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INTERNATIONAL TRADE AND DEMOCRACY: HOW TRADE PARTNERS AFFECT REGIME CHANGE AND PERSISTENCE

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INTERNATIONAL TRADE AND DEMOCRACY: HOW TRADE PARTNERS AFFECT REGIME CHANGE AND PERSISTENCE[2]

This paper explores how international trade flows contribute to democracy and shows that countries' trade partners define the nature of this relationship: higher volumes of trade with democracies are conducive to democracy, while higher trade levels with autocracies undermine it. Moreover, the effects of trade are uneven and are pronounced only for 49 states (34% of the sample). Results also indicate that trade with democracies does not sufficiently influence democratic transitions but rather helps already established democracies to endure. The "autocratic trade", on the opposite, undermines democratic survival, and it also reduces the probability of transition from partial democracies. Therefore, trade only partially supports democratic promotion when it is, indeed, a source of authoritarian promotion and consolidation. These findings are robust to accounting for autocorrelation, checking sensitivity of model specifications and acknowledging that democracy is measured with error. Finally, Instrumental Variable estimation, using predicted trade volumes from the Gravity Equation, shows that these effects are also causal.

JEL Classification: D72, F68

Keywords: Democracy, Regime Transitions, International Trade, Economic Globalization, Bayesian Modeling

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1 Introduction

The global "rush to free trade" started the so-called "era of economic globalization" (Rodrik 1992) and coincided with the third-wave of democratization, making scholars wonder how these processes are related. The versatile research on the international factors of democratization has found evidence for all possible relationships between democracy and economic globalization. Arguments were advanced, supporting each possible association. This paper argues that trade partners' characteristics define how trade contributes to democracy.

Acknowledging these characteristics can inform the modern research on the effects of international interactions on democratization. Rudra (2005) pointed to the lack of theoretical explanations of the exact circumstances and channels that define relationships between rising trade flows and democracy. Similarly, Haggard & Kaufman (2016) insisted that further research should acknowledge the possibility of different causal paths, pointing that the assumption of universality of effects turns to be misleading. Alternatively, López-Córdova & Meissner (2008) supposed that finding this relationship is a purely empirical question that should be resolved by using more comprehensive and rigorous empirical strategies. Therefore, this paper aims to contribute from both theoretical and empirical perspectives.

This paper focuses on the period from 1974 to 1994 that covers the Third Wave of democratization and the Post-Soviet democratization. The sample consists of 143 states.

Firstly, this paper shows that countries' trade partners define the effects of international trade on democracy: higher volumes of trade with democracies are conducive to democracy, while higher trade levels with autocracies undermine it. Moreover, the effects are overlapping and cancel each other. Therefore, it is not the trade volume that matters per se, but how much more states trade with democracies rather than autocracies and vice versa. In addition to trade partners, trade competitors can also affect democracy, as suggested by Simmons et al. (2006), who supposed that trade competition is conducive to democracy. However, this is not the case, and the selection of trade partners is of greater importance. These findings were obtained using the Bayesian Linear Model, accounting for the possibility that democracy is measured with error. These results are robust to a battery of robustness checks to account for the possible autocorrelation (Arellano-Bond estimator, 5-year, and 10-year averages) and to sensitivity checks based on the Bayesian Model Averaging.

Secondly, to explore whether the average effects of linear models represent the underlying process, I estimated the Bayesian Multilevel Models, allowing coefficients to vary on a country or year basis. The results have shown that trade does not influence democracy

ubiquitously and affects only 49 of 143 states. Therefore, previous research's inability to establish robust relationships between democracy and trade is probably due to the sample size and sample selection.

Thirdly, to infer whether trade openness influences democratic survival or democratic transition, I estimated the first-order probit Markov regressions proposed by Epstein et al. (2006). Also, following Epstein et al. (2006), I treated democracy as a trichotomous variable that includes autocracy, partial democracy, and democracy. The results indicate that trade with democracies does not sufficiently influence democratic transitions but rather helps already established democracies to endure. Indeed trade with democracies also reduces the probability to transition to democracy from authoritarian states and has no impact on the transition from partial types. The "autocratic trade", on the opposite, undermines democratic survival, and it also reduces the probability of transition from partial democracies. Therefore, trade only partially supports democratic promotion when it is, indeed, a source of authoritarian promotion and consolidation.

Finally, to explore the causal effect, I instrumented trade with predicted trade from the Gravity Equations, following the recent research's general practice. This approach shows that the aforementioned effects are also causal.

The rest of the paper is organized as follows. Section 2 discusses the literature on the direct and conditional effects of trade on democracy. Section 3 advances the hypotheses regarding the effects of democratic and autocratic trade and trade competition. Section 4 discusses the data. Section 5 presents the specifications of empirical models. Section 6 presents the results of the empirical analysis. Section 7 concludes and proposes further research agenda. Additional details are available in the Appendix.

2 State of the art

2.1 Direct effects

Theoretical explanations International economics can be both the mean of external coercion and external influence. One of the earliest arguments was made by Hadenius (1992), who argued, based on the modernization theory, that international trade causes economic growth, which, subsequently, brings democratization.

In 2003 Li & Reuveny reviewed the literature and summarised the arguments that were previously advanced by scholars. Studies, insisting on the positive effects of economic globalization on democracy, argue that it (1) promotes growth and exchange of information,

(2) lowers autocrat's capabilities to govern civil society, (3) makes international institutions and businesses more influential for domestic politics. Those arguing for adverse effects of economic globalization point that (1) influence of international business may not be beneficial for democracy, (2) globalization widens the gap between rich and poor, (3) contributes to economic crises, (4) destroys the concept of citizenship by advancing cosmopolitan views. Finally, the third group of scholars believes that economic globalization has no effects, or the effects are negligible or uneven. Almost none of these statements were tested, and some of them arguably can not be tested at all. These contradictory arguments resulted in scholars' steady occupation with empirical modeling, following the idea of López-Córdova & Meissner (2008), that "relationship between economic globalization and democracy is a purely empirical question."

Empirical findings Empirical research resulted in a multitude of contradicting findings. Scholars found strikingly opposing evidence, arguing for negative (Li & Reuveny 2003, Boix & Stokes 2003), positive (Eichengreen & Leblang 2008, López-Córdova & Meissner 2008) and no effects (Bussmann 2001, Rigobon & Rodrik 2005, Decker & Lim 2009, Milner & Mukherjee 2009).

Bussmann (2001), exploring the end of the 20th century, found that it is hardly likely that international trade was a decisive feature of democratization during that period. Rodrik et al. (2004) and Rigobon & Rodrik (2005) argued that effect of trade is either negative and small or statistically insignificant. On the other hand, Li & Reuveny (2003) reviewed papers that found evidence for both positive, negative, and no effects. After conducting their empirical analysis, they conclude that negative association takes place. López-Córdova & Meissner (2008) criticize the paper by Li & Reuveny (2003) for poor model specification that results in Nickell bias. They propose a novel instrumental variable based on the Gravity Equation. They also disaggregate between three time periods: (1) the first era of globalization, (2) interwar years, and (3) post World War II period. Their findings contrast with studies outlined above and are indeed consistent with Geddes (2007) classification of democracy predictors by periods. Authors find that trade openness has a positive effect on democracy only after WWII. In the same year, Eichengreen & Leblang (2008) also find a positive association between trade openness and democracy. However, shortly after Milner & Mukherjee (2009) found this association insignificant.

2.2 Conditional effects

In contrast to the studies of the direct effects, another branch of literature exists that focuses mostly on the conditional effects of economic globalization on democracy. These conditional factors include (1) relative factor endowments, (2) social spending, (3) hegemonic shocks, and (4) GDP.

Factor endowments and Income Inequality In states characterized by an abundance of labor, the poor will gain from trade, reducing inequality and making democratization more likely. In contrast, in states with land abundance, inequality will increase as trade rises, as it is the elite that owns the land, focusing rents in their hands. Building on this premise, Acemoglu & Robinson (2005) predict that in states with a higher relative abundance of labor, economic globalization will have positive effects on democratization, while in the societies with capital or land abundance, the effects will be adverse. López-Córdova & Meissner (2008), Freeman & Quinn (2012), Doces & Magee (2015) provided empirical evidence in favour of this theory.

Social Spending and Cohesiveness of elite Rudra (2005) argued that economic globalization affects democratization by undermining the cohesiveness of the elite. In Rudra's theory, economic globalization undermines the autocrat's ability to control the elite and increases political actors' uncertainty. It forces them to choose between repression and liberalization to stabilize the domestic situation. Rising social spending allows the elite to compensate for the destabilizing effects of economic globalization. Therefore, the effects of economic globalization depend on the levels of social spending adopted by the elite.

Hegemonic Shocks Gunitsky (2014) suggests that the effects of trade are conditional on hegemonic shocks. Changes of hegemony in world politics create windows of opportunities that reshape the political map and create globalization waves. When the hegemonic power of a state declines, other states compete for the influence over the territory by expanding their ties. Therefore, economic globalization only has democratizing effects when the hegemonic shocks occur as only in these periods, the political map is reshaped, and new competition over influence begins.

GDP Kollias & Paleologou (2016) also tested the effects of economic globalization on democracy while disaggregating by income groups. They found that the effect is only pro-

nounced in upper-middle and lower-middle income groups, implying the non-linear relationship between countries' GDP, economic globalization, and democracy. Unfortunately, the authors do not explain why this might happen.

3 Theory: Partners and Competitors

Previous studies highlighted that international trade effects are conditional on domestic factors (factor endowments, social spending or GDP) and other international factors (hegemonic shock). In this section, I argue that the identity of trade partners also matters as well as the overall level of trade competition.

