

# Democratization, Contracts and Comparative Advantage

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## Abstract

We study how the international spread of democracy shaped the comparative advantage of countries. Using data on the “Third Wave of Democratization” between 1976 and 2000 we find that democratizing countries shifted their exports towards more contract intensive goods that require a larger portion of relationship-specific inputs. This shift is observed on the intensive margin (volumes of industry-level exports) as well as the extensive margin of trade (number of goods a country exports). Using an instrumental variable strategy based on democracy waves, alternative proxy variables and subsamples suggests that the effects of democratization on trade specialization are causal.

**JEL classification:** L14, D23, F11, O10

**Keywords:** Comparative advantage; Institutional change; Relationship-specific investments.

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# 1 Introduction

According to neoclassical trade theory, the factor endowments of a country and industry-level dependencies on those factors determine the comparative advantage of an economy. The literature on the determinants of cross-country cross-industry specialization has documented that factors such as the level of financial development, the quality of judicial institutions or the stringency of environmental regulations shape trade patterns (Manova, 2008; Nunn, 2007, Broner et al., 2012). Few studies in this literature take a dynamic approach and consider the role of changing institutional factors on trade patterns. This has two drawbacks. First, static analyses may leave open which way causality runs. Natural comparative advantage may have potentially incentivized countries to develop the aforementioned factors to further support their exporting industries.<sup>1</sup> Second, cross-sectional studies are unable to test the Rybczynski theorem, a sharp prediction of the neoclassical trade model. The theorem states that an increase in the endowment of one factor should decrease, in absolute terms, exports in industries that use this factor less intensively.<sup>2</sup> In contrast to the extensive evidence on factors contributing to the pattern of specialization, the role these reallocation effects play for the dynamics of comparative advantage is not well understood empirically.

To overcome these shortcomings, we exploit the spread of democracy between 1976 and 2000 as a shock to the ability to export contract intensive goods. We postulate that institutional change driven by democratization benefits contract intensive industries since those industries depend strongly on the higher institutional quality associated with democratic regimes. Our study builds on Nunn (2007), who studies the effect of judicial institutions on comparative advantage in those goods. We extend his analysis by investigating the effect of “The Third Wave of Democratization” (Huntington, 1991) on the specialization in contract intensive goods. By doing so, we clarify the direction of causality and provide novel evidence how institutional change affects a country’s comparative advantage. Our results indicate that democratizing countries export relatively more contract intensive goods that rely to a larger portion on relationship-specific inputs. Furthermore, we find support for a Rybczynski effect as democratizing economies export less goods with relatively low contract intensity. We find these results robust to controlling for several confounding factors such as differences in income, human and physical capital. Additionally, we instrument for democratization using democracy waves.

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<sup>1</sup>See Do et al. (2016) for evidence on this hypothesis.

<sup>2</sup>A notable exception is the study by Manova (2008). The author estimates cross-country cross-industry regressions with panel data and finds that financial liberalization leads to an increase in all exports, benefiting industries dependent on external finance the most. She does not find evidence in favor of reallocation of economic activity, from less to more financially dependent sectors.

## 2 Data and Estimation Equation

The three most important variables in the empirical analysis are export flows, a measure of contract intensity and data on democracy. We aggregate bilateral trade data from Feenstra et al. (2005) at the SITC Rev. 2 level to the 1997 US I-O industry classification and across destinations to get industry-level exports to the rest of the world using the method described in Nunn (2007).

Following Nunn (2007), we construct our measure of contract intensity by combining Rauch’s (1999) classification of final goods with data on input use from the US I-O table. Specifically, contract intensity measures the share of inputs that are neither reference priced nor sold on an organized exchange, i.e. the share of industry-level production that requires the producer to write a contract with the supplier and is thus prone to hold-up problems. We rely on the measure provided by Nunn (denoted by  $z^{rs1}$  in his paper) because for older I-O tables before 1997 20% fewer SITC industries can be linked to I-O industries. Since the Rauch classification is available at the SITC level, this arguably creates random measurement error when determining the relationship-specificity of a supplier industry.<sup>3</sup>

