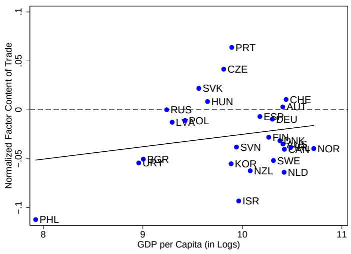
(d) Clerks



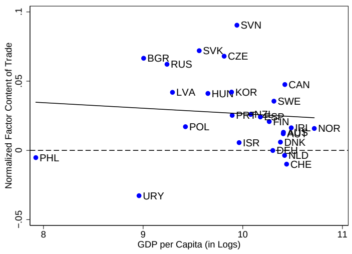
(e) Service workers and sales workers



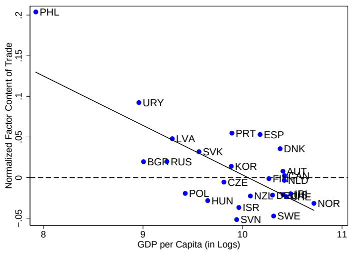
(f) Skilled agricultural workers



(g) Craft and related trade workers



(h) Plant and machine operators



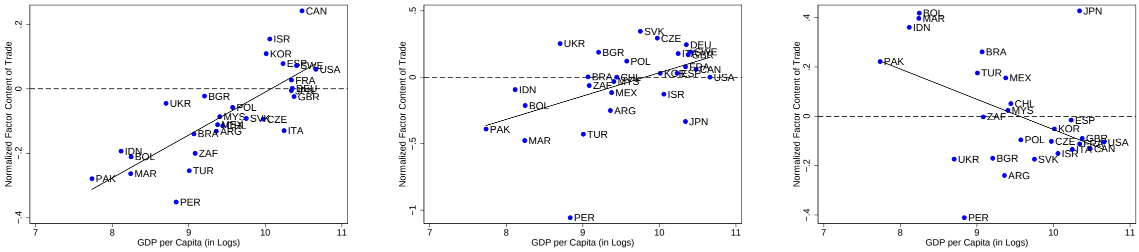
(i) Elementary occupations

ize the variable by a country's overall effective labor endowment: $\widetilde{F}_{mc} = F_{mc}/(\sum_m \delta_c V_{mc})$. This normalization is neutral in the sense that the scaling factor is the same for all skill groups within a country. Importantly, the absolute value of $\widetilde{F}_{mc}$ is uncorrelated with different measures of country size and therefore comparable across countries.

We can now compare the (normalized) factor endowment profiles of different countries. Figure 2 (ISSP) and Figure 3 (GAP) plot the factor content of free trade against countries' GDP per capita (separately for each skill group). A country is abundant in the factors with positive net exports (and scarce in the other factors). The figures show that our factor content data accord with common perceptions about the global distribution of skills, in particular the concentration of high-skilled labor in the developed world.

In the ISSP, the two skill groups corresponding to the most advanced labor mar-

Figure 3: Factor Content of Free Trade, $\widetilde{F}_{mc}$, and GDP Per Capita, GAP



(a) High-skilled labor (b) Medium-skilled labor (c) Low-skilled labor

ket skills ("Professionals" and "Technicians and associate professionals") are much more abundant in high-income countries than in middle- or low-income countries.[11] Conversely, the skill group corresponding to the most basic labor market skills ("Elementary occupations") tends to be abundant in developing countries such as the Philippines and Uruguay, but scarce in developed countries such as Norway, Sweden, and Germany. Interesting differences exist between the five skill groups corresponding to intermediate labor market skills: "Clerks", for instance, are only abundant in high-income countries; "Craft and related trade workers" and "Plant and machine operators", in contrast, tend to be particularly abundant in middle-income countries. This heterogeneity would go unnoticed in a two-factor version of our model.[12]

We find an overall very similar pattern for the GAP. High-skilled labor appears to be more abundant in developed countries than in developing countries. The same holds true, to a lesser extent, for medium-skilled labor but not for low-skilled labor. Hence, bundling low-skilled labor and medium-skilled labor into a single skill group would seem to risk an aggregation bias in our empirical analysis. Interestingly, we find that some countries, viz. Argentina, Peru, and South Africa, are scarce in all skill groups (while possibly being abundant in other factors such as capital or land).

[11]See ILO (1993) for a classification of the nine major ISCO occupations into four hierarchical levels of labor market skills.

[12]For the skill group "Legislators, senior officials and managers" there is only a loose relationship between factor abundance and GDP per capita. This might be due to large differences in the actual skill requirements of the occupations belonging to this group; see ILO (1993).

3.3 Empirical Model and Identification

We next turn to our empirical model and identification strategy. Let individuals be indexed by i. Denote by $\mathcal{I}_{mc}$ the set of individuals owning factor m and living in country c. Let $\Delta_p U_i$ denote individual i's change in utility when switching from the free trade equilibrium to the policy equilibrium. We assume that this change can be decomposed as follows:

$$\Delta_p U_i = \Delta_p U_{mc} + \Delta_p W_i + \varepsilon_i, \quad i \in \mathcal{I}_{mc}, \tag{6}$$

where $\Delta_p U_{mc}$ captures the distributional effects of trade policy derived in Section 2; $\Delta_p W_i$ represents all effects operating through other channels (and attributable to observable variables such as country of residence, skill group, age, gender, or income); and ε_i is a random term capturing the effects of unobservables (such as intelligence, social values, or political identity). Since $\Delta_p U_i$ is an unobservable latent variable, we assume that our pro-trade indicator variable, denoted by y_i, is equal to one if the individual is worse off in the policy equilibrium than in the free trade equilibrium ($\Delta_p U_i < 0$). Hence, the probability that individual $i \in \mathcal{I}_{mc}$ is pro-trade can be written as:

$$\begin{aligned} \Pr(y_i = 1) &= \Pr(\Delta_p U_i < 0) \\ &= \Pr(\Delta_p U_{mc} + \Delta_p W_i < -\varepsilon_i) \\ &= 1 - \Phi\left(\Delta_p U_{mc} + \Delta_p W_i\right), \end{aligned} \tag{7}$$

where we assume that the random term is drawn independently from a standard normal distribution, $\varepsilon_i \sim N(0, 1)$.

Our main interest is with $\Delta_p U_{mc}$, i.e., the effect of trade policy on individual utility through the general equilibrium adjustment in factor prices, and how it feeds into trade policy preferences. Prediction 1 states that owners of factors with a higher factor content of free trade tend to be more positive towards trade. To capture this idea empirically, we parameterize $\Delta_p U_{mc} = \beta \cdot \widetilde{F}_{mc}$. Based on a suitable specification of $\Delta_p W_i$, we can estimate the Probit model in (7) in order to test Prediction 1 against the null hypothesis that $\widetilde{F}_{mc}$ is no significant predictor of individual attitudes towards trade:

$$H_0 : \frac{\partial \Pr(y=1|\cdot)}{\partial \widetilde{F}_{mc}} = 0.$$

We next lay out a parameterization of $\Delta_p W_i$ that allows us to empirically isolate the distributional effects of trade policy from other confounding factors. The problem we need to address is that an individual's skill group determines not only $\Delta_p U_{mc}$ (through factor ownership), but also $\Delta_p W_i$ (through various different channels): advanced labor market skills, for instance, are associated with more cosmopolitan views, creating strong preferences for globalization in general (Hainmueller & Hiscox, 2006). They also reduce sensitivity towards issue framing (Hiscox, 2006). Psychological factors such as loss aversion feed into opposition towards free trade (Kemp, 2007), and presumably all the more so for workers with only basic labor market skills. Skill groups also differ regarding their position on the labor market. For example, inter-sectoral mobility varies across skill groups.[13] In consequence, some skill groups are potentially more affected by trade policy because they cannot easily be re-employed in other sectors.