3.1 Democratic and Autocratic Trade Partners

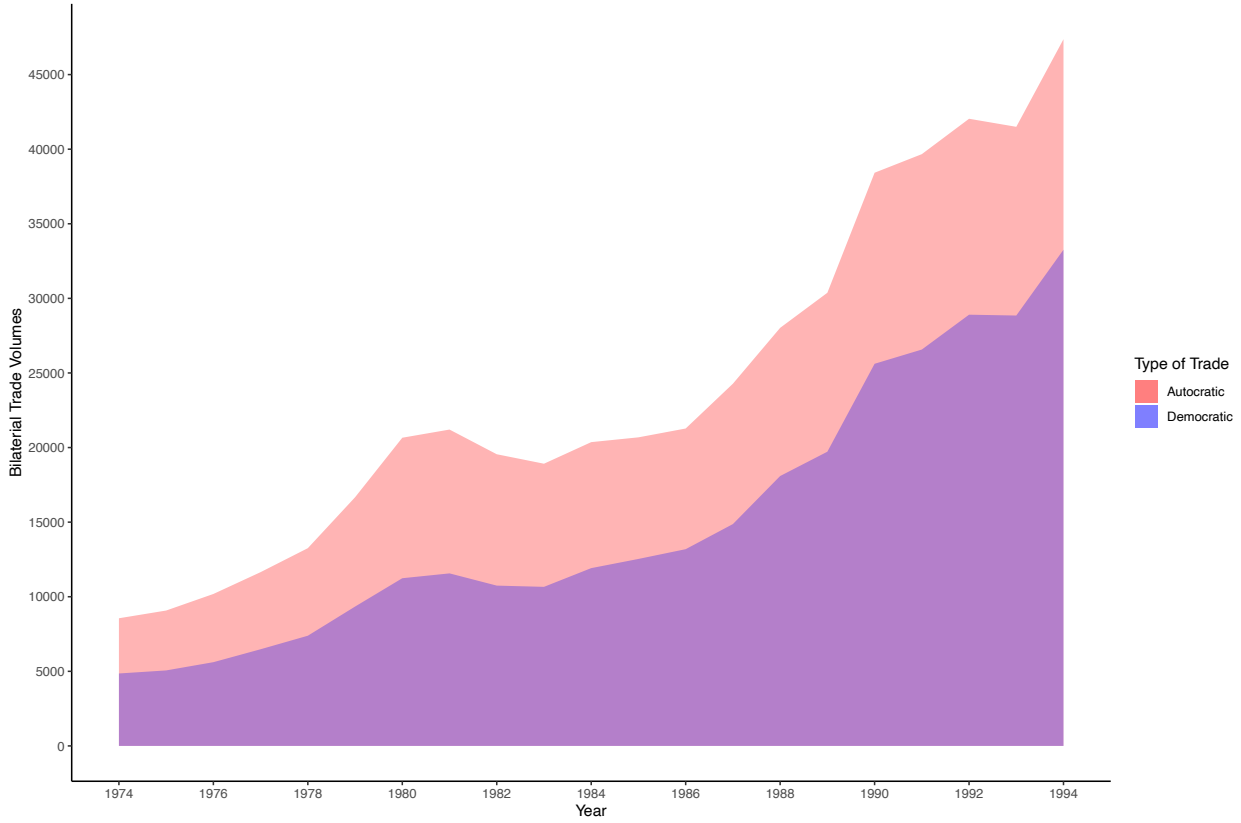


Figure 1: Autocratic and Democratic Trade Openness

Note: The figure shows yearly average of trade volumes in millions of US dollars for two types of trade.

I suppose that the trade partners' democracy levels influence the effect of economic globalization on democracy. Trading with democracies will have positive effects on democratization, while trading with autocracies will impede it. Below I elaborate more on why this happens.

Levitsky & Way (2006) proposed that connections with Western countries create a

new class of people interested in promoting democracy and overcoming the international isolation that autocracies typically have. Levitsky & Way (2006) theorizes that all sorts of ties to the West lead to the diffusion of ideas, which subsequently brings democratization. Democracy promotion effects are commonly attributed to the trade flows with the Western States in general and, specifically, with the United States. Several papers explored these effects empirically. Gunitsky (2014) directly tested whether trade with the United States promote democratization and finds that the effect is positive and significant. However, not only the trade volumes have democratizing effects directly, but they also are necessary preconditions for the imposition of economic sanctions. The research has shown that democracies are more likely to onset economic sanctions, and autocracies are more likely to be targeted (Lektzian & Souva 2003, 2007). Moreover, sanctions positively affect the breakdown of the authoritarian regime, but only for the personalist regimes in the Geddes classification (Escribà-Folch & Wright 2010). However, Gunitsky (2014) argues that the effects are only significant during the hegemonic shocks (changes in the structure of international power relations). Gunitsky (2014) also accounts only for the trade with United States and not with other democracies.

The so-called "Black night" phenomenon is opposed to democracy promotion. It is the promotion of autocratic values and supporting authoritarian survival. Multiple scholars describe Russia and China as authoritarian patrons that support authoritarianism abroad (e.g. Tolstrup 2015, Chou 2017). Schmotz & Tansey (2018) explored these effects of connections to autocracies empirically. They found that trade, migration, and diplomatic ties to surrounding autocracies reduce the probability of authoritarian breakdown. Schmotz & Tansey (2018) argue that this happens for four main reasons: (1) mutual authoritarian support reduces elite defection and helps to stabilize domestic regimes, (2) economic and political connections to other autocracies make autocracies more defended from western pressures and sanctions, (3) autocracies support each other during economic or political crises, (4) such ties also elevate the process of "authoritarian learning".

Therefore, I expect that the "democratic" and "autocratic" trade openness should have opposing effects on democracy. Figure 1 plots the dynamics of the world averages of these two values.

Hypothesis$_1$: Higher levels of trade with democracies are assosiated with higher levels of democracy.

Hypothesis$_2$: Higher levels of trade with autocracies are assosiated with lower levels of democracy.

3.2 Competition over foreign markets

Simmons et al. (2006) include competition as one of the critical channels of diffusion of political liberalism over states. They supposed that investors and traders prefer democracies over autocracies for making deals. According to this argument, states that do not face any competition over international economic markets typically prefer more regularised domestic economic systems. This model supposes that higher economic competition between states promotes the diffusion of political liberalism between them. As the world became more democratic with time, states have to liberalize their policies to remain competitive in international markets.

Since the paper by Simmons et al. (2006), the theory of the effects of the political regime on international trade has advanced significantly. Mansfield et al. (2000) and Mansfield et al. (2002) showed that democracies are more willing to liberalize their trade barriers because of the pro-trade preferences of the median voter. In contrast, autocracies do not represent the mean voter, and the political elite is more willing to receive gains from the trade barriers, driving autocracies to have higher trade barriers and less liberalized trade. Empirically, it is also true that democracies are much more globalized economically than autocracies.

However, not only the regime type of the home country is important, but the regime type of trading partners also. Rodrik (2000) supposes that democracies are better trade partners than autocracies as they generally have higher standards of product regulation. It was also found in the literature that democracies better protect property rights (e.g. Barro 1996, Leblang & Satyanath 2006, Knutsen 2011). Mobarak (2005) also shows that democracies are associated with greater political stability, which brings economic growth as higher political stability is important not only for economic development but also for attracting private investment (Azzimonti 2011). All these combined make democracies more reliable trade partners than autocracies. This hypothesis was tested empirically by Yu (2010), who found that partners' democracy level in trading dyads significantly and positively affects bilateral trade flows. These theories and findings conclude that democracies are more reliable trade partners.

If there is one thing that autocrats value the most, it is the authoritarian survival, stability, and longevity of their rule. Therefore, autocrats would be interested in trade only if it helps them to survive. Chang & Wu (2016) show that it is indeed the case as the number of Preferential Trade Agreements reduces the probability of authoritarian breakdowns. They

theorize that autocrats can use international trade to affect the income distribution within the state and stabilize the domestic society. Chang & Wu (2016) also relied on the Stopler-Samuelson theorem, which shows that relatively abundant factors gain from trade. Therefore, labor-abundant autocracies may use rising trade flows to decrease income inequality without redistribution of existing wealth from the ruling elite to the poor.

Therefore, as autocracies value trade for enrichment and survival, higher economic competition over foreign markets should force them to adopt democratizing policies.

> **Hypothesis$_3$:** Higher levels of economic competition over foreign markets is conducive to democracy.

4 Data

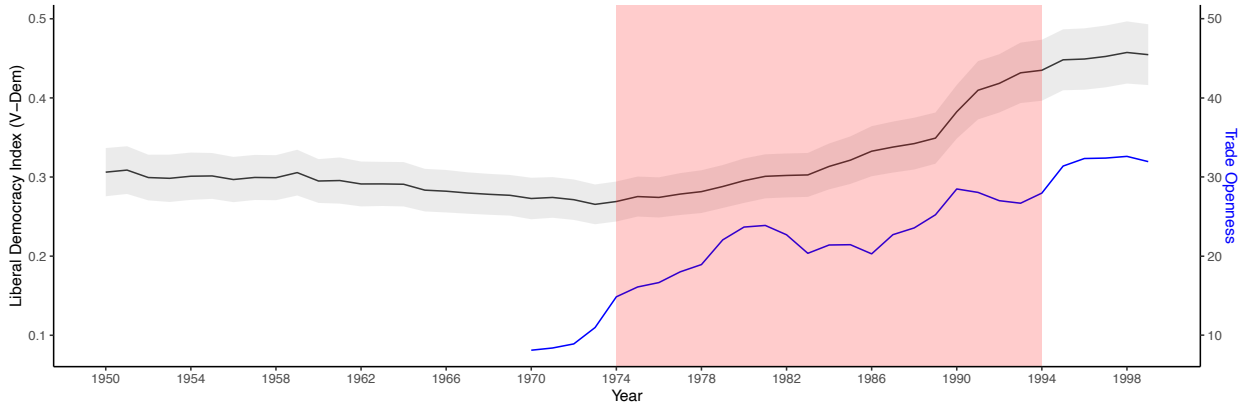


Figure 2: Boundaries of this study

Time period Boix & Stokes (2003) have found that before 1950, economic development contributes significantly to democratization, but these effects nearly vanish (yet remain statistically significant) after 1950. Bussmann (2001), exploring the end of the 20th century, finds that it is hardly likely, that international trade was a decisive feature of democratization during that period. Li & Reuveny (2003) disaggregate between three time periods: (1) first era of globalization, (2) interwar years, and (3) post World War II period. Authors find that trade openness has a positive effect only after WWII when previously having no effect. Geddes (2007) suggests, that in various periods are characterized by different causality of democratization. She supposed that before 1945 it was economic development that had a decisive impact on democratization. However, after World War II, it was international influences (international trade, alliances, and organizations) that mostly contributed to the democratization. It implies that studies that seek to cover massive periods without disag-

gregating datasets temporally produce the aggregation bias as the effects between different periods vary.