As our main measure of political institutions, we use the binary democracy indicator provided by Acemoglu et al. (forthcoming). This regime coding takes into account both formal aspects such as the existence of free election, but also de facto constraints on the executive. Consolidating a number of existing measures into one variable aims at minimizing measurement error.<sup>4</sup> Control variables include human capital, capital stock and GDP data from the PWT 9.0 (Feenstra et al., 2015) as well as industry characteristics from Nunn (2007). The final dataset consists of 154 countries and 219 industries over 25 years.<sup>5</sup>

In what follows, results based on estimating variations of the following equation will be presented:

$$x_{cit} = \delta_0 + \beta_1 \cdot D_{ct} + \beta_2 \cdot D_{ct} \cdot z_i + X' + \gamma_c + \gamma_i + \gamma_t + \epsilon_{cit}, \quad (1)$$

where  $x_{cit}$  will either be the log of total industry-level exports (intensive margin) or a dummy variable that takes the value 1 if a country exported in that industry in a given year (extensive margin). All estimations include combinations of year, country and industry fixed effects.  $X'$  is a vector of control variables. While  $\beta_1$  measures the conditional correlation between the dichotomous democracy measure  $D_{ct}$  and the outcome  $x_{cit}$ , the parameter  $\beta_2$  is the coefficient of interest. It allows the effect of democracy on the respective outcome to vary by the contract intensity of an industry  $z_i$ . Based on the hypothesis that contract intensive industries profit

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<sup>3</sup>Nevertheless, we constructed contract intensities based on the 1987 and 1977 I-O tables, which shows that these measures are highly correlated across years at about 0.8.

<sup>4</sup>See their paper for a discussion of their and related measures of political institutions.

<sup>5</sup>We focus on the period 1976-2000, as most democratizations of the “Third Wave” fall into this window and because it is unlikely that the time constant measure of contract intensity is representative of an even longer stretch.

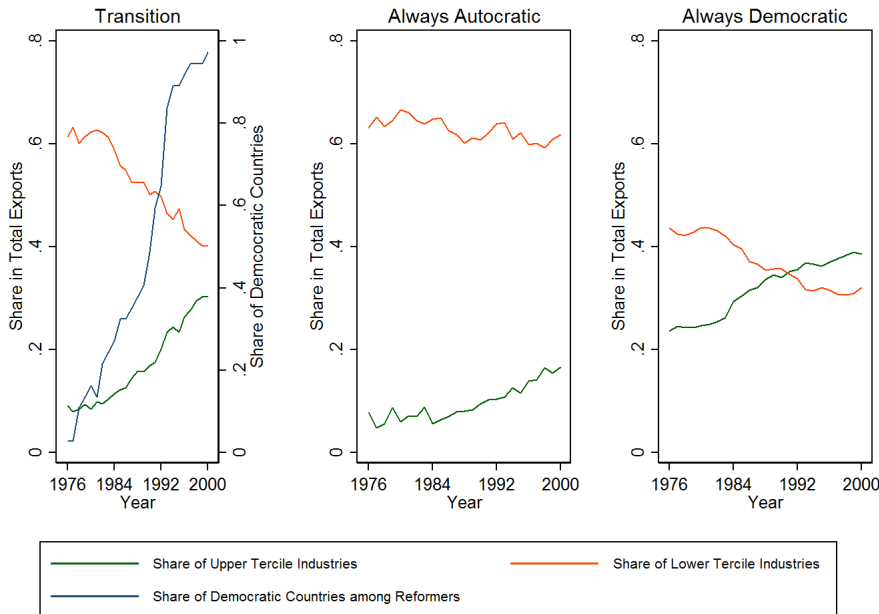
the most from democratization, we expect  $\beta_2 > 0$ .

### 3 Results

#### 3.1 Graphical Evidence

To illustrate the regression results, we divide industry-level exports into terciles according to their contract intensity. Figure 1 displays how the share of the upper and lower tercile in overall exports evolve for the three groups of countries in our data, transition, always autocratic and always democratic countries.<sup>6</sup>

FIGURE 1: TRENDS IN THE IMPORTANCE OF CONTRACT INTENSIVE GOODS 1976-2000



The evidence shows that transition countries and always autocratic countries start out with a similarly small share of their exports in the most contract intensive industries. By the end of the sample period, contract intensive exports are about twice as important among transition(ed) countries compared to autocratic countries.