Previous literature has approached this identification problem by introducing various control variables in the estimation. However, this approach only partly accounts for the aforementioned confounding factors because they are hard or impossible to measure explicitly. The cross-country dimension of our data enables us to address the issue in a fundamentally different way: namely, by including fixed effects for the different skill groups. In contrast to the received literature, our approach allows us to control for any unobserved skill-group specific heterogeneity in $\Delta_p W_i$.

Finally, recall that Prediction 1 relates trade policy preferences to the *within-country* variation in $\mathbf{F}_c$. To operationalize the prediction in a cross-country setting, we need to account for differences in the distribution of $\mathbf{F}_c$. While the normalization we choose for $\mathbf{F}_c$ eliminates differences in the second moment of the distribution, we augment the model by country fixed effects to account for differences in the first moment of the distribution.

[13] In contrast to the two-factor version of the neoclassical trade model, the many-factor version that we use here can accommodate imperfect sectoral mobility in a way that leaves the predictions of the model unchanged. More specifically, it can rule out employment of some factor(s) in some sector(s) as part of the exogenously given production technology.

The country fixed effects we include also absorb the influence of country-specific variables such as GDP per capita, trade openness, productivity growth and the like.

We thus specify $\Delta_p W_i$ as a function of a country fixed effect, γ_c, a skill group fixed effect, η_m, and a vector of individual-specific control variables, $\mathbf{X}_i = (X_{i1}, \ldots, X_{iS})^{\mathrm{T}}$. Our final estimation equation reads as follows:

$$\Pr(y_i = 1) = 1 - \Phi\left(\beta \cdot \widetilde{F}_{mc} + \boldsymbol{\lambda} \cdot \mathbf{X}_i + \gamma_c + \eta_m\right), \quad i \in \mathcal{I}_{mc}, \tag{8}$$

where $\boldsymbol{\lambda} = (\lambda_1, \ldots, \lambda_S)$ is a vector of parameters to be estimated. In this setup, identification comes from the cross-country variation in the factor content of free trade within a skill group.

4 Results

This section takes our empirical model of individual preference formation to the data. Tables 1 and 2 show results for the ISSP and the GAP, respectively. We always report the estimated marginal effects on the probability of being pro-trade (evaluated at the sample means of all regressors). For indicator variables (such as those used to estimate skill-group fixed effects), we report the effects of a discrete change from zero to one. Standard errors are robust to arbitrary forms of heteroskedasticity.

For both the ISSP and the GAP, we employ three different specifications. Each specification includes the factor content of free trade, $\widetilde{F}_{mc}$, as the main explanatory variable of interest. In column (1) of either table, we control for country fixed effects, along with an individual's age, gender, and citizenship (where available). In column (2), we proceed to the empirical model derived in Equation (8) and include a full set of skill-group fixed effects. In the ISSP, where we use occupations to represent skill groups, we also control for an individual's education (in years) as a complementary measure of labor market skills. And finally, in column (3), we add an extensive set of individual-specific control variables, including income, nationalist attitudes, and openness towards foreign cultures. This specification allows us to control for sources of individual heterogeneity (other than an individual's skill group) that the received literature has identified to predict individual trade policy preferences. The complete set of control variables can be found in Tables A.2 and A.3 in the Data Appendix and is largely identical to the ones used in Mayda & Rodrik (2005) for the ISSP and Jäkel & Smolka (2013) for the GAP. In the GAP, the survey questions on which these variables are based were only asked in a subset of countries. Moreover, extending the set of control variables significantly reduces the sample size in both survey sources due to missing data for different survey items. In order to facilitate the comparison between the different specifications, we therefore also estimate the second specification on the smaller sample of column (3); see column (2') of either table.

Our estimation results indicate that the factor content of free trade is a relevant input in the formation of individual trade policy preferences. In line with Prediction 1, we find a positive and robustly significant effect of the factor content variable across all specifications that control for skill-group fixed effects. Moreover, the effect is borne out in both data sets. Hence, our estimates lend support to the idea that individual trade policy preferences are influenced by concerns about the distributional effects of trade policy as predicted by the neoclassical trade model.

As for the quantitative implications, the estimated effects of $\widetilde{F}_{mc}$ are large enough to be relevant yet far from being the predominant force in determining attitudes towards trade. Take the estimates in column (2), which are based on the largest number of countries and observations and which include fixed effects for the different skill groups. In the ISSP, the marginal effect of $\widetilde{F}_{mc}$ stands at 0.195 (significant at the one percent level). Going from the minimum (-0.14) to the maximum ($+0.20$) of $\widetilde{F}_{mc}$ in the sample, the probability of being pro-trade increases by 6.6 percentage points. An increase in the factor content of free trade by two standard deviations increases the probability of being pro-trade by approximately 2.1 percentage points.[14] These effects are small but need to be judged against the overall low probability of being pro trade in the ISSP of 25 percent.

In the GAP, the marginal effect of $\widetilde{F}_{mc}$ is 0.029 in column (2) of Table 2. In this sample, the factor content of free trade is more dispersed than it is in the ISSP, with minimum and maximum values of -1.1 and $+0.43$, respectively, and a standard deviation of 0.27.

[14]We depict the distribution of $\widetilde{F}_{mc}$ in Figure A.1 in the Data Appendix.

Hence, the maximum predicted effect (going from the lowest to the highest value of $\widetilde{F}_{mc}$) is equal to 4.1 percentage points, while an increase by two standard deviations increases the probability of being pro-trade by 1.6 percentage points. These magnitudes are very similar to those obtained in the ISSP, but they need to be seen against the generally more positive attitudes towards trade in the GAP.

Our results are difficult to attribute to omitted variables bias, as we control for any skill-related confounding factors through skill-group fixed effects. These fixed effects are jointly significant in all specifications and in both data sets. Importantly, the differences in the estimates between columns (1) and (2) of both tables demonstrate that the estimated effect of $\widetilde{F}_{mc}$ is significantly biased if skill-group fixed effects are *not* taken into account. Moreover, the results suggest that the direction of the bias depends on the countries in the estimation sample. We find an upward-biased estimate in the ISSP, which mostly covers developed countries, and a downward-biased estimate in the GAP, which offers a much more balanced selection of countries. This difference is not surprising and reflects two facts: first, that advanced labor market skills are positively correlated with the factor content of free trade in developed countries (where these skills are abundant), and negatively correlated in developing countries (where they are scarce); secondly, that advanced labor market skills are associated with more positive attitudes towards trade in general.