In this paper, I restrict the analysis to the period from 1974 to 1994, which mainly covers the Third Wave of democratization and post-soviet democratization. Figure 2 shows this period and the values of the mean trade openness in the world and the mean liberal democracy score obtained from V-Dem (Coppedge et al. 2020),

Democracy and Trade Openness I use the data on the Liberal Democracy score from V-dem (Coppedge et al. 2020), which is based on the latent variable framework and builds on numerous nuanced indicators (Pemstein et al. 2018). This approach allows to overcome the lack of precision of Polity score (see Treier & Jackman 2008) and allows to incorporate the measurement error as I discuss it below.

To calculate Trade Openness, I use the bilateral trade flows data from Correlates of War (Barbieri et al. 2016) and GDP data from World Bank (WB) (2020) and Penn World Tables (PWT) (Feenstra et al. 2015). Exploring the reliability of GDP data, Pinkovskiy & Sala-i Martin (2016) has found that WB data is more reliable than PWT. However, he points out that the most rigorous approach is calculating the linear combination of these two measures with equal weights. Therefore, I calculate a novel GDP variable as an average between WB and PWT data.

Trade Openness is defined as a ratio of total trade and GDP. Democratic Trade Openness is calculated as the sum of trade with democracies divided by GDP, and Autocratic Trade Openness is calculated similarly as trade with autocracies divided by GDP. To distinguish between democracies and autocracies, I use the Boix binary democracy indicator (Boix et al. 2013) as it is based on minimalist requirements for democracy and utilizes only information on suffrage, the fairness of elections, and variability of political leaders.

Other aspects of Economic Globalization Economic globalization is a multifacial phenomenon that includes trade and financial globalization. Furthermore, studies focus on different manifestations of economic globalization, namely, De Facto trade flows (e.g. Eichengreen & Leblang 2008, Tavares 2007) or De Jure aspects, such as preferential trade agreements (e.g. Baccini 2019) and tariffs (e.g. Milner & Kubota 2005). These camps do not intersect. Even in the "De Facto" camp, scholars rarely acknowledge the importance of Financial Globalization. To overcome these limitations, I control for other aspects of Economic Globalization, using subcomponents of the KOF Globalization Index (Gygli et al. 2019): Trade

Globalisation De Jure and Financial Globalization.

Relative Labor Endowments Relative Labor Endowments are of paramount importance for the effects of trade. In this paper, I follow the tradition of Doces & Magee (2015), who treat relative labor endowments as a ratio between capital endowments and labor endowments. I use the data on capital and labor from the Penn World Table (Feenstra et al. 2015).

Trade Competition Kim et al. (2020) proposed a novel approach to measure trade competitiveness, based on the dynamic clustering algorithm and analysis of 9 billion of disaggregated trade flows. They measure trade similarity based on the trade profiles and trade partners. Their measure follows the definition of Elkins et al. (2006), who treats trade competition as "the degree to which nations compete in the same foreign markets". The algorithm of Kim et al. (2020) makes the definition even more concrete: "the degree to which nations compete for *for similar products* with the same partners". This measure of trade competition depends on the considered cluster size. Authors provide three various measures, depending on cluster size: 3CL (three-cluster), 7CL (seven-cluster) and 15CL (fifteen-cluster). Their data also covers the period from 1960 to 2014. In this study, I use the three-cluster data as it is recommended by Kim et al. (2020). This data is more stable over time, while the 7CL and 15CL data capture more subtle changes in trade competitors' economies. As democracy is a slowly changing variable, I do not use these nuanced versions to avoid introducing undesired noise to the data. Moreover, all three measures of trade competition are highly correlated ($corr > 0.8$).

I use their data and convert it from dyad-year format to state-year format. I define trade competitiveness of state as the sum of trade profile similarity with all members in a cluster.

$$\text{Trade Competitiveness}_{it} = \sum_{j}^{N} \text{Trade Profile Similarity}_{jt}, \tag{1}$$

where i is a state of interest and j indicates all other states in the trading system in the year t. Table 1 shows correlations between three Trade Openness variables and Competition.

Other control variables To reduce the probability of omitted variable bias, I also use a set of other control variables. To account for other international influences, I calculate a proportion of Democratic Neighbors. I use the "CShapes" minimum distance dataset

Table 1: Correlation Between Types of Trade Openness

	Democratic Openness	Autocratic Openness	Total Openness
Autocratic Openness	0.498		
Total Openness	0.972	0.687	
Competition	0.213	0.059	0.195

(Weidmann et al. 2010) and the 500 kilometers threshold to define neighbors. In doing this, I follow the paper by Gleditsch & Ward (2006), who originally proposed this method and argued that it is robust to other thresholds (1000 and 1500) kilometers. I also utilize Boix et al. (2013) binary democracy data to calculate the share of democratic neighbors from all neighbors.

Rao et al. (2011) points out that, commonly, studies of the effects of globalization do not acknowledge the political dimension of globalization. To account for it, I also include the Political Globalization variable from the KOF Globalization Index (Gygli et al. 2019) as it is a composite index that accounts for a wide range of international effects. Political Globalization also consists of De Jure and De Facto's side. De Jure's side includes membership in international organizations, signing international treaties, diversity of treaty partners, while the De Facto side accounts for the number of embassies, UN peacekeeping missions, and International Non-Governmental Organizations.

I also account for Modernization Theory variables: Secondary Education and GDP Per Capita. As noted above, GDP Per Capita is calculated as the average of Penn World Tables and World Bank, following the suggestion of Pinkovskiy & Sala-i Martin (2016). For Secondary Education, I follow a similar approach as for GDP Per Capita. I do this as there is a lot of missing data in this variable. I use the education data from World Bank (2020) and Barro & Lee (2013). I use those data that are available for any of them or average the data if it is present in both sources.

I also include previous information on Previous Democratic Breakdowns, Natural Resources, Civil War, Infant Mortality, and Population (logged). All this data comes from the V-Dem dataset (Coppedge et al. 2020).

Finally, I account for unchanging variables in time, such as geographic area, the share of the protestant population, whether the country is communist or not through the inclusion of fixed effects on a country basis. I also account for variables that affect all states simultaneously, like hegemonic shocks or world economic crises, by adding fixed effects on years.

Missing data The problem of reporting and analyzing missing data in observational statistical studies is ubiquitous (Sterne et al. 2009). As my data frame covers the period from 1974 to 1994, I consider only the states that already existed in 1974. I also delete all observations with missing data in dependent and theoretical variables, allowing missing values only in controls. The resulting data set contains 2.4% of missing values. After the row-wise deletion of missing values, the remaining dataset consists of 1687 observations: only 60% of data remains. Deleting such amounts of data creates selection bias as the data is not Missing Completely At Random: there is more available data for developed states. I suppose that imputing 2.4% of data creates less bias than deleting 40% of the information.

For the imputation of missing data, I use the Multiple Imputations by Chained Equations approach[3]. Table 6 in the Appendix compares the descriptive statistics calculated for variables with imputed and omitted data.

Transformations All continuous variables are also standardized by subtracting mean and divided by two standard deviations recommended by Gelman (2008). This procedure makes coefficients comparable and significantly speeds the convergence of Gibbs Sampler used to find and explore the posterior distributions. Preliminary to standardization, I apply logarithmic transformation for democratic and autocratic openness as these variables are highly skewed. I also exclude all observations with values further than four standard deviations from the mean to avoid highly influential observations that may bias the results. Table 7 in Appendix presents the descriptive statistics for the resulted dataset.

5 Empirical strategy

To test the hypotheses, I take a gradual strategy, sequentially rising model complexity. Firstly, I estimate a simple model for the average effects of two types of trade. I also assess the robustness of coefficients to various model specifications and account for autocorrelation. Secondly, I explore whether any heterogeneity of effects exists in space and time. Thirdly, I explore whether trade contributes to democratization or to democratic survival. I also instrument trade to test whether effects are causal.

[3]See White et al. (2011) for an overview of this method and package "mice" for implementation in R (Buuren & Groothuis-Oudshoorn 2010)

5.1 Average effects

As baseline I estimate a bayesian linear model with varying-intercepts on both country and year basis. As was shown by Stegmueller (2013), bayesian models outperform maximum likelihood estimation and generally produce more robust and less biased results. This model assumes that democracy comes from a normal distribution

$$\text{Democracy} \sim N(\mu, \tau),$$

where the mean (μ) is given by a linear function

$$\mu = \alpha_C + \alpha_Y + \beta_1 \text{Trade Open.} + \beta_2 \text{RLE} + \beta_3 \text{RLE} * \text{Trade Open.} + \beta_4 \text{Competition} + \gamma \mathbf{W} \quad (2)$$

or

$$\mu = \alpha_C + \alpha_Y + \beta_1 \text{Dem. Open.} + \beta_2 \text{Aut. Open.} + \beta_3 \text{Competition} + \gamma \mathbf{W}, \quad (3)$$

where $\mathbf{W}$ denotes a vector of control variables, RLE stands for relative factor endowments. τ denotes general model precision ($\frac{1}{\sigma^2}$) that comes from the Gamma distribution.