The ex-ante similarity of autocracies and transition countries is relevant to the interpretation of the regression based results. Levchenko (2013) argues that institutional change is a result of countries aiming to retain rents that are generated from exporting an institutionally intensive good. Econometrically, this would lead to an upward bias of the coefficient  $\beta_2$  due to reverse causation. In Appendix A.1, we present a simple test for initial differences among countries' specialization patterns. These results broadly confirm the visual impressions conveyed in Figure

<sup>6</sup>The definition of transition countries follows the definition of partial and full democratizations by Papaioannou and Siourounis (2008).

1, namely that there is no significant initial difference between autocracies and transition countries with regards to their specialization pattern. Though the evidence presented clearly does not constitute an exhaustive test of Levchenko’s hypothesis, it seems that democratizations are relatively exogenous with respect to countries’ initial comparative advantage.

### 3.2 Intensive Margin

We start by investigating the effect of democratization on the intensive margin of exports. In Table 1, the dependent variable is the log of total industry-level exports. The standard errors are clustered on the country-industry level to account for the serial correlation of trade flows over time. Abadie et al. (2017) suggest to correct the standard errors by clustering at the treatment cluster level which is at the country-industry level, here. We also report two-way cluster robust standard errors that correct for clustering at the country and industry level in brackets. All specifications control for log per capita GDP.<sup>7</sup>

Column (1) shows that democratization is associated with a secular increase in exporting volume. Column (2) features the interaction term between contract intensity and democracy. It has the expected sign and is statistically highly significant. Interestingly, the coefficient  $\beta_1$  now becomes quite large and significantly negative. This indicates that only industries above the mean level of contract intensity benefit from democratization. In line with the Rybczynski theorem, industries low in contract intensity decrease substantially in response to democratization. Looking at the size of the coefficient reveals that the effect is also economically significant: The industry at the 80th percentile in contract intensity, (refrigeration & forced air heating) saw a 58 percentage points larger increase than the one at the 20th percentile (knit fabric mills).

The results from the remaining columns can be summarized as follows: The specification in column (3) uses the same fixed effects but adds Heckscher-Ohlin factor intensity terms, the respective country-level endowments (output suppressed) and an interaction of GDP with  $z_i$ . Skill and capital industry-level intensities are from Nunn (2007) and their definition is in the table notes. While this cuts the size of the coefficient in half, it shows that the effect of democratization on exports in contract intensive industries is distinct from simultaneous accumulation processes and GDP growth. In relative terms, we can determine the importance of democratization by comparing it to the effect of classical H-O forces. Across columns (3)-(6), the effect of democratization on export volumes in contract intensive industries is slightly lower than the H-O effects combined, but always greater than either one taken individually.<sup>8</sup>

In addition to the control variables, columns (4)-(6) show that the effect is also robust to stricter fixed effects. One should be cautious, however, when interpreting the size of the estimated coefficient of interest,  $\beta_2$ , based on these specifications. For one, the industry characteristics are

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<sup>7</sup>For brevity, we refer to log per capita GDP simply as GDP.

<sup>8</sup>The 80-20 spreads are 0.42 for contract, 0.2 for skill and 0.6 for capital intensity for the 181 industries for which all three measures are available.

economically linked, such that an increase in contract intensity cannot be viewed as separate from increasing, for instance, the Herfindahl index, a related measure of input intensity. Second, human and physical capital accumulation and GDP are themselves affected by political institutions (Acemoglu et al., 2014). Thus, columns (2)-(6) in Table 1 present plausible upper and lower bounds of our effect. While two-way clustering at the country and industry level generally yields larger standard errors, our coefficient of interest remains significant throughout all specifications with the exception of column (4).

### 3.3 Extensive Margin

Next, we explore whether democratization also matters on the extensive margin. Even without focusing on bilateral exports, the export data is sufficiently disaggregated to allow this. For the dependent variable, we assign observations where a trade flow is recorded the value 1 and the remaining observations the value 0. Table 2 displays the results of estimating a linear probability model, as in equation 1.

The interaction between contract intensity and the indicator of democratization is again positive and significant. It remains largely unchanged, when we add more control interactions across columns. These results again indicate that democratization *decreases* the probability of exporting in the least contract intensive industries. To get a sense whether the estimated effect is large in absolute terms, we compare the effect of democratization on the extensive margin of exports with that of a one standard deviation increase in human capital. The effect of such an increase in human capital is about twice the size of the effect of democratization.