The differences in trade policy preferences that are explained by differences in labor market skills alone are indeed substantial. For the ISSP, our estimates reveal that "Legislators, senior officials and managers" (the reference category) and "Professionals" are significantly more likely to be pro-trade than individuals in any other skill group (with a margin of up to 16 percentage points). In contrast, individuals employed in "Elementary occupations", the skill group with the least skill requirements, hold more negative views on trade. The individuals that reveal by far the most skeptical attitudes towards trade are "Skilled agricultural and fishery workers". This finding is consistent with relatively high and persistent levels of agricultural protection prevailing around the globe, as well as strong lobbies for trade protection in the agriculture and food industry. Interestingly,

Table 1: Test of Prediction 1 in a Probit Framework – ISSP[a]

	Dependent Variable: Individual-Specific Pro-Trade Indicator			
	(1)	(2)	(2')	(3)
$\widetilde{F}_{mc}$	0.378***	0.195***	0.346***	0.389***
	(0.061)	(0.076)	(0.125)	(0.128)
Age_i	-0.002***	-0.001***	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$Male_i$	0.076***	0.088***	0.087***	0.060***
	(0.006)	(0.007)	(0.011)	(0.011)
$Citizen_i$	-0.082***	-0.087***	-0.147***	-0.110**
	(0.022)	(0.023)	(0.048)	(0.054)
$Education\ (in\ years)_i$		0.010***	0.012***	0.008***
		(0.001)	(0.002)	(0.002)
$Income_i$				0.046***
				(0.009)
Skill-Group Fixed Effects (η_m)				
–*Professionals*		-0.020*	-0.037**	-0.037**
		(0.012)	(0.018)	(0.019)
–*Technicians and associate professionals*		-0.061***	-0.084***	-0.061***
		(0.011)	(0.017)	(0.018)
–*Clerks*		-0.079***	-0.088***	-0.061***
		(0.011)	(0.017)	(0.019)
–*Service workers; shop and market sales workers*		-0.088***	-0.095***	-0.057***
		(0.011)	(0.018)	(0.020)
–*Skilled agricultural and fishery workers*		-0.158***	-0.210***	-0.164***
		(0.010)	(0.015)	(0.020)
–*Craft and related trade workers*		-0.125***	-0.150***	-0.109***
		(0.009)	(0.015)	(0.018)
–*Plant and machine operators and assemblers*		-0.128***	-0.163***	-0.123***
		(0.010)	(0.016)	(0.019)
–*Elementary occupations*		-0.113***	-0.140***	-0.087***
		(0.011)	(0.020)	(0.024)
Number of Observations	25,879	25,879	10,729	10,729
Country Fixed Effects	Yes	Yes	Yes	Yes
Joint Significance of η_m's[b]		278.33***	152.23***	64.63***
Additional Controls[c]	No	No	No	Yes
Number of Countries	26	26	25	25
Pseudo R^2	0.07	0.10	0.10	0.15
Log Pseudolikelihood	-13512.18	-13116.22	-5850.43	-5547.98

[a] The table gives the marginal effects for each explanatory variable on the probability of being pro trade, evaluated at the sample means. Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively.
[b] Gives the χ^2 statistic for the test of joint significance of the skill-group fixed effects.
[c] See Table A.2 in the Data Appendix for a description of all additional individual-specific control variables. Country dropped in columns (2') and (3): Israel.

Table 2: Test of Prediction 1 in a Probit Framework – GAP[a]

	Dependent Variable: Individual-Specific Pro-Trade Indicator			
	(1)	(2)	(2')	(3)
$\widetilde{F}_{mc}$	-0.019	0.029*	0.053**	0.051**
	(0.014)	(0.017)	(0.025)	(0.025)
Age_i	-0.001***	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$Male_i$	0.022***	0.019***	0.024***	0.019**
	(0.005)	(0.005)	(0.008)	(0.008)
$Income_i$				0.017***
				(0.005)
Skill-Group Fixed Effects (η_m)				
–Low-skilled labor		-0.085***	-0.062***	-0.040**
		(0.012)	(0.017)	(0.017)
–Medium-skilled labor		-0.038***	-0.015	-0.005
		(0.007)	(0.011)	(0.011)
Number of Observations	19,379	19,379	9,083	9,083
Number of Countries	28	28	20	20
Country Fixed Effects (γ_c)	Yes	Yes	Yes	Yes
Joint Significance of η_m's[c]		58.14***	15.54***	7.35**
Additional Controls[d]	No	No	No	Yes
Pseudo R^2	0.06	0.07	0.06	0.09
Log Pseudolikelihood	-7807.80	-7774.44	-3545.07	-3459.32

[a] The table gives the marginal effects for each explanatory variable on the probability of being pro trade, evaluated at the sample means. Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively.
[b] Gives the χ^2 statistic for the test of joint significance of the skill-group fixed effects.
[c] See Table A.3 in the Data Appendix for a description of all additional individual-specific control variables. Countries dropped in columns (2') and (3): Canada, Czech Republic, France, Germany, Slovak Republic, Sweden, United Kingdom, United States.

"Service workers and shop and market sales workers" hold rather moderate views on trade, although they are often regarded as low-skilled. One possible explanation for this result is that the corresponding occupations require personal contact with clients, which protects them from being offshored and the associated services from being substituted by imports.[15] Individual concerns about job losses or wage cuts due to international trade might therefore be diluted.

The estimation results from the GAP provide further evidence that advanced labor market skills are associated with more positive attitudes towards trade across all countries (i.e., independent of the distributional effects of trade policy). High-skilled individuals (the reference category) have a 3.8 percentage points higher probability of being pro-trade than medium-skilled individuals; see column (2) of Table 2. Low-skilled individuals, in turn, hold the least positive attitudes towards trade (with a margin of 8.5 percentage points relative to high-skilled individuals).

These findings from the GAP square well with the evidence in the ISSP that an individual's exposure to education contributes to more positive views on trade (independently of the skill-group fixed effects); see columns (2)–(3) in Table 1. One additional year of education increases the probability of being pro-trade by 1 percentage point. Hainmueller & Hiscox (2006) argue that the effect of education is larger in developed countries than in developing countries due to differences in the quality of educational systems. We find evidence for this idea by interacting an individual's years of education with a country's GDP per capita (as a proxy for the quality of educational systems); see the online supplement to this paper for regression results. Importantly, the effects of all other variables, in particular the effect of the factor content of free trade, remain qualitatively unchanged in these regressions (though quantitative predictions are slightly reduced).

In column (3) of either table we add an extensive set of individual control variables. We refer the reader to the online supplement to this paper for estimated marginal effects of these additional controls; here, we focus on how the estimates of our main explanatory

[15] Among the occupations belonging to this skill group are: housekeeping; child care; nursing; personal care; hairdressing or beauty treatment; funeral arrangements; selling goods in wholesale or retail establishments; demonstrating goods to potential customers and so on.

variables are affected. In column (3), differences in attitudes towards trade that can be attributed to an individual's skill group are significantly reduced compared to column (2'). The marginal effect of $\widetilde{F}_{mc}$, however, is virtually unaffected. Factors such as individual income and cosmopolitan views (as proxied here by nationalist attitudes and openness towards foreign cultures) are thus correlated with an individual's educational background and occupation, but not with the factor content of free trade of his or her production factor.

Finally, in line with previous studies (e.g. Mayda & Rodrik (2005)), we find evidence in both data sets that a higher individual income goes hand in hand with significantly more positive views on trade. Because we control for a country's GDP per capita through country fixed effects, this effect is actually driven by the *relative* income position of the individual in his or her country of residence. The strength of the effect varies considerably across the two surveys. In the ISSP, a doubling of income increases the probability of being pro-trade by 4.6 percentage points. In the GAP, the corresponding number is only 1.7 percentage points. This disparity may derive from the differences between the two surveys in terms of the countries included in the sample as well as the framing of the trade-related survey question. Notably, however, our conclusions on the role of the distributional effects of trade policy for explaining trade policy preferences are robust across these two very different survey sources.