Unlike simple information like land area or state membership in international organizations, democracy is tough to measure due to conceptual vagueness. As Casper & Tufis (2003) have shown, the choice of the measure (Polity IV, FreedomHouse, or Vanhanen in their example) influences the statistical significance of the model covariates. Treier & Jackman (2008) has shown that Polity lacks precision, and researchers should not rely on it with confidence. In this paper, I acknowledge that democracy is measured with error and treat democracy not as a point-estimate but as an interval. This approach to democracy as a latent variable and distribution that has a mean and standard deviation was developed by Treier & Jackman (2008), Pemstein et al. (2010, 2018). Bayesian modeling allows to incorporate the measurement error directly in the model. I treat the dependent variable as coming from a normal distribution, where the mean (μ) is given by a linear model and the precision ($\tau = 1/\sigma^2$) is a linear combination of model error (σ^2_{Model}) and observation-wise measurement error for democracy ($\sigma^2_{Measurement}$). This linear combination means that the higher is the measurement error, the is the precision. In this case, I assume that the overall model error comes additively from these two components:

$$\tau_i = \frac{1}{\sigma^2_{Model} + \sigma^2_{Measurement_i}}$$

$$\tau \sim \Gamma(1,1)$$

Both equations (2) and (3) are estimated with uninformative normal priors for covariates:

$$\beta_i, \gamma_i \sim N(\mu = 0, \tau = 0.0001)$$

α_C are individual country intercepts with individual variation, that also have uninformative priors and come from normal distributions:

$$\begin{aligned}
\alpha_{C_i} &\sim N(\mu_{c_i}, \tau_{c_i}) \forall i \in [1, \ldots, 143] \\
\mu_{c_i} &\sim N(\mu = 0, \tau = 0.0001) \forall i \in [1, \ldots, 143] \\
\tau_{c_i} &\sim \Gamma(1,1),
\end{aligned}$$

where $[1, \ldots, 143]$ are the indices of the countries in the sample. The same applies to α_Y, which are individual year intercepts:

$$\begin{aligned}
\alpha_{Y_i} &\sim N(\mu_{y_i}, \tau_{y_i}) \forall i \in [1974, \ldots, 1994] \\
\mu_{y_i} &\sim N(\mu = 0, \tau = 0.0001) \\
\tau_{y_i} &\sim \Gamma(1,1)
\end{aligned}$$

All bayesian linear models are estimated under 30.000 iterations of Markov Chain Monte Carlo with 10.000 burning period. The convergence diagnostics did not depict signs of slow mixing or autocorrelation of the chains.

Robustness Checks I also corroborate the results by estimating a non-bayesian fixed effects models and Bayesian Model Averaging (BMA), which is a statistical strategy to overcome idiosyncratic model specifications by averaging over all possible model specifications and weighting by the model probability[4]. I demean the data before the estimation on the country bases to account for the fixed effects. I also restrict the available model space by forcing the interactions to be included only with their parts. The resulting estimates for β are calculated based on the best 200 models. All models were estimated using 100.000 iterations and 50.000 burning periods. The shrinkage coefficient that is used to approximate

[4]See Montgomery & Nyhan (2010) for a more in-depth discussion and Fernandez et al. (2001) for an application. I use the package 'BMS' created by Feldkircher & Zeugner (2009) for estimation. It sets automatically Zellner's g-prior to the regressions coefficients and allows to specify a hyperprior for it. In the selection of the hyperprior, I follow the approach of Fernandez et al. (2001). I also use three different priors for the model choice: fixed, random, and uniform. The baseline results show the estimates for the random prior as it was recommended by Ley & Steel (2009).

convergence for all models exceeds 0.99, meaning the models are highly likely to converge.

It is reasonable to suppose that the current level of democracy is likely to be determined by the level of democracy in the previous year. It is necessary to include the lagged dependent variable to account for this autocorrelation. However, if the fixed effects are already included in the regression, lags of dependent variables create a Nickel bias. Arellano & Bond (1991) model is commonly used in economics to avoid this situation. This model uses further lags of dependent and independent variables as instruments. It also transforms the data as first differences by subtracting the previous values from the current ones. This allows to get rid of the possible trends in data, which may also bias the results. I estimate the model of the following form:

$$\text{Democracy}_{it} = \alpha\text{Democracy}_{it-1} + \beta\mathbf{x}_{it} + v_{it} + \varepsilon_{it}, \tag{4}$$

where $\mathbf{x}_{it}$ is a vector of variables (both main and controls), v_{it} are the year fixed effects. I use the further lags of the dependent and independent variables as the instruments for this model. I use the 2-5 lags of dependent variable and 5 lags of independent variables to a total of 54 instruments. I only use the variables that were found robust by Bayesian Model Averaging as the necessity to include numerous lags leads to a quick reduction of the degrees of freedom. I also expand the data to start from 1970 to compensate for the missing data that comes from the further lags of variables.

I also estimate two additional models: 5 year averages and 10 year averages. These models effectively reduce the number of observations and the number of time periods respectively, making autocorrelation a less pronounced problem. I also include the initial level of democracy (in 1974) for these two models. They are also estimated using fixed effects on years and countries.

5.2 Inside the black box

The average effects might misrepresent the underlying processes: it is highly unlikely that the effects will be the same for all 143 states in the sample.

There are also theoretical reasons for allowing for varying effects of trade. Geddes (2007) notes that theories of Acemoglu & Robinson (2005) and Boix & Stokes (2003) were invented through reflexing on the historical experience of Latin America and Europe. This remark suggests that various ways of democratization exist that are clustered both temporally and spatially. Also, several studies, like Boix & Stokes (2003), exclude African

democratization experience as their samples cover only limited periods, ending in the 1990s. Lots of studies also exclude the post-soviet democratization that started in the 1990s. Moreover, Gunitsky (2014) supposed that trade impacts democracy only in periods defined by the changes of hegemonic powers. Therefore, it is vital to explore whether the average estimates capture the underlying process correctly and are not driven by a small fraction of states or periods.

I estimate the Bayesian Multilevel Model in two forms. The first form allows for individual country-based slope (δ_c) for trade openness:

$$\mu = \alpha_C + \alpha_Y + \delta_c \text{Trade Open.} + \beta_1 \text{Competition} + \gamma \mathbf{W} \tag{5}$$

or

$$\mu = \alpha_C + \alpha_Y + \delta_{c_1} \text{Dem. Open.} + \delta_{c_2} \text{Aut. Open.} + \beta_1 \text{Competition} + \gamma \mathbf{W}. \tag{6}$$

The second forms is similar but allows for individual year-based slopes (δ_y) instead:

$$\mu = \alpha_C + \alpha_Y + \delta_y \text{Trade Open.} + \beta_1 \text{Competition} + \gamma \mathbf{W} \tag{7}$$

or

$$\mu = \alpha_C + \alpha_Y + \delta_{y_1} \text{Dem. Open.} + \delta_{y_2} \text{Aut. Open.} + \beta_1 \text{Competition} + \gamma \mathbf{W}. \tag{8}$$

5.3 Democratic Transition or Democratic Survival

Even though the numeric operationalization of democracy is superior to other measures, it does not allow to differentiate between democratic transition and democratic survival.

To do this, I follow the approach of Epstein et al. (2006), who used a first-order Markov probit regression to study democratization. I also use their trichotomous measure of democracy as a compromise between numeric and binary indicators. This measure divides political regimes into three categories: Autocracy (A), Partial democracy (P), and Democracy (D), based on the Polity Score. I follow this method to utilize democracy data from the Polity 5 project (Marshall et al. 2020). Following Epstein et al. (2006), I treat a regime as democratic if its Polity2 scores exceed 7, as partially democratic if its score is from 1 to 7, and all regimes below 1 are treated as autocratic.

Epstein et al. (2006) assume that democratization is the first-order Markov process, meaning that values of the political regime in t only dependent on the values in $t-1$. This model allows capturing the dynamic nature of the data and the dependent variable's

persistence over time. Simply regressing the political regime on the previous year value explains more than 90% of the data. This indicates that democratic transitions occur rarely, and there are not that many actual observations of regime change. In this case, it is crucial to account for the lagged dependent variable to reduce the bias created by autocorrelation.

Probit Markov model can be formalized in the following way:

$$\Phi^{-1}[Pr(Y_{it} = b|Y_{it-1} = a)] = \theta_{ab} + X_{it}\beta_a + \varepsilon, \tag{9}$$

where Φ^{-1} denotes probit function, Y_{it} and Y_{it-1} are the political regimes of a country i in year t and $t-1$ respectively, b and a denote types of political regime.

Y_{it} can be expressed as an unobserved dependent variable Y^*_{it}. Y^*_{it} is equal to 0 for autocracy, 1 for partial democracy, and 2 for full democracy. The previous regime type can be expressed as a combination of two dummy variables Y^*_0 and Y^*_1. Table 2 shows how these variables can be translated into trichotomous democracy understanding.

Table 2: Interpretation of Y^*_i

Political Regime	Autocracy	Partial	Democracy
Y^*_0	1	0	0
Y^*_1	1	1	0

Based on Equation 9 the estimated Probit for three categories takes the following form:

$$\Phi^{-1}[Pr(Y_{it} = b|Y^*_{it-1} = y^*_{it-1})] = Y_{1t-1} + Y_{0t-1} + \alpha X + \beta * Y_{1t-1} * X + \gamma * Y_{0t-1} * X + \varepsilon, \tag{10}$$

where Y_{1t-1} and Y_{0t-1} are indicators of the previous regime and X is a vector of explanatory variables. If $Y^*_0 = Y^*_1 = 0$ then α denotes the vector of effects of regression given that regime was previously democratic. If $Y^*_0 = 0, Y^*_1 = 1$ then $\alpha + \beta$ indicate the effects of regressors given that regime was partially democratic in $t-1$. Finally, if $Y^*_0 = 0, Y^*_1 = 1$ then $\alpha + \beta + \gamma$ indicate the effects of regressors given that regime was autocratic in previous period. In another words α captures the democratic survival, $\alpha + \beta$ transition from partial democracy, and $\alpha + \beta + \gamma$ transition from autocracy to democracy[5].

5.4 Instruments

Several studies suggest that the relationship between trade openness and democracy is likely to run both ways (e.g. Mansfield et al. 2002, Milner & Kubota 2005, Yu 2010). It creates a

[5]The standard errors for the sum of coefficients were calculated based on the Variance Sum Law.

problem of endogeneity that biases the regression coefficients. Following Tavares (2007) and Eichengreen & Leblang (2008), I instrument Overall, Democratic and Autocratic Openness with Predicted values based on the Gravity Equation (for an overview see De Benedictis & Taglioni 2011). I use the data for Gravity Regressions from CEPII Gravity Dataset (Head et al. 2010). I estimate three regressions: predicting the bilateral trade flows with democracies, with autocracies, and overall trade flows without differentiating between partners' political regime. I treat those countries as democracies that exceed 7 points on the Polity2 scale.