### 3.4 Sensitivity Analyses

Finally, we discuss two further endogeneity concerns that might confound our results. In particular, we focus on bias caused by measurement errors and reversed causality.

First, measurement error can bias our estimates. Ciccone and Papaioannou (2016) point out that there is the possibility of an amplification bias in the coefficient of interest when data on the industry characteristic  $z_i$  derived from US Input-Output tables is imposed on other countries. Intuitively, amplification arises if the measurement error of using US instead of own country data covaries with the country characteristic,  $D_{ct}$ . They also find that amplification bias is unlikely to drive results in the context of contract intensity and judicial institutions. In Table A1 of the appendix, we reestimate equation (1) focusing only on countries that transitioned during the “Third Wave” in order to include a comparable group of economies. We find that our results are robust to focusing on countries that share the same political trajectory. In Table A2 we replicate our estimation using the Polity Score or an older I-O table from 1977 to

confirm that our results do not hinge on the proxies for democracy and contract intensity we used.

Second, our estimates of democratization on trade patterns could suffer from reversed causality or other omitted factors. We address these concerns by following an instrumental variable strategy based on regional waves of democratization and reversals to instrument for democracy as suggested by Acemoglu et al. (forthcoming). Also the instrumental variable regression supports the hypothesis that democratization favors exports in contract intensive industries. Appendix A.3 provides more details on the instrumental variable estimation.

## 4 Discussion

We provide evidence suggesting that democratization does not promote trade uniformly but rather leads to a significant reallocation of exports by democratizing economies. One way of interpreting these results, formalized by Levchenko (2013), is that institutional change occurs to retain rents in contract intensive industries and then feeds back into productivity. However, this idea does not appear to fully drive our results given the ex-ante similarity between transition countries and autocracies. More plausibly, our results reflect the existence of prior institutional constraints on investment in contract intensive industries and a Rybczynski effect following democratization. Our results are robust to further sensitivity analyses such as using different fixed effect schemes and control variables, variable measurements as well as instrumental variables estimates.

TABLE 1: THE EFFECT OF DEMOCRATIZATION ON COMPARATIVE ADVANTAGE

|   | (1)                              | (2)                              | (3)                              | (4)                              | (5)                             | (6)                             |
|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|
| Democracy: $D_{ct}$                               | 0.0451**<br>(0.0184)<br>[0.0832] | -0.565***<br>(0.0460)<br>[0.171] | -0.290***<br>(0.0531)<br>[0.157] | -1.734***<br>(0.236)<br>[0.602]  | -0.785***<br>(0.201)<br>[0.376] |                                 |
| Democracy interaction: $D_{ct} \times z_i$        |                                  | 1.288***<br>(0.0890)<br>[0.329]  | 0.648***<br>(0.0994)<br>[0.286]  | 0.432***<br>(0.103)<br>[0.282]   | 0.414***<br>(0.0895)<br>[0.188] | 0.338***<br>(0.0823)<br>[0.184] |
| GDP interaction: $Y_{ct} \times z_i$              |                                  |                                  | 0.724***<br>(0.0595)<br>[0.197]  | 0.732***<br>(0.0593)<br>[0.196]  | 2.066***<br>(0.154)<br>[0.404]  | 2.182***<br>(0.142)<br>[0.417]  |
| Skill interaction: $HC_{ct} \times skill_i$       |                                  |                                  | 0.784***<br>(0.131)<br>[0.439]   | 0.723***<br>(0.130)<br>[0.438]   | 0.708**<br>(0.289)<br>[0.991]   | 0.670***<br>(0.256)<br>[0.977]  |
| Capital interaction: $C_{ct} \times capital_i$    |                                  |                                  | 0.185***<br>(0.0254)<br>[0.0752] | 0.191***<br>(0.0254)<br>[0.0756] | 0.106*<br>(0.0599)<br>[0.147]   | 0.0719<br>(0.0539)<br>[0.152]   |
| Herfindahl interaction: $D_{ct} \times (1 - H_i)$ |                                  |                                  |                                  | 1.755***<br>(0.277)<br>[0.693]   | 0.762***<br>(0.237)<br>[0.414]  | 0.489**<br>(0.222)<br>[0.376]   |
| 80th vs. 20th percentile in $z_i$                 |                                  | 58%                              | 27%                              | 18%                              | 19%                             | 14%                             |
| Country F.E.                                      | yes                              | yes                              | yes                              | yes                              | no                              | no                              |
| Industry F.E.                                     | yes                              | yes                              | yes                              | yes                              | no                              | no                              |
| Country-Industry F.E.                             | no                               | no                               | no                               | no                               | yes                             | yes                             |
| Year F.E.   | yes                              | yes                              | yes                              | yes                              | yes                             | no                              |
| Country-Year F.E.                                 | no                               | no                               | no                               | no                               | no                              | yes                             |
| Observations                                      | 342942                           | 342942                           | 273986                           | 273986                           | 272188                          | 272181                          |
| Number of country-industry clusters               | 25307                            | 25307                            | 19292                            | 19292                            | 17494                           | 17494                           |