5 Conclusion

It is often argued that international trade may harm domestic workers through wage cuts or job losses associated with fiercer international competition. Where these views feed into aversion towards free trade, politicians will be inclined to erect new trade barriers and thereby jeopardize the economic gains from trade. In order to prevent such a protectionist backlash it is important to understand (and subsequently address) the concerns of the general public.

In this paper we focus on a specific economic channel that has (with some controversy) been argued to affect attitudes towards trade: distributional effects of trade policy as driven by differences in factor endowments between countries. In contrast to most previous studies on trade policy preferences, we allow for many input factors in production. Theoretically, we show that departures from free trade change a country's income distribution in favor of the scarce factors, and against the abundant factors. Reductions in tariffs and other trade costs have in fact been widely discussed as a source of growing inequality in developed countries during the 1980s, 1990s and 2000s; see Krugman (2008) and the references cited therein.

Are these predicted distributional effects (independently of whether they actually occur) reflected in how individuals perceive free trade? To answer this question, we analyze two survey data sets on individual trade policy preferences spanning a considerable number of countries from around the globe. In line with the neoclassical trade model, we find that individuals are more likely to be pro-trade if their skills are in more abundant domestic supply (other things equal). Importantly, our novel identification strategy controls for any skill-related confounding factors through skill-group fixed effects, and thus shields our estimates against omitted variables bias.

To conclude our analysis, we examine to what extent our empirical model succeeds in explaining the vast differences in public opinion between and within countries highlighted in the introduction. To this aim, we first estimate the standard deviation of the country fixed effects using an OLS specification without any controls. We do the same exercise, separately, with respect to the skill-group fixed effects. This provides us with summary measures of the variation in attitudes across both countries and skill groups.[16] Next, we repeat these estimations using different sets of control variables. If differences in public opinion across countries and skill groups are due to differences in our explanatory variables, we expect the standard deviations of the fixed effects to fall noticeably.

We focus on results for the ISSP where we can distinguish a larger number of skill groups. We also restrict the analysis to the reduced sample for which our extensive set

[16]We adjust the standard deviation of the country fixed effects for the bias due to sampling variation as follows: $\widehat{SD(\gamma)} = \sqrt{Var(\widehat{\gamma}) - \sum_c \frac{\widehat{\sigma}_c^2}{C} + \sum_c \sum_{c'} \frac{\widehat{\sigma}_{cc'}}{C^2}}$ where $\widehat{\sigma}_c$ is the standard error of $\widehat{\gamma}_c$ and $\widehat{\sigma}_{cc'}$ is the covariance between $\widehat{\gamma}_c$ and $\widehat{\gamma}_{c'}$. We proceed accordingly when estimating the standard deviation of the skill-group fixed effects. Our formulation builds on Krueger & Summers (1988), but in contrast to their study we adjust for both the variance and the covariance terms.

of control variables is applicable. Going from the specification with no controls to the specification with the full set of control variables reduces the standard deviation of the skill-group fixed effects by more than 50 percent (from 0.111 to 0.050). Hence, a large part of differences in attitudes across skill groups is explained by observable attributes. Consider next differences in attitudes across countries: going from the specification with no controls to the specification with our essential labor market controls (the factor content variable, occupation fixed effects and education) reduces the standard deviation of the country fixed effects by 15 percent (from 0.124 to 0.105). Adding all control variables including income, cultural factors, ideology etc. reduces the standard deviation by another 20 percent (from 0.105 to 0.084). In sum, our empirical model is reasonably successful in explaining cross-country differences in public opinion towards trade.

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A Data Appendix

All data used for the ISSP and the GAP pertain to the years 2003 and 2007, respectively, unless indicated otherwise. For both survey sources, we restrict the sample to countries with information on endowments and to individuals for which all basic survey items of interest have non-missing values.

Endowments. Data on country-specific endowments are taken from the ILO labor statistics. For countries for which ILO data are not available in the survey years, we take data from the closest applicable year and adjust for population growth from that year to the survey year, treating the endowment distributions as constant. Population data come from the World Development Indicators (WDI).

The ISSP sample uses data on the total economically active population by occupational position (nine occupations). The ILO data disaggregate labor into ten occupations in line with the major groups of the one-digit ISCO-88 classification; see ILO (1993) for details. These occupations are "Legislators, senior officials and managers", "Professionals", "Technicians and associate professionals", "Clerks", "Service workers and shop and market sales workers", "Skilled agricultural and fishery workers", "Craft and related trade workers", "Plant and machine operators and assemblers", "Elementary occupations", and "Armed forces". We exclude "Armed forces", because its scope is independent of skill requirements. We drop countries for which data refer to the ISCO-68 classification, since it cannot be mapped with the ISCO-88 classification in any consistent way. We are left with 75 countries for the computation of world endowments, which account for roughly 75% of world GDP, 79% of world exports and 80% of world imports in 2003. We consider each of the nine occupational positions as a separate factor of production.

The GAP sample uses data on the total economically active population by levels of educational attainment (six strictly hierarchical groups). The ILO data include information on educational attainment according to the International Standard Classification of Education (ISCED). We bring the older ISCED-76 classification in line with the recent ISCED-97 classification according to Table A.1. The 90 countries we use to compute world endowments account for 75% of world GDP, 80% of world exports and 84% of world imports in 2007. We map the information in the GAP survey with the ILO data according to Table A.1 and distinguish three labor inputs (high-skilled, medium-skilled, and low-skilled labor).

Technology. In order to compute technology parameters, we use WDI information on countries' GDP per capita. The country with the highest GDP per capita (Norway) provides the benchmark technology ($\delta_c = 1$).[17] We define the country-specific efficiency parameter as the ratio of each country's GDP per capita relative to the GDP per capita

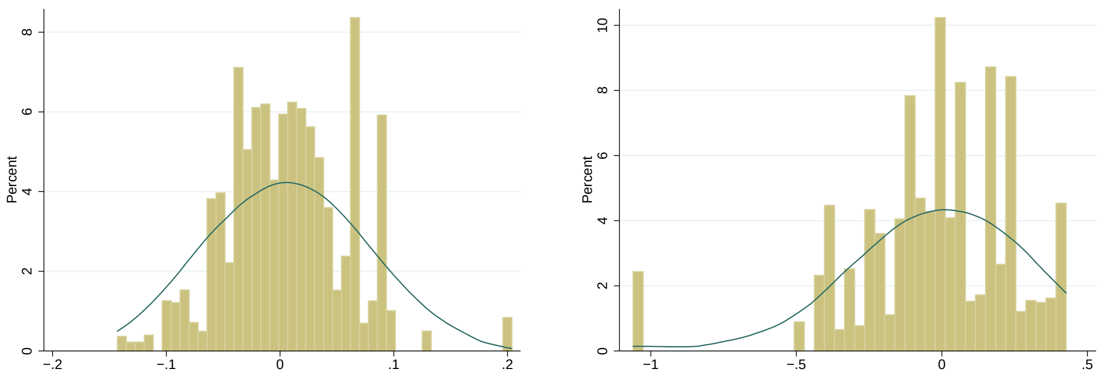
[17] Luxembourg and Qatar are excluded from these computations.

of the benchmark economy.

Factor content of trade. We compute the factor content of trade for each factor according to Equation (5), given data on effective country and world endowments. Consumption shares are defined as $s_c = (Y_c - B_c)/Y_w$, where B_c represents country c's trade balance. Both GDP and trade data are from the WDI. World GDP, Y_w, is the sum of GDP over all countries for which endowment data are available.