The estimated regressions take the following form:

$$\text{Trade Flows}_{ijt} = \beta_0 + \beta_1 X_{ijt} + \beta_2 W_{it} + \beta_3 W_{jt} + \beta_4 C_i + \beta_5 T_t + \varepsilon, \tag{11}$$

where i denotes states of origin, j state of destination and t year. X_{ijt} is a vector of dyad-level variables for a year: minimal distance, regional trade agreement, contingency, common currency, common legal system, and common language. W_{it} and W_{jt} are vectors of characteristics of origin and destination: GDP Per Capita and GATT/WTO Membership. C_i and T_t are vectors of origin and year fixed effects, respectively. The Predicted Trade Openness variables are calculated from these models' predicted values by dividing the sum of predicted trade flows with all partners by the country's GDP. These variables are further used to model the effects of Trade Openness. Table 8 in the Appendix presents the estimates of Gravity Models, predicting Overall, Democratic and Autocratic Trade Openness.

6 Results of empirical analysis

6.1 Trade partners matter but competition does not

Table 3 presents the results of the baseline model and compares them with the two-way fixed effects model and Bayesian model without accounting for measurement error in the dependent variable. Table 3 disaggregates between democratic and autocratic openness. All three models support the hypotheses about the negative effects of trade with autocracies and positive effects on trade with democracies on democracy. Moreover, "autocratic trade" mutes the positive effects of "democratic trade" as one unit increase in both types of trade leads to an overall null effect. Therefore, it is not the "democratic trade" that matters per se, but higher reliance on democratic trade partners than on autocratic ones.

The effects of Trade Competition on the levels of democracy are only significant when the trade openness is included as a whole and disappears after the trade is disaggregated.

Table 3: Comparison with Frequentist Estimates: Types of Trade Openness

	Twoway FE		**Bayesian w/o Mes. Error**		**Bayesian w Mes. Error**	
Variable	**Estimate**	**95% Conf.Int.**	**Estimate**	**95% Cred.Int.**	**Estimate**	**95% Cred.Int.**
			Main Results			
Democratic Openness	**0.08**	[0.013,0.139]	**0.08**	[0.053,0.101]	**0.06**	[0.04,0.087]
Autocratic Openness	**-0.07**	[-0.11,-0.02]	**-0.07**	[-0.082,-0.047]	**-0.06**	[-0.075,-0.041]
Competition	0.02	[-0.013,0.056]	0.02	[-0.008,0.047]	0.02	[-0.007,0.048]
			Controls: Economic Globalization			
Financial Globalization	0.02	[-0.053,0.086]	0.02	[-0.014,0.046]	0.02	[-0.011,0.046]
Trade Glob. De Jure	0.01	[-0.125,0.141]	0.01	[-0.036,0.059]	0.02	[-0.02,0.068]
			Controls: International Influence			
Democratic Neighbors	**0.09**	[0.047,0.129]	**0.09**	[0.071,0.105]	**0.09**	[0.071,0.106]
Political Globalization	-0.00	[-0.08,0.075]	-0.00	[-0.043,0.043]	-0.01	[-0.048,0.036]
			Controls: Modernization Theory			
GDP pc log	0.00	[-0.095,0.099]	0.00	[-0.041,0.044]	0.00	[-0.036,0.044]
Secondary Education	0.03	[-0.023,0.083]	0.03	[-0.002,0.063]	0.03	[-0.001,0.057]
			Other Controls			
Breakdowns	**-0.15**	[-0.237,-0.055]	**-0.15**	[-0.182,-0.109]	**-0.13**	[-0.164,-0.098]
Natural Resources	0.01	[-0.001,0.024]	0.01	[-0.001,0.024]	0.01	[-0.001,0.021]
Civil War	-0.01	[-0.041,0.015]	-0.01	[-0.032,0.006]	-0.01	[-0.03,0.008]
Infant Mortality	-0.04	[-0.133,0.045]	**-0.04**	[-0.088,-0.002]	**-0.03**	[-0.073,0.012]
Population	-0.02	[-0.157,0.122]	-0.02	[-0.096,0.052]	-0.01	[-0.08,0.062]
RLE	-0.00	[-0.085,0.078]	-0.00	[-0.052,0.043]	0.01	[-0.03,0.055]
N	2507		2507		2507	
R^2	0.138					

Note: Bold typeface highlights variables that are significant on 95% confidence or credible level. Bayesian models also include random country and year effects. The Bayesian model with measurement error accounts for the measurement error in the democracy score. Bayesian models were estimated using 30.000 iterations with a 10.000 burning period and depicted no signs of non-convergence after exploring the mixing of Markov Chains and autocorrelation.

This indicates that this variable is not robust and probably should also be disaggregated further in competition with democracies and competition with autocracies.

Table 9 in Appendix also shows the effects of overall trade flows. The results support the hypothesis that higher relative labor endowments positively affect trade openness on democracy. However, the general effects of trade openness remain insignificant.

Robustness checks These results are robust to various model specifications. Table 10 in the Appendix shows the results of Bayesian Model Averaging. Autocratic and Democratic Trade is indeed among the most robust variables, while the effects of Overall Trade are highly model dependent as well as the interaction between Trade Openness and Relative

Labor Endowments. Results are also robust to accounting for autocorrelation. Table 11 in the Appendix shows the estimates for the Arellano-Bond model, 5-year averages, and 10-year averages. In all cases, the effects of Democratic Openness are positive and significant, while Autocratic Openness's effects are negative and significant.

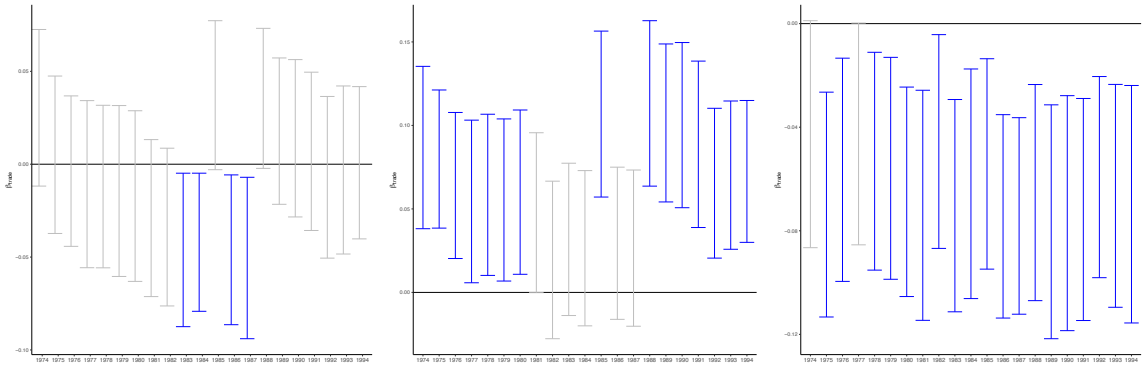
6.2 Effects are driven by a small group of states

Table 4: Varying effects of Trade Openness on Democracy on Country Basis

Effects	Positive	Negative	Any
	Overall Trade		
Trade Openness	18(12.6%)	17(11.9%)	35(24.5%)
	Types of Trade		
Democratic Openness	20(13.9%)	8(5.6%)	28(19.5%)
Autocratic Openness	7(4.8%)	14(9.8%)	21(14.7%)
Any	25(17.5%)	31(21.7%)	49(34.3%)

Note: "Any" indicates the number of states that are affected either by Democratic or Autocratic Trade Openness.

Table 4 and Figure 3 summarize the estimates of the Bayesian multilevel models. A full list of effects by states is available in the Appendix in Section A.8. The effects of Overall Trade Openness are significant for 35 states (or 24.5% of all states in the sample). The effects are positive for 18 states (12.6%) and negative for 17 (11.9%). Therefore, the inability to establish consistent international trade effects on democracy is probably due to the sample selection, which makes one group more prevalent. The effects of Overall Trade Openness are not time consistent and only significant for 4 years during 1974-1994 (see Figure 3a). During the Soviet Collapse (1989-1995), trade effects are also insignificant. These findings contradict the theory of Gunitsky (2014), who predicted that trade openness should affect democracy during hegemonic shocks.



(a) Overall Openness (b) Democratic Openness (c) Autocratic Openness

Figure 3: Time varying effects

Either democratic or autocratic trade openness in total affects 49 states (or 34.3% of the whole sample). Trade with democracies affects 28 states (19.4%) and positively affects the majority of them (20 states). Trade with autocracies has a significant effect on 21 states (14.7%) and has a negative effect on democracy for 14 (9.8%). Effects of both Democratic and Autocratic trade are present across the whole time period from 1974 to 1994 (see Figures 3c and 3b).

These results indicate that all types of trade openness (overall, democratic and autocratic) affect, at most, 49 states, and only the effects of democratic and autocratic trade are time-consistent.

6.3 It is mostly Democratic Survival

Table 5 summarizes and interprets the results of Markov regressions. The full results of the underlying models are presented in Table 12 in the Appendix. Rows, indicated by the letter "A", shows the effects on the transition from full Autocracy to full Democracy; rows, indicated by letter "P", show the effects on the transition from Partial Autocracy to Democracy; finally, rows, indicated by letter "D", show the effects on democratic survival.

Model 1 includes the variables that were initially used by Ahlquist & Wibbels (2012)and additionally GDP per capita (as it is one of the most robust predictors of democratic survival in many studies). Model 2 recalculates the first specification based on the novel data and instrumented Trade Openness. Model 3 controls for other aspects of Economic Globalization. Model 4 includes additional controls for democratization. Finally, Model 5 differentiates between two types of Trade Openness and includes all the control variables.

Model 1 is calculated based on the Ahlquist & Wibbels (2012) data. It is not instrumented as Ahlquist & Wibbels (2012) specifically operationalized trade openness with world trade openness to make this variable exogenous. However, their model assumes that the effects of trade openness on democratization are similar across all states in the world. It is an unacceptably strong assumption from my point of view. Models 2-5 show that the insignificant effect of trade openness on democratization found by Ahlquist & Wibbels (2012) is most likely to be a product of weak operationalization strategy. Models 2-5 use the predicted trade openness that was calculated based on predicted values of Gravity Equations. Therefore, practically Models 2-5 in Table 5 are the second-stage regressions, and the effects of Predicted Openness variables show the causal effect of trade openness on the probability of democratization.