The dependent variable is the log of total industry-level exports. Standard errors clustered at the country-industry level in parentheses; two-way cluster robust standard errors, clustered at the country and the industry level, in brackets.  $capital_i$  (capital intensity) is defined as the total capital stock divided by value added.  $skill_i$  (skill intensity) is the ratio of non-production workers' wages to total wages.  $z_i$  (contract intensity) is the share of inputs not sold on an organized exchange or reference priced.  $1 - HI_i$  is 1 minus the Herfindahl index. These measures are calculated based on US industry-level data. Specifications including GDP, Skill and Capital interaction terms also control for the respective country-level co-variate (output suppressed). "80th vs. 20th percentile" indicates how many percentage points larger the marginal effect of democratization is for the 80th percentile industry in contract intensity compared to the 20th percentile industry.  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*.

TABLE 2: EXTENSIVE MARGIN EFFECTS

|   | (1)                                 | (2)                                 | (3)                                 | (4)                                 | (5)                               |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-----------------------------------|
| Democracy: $D_{ct}$                               | -0.0270***<br>(0.00560)<br>[0.0179] | -0.0254***<br>(0.00559)<br>[0.0177] | -0.0206***<br>(0.00638)<br>[0.0188] | -0.0205***<br>(0.00638)<br>[0.0188] |                                   |
| Democracy interaction: $D_{ct} \times z_i$        | 0.0806***<br>(0.0104)<br>[0.0235]   | 0.0772***<br>(0.0104)<br>[0.0228]   | 0.0730***<br>(0.0114)<br>[0.0226]   | 0.0727***<br>(0.0114)<br>[0.0224]   | 0.0741***<br>(0.0110)<br>[0.0224] |
| GDP interaction: $Y_{ct} \times z_i$              |                                     | 0.128***<br>(0.0183)<br>[0.0458]    |                                     | 0.137***<br>(0.0214)<br>[0.0489]    | 0.137***<br>(0.0192)<br>[0.0499]  |
| Skill interaction: $HC_{ct} \times skill_i$       |                                     |                                     | 0.347***<br>(0.0465)<br>[0.199]     | 0.319***<br>(0.0467)<br>[0.197]     | 0.320***<br>(0.0426)<br>[0.198]   |
| Capital interaction: $C_{ct} \times capital_i$    |                                     |                                     | -0.0140*<br>(0.00787)<br>[0.0159]   | 0.00464<br>(0.00828)<br>[0.0171]    | 0.00461<br>(0.00752)<br>[0.0175]  |
| Herfindahl interaction: $D_{ct} \times (1 - H_i)$ |                                     |                                     |                                     |                                     | -0.0104<br>(0.0292)<br>[0.0537]   |
| 80th vs. 20th percentile in $z_i$                 | 3.6%                                | 3.5%                                | 3.1%                                | 3.1%                                | 3.1%                              |
| Country-Industry F.E.                             | yes                                 | yes                                 | yes                                 | yes                                 | yes                               |
| Year F.E.   | yes                                 | yes                                 | yes                                 | yes                                 | no                                |
| Country-Year F.E.                                 | no                                  | no                                  | no                                  | no                                  | yes                               |
| Observations                                      | 720072                              | 720072                              | 544810                              | 544810                              | 544810                            |
| Number of country-industry clusters               | 31755                               | 31755                               | 23530                               | 23530                               | 23530                             |

The dependent variable takes the value 1 if a trade flow is recorded on the BEA 1997 industry-level zero otherwise. Zeros are imputed. Standard errors clustered at the country-industry level in parentheses; two-way cluster robust standard errors, clustered at the country and the industry level, in brackets. See Table 1 for a description of the control variables. Specifications including GDP, Skill and Capital interaction terms also control for the respective country-level co-variate (output suppressed). “80th vs. 20th percentile” indicates how many percentage points larger the marginal effect of democratization is for the 80th percentile industry in contract intensity compared to the 20th percentile industry.  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*.