Individual-level survey variables. Tables A.2 and A.3 give a comprehensive list of all individual-level survey variables that we employ in our regression analysis for the ISSP and the GAP, respectively. Whenever survey items allow for more than two ordered answer categories, we implement a binary coding for the corresponding variable, in order to mitigate cross-country differences driven by extreme-response bias.

Figure A.1: Distribution of $\widetilde{F}_{mc}$ †



(a) ISSP 2003

(b) GAP 2007

†Notes: The figures show the distribution of the factor content of free trade $\widetilde{F}_{mc}$ at the level of the individual; i.e. for each country c and skill group m, $\widetilde{F}_{mc}$ is weighted by the number of individuals in the set $\mathcal{I}_{mc}$.

Table A.1: Harmonization of ISCED-76/ISCED-97 and GAP 2007 Education Data

ISCED-76		ISCED-97		GAP 2007		Production Factor
X	No formal schooling	X	No schooling	0	No formal education; Incomplete primary education	
0	Education preceding the first level	0	Pre-primary education			Low-skilled labor
1	First level	1	Primary-education or first stage of basic education	1	Complete primary education	
2	Second level, first stage	2	Lower secondary education or second stage of basic education	2	Incomplete secondary education (technical/vocational)	
3	Second level, second stage	3	Upper secondary education	3	Complete secondary education (technical/vocational); Incomplete secondary education (university-preparatory); Complete secondary education (university-preparatory)	Medium-skilled labor
5	Third level, first stage (not equivalent to university qualification)	4	Post-secondary non-tertiary education	4	Some university education (without degree)	
6	Third level, first stage (leading to university qualification)	5	First stage of tertiary education (not leading to research qualification)	5	University education (with degree)	High-skilled labor
7	Third level, second stage (post-graduate)	6	Second stage of tertiary education (advanced research qualification)			

Table A.2: Coding of Individual-Level Survey Variables, ISSP 2003

Variable	Description & Coding
Age	Respondent's age in years.
Male	Coded (1) male; (0) female.
Education (in years)	Respondent's education in years; upper bound at 20 years.
Income	Log of real income; calculated on the basis of income information in local currency and PPP conversion factors.
Citizen	Coded (1) citizen; (0) otherwise.
Unemployed	Coded (1) unemployed; (0) otherwise.
Social class	Subjective social class: six categories, higher values correspond to higher social classes.
Residence	Respondent's urban-rural self-assessment of the type of community: five categories, higher values correspond to more rural residences.
Product quality	"How much do you agree or disagree with the following statements? 'Free trade leads to better products becoming available in [respondent's country].' "; coded (1) "agree strongly", "agree"; (0) "neither agree nor disagree", "disagree", "disagree strongly".
Party affiliation	Respondent's party affiliation: categories (1) "far left" to (5) "far right".
Trade union	Trade union membership: coded (1) yes; (0) no.
Patriotism[a]	"How much do you agree or disagree with the following statements? 'I would rather be a citizen of [respondent's country] than of any other country in the world.' "; coded (1) "agree strongly", "agree"; (0) "neither agree nor disagree", "disagree", "disagree strongly".
Nationalism[a]	"How much do you agree or disagree with the following statements? 'Generally speaking, [respondent's country] is a better country than most other countries.' "; coded (1) "agree strongly", "agree"; (0) "neither agree nor disagree", "disagree", "disagree strongly".
National interests[a]	"How much do you agree or disagree with the following statements? '[Respondent's country] should follow its own interests, even if this leads to conflicts with other countries.' "; (1) "agree strongly", "agree"; (0) "neither agree nor disagree", "disagree", "disagree strongly".
Pride democracy[a]	"How proud are you of [respondent's country] in [...] the way democracy works"; coded (1) "very proud", "proud"; (0) "not very proud", "not proud at all".
Pride influence[a]	"How proud are you of [respondent's country] [in its] political influence in the world?"; coded (1) "very proud", "proud"; (0) "not very proud", "not proud at all".
Pride economy[a]	"How proud are you of [respondent's country] [in its] economic achievements?"; coded (1) "very proud", "proud"; (0) "not very proud", "not proud at all".
Pride social[a]	"How proud are you of [respondent's country] [in its] social security system?"; coded (1) "very proud", "proud"; (0) "not very proud", "not proud at all".

[a] Binary coding applied in order to mitigate problems of extreme-response bias.

Table A.3: Coding of Individual-Level Survey Variables, GAP 2007

Variable	Description & Coding
Male	Coded (1) male; (0) female.
Income	Log of monthly real income. Survey respondents sort themselves into income groups, based on (country-specific) lists of incomes. As a general rule, we compute individual income as the middle value of the income interval chosen by the individual, adjusted by PPP conversion factors from the World Development Indicators, expressed in logs, and, if necessary, converted to a monthly basis. More detailed information on this procedure is available upon request.
Economic awareness[a]	"Please tell me whether you completely agree, mostly agree, mostly disagree or completely disagree with the following statement. 'Most people are better off in a free market economy, even though some people are rich and some are poor' "; coded (0) "completely disagree", "disagree"; (1) "agree", "completely agree".
Informed	"Which of the following two statements best describes you: 'I follow INTERNATIONAL news closely ONLY when something important is happening' OR 'I follow INTERNATIONAL news closely most of the time, whether or not something important is happening'?"; coded (1) "Most of the time, whether or not something important is happening"; (0) "Only when something important is happening".
Sociotropic views[a]	"Please tell me whether you completely agree, mostly agree, mostly disagree or completely disagree with the following statement. 'Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs.' "; coded (0)"completely disagree", "mostly disagree"; (1) "mostly agree", "completely agree".
Fears of cultural spill-overs	"I am going to read some phrases which have opposite meanings. Tell me which comes closer to describing your views."; coded (1) "It's bad that American ideas and customs are spreading around the world"; (0) "It's good that American ideas and customs are spreading around the world".
Nationalism[a]	"As I read another list of statements, for each one, please tell me whether you completely agree, mostly agree, mostly disagree or completely disagree with it. 'Our people are not perfect, but our culture is superior to others."; coded (0) "completely disagree", "mostly disagree"; (1) "mostly agree", "completely agree".
Fears of international competition	"Turning to China, overall do you think that China's growing economy is a good thing or a bad thing for our country?"; coded (1) "bad thing"; (0) "good thing".

[a] Binary coding applied in order to mitigate problems of extreme-response bias.