Models 2-4 indicate that trade openness has no effects on democratization and even

Table 5: Interpretation of Markov Regressions for Trichotomous Ordered Dependent Variable

		(1)	(2)	(3)	(4)	(5)
Predicted Openness	A	-0.01	0.00	0.00	0.00	
	P	0.03	-0.02	**-0.02**	-0.02	
	D	-0.012	**-0.112**	**-0.130**	**-0.132**	
Predicted Democratic Openness	A					**-0.01**
	P					-0.01
	D					**0.011**
Predicted Autocratic Openness	A					0.00
	P					**-0.01**
	D					**-0.194**
Labor Endowments	A	-0.48	-0.03	-0.11	-0.09	
	P	0.32	-0.11	-0.10	-0.14	
	D	-0.367	**-0.581**	-0.262	-0.138	
Labor Endowments x Pred. Tr. Op.	A	0.01	-0.00	-0.00	-0.00	
	P	-0.01	0.00	0.00	0.00	
	D	0.010	**0.021**	**0.024**	**0.025**	
Proportion Democracies	A	**0.02**	**0.01**	**0.02**	**0.02**	**0.01**
	P	-0.01	0.00	0.00	-0.00	0.00
	D	0.016	**0.024**	0.002	-0.006	0.003
Neighbor Democracies	A	**0.92**	**0.87**	**0.85**	**0.65**	**0.73**
	P	0.41	0.33	0.33	0.34	0.41
	D	0.086	0.243	0.092	0.047	-0.317
Breakdowns	A	**0.33**	**0.35**	**0.37**	**0.33**	**0.32**
	P	-0.13	-0.11	-0.12	-0.16	**-0.20**
	D	**-0.272**	**-0.265**	**-0.239**	-0.211	**-0.365**
GDP Per Capita	A	-0.00	-0.00	-0.00	-0.00	0.00
	P	0.00	0.00	0.00	0.00	0.00
	D	0.000	**0.002**	**0.003**	**0.004**	**0.006**
GDP Growth	A	-0.01	-0.01	-0.01	-0.01	-0.01
	P	-0.01	-0.01	-0.01	-0.01	-0.01
	D	0.042	**0.051**	0.046	**0.053**	0.048
Trade Glob. De Jure	A			**-0.01**	**-0.01**	-0.01
	P			-0.00	0.00	0.00
	D			0.005	0.001	-0.014
Financial Globalization	A			-0.01	-0.01	-0.01
	P			0.01	0.01	0.00
	D			**0.042**	**0.046**	0.018
Secondary Education	A				0.00	0.01
	P				-0.00	-0.00
	D				**0.017**	0.014
Political Globalization	A				0.01	**0.01**
	P				0.01	0.01
	D				-0.012	-0.010

Note: Bold typeface indicates that the P-value for the coefficient is less or equal to 0.05. "A" indicates the transition from Autocracy to Democracy, "P" – transition from partial democracy to democracy, and "D" – that country remains democratic.

destabilizes the democratic regimes. However, the coefficient for Interaction between Relative Labor Endowments and Trade Openness is also statistically significant. Theory predicts that Trade Openness leads to democratization when labor is an abundant factor. Reasons behind it are discussed in Section 2.2. However, Models 2-4 only partially support this theory. From the output, it is evident that higher Labor Endowments can compensate for the negative effect of Trade Openness. This effect is only present for established democracies, meaning

that Labor Endowments help trading democracies to survive. However, there is no effect of Trade Openness and Labor Endowments on Democratic Transitions either from Autocracy or Partial Democracy.

The results of Model 5 support the hypotheses regarding the varying effects of Autocratic and Democratic Openness. Trade with democracies does have a significant positive and causal effect on democratic survival. However, it seems that it has a negative effect on democratic transitions. The effects of Autocratic Trade Openness are also in line with my hypotheses. Trading with autocracies undermines prospects for Democratic Survival and undermines prospects for democratization for the Partially Democratic States. These findings corroborate the autocracy promotion literature and establish that not only the volume of trade matters for democratization but also the political regime of trade partners.

Notable are the effects of other aspects of economic globalization. The effects of Financial Globalization and Trade Globalization De Jure are significant, supporting the necessity to control for other faces of globalization. However, when trade openness is disaggregated into democratic and autocratic ones, these effects vanish. I suppose it happens as these variables also should be disaggregated into democratic and autocratic ones. Therefore, I only interpret Models 3-4 for them. In Model 3 and 4, financial globalization is positively associated with democratic stability. This effect is opposite to trade openness and indicates that these two processes should be distinguished theoretically. Further research can address these issues directly.

7 Conclusion

In this paper, I explored the effects of trade openness on democracy. I hypothesized that not the volumes of trade matter, but the characteristics of trade partners (their political regimes) and the level of economic competition that states face when selling the goods to the foreign markets.

Considering the economic competition, even though it is significant in some model specifications, it is not robust. Therefore, there is no evidence that the overall degree of economic competition does influence democratization.

Considering trade, by disaggregating between trade with autocracies and trade with democracies, I have shown that these two phenomena have opposing effects on democracy. Higher volumes of "democratic trade" are associated with higher levels of democracy, when higher volumes of "autocratic trade" with lower levels. Further analysis, using trichotomous

measures of democracy, advocated by Epstein et al. (2006), indicates that these effects are conducive not to democratic transition but mostly to democratic survival. Trade with democracies contributes to democratic survival when trade with autocracies undermines it. These effects are also causal.

Furthermore, higher trade levels with democracies have adverse effects on the probability of democratization if the country is autocratic and no effects if the country is already partially democratic. This result is consistent with the literature on authoritarian survival that shows that autocrats can use the gains from trade to stabilize domestic society and extend their rule. However, autocratic trade has no effects on the transition from autocracies and only undermines the transitions from partial regimes.

These findings indicate that "democracy promotion" effects of democratic trade are partially present and only help to stabilize the established democracies, while the "autocracy promotion" effects of autocratic trade not only undermine the established democracies but also help to consolidate autocracies in partially democratic regimes.

These trade effects are present in all years covered by this study (1974-1994). However, it seems that only around 35% of the sample (49 states) are influenced by trade, while other states remain untouched.

Additionally, this study has shown that (1) these estimates are robust across all possible model specifications, (2) they are not influenced by the measure of democracy (numeric or trichotomous) or the included measurement error of democracy, (3) the existing autocorrelation does not bias the results.

There are several ways to continues this study. Firstly, scholars may extend the period to cover the whole 20th century and explore whether the effects of autocratic and democratic trade have changed over time. Secondly, scholars might disaggregate other measures of economic globalization (economic globalization de jure and financial globalization) into autocratic and democratic dimensions. The same can be applied to the level of trade competition. Thirdly, it is evident that trade affects only a group of states, but it is unexplained why this happens. Further studies may concentrate on this issue directly and explore how states' domestic characteristics can explain the presence or absence of trade effects on democracy. Finally, in some cases, trade with autocracies positively impacts democracy, while trade with democracies has a negative impact. Further studies may explore why this happens precisely and under what circumstances having autocratic trade partners might contribute to democracy at home.

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A Appendix

A.1 Missing data imputation

Table 6: Comparison of dataset with imputed missing values with dateset with omitted missing values

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Infant Mortality							
Omitted	3,727	63.677	46.809	3.400	21.500	101.500	221.000
Imputed	3,761	63.928	46.832	3.400	21.700	102.000	221.000
Natural Resources							
Omitted	3,695	936.070	4,657.904	0.000	1.950	345.075	81,161.850
Imputed	3,761	950.080	4,666.013	0.000	1.960	352.900	81,161.850
Democratic Neighbors							
Omitted	3,195	0.332	0.302	0.000	0.100	0.500	1.000
Imputed	3,761	0.344	0.308	0.000	0.100	0.600	1.000
Relative Labor Endowments							
Omitted	3,419	0.066	0.106	0.0004	0.009	0.085	1.379
Imputed	3,761	0.061	0.102	0.0004	0.008	0.075	1.379
Secondary Schooling							
Omitted	3,422	45.816	30.080	0.000	18.336	72.886	126.283
Imputed	3,761	44.458	30.001	0.000	17.300	70.514	126.283
GDP pc ln							
Omitted	3,724	174.056	683.098	0.223	5.333	97.084	11,039.460
Imputed	3,761	172.473	679.923	0.223	5.244	95.747	11,039.460

A.2 Descriptive statistics

Table 7: Descriptive statistics for continuous variables

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Liberal Democracy	3,649	0.305	0.272	0.009	0.084	0.526	0.891
Liberal Democracy (std. error)	3,649	0.030	0.018	0.003	0.015	0.046	0.093
Democratic Openness	3,649	0.000	0.500	−2.046	−0.290	0.350	1.404
Autocratic Openness	3,649	0.000	0.500	−2.052	−0.285	0.316	1.660
Trade Openness	3,649	0.000	0.500	−1.947	−0.289	0.354	1.461
Competition	3,649	0.000	0.500	−1.296	−0.239	0.329	1.323
Financial Globalization	3,649	0.000	0.500	−1.141	−0.353	0.315	1.539
Trade Glob. De Jure	3,649	0.000	0.500	−0.809	−0.387	0.278	1.326
Democratic Neighbors	3,649	0.000	0.500	−0.568	−0.388	0.403	1.051
Political Globalization	3,649	0.000	0.500	−1.179	−0.374	0.345	1.207
GDP pc ln	3,646	0.000	0.500	−1.725	−0.397	0.348	1.857
Secondary Education	3,649	0.000	0.500	−0.751	−0.451	0.438	1.364
Breakdowns	3,649	0.000	0.500	−0.256	−0.256	0.421	2.452
Infant Mortality	3,649	0.000	0.500	−0.649	−0.448	0.412	1.576
Natural Resource	3,649	0.000	0.500	−0.098	−0.098	−0.082	11.013
RLE	3,649	0.000	0.500	−0.298	−0.260	0.062	6.392
Population	3,646	0.000	0.500	−0.141	−0.129	−0.063	5.005

Note: All variables except Liberal Democracy are standartized following the recommendation of Gelman (2008).