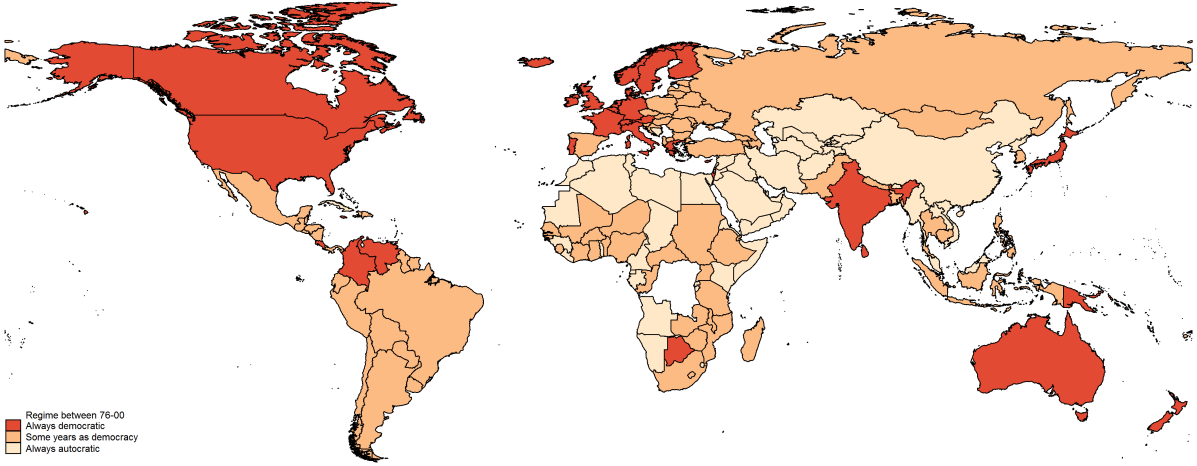
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# A Supplementary Material

FIGURE 2: REGIME TRANSITIONS 1976-2000



## A.1 Initial Specialization Patterns

To test the similarity of a country's exporting portfolios formally, we compute, for the year 1976, the institutional intensity of a country's exports, defined as  $\sum_i X_{ci} \times z_i / X_c$ , where  $X_{ci}$  are industry-level exports,  $z_i$  measures an industry's contract intensity and  $X_c$  is the total of all exports. This index follows Manova (2008) and is conceptually similar to Levchenko's (2013) preferred measure. To compare the two groups of countries, we conduct both a parametric t-test and a Mann-Whitney-U test. The t-test for equality of means is unable to reject the null of equal means ( $p = 0.43, N = 87$ ). Similarly, the null under the Mann-Whitney-U test for equal distribution in the two groups and hence equal mean rank is not rejected ( $p = 0.23, N = 87$ ). Results using only the share of exports in the upper tercile are somewhat less clear cut. The t-test for equality of means also does not reject the null ( $p = 0.61, N = 87$ ), while the Mann-Whitney-U does find a significant difference at the 5%-level. ( $p = 0.036, N = 87$ ). However, the results based on the intensity measure are arguably more reliable as they take into account the full distribution of exports and do not rely on an arbitrary cutoff rule such as the upper tercile used above.