Table A.4: Descriptives on Survey, Technology, and Endowment Data, ISSP 2003[a]

Country	N	$\overline{y}_i$	δ_c	Factors with $F_{mc} > 0$[b]
Australia	1,804	0.15	0.73	1,2,3,4,8
Austria	836	0.21	0.73	2,3,4,7,8,9
Bulgaria	799	0.12	0.18	2,8,9
Canada	633	0.28	0.74	2,3,4,8,9
Czech Republic	916	0.25	0.40	2,3,7,8
Denmark	1,005	0.50	0.71	2,3,8,9
Finland	964	0.40	0.64	2,3,8
Germany	1,069	0.33	0.66	2,3
Hungary	807	0.15	0.34	2,7,8
Ireland	853	0.27	0.79	1,2,4,8
Israel	821	0.25	0.47	2,4,8
Japan	507	0.29	0.64	–
Latvia	674	0.16	0.24	2,6,8,9
Netherlands	1,462	0.41	0.74	1,2,3,4
New Zealand	669	0.24	0.53	1,2,4,6,8
Norway	1,203	0.37	1.00	2,3,5,8
Philippines	933	0.10	0.06	6,9
Poland	1,030	0.12	0.27	2,6,8
Portugal	1,211	0.20	0.44	6,7,8,9
Russia	1,970	0.20	0.23	2,3,7,8,9
Slovakia	732	0.09	0.32	3,7,8,9
Slovenia	867	0.30	0.46	2,3,6,8
South Korea	999	0.23	0.44	4,5,6,8,9
Spain	818	0.15	0.58	2,8,9
Sweden	868	0.37	0.67	2,3,5,8
Switzerland	975	0.43	0.76	2,3,4,7
United Kingdom	710	0.18	0.67	–
Uruguay	961	0.13	0.17	9

[a] The table reports the number of observations (N), the average of the pro-trade dummy variable ($\overline{y}_i$), the technology index (δ_c), and the factors that feature a positive factor content of free trade F_{mc}. Chile, France, South Africa, and Venezuela participated in the ISSP 2003 but are excluded due to lack of ILO endowment data. The United States are excluded due to missing endowment data for some occupations. West Bank & Gaza is excluded due to missing trade data.

[b] Factors $m = 1, \ldots, 9$ are: (1) "Legislators, senior officials and managers", (2) "Professionals", (3) "Technicians and associate professionals", (4) "Clerks", (5) "Service workers and shop and market sales workers", (6) "Skilled agricultural and fishery workers", (7) "Craft and related trade workers", (8) "Plant and machine operators and assemblers", and (9) "Elementary occupations". Endowment data for one of the occupations is not applicable for Japan and the United Kingdom. Their overall effective endowment can therefore not be calculated and we set $\widetilde{F}_{mc}$ to missing for all factors in these two countries.

Table A.5: Descriptives on Survey, Technology, and Endowment Data, GAP 2007[a]

Country	N	$\overline{y}_i$	δ_c	Factors with $F_{mc} > 0$[b]
Argentina	699	0.78	0.24	none
Bolivia	791	0.84	0.08	1
Brazil	958	0.74	0.18	1,2
Bulgaria	449	0.95	0.21	2
Canada	472	0.86	0.73	2,3
Chile	765	0.91	0.26	1,2
Czech Republic	445	0.81	0.44	2
France	500	0.79	0.64	2,3
Germany	478	0.87	0.65	2,3
Indonesia	938	0.75	0.07	1
Israel	849	0.94	0.48	3
Italy	449	0.77	0.58	2
Japan	679	0.80	0.64	1
Korea, Rep.	677	0.90	0.46	2,3
Malaysia	666	0.95	0.25	1
Mexico	792	0.80	0.24	1
Morocco	864	0.80	0.08	1
Pakistan	1,704	0.95	0.05	1
Peru	774	0.84	0.14	none
Poland	468	0.83	0.30	2
Slovak Republic	439	0.85	0.35	2
South Africa	948	0.91	0.18	none
Spain	456	0.91	0.57	2,3
Sweden	466	0.91	0.68	2,3
Turkey	827	0.85	0.17	1
Ukraine	478	0.94	0.12	2
United Kingdom	398	0.83	0.66	2
United States	950	0.63	0.88	2,3

[a] The table reports the number of observations (N), the average of the pro-trade dummy variable ($\overline{y}_i$), the technology index (δ_c), and the factors that feature a positive factor content of free trade F_{mc}. The following countries participated in the GAP 2007 but are excluded due to lack of ILO endowment data: Bangladesh, China, Cote d'Ivoire, Egypt, Ethiopia, Ghana, India, Jordan, Kenya, Lebanon, Mali, Nigeria, Russian Federation, Senegal, Uganda. Kuwait is excluded since its GDP per capita is not commensurate with its state of technology. Due to missing trade data, observations from West Bank & Gaza were also excluded from the sample.

[b] Factors $m = 1, 2, 3$ are: (1) low-skilled labor, (2) medium-skilled labor, and (3) high-skilled labor; see Table A.1.

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B Supplementary Material (not intended for publication)

This document contains supplementary material for the paper "Trade Policy Preferences and the Factor Content of Trade" by Ina C. Jäkel and Marcel Smolka. It is organized in three sections. Section B.1 provides full regression results for Tables 1 and 2 in the paper, including all individual-specific control variables. Section B.2 presents an extension of our empirical model with a more detailed specification of skill-group fixed effects. Section B.3 discusses further robustness checks.

B.1 Full Regression Results

Tables B.1 and B.2 report full regression results for Prediction 1 in the paper. The chosen set of individual-specific control variables is discussed in more detail in Mayda & Rodrik (2005) and Jäkel & Smolka (2013) for the ISSP and the GAP, respectively. See Tables A.2 and A.3 in the Data Appendix of the paper for definition and coding of variables.

Table B.1: Test of Prediction 1 in a Probit Framework, ISSP 2003[a]

	Dependent Variable: Individual-Specific Pro-Trade Indicator			
	(1)	(2)	(2')	(3)
$\widetilde{F}_{mc}$	0.378***	0.195***	0.346***	0.389***
	(0.061)	(0.076)	(0.125)	(0.128)
Age_i	-0.002***	-0.001***	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$Male_i$	0.076***	0.088***	0.087***	0.060***
	(0.006)	(0.007)	(0.011)	(0.011)
$Citizen_i$	-0.082***	-0.087***	-0.147***	-0.110**
	(0.022)	(0.023)	(0.048)	(0.054)
$Education\ (in\ years)_i$		0.010***	0.012***	0.008***
		(0.001)	(0.002)	(0.002)
$Income_i$				0.046***
				(0.009)
Skill-Group Fixed Effects (η_m)				
–*Professionals*		-0.020*	-0.037**	-0.037**
		(0.012)	(0.018)	(0.019)
–*Technicians and associate professionals*		-0.061***	-0.084***	-0.061***
		(0.011)	(0.017)	(0.018)
–*Clerks*		-0.079***	-0.088***	-0.061***
		(0.011)	(0.017)	(0.019)
–*Service workers; shop and market sales workers*		-0.088***	-0.095***	-0.057***
		(0.011)	(0.018)	(0.020)
–*Skilled agricultural and fishery workers*		-0.158***	-0.210***	-0.164***
		(0.010)	(0.015)	(0.020)
–*Craft and related trade workers*		-0.125***	-0.150***	-0.109***
		(0.009)	(0.015)	(0.018)
–*Plant and machine operators and assemblers*		-0.128***	-0.163***	-0.123***
		(0.010)	(0.016)	(0.019)
–*Elementary occupations*		-0.113***	-0.140***	-0.087***
		(0.011)	(0.020)	(0.024)
Add. Individual-Specific Controls				
–$Unemployed_i$				0.039
				(0.035)
–$Social\ class_i$				0.009**
				(0.004)
–$Residence_i$				-0.013***
				(0.004)
–$Product\ quality_i$				0.152***
				(0.010)
–$Party\ affiliation_i$				-0.000
				(0.005)
–$Trade\ union_i$				-0.008
				(0.012)

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				cont'd from prev. page
	(1)	(2)	(2')	(3)
–*Patriotism*$_i$				-0.115***
				(0.013)
–*Nationalism*$_i$				-0.043***
				(0.011)
–*National interests*$_i$				-0.089***
				(0.010)
–*Pride democracy*$_i$				0.011
				(0.012)
–*Pride influence*$_i$				-0.017
				(0.011)
–*Pride economy*$_i$				0.025**
				(0.012)
–*Pride social*$_i$				-0.006
				(0.012)
Number of Observations	25,879	25,879	10,729	10,729
Country Fixed Effects	Yes	Yes	Yes	Yes
Number of Countries	26	26	25	25
Pseudo R^2	0.07	0.10	0.10	0.15
Log Pseudolikelihood	-13512.18	-13116.22	-5850.43	-5547.98

[a]The table gives the marginal effects for each explanatory variable on the probability of being pro trade, evaluated at the sample means. For all binary variables, the table reports the effect of a discrete change from zero to one. Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively. See Table A.2 in the Data Appendix of the paper for a description of all additional individual-specific control variables. Country dropped in columns (2') and (3): Israel.