A.3 Results of Gravity Model Estimation

Table 8: Estimates of Gravity Equations For Bilateral Trade Flows

	Dependent variable:		
	Overall	Democratic	Autocratic
	(1)	(2)	(3)
Distance	-0.004^{***}	0.007^{***}	-0.006^{***}
	(0.001)	(0.002)	(0.0003)
GDP Per Capita origin	0.039^{***}	0.086^{***}	0.012^{***}
	(0.001)	(0.003)	(0.0004)
GDP Per Capita destination	0.039^{***}	0.045^{***}	0.013^{***}
	(0.0004)	(0.001)	(0.0003)
Regional Trade Agreement	$1{,}496.495^{***}$	$1{,}805.077^{***}$	277.950^{***}
	(18.200)	(43.576)	(9.823)
Contingency	$1{,}243.593^{***}$	$4{,}991.092^{***}$	186.619^{***}
	(18.770)	(64.062)	(7.316)
Common Currency	-163.726^{***}	$1{,}184.105^{***}$	23.212^{**}
	(27.699)	(186.196)	(10.100)
Common Legal System	90.963^{***}	156.733^{***}	19.362^{***}
	(6.692)	(19.498)	(2.769)
GATT Member origin	-16.098	-54.710	-5.164
	(14.084)	(38.158)	(5.984)
GATT Member destination	52.381^{***}	15.417	17.797^{***}
	(6.187)	(27.768)	(2.374)
Common Language	-2.414	119.261^{***}	-34.159^{***}
	(8.770)	(26.388)	(3.603)
Constant	-143.195^{**}	-326.767^{*}	0.524
	(67.914)	(197.105)	(27.869)
Observations	427,347	138,715	288,632
R^2	0.103	0.184	0.069

Note: *p<0.1; **p<0.05; ***p<0.01. All models include country and year fixed effects.

A.4 Overall effects of Trade

Table 9: Comparison with Frequentist Estimates: Overall Trade Openness

	Twoway FE		**Bayesian w/o Mes. Error**		**Bayesian w Mes. Error**	
Variable	**Estimate**	**95% Conf.Int.**	**Estimate**	**95% Cred.Int.**	**Estimate**	**95% Cred.Int.**
			Main Results			
Trade Openness	-0.01	[-0.058,0.029]	-0.01	[-0.04,0.012]	-0.01	[-0.038,0.009]
Trade Openness x RLE	**0.08**	[0.152,0.005]	**0.08**	[0.119,0.04]	**0.06**	[0.101,0.029]
RLE	0.04	[-0.043,0.127]	0.04	[-0.006,0.093]	0.04	[-0.003,0.093]
Competition	**0.04**	[0.002,0.072]	**0.04**	[0.008,0.067]	**0.03**	[0.008,0.061]
			Controls: Economic Globalization			
Financial Globalization	0.03	[-0.04,0.102]	**0.03**	[0.001,0.061]	**0.03**	[0.002,0.058]
Trade Glob. De Jure	0.02	[-0.117,0.158]	0.02	[-0.027,0.069]	0.03	[-0.013,0.076]
			Controls: International Influence			
Democratic Neighbors	**0.10**	[0.059,0.15]	**0.10**	[0.088,0.12]	**0.10**	[0.088,0.121]
Political Globalization	0.00	[-0.08,0.08]	0.00	[-0.042,0.047]	-0.00	[-0.045,0.04]
			Controls: Modernization Theory			
GDP pc log	0.01	[-0.092,0.103]	0.01	[-0.036,0.046]	0.01	[-0.03,0.051]
Secondary Education	0.05	[-0.011,0.103]	**0.05**	[0.013,0.08]	**0.04**	[0.01,0.069]
			Other Controls			
Breakdowns	**-0.15**	[-0.242,-0.057]	**-0.15**	[-0.186,-0.114]	**-0.14**	[-0.168,-0.103]
Natural Resources	**0.01**	[0.002,0.026]	**0.01**	[0.001,0.027]	0.01	[0,0.023]
Civil War	-0.01	[-0.042,0.013]	-0.01	[-0.035,0.005]	-0.01	[-0.031,0.006]
Infant Mortality	-0.01	[-0.089,0.078]	-0.01	[-0.05,0.039]	0.00	[-0.04,0.042]
Population	-0.02	[-0.17,0.133]	-0.02	[-0.087,0.053]	-0.01	[-0.082,0.06]
N	2507		2507		2507	
R^2	0.115					

A.5 Bayesian Model Averaging

Table 10: Results of Bayesian Model Averaging

				Posterior		
	Variable	Prior	PIP	2.5%	Mean	97.5%
1	Trade Openness	Random	0.11	-0.01	-0.00	0.01
		Uniform	0.03	-0.01	-0.00	0.01
		Fixed	0.04	-0.01	-0.00	0.01
2	Trade Openness x RLE	Random	0.02	-0.01	0.00	0.01
		Uniform	0.00	-0.00	0.00	0.00
		Fixed	0.00	-0.00	0.00	0.00
3	Competition	Random	0.08	-0.01	-0.00	0.01
		Uniform	0.04	-0.01	-0.00	0.01
		Fixed	0.04	-0.01	-0.00	0.01
4	RLE	Random	0.30	-0.03	-0.01	0.02
		Uniform	0.19	-0.02	-0.00	0.01
		Fixed	0.18	-0.02	-0.00	0.01
5	Financial Globalization	Random	0.24	-0.02	0.01	0.03
		Uniform	0.11	-0.01	0.00	0.02
		Fixed	0.10	-0.01	0.00	0.02
6	**Trade Glob. De Jure**	Random	1.00	0.09	0.12	0.14
		Uniform	1.00	0.09	0.12	0.14
		Fixed	1.00	0.09	0.12	0.14
7	**Democratic Neighbors**	Random	1.00	0.11	0.12	0.14
		Uniform	1.00	0.11	0.12	0.14
		Fixed	1.00	0.11	0.12	0.14
8	**Political Globalization**	Random	1.00	0.10	0.12	0.15
		Uniform	1.00	0.10	0.13	0.15
		Fixed	1.00	0.10	0.13	0.15
9	**GDP pc ln**	Random	1.00	0.04	0.07	0.11
		Uniform	1.00	0.04	0.07	0.11
		Fixed	1.00	0.04	0.07	0.10
10	**Secondary Education**	Random	0.96	0.02	0.05	0.08
		Uniform	0.95	0.01	0.05	0.08
		Fixed	0.94	0.01	0.05	0.08
11	**Breakdowns**	Random	1.00	-0.08	-0.06	-0.05
		Uniform	1.00	-0.08	-0.06	-0.05
		Fixed	1.00	-0.08	-0.06	-0.05
12	**Natural Resources**	Random	1.00	-0.07	-0.06	-0.05
		Uniform	1.00	-0.07	-0.06	-0.05
		Fixed	1.00	-0.07	-0.06	-0.05
13	Civil War	Random	0.48	-0.05	-0.01	0.02
		Uniform	0.35	-0.04	-0.01	0.02
		Fixed	0.34	-0.04	-0.01	0.02
14	**Infant Mortality**	Random	1.00	-0.12	-0.09	-0.06
		Uniform	1.00	-0.12	-0.09	-0.06
		Fixed	1.00	-0.12	-0.09	-0.06
15	Population	Random	0.14	-0.01	0.00	0.02
		Uniform	0.06	-0.01	0.00	0.01
		Fixed	0.06	-0.01	0.00	0.01

				Posterior		
	Variable	Prior	PIP	2.5%	Mean	97.5%
1	**Autocratic Openness**	Random	1.00	-0.07	-0.05	-0.03
		Uniform	1.00	-0.07	-0.05	-0.03
		Fixed	1.00	-0.07	-0.05	-0.03
2	**Democratic Openness**	Random	0.97	0.01	0.04	0.07
		Uniform	0.92	0.01	0.04	0.07
		Fixed	0.93	0.01	0.04	0.07
3	Competition	Random	0.47	-0.03	-0.01	0.01
		Uniform	0.14	-0.02	-0.00	0.01
		Fixed	0.15	-0.02	-0.00	0.01
4	RLE	Random	0.80	-0.05	-0.02	0.01
		Uniform	0.44	-0.04	-0.01	0.02
		Fixed	0.45	-0.04	-0.01	0.02
5	Financial Globalization	Random	0.27	-0.02	0.01	0.03
		Uniform	0.13	-0.02	0.00	0.02
		Fixed	0.12	-0.02	0.00	0.02
6	**Trade Glob. De Jure**	Random	1.00	0.10	0.12	0.15
		Uniform	1.00	0.10	0.13	0.15
		Fixed	1.00	0.10	0.13	0.15
7	**Democratic Neighbors**	Random	1.00	0.08	0.10	0.12
		Uniform	1.00	0.08	0.10	0.12
		Fixed	1.00	0.08	0.10	0.12
8	**Political Globalization**	Random	1.00	0.10	0.13	0.16
		Uniform	1.00	0.11	0.14	0.16
		Fixed	1.00	0.11	0.14	0.16
9	**GDP pc ln**	Random	0.96	0.02	0.06	0.11
		Uniform	0.83	-0.01	0.05	0.11
		Fixed	0.83	-0.01	0.05	0.11
10	**Secondary Education**	Random	1.00	0.03	0.05	0.08
		Uniform	0.98	0.02	0.05	0.09
		Fixed	0.98	0.02	0.05	0.09
11	**Breakdowns**	Random	1.00	-0.07	-0.06	-0.04
		Uniform	1.00	-0.08	-0.06	-0.04
		Fixed	1.00	-0.08	-0.06	-0.04
12	**Natural Resource**	Random	1.00	-0.07	-0.06	-0.04
		Uniform	1.00	-0.07	-0.06	-0.04
		Fixed	1.00	-0.07	-0.06	-0.04
13	Civil War	Random	0.76	-0.05	-0.02	0.01
		Uniform	0.42	-0.04	-0.01	0.02
		Fixed	0.41	-0.04	-0.01	0.02
14	**Infant Mortality**	Random	1.00	-0.12	-0.10	-0.07
		Uniform	1.00	-0.13	-0.10	-0.07
		Fixed	1.00	-0.13	-0.10	-0.07
15	Population	Random	0.32	-0.02	0.01	0.03
		Uniform	0.08	-0.01	0.00	0.01
		Fixed	0.08	-0.01	0.00	0.01

Note: The estimates of coefficients are averaged across 200 best models. Prior indicates one of three priors on the model size. Random prior is the "random theta" prior suggested by Ley & Steel (2009). Fixed prior assumes that each regressor has equal inclusion probability. Uniform prior assumes that number model size is uniformally distributed (extremely small and extremely large models are less likely). PIP indicates the posterior inclusion probability of covariates. The results support the previous findings that overall trade openness is an unreliable variable as it has a PIP of only 3-11%. However, autocratic and democratic openness are among the most robust predictors of democracy in levels as they both have nearly 100% inclusion probability.