Table B.2: Test of Prediction 1 in a Probit Framework, GAP 2007[a]

	Dependent Variable: Individual-Specific Pro-Trade Indicator			
	(1)	(2)	(2')	(3)
$\widetilde{F}_{mc}$	-0.019	0.029*	0.053**	0.051**
	(0.014)	(0.017)	(0.025)	(0.025)
Age_i	-0.001***	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$Male_i$	0.022***	0.019***	0.024***	0.019**
	(0.005)	(0.005)	(0.008)	(0.008)
$Income_i$				0.017***
				(0.005)
Skill-Group Fixed Effects (η_m)				
–Low-skilled labor		-0.085***	-0.062***	-0.040**
		(0.012)	(0.017)	(0.017)
–Medium-skilled labor		-0.038***	-0.015	-0.005
		(0.007)	(0.011)	(0.011)
Add. Individual-Specific Controls				
–*Economic awareness*$_i$				0.039***
				(0.009)
–*Fears of international competition*$_i$				-0.069***
				(0.009)
–*Fears of cultural spill-overs*$_i$				-0.037***
				(0.009)
–*Nationalism*$_i$				0.021**
				(0.010)
–*Informed*$_i$				0.004
				(0.008)
–*Sociotropic views*$_i$				0.020**
				(0.009)
Number of Observations	19,379	19,379	9,083	9,083
Number of Countries	28	28	20	20
Country Fixed Effects (γ_c)	Yes	Yes	Yes	Yes
Pseudo R^2	0.06	0.07	0.06	0.09
Log Pseudolikelihood	-7807.80	-7774.44	-3545.07	-3459.32

[a]The table gives the marginal effects for each explanatory variable on the probability of being pro trade, evaluated at the sample means. For all binary variables, the table reports the effect of a discrete change from zero to one. Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively. See Table A.3 in the Data Appendix of the paper for a description of all additional individual-specific control variables. Countries dropped in columns (2') and (3): Canada, Czech Republic, France, Germany, Slovak Republic, Sweden, United Kingdom, United States.

B.2 Within-Skill-Group Differences in Attitudes Towards Trade

In the main text of the paper, we align the construction of skill-group fixed effects η_m with the definition of production factors in our empirical model. This definition is driven by the availability of endowment data from the ILO. Accordingly, in the ISSP, skill-group fixed effects are based on the nine occupations at the one-digit level of the ISCO-classification. In the GAP, we have three skill groups – low-skilled, medium-skilled and high-skilled labor. Both surveys allow us to further distinguish different types of workers. In this section, we use this additional information to account for differences in attitudes towards trade between types of workers *within* each skill group m.

In the ISSP, we include a total of 157 fixed effects for occupations at the three-digit level of the ISCO-classification.[1] These fixed effects control for differences in preferences across very detailed occupations. For example, attitudes may differ between "Business professionals" and "Health professionals" because the former group is more exposed to the opportunities and challenges resulting from economic integration. In the main text of the paper, these workers are lumped into the group "Professionals".

In the GAP, we include six fixed effects for different levels of educational attainment; see Table A.1 in the Data Appendix of the paper. These fixed effects account for differences in attitudes between e.g. workers with some university education (without degree) and workers with a university degree. Attitudes towards trade may vary across these two groups because individuals who completed their degree may have been more exposed to economic ideas and information (Hainmueller & Hiscox, 2006). In the main text of the paper, these workers have a common skill-group fixed effect for "High-skilled labor".

The regression results reported in Table B.3 confirm that our findings are qualitatively and quantitatively robust to these extensions.

B.3 Further Robustness Checks

This section discusses further robustness checks. To economize on space, we only present results with the whole battery of individual-level control variables.

B.3.1 Ordered Probit Model

This section presents results from an Ordered Probit model, which allows us to exploit the whole information contained in the survey responses regarding attitudes towards trade. In the ISSP, the ordered dependent variable *Trade Opinion* is coded as follows: 1 ("agree strongly"), 2 ("agree"), 3 ("neither agree nor disagree"), 4 ("disagree"), 5 ("disagree strongly"). In the GAP, *Trade Opinion* is coded 1 ("very bad thing"), 2 ("somewhat bad

[1] See `http://laborsta.ilo.org/applv8/data/isco88e.html` for a complete list of occupations.

Table B.3: Test of Prediction 1, Accounting for Within-Skill-Group Differences[a]

	Dependent Variable: Individual-Specific Pro-Trade Indicator							
	ISSP 2003, Probit Model				GAP 2007, Probit Model			
	(1)	(2)	(2')	(3)	(4)	(5)	(5')	(6)
$\widetilde{F}_{mc}$	0.129*	0.174**	0.333**	0.400***	-0.019	0.035**	0.057**	0.054**
	(0.054)	(0.065)	(0.109)	(0.109)	(0.014)	(0.017)	(0.025)	(0.025)
Age_i	-0.002***	-0.001***	-0.000	0.000	-0.001***	-0.000*	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Male_i$	0.074***	0.083***	0.079***	0.054***	0.022***	0.019***	0.024***	0.019**
	(0.006)	(0.007)	(0.011)	(0.011)	(0.005)	(0.005)	(0.008)	(0.008)
$Citizen_i$	-0.085***	-0.086***	-0.135***	-0.096**				
	(0.023)	(0.022)	(0.047)	(0.052)				
$Education\ (in\ years)_i$		0.010***	0.012***	0.009***				
		(0.001)	(0.002)	(0.002)				
$Income_i$				0.045***				0.016***
				(0.009)				(0.005)
Number of Observations	25,840	25,840	10,648	10,648	19,379	19,379	9,083	9,083
Country Fixed Effects (γ_c)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation/Education Fixed Effects[b]	No	Yes	Yes	Yes	No	Yes	Yes	Yes
– Joint Significance[c]		512.17***	366.77***	268.90***		64.51***	16.58***	7.79
Additional Controls[d]	No	No	No	Yes	No	No	No	Yes
Number of Countries	26	26	25	25	28	28	20	20
Pseudo R^2	0.10	0.11	0.12	0.16	0.06	0.07	0.06	0.09
Log Pseudolikelihood	-13028.16	-12960.84	-5721.35	-5431.48	-7807.80	-7770.74	-3544.55	-3459.06

[a] The table gives the marginal effects for each explanatory variable on the probability of being pro trade, evaluated at the sample means. Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively.
[b] Occupation/education fixed effects refer either to 157 different occupational positions (ISCO-88 classification at the three-digit level; ISSP) or to six different levels of educational attainment (see Table A.1 in the Data Appendix of the paper; GAP).
[c] Gives the χ^2-statistic for the test of joint significance of the occupation (education) fixed effects in the ISSP (GAP).
[d] See Tables A.2 and A.3 in the Data Appendix of the paper for a description of all additional individual-specific control variables. Countries dropped in columns (2') and (3): Israel, United Kingdom. Countries dropped in columns (5') and (6): Canada, Czech Republic, France, Germany, Slovak Republic, Sweden, United Kingdom, United States.

thing"), 3 ("somewhat good thing"), 4 ("very good thing").[2]

Table B.4 reports marginal effects on the probability of the four (five) response categories in the ISSP (GAP). All covariates are as in column (3) of Tables 1 and 2 for the ISSP and the GAP, respectively. In the ISSP, individuals endowed with factors that are in more abundant domestic supply are significantly more likely to "neither agree nor disagree", "disagree" or "disagree strongly" with imposing trade restrictions. Similarly, in the GAP, the factor content variable has a positive effect on the probability to state that trade and business ties with other countries are a "very good thing". Hence, the results presented in the main text of the paper are not driven by the coding of the dependent variable: factor abundance is associated with more positive view towards free trade.

B.3.2 Influence of Outliers and Robust Regression

We next investigate the influence of outliers of the main variable of interest, $\widetilde{F}_{mc}$. Figures A.1(a) and A.1(b) show the distribution of $\widetilde{F}_{mc}$ for the ISSP and the GAP, respectively. For the ISSP, "Elementary occupations" in the Philippines are a clear outlier, with a value of $\widetilde{F}_{mc}$ more than three standard deviations above the mean. In the GAP, medium-skilled labor in Peru is an extreme outlier at the negative end of the distribution of $\widetilde{F}_{mc}$. In columns (1) and (2) in Table B.5, we drop these outliers to find that this has little impact on our results.[3]

B.3.3 Cross-Country Differences in Educational Quality

Hainmueller & Hiscox (2006) argue that the effect of education on pro-trade attitudes is larger in developed countries than in developing countries due to differences in the quality of educational systems. Based on our sample from the ISSP, we can test this prediction. In particular, to accommodate their hypothesis, we include an interaction term between an individual's years of education and a country's GDP per capita (as a proxy for institutional quality). For ease of interpretation, we report results from the linear probability model (LPM).[4] We indeed find large cross-country differences in the effect of education on attitudes towards trade: one more year of education does not have any significant effect in countries with low GDP per capita, such as Uruguay and Bulgaria, but it increases the probability of being pro-trade by 1.7 percentage points in Norway, the country with the highest GDP per capita; see column (3) in Table B.5. The Philippines

[2]Note that only approx. six (four) percent of individuals responded "disagree strongly" ("very bad thing") in the ISSP (GAP). Therefore, marginal effects for the fifth (first) answer category have to be interpreted with caution.

[3]Alternatively, we performed robust regressions with the ordered dependent variable *Trade Opinion* using Stata's `rreg` command. This estimator is based on iteratively re-weighted least squares, i.e. it assigns a weight to each observation with higher weights given to better behaved observations.

[4]Results for the Probit model are largely comparable, but harder to interpret due to the non-linearity of the model.

Table B.4: Ordered Probit Model – Marginal Effects of $\widetilde{F}_{mc}$[a]

	Dependent Variable: Trade Opinion	
	ISSP 2003	GAP 2007
	(1)	(2)
Pr(Trade Opinion=1)	-0.232***	-0.0125***
	(0.0623)	(0.00434)
Pr(Trade Opinion=2)	-0.195***	-0.0403***
	(0.0527)	(0.0139)
Pr(Trade Opinion=3)	0.0760***	-0.0387***
	(0.0207)	(0.0134)
Pr(Trade Opinion=4)	0.255***	0.0915***
	(0.0687)	(0.0314)
Pr(Trade Opinion=5)	0.0960***	
	(0.0260)	
Number of Observations	10,729	9,083
Country Fixed Effects (γ_c)	Yes	Yes
Skill Group Fixed Effects (η_m)[b]	Yes	Yes
Control Variables[c]	Yes	Yes
Number of Countries	25	20
Pseudo R^2	0.09	0.07
Log Pseudolikelihood	-14672	-8880

[a] The table gives the estimated marginal effects of $\widetilde{F}_{mc}$ on the probability of each of the outcomes of the five-valued (four-valued) *Trade Opinion* variable in the ISSP (GAP). Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively.
[b] Skill groups refer either to the nine different occupational positions (ISCO-88 classification at the one-digit level; ISSP) or to the three different types of labor (akin to ISCED-76/ISCED-97, aggregated into low-skilled, medium-skilled and high-skilled labor; GAP).
[c] Control variables are as in column (3) in Tables 1 and 2 in the paper. See Tables A.2 and A.3 in the Data Appendix of the paper for a description of all additional individual-specific control variables.

Table B.5: Additional Robustness Analysis[a]

	Dependent Variable: Individual-Specific Pro-Trade Indicator		
	Drop Outliers		Education × GDP per Capita
	Probit		LPM
	ISSP	GAP	ISSP
	(1)	(2)	(3)
$\widetilde{F}_{mc}$	0.330**	0.060**	0.258**
	(0.137)	(0.026)	(0.107)
Age_i	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
$Male_i$	0.058***	0.019**	0.054***
	(0.011)	(0.008)	(0.010)
$Citizen_i$	-0.110**		-0.092**
	(0.054)		(0.047)
$Education\ (in\ years)_i$	0.008***		-0.100***
	(0.002)		(0.018)
$Education\ (in\ years)_i$ ×			0.011***
$GDP\ per\ capita_c$			(0.002)
$Income_i$	0.046***	0.014***	0.042***
	(0.009)	(0.005)	(0.007)
Number of Observations	10,659	8,765	10,729
Country Fixed Effects (γ_c)	Yes	Yes	Yes
Skill-Group Fixed Effects (η_m)[b]	Yes	Yes	Yes
– Joint significance[c]	60.74***	8.36**	8.95***
Additional Controls[d]	Yes	Yes	Yes
Number of Countries	25	20	25
R^2/Pseudo R^2	0.15	0.09	0.17
Log Pseudolikelihood	-5510.90	-3336.99	

[a] Columns (1) and (2) are based on a probit model and give the marginal effects for each explanatory variable on the probability of being pro trade, evaluated at the sample means. Column (3) reports coefficient estimates from a linear probability model (LPM). Heteroskedasticity-robust standard errors are given in parentheses. *,**,*** denote significance at the 10%, 5%, 1% levels, respectively.
[b] Skill groups refer either to the nine different occupational positions (ISCO-88 classification at the one-digit level; ISSP) or to the three different types of labor (akin to ISCED-76/ISCED-97, aggregated into low-skilled, medium-skilled and high-skilled labor; GAP).
[c] Gives the χ^2-statistic (F-statistic) for the test of joint significance of the skill-group fixed effects in columns (1) and (2) (column (3)).
[d] See Tables A.2 and A.3 in the Data Appendix of the paper for a description of all additional individual-specific control variables.

is the only country where education significantly *decreases* the probability of being pro trade. These findings are in line with cross-country differences in the content and quality of schooling. Our conclusions on the importance of factor abundance for attitudes towards trade are, however, unaffected.

B.3.4 Dropping Individual Countries

Finally, for both the ISSP and the GAP we confirm that our findings are robust to dropping individual countries from the sample. Results are available on request.

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