A.6 Accounting for autocorrelation

Table 11: Models Accounting for Autocorrelation

	Arellano-Bond	5 Year	10 Year
Democratic Openness	0.037**	0.041**	0.041**
	(0.015)	(0.017)	(0.020)
Autocratic Openness	−0.022**	−0.046***	−0.030*
	(0.010)	(0.014)	(0.017)
Trade Globalization De Jure	−0.031	0.021	0.010
	(0.027)	(0.017)	(0.020)
Democratic Neighbors	0.025***	0.057***	0.046**
	(0.008)	(0.016)	(0.019)
Political Globalization	−0.011	0.047***	0.044**
	(0.020)	(0.017)	(0.019)
GDP Per Capita ln	−0.022	−0.000	0.006
	(0.019)	(0.022)	(0.025)
Secondary Education	0.005	0.040*	0.051*
	(0.010)	(0.023)	(0.028)
Democratic Breakdowns	−0.058**	0.039***	0.031**
	(0.028)	(0.011)	(0.013)
Natural Resources	0.003**	−0.013	−0.014
	(0.002)	(0.010)	(0.012)
Infant Mortality	−0.028*	−0.038*	−0.019
	(0.015)	(0.021)	(0.024)
Liberal Democracy Lagged	0.821***		
	(0.030)		
Initial Level of Democracy		0.718***	0.740***
		(0.028)	(0.033)
Intercept		0.127***	0.116***
		(0.009)	(0.011)
Observations	2937	550	329
Sargan Test: p-value	1.000		
Wald Test Coefficients: p-value	0.000		
Wald Test Time Dummies: p-value	0.006		
R^2		0.826	0.859

Note: *p<0.1; **p<0.05; ***p<0.01. The Null hypothesis of the Sargan's test states that the overidentifying restrictions are valid and is not rejected in this case. Wald test verifies that Time effects are significant as well as other model coefficients.

A.7 Results of Markov Regressions for Ordered Probit

Table 12: Full Results of Markov Regressions

	Epstein et al. (2006) Trichotomous Democracy Indicator				
	AW Data	New Data			
	(1)	(2)	(3)	(4)	(5)
Y1	−3.752***	−3.729***	−1.624	−1.202	−3.281***
	(1.150)	(0.651)	(1.112)	(1.246)	(0.719)
Y0	−2.885***	−4.176***	−3.246***	−3.729***	−3.824***
	(0.890)	(0.494)	(0.670)	(0.819)	(0.479)
Trade Openness	−0.012	−0.112***	−0.130***	−0.132***	
	(0.035)	(0.033)	(0.036)	(0.041)	
Trade Openness x Y1	0.043	0.095***	0.112***	0.113***	
	(0.041)	(0.035)	(0.037)	(0.042)	
Trade Openness x Y0	−0.042	0.019	0.018	0.020	
	(0.032)	(0.013)	(0.013)	(0.013)	
RLE	−0.367	−0.581***	−0.262	−0.138	
	(0.978)	(0.112)	(0.161)	(0.176)	
RLE x Y1	0.683	0.468***	0.163	−0.005	
	(1.179)	(0.131)	(0.181)	(0.200)	
RLE x Y0	−0.795	0.080	−0.014	0.051	
	(0.857)	(0.083)	(0.101)	(0.120)	
RLE x Trade Openness	−0.010	0.021***	0.024***	0.025***	
	(0.030)	(0.007)	(0.007)	(0.008)	
RLE x Trade Openness x Y1	−0.004	−0.018**	−0.021***	−0.022**	
	(0.036)	(0.007)	(0.008)	(0.008)	
RLE x Trade Openness x Y0	0.027	−0.003	−0.003	−0.003	
	(0.026)	(0.003)	(0.003)	(0.003)	
Democratic Openness					0.011**
					(0.005)
Democratic Openness x Y1					−0.016**
					(0.008)
Democratic Openness x Y0					−0.006
					(0.008)
Autocratic Openness					−0.194***
					(0.037)
Autocratic Openness x Y1					0.183***
					(0.037)
Autocratic Openness x Y0					0.016**
					(0.007)
Trade Globalization De Jure			0.005	0.001	−0.014
			(0.008)	(0.009)	(0.008)
Trade Globalization De Jure x Y1			−0.005	0.000	0.016*
			(0.009)	(0.010)	(0.009)
Trade Globalization De Jure x Y0			−0.011*	−0.011*	−0.012*
			(0.006)	(0.007)	(0.006)
Financial Globalization			0.042***	0.046***	0.018
			(0.010)	(0.012)	(0.013)
Financial Globalization x Y1			−0.037***	−0.041***	−0.014
			(0.011)	(0.013)	(0.014)
Financial Globalization x Y0			−0.010	−0.011	−0.009
			(0.007)	(0.007)	(0.007)
Proportion Democracies	0.016	0.024**	0.002	−0.006	0.003
	(0.011)	(0.011)	(0.013)	(0.014)	(0.014)
Proportion Democracies x Y1	−0.022	−0.023*	−0.002	0.006	−0.002
	(0.013)	(0.012)	(0.014)	(0.015)	(0.016)
Proportion Democracies x Y0	0.022**	0.013	0.018*	0.017*	0.014
	(0.010)	(0.009)	(0.009)	(0.010)	(0.011)
Neighboring Democracies	0.086	0.243	0.092	0.047	−0.317
	(0.343)	(0.349)	(0.363)	(0.392)	(0.410)
Neighboring Democracies x Y1	0.328	0.084	0.236	0.296	0.723
	(0.410)	(0.418)	(0.430)	(0.461)	(0.476)
Neighboring Democracies x Y0	0.502	0.546	0.520	0.309	0.324
	(0.344)	(0.346)	(0.354)	(0.376)	(0.373)
Breakdowns	−0.272**	−0.265**	−0.239**	−0.211	−0.365***
	(0.127)	(0.120)	(0.120)	(0.129)	(0.141)
Breakdowns x Y1	0.145	0.156	0.120	0.051	0.169
	(0.148)	(0.142)	(0.143)	(0.154)	(0.165)
Breakdowns x Y0	0.459***	0.458***	0.492***	0.485***	0.520***
	(0.107)	(0.109)	(0.111)	(0.119)	(0.119)
Communist	−0.100	−0.056	−0.057	−0.102	−0.171
	(0.209)	(0.214)	(0.218)	(0.236)	(0.235)
Neighbor Democratic Transitions	0.250**	0.234*	0.229*	0.233*	0.226*
	(0.119)	(0.120)	(0.120)	(0.122)	(0.124)
GDP Per Capita	0.000	0.002**	0.003***	0.004***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
GDP Per Capita x Y1	−0.000	−0.002*	−0.003***	−0.004***	−0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
GDP Per Capita x Y0	−0.000	−0.001	−0.001	−0.001	−0.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
GDP Growth	0.042*	0.051**	0.046*	0.053**	0.048*
	(0.022)	(0.024)	(0.025)	(0.027)	(0.028)
GDP Growth x Y1	−0.048**	−0.056**	−0.052**	−0.061**	−0.057**
	(0.024)	(0.026)	(0.027)	(0.028)	(0.029)
GDP Growth x Y0	−0.001	−0.001	0.001	0.001	0.001
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)
Secondary Education				0.017**	0.014*
				(0.007)	(0.008)
Secondary Education x Y1				−0.021**	−0.016**
				(0.008)	(0.008)
Secondary Education x Y0				0.006	0.008*
				(0.005)	(0.005)
Political Globalization				−0.012	−0.010
				(0.012)	(0.013)
Political Globalization x Y1				0.017	0.016
				(0.014)	(0.014)
Political Globalization x Y0				0.002	0.004
				(0.008)	(0.008)
Natural Resources				−0.000	−0.000
				(0.000)	(0.000)
Observations	3,161	2,955	2,955	2,955	3,128
Log Likelihood	−646.641	−630.298	−615.364	−608.410	−598.359

Note: *p<0.1; **p<0.05; ***p<0.01

A.8 List of states by effects of trade

- Positive
  - **Overall.** Albania, Australia, Canada, Chad, Georgia, Guinea-Bissau, Ireland, Kenya, Lithuania, Myanmar (Burma), Nepal, Pakistan, Russia, Senegal, Sierra Leone, Slovakia, Ukraine, Uzbekistan
  - **Democratic.** Albania, Australia, Canada, Chad, Georgia, Greece, Hungary, Ireland, Japan, Lithuania, Morocco, Myanmar (Burma), Nepal, Pakistan, Russia, Senegal, Sierra Leone, Slovakia, Thailand, Uzbekistan
  - **Autocratic.** Albania, Bhutan, Chad, Guinea-Bissau, Ireland, Pakistan, Qatar
- Negative
  - **Overall.** Argentina, Belgium, Burkina Faso, Cyprus, Equatorial Guinea, Ethiopia, Finland, Germany, Guyana, Iran, Israel, Kazakhstan, Malawi, Papua New Guinea, Philippines, Saudi Arabia, Sri Lanka
  - **Democratic.** Austria, Belgium, Bosnia & Herzegovina, Ethiopia, Germany, Iran, Philippines, Sri Lanka
  - **Autocratic.** Australia, Botswana, Burundi, Canada, China, Cyprus, Japan, Kazakhstan, Nepal, Nicaragua, Russia, Senegal, Sweden, Thailand

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