## A.2 Further Robustness Checks

TABLE A1: SWITCHERS ONLY

|  | (1)                              | (2)                              | (3)                              | (4)                                 | (5)                                | (6)                                 |
|--|----------------------------------|----------------------------------|----------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
|  | Intensive Margin                 |                                  |                                  | Extensive Margin                    |                                    |                                     |
|  | All switchers                    | Full reformers                   | Without socialist                | All switchers                       | Full reformers                     | Without socialist                   |
| Democracy: $D_{ct}$                            | -0.277***<br>(0.0459)<br>[0.105] | -0.228***<br>(0.0563)<br>[0.115] | -0.343***<br>(0.0530)<br>[0.108] | -0.0319***<br>(0.00644)<br>[0.0205] | -0.0233**<br>(0.00977)<br>[0.0295] | -0.0478***<br>(0.00677)<br>[0.0200] |
| Democracy interaction: $D_{ct} \times z_i$     | 0.560***<br>(0.0849)<br>[0.201]  | 0.392***<br>(0.105)<br>[0.225]   | 0.630***<br>(0.0996)<br>[0.240]  | 0.0797***<br>(0.0114)<br>[0.0224]   | 0.0860***<br>(0.0169)<br>[0.0303]  | 0.0784***<br>(0.0120)<br>[0.0228]   |
| GDP interaction: $Y_{ct} \times z_i$           | 1.595***<br>(0.262)<br>[0.475]   | 1.943***<br>(0.303)<br>[0.526]   | 1.518***<br>(0.309)<br>[0.567]   | 0.159***<br>(0.0373)<br>[0.0744]    | 0.228***<br>(0.0554)<br>[0.101]    | 0.127***<br>(0.0399)<br>[0.0826]    |
| Skill interaction: $HC_{ct} \times skill_i$    | 0.217<br>(0.512)<br>[1.173]      | 0.883<br>(0.575)<br>[1.198]      | 0.419<br>(0.586)<br>[1.254]      | 0.109<br>(0.0704)<br>[0.190]        | 0.193**<br>(0.0943)<br>[0.223]     | 0.0713<br>(0.0771)<br>[0.193]       |
| Capital interaction: $C_{ct} \times capital_i$ | 0.124<br>(0.0912)<br>[0.139]     | 0.223**<br>(0.0995)<br>[0.149]   | 0.169<br>(0.103)<br>[0.141]      | -0.0122<br>(0.0126)<br>[0.0192]     | -0.0234<br>(0.0161)<br>[0.0278]    | -0.00945<br>(0.0134)<br>[0.0193]    |
| 80th vs. 20th percentile in $z_i$              | 24%                              | 17%                              | 27%                              | 3.4%                                | 3.4%                               | 3.3%                                |
| Country-Industry F.E.                          | yes                              | yes                              | yes                              | yes                                 | yes                                | yes                                 |
| Year F.E.                                      | yes                              | yes                              | yes                              | yes                                 | yes                                | yes                                 |
| Observations                                   | 110524                           | 76719                            | 81237                            | 271138                              | 129053                             | 229870                              |
| Number of country-industry clusters            | 8318                             | 4996                             | 5750                             | 12127                               | 5973                               | 9231                                |

In columns 1 to 3, the dependent variable is the log of total BEA 1997 industry-level exports. In columns 4 to 6, the dependent variable takes the value 1 if a trade flow is recorded on the industry-level and zero otherwise. Zeros are imputed. Standard errors clustered at the country-industry level in parentheses; two-way cluster robust standard errors, clustered at the country and the industry level, in brackets. Democracy takes the value 1 in all years a country is democratic and zero otherwise.  $capital_i$  (capital intensity) is defined as the total capital stock divided by value added.  $skill_i$  (skill intensity) is the ratio of non-production workers' wages to total wages.  $z_i$  (contract intensity) is the share of inputs not sold on an organized exchange or reference priced.  $1 - HI_i$  is 1 minus the Herfindahl index. These measures are calculated based on US industry-level data. Specifications including GDP, Skill and Capital interaction terms also control for the respective country-level co-variate (output suppressed). "80th vs. 20th percentile" indicates how many percentage points larger the marginal effect of democratization is for the 80th percentile industry in contract intensity compared to the 20th percentile industry.  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*.

TABLE A2: DIFFERENT MEASURES OF CONTRACT INTENSITY AND POLITICAL INSTITUTIONS

|   | (1)                              | (2)                               | (3)                                 | (4)                                  |
|---|----------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
|   | Intensive Margin                 |                                   | Extensive Margin                    |                                      |
| <b>Panel A: Polity Score</b>                      |                                  |                                   |                                     |                                      |
| Polity 2: $P_{ct}$                                | -0.633***<br>(0.0665)<br>[0.196] |                                   | -0.0642***<br>(0.00906)<br>[0.0293] |                                      |
| Polity interaction: $P_{ct} \times z_i$           | 1.245***<br>(0.128)<br>[0.344]   | 0.499***<br>(0.136)<br>[0.312]    | 0.144***<br>(0.0168)<br>[0.0430]    | 0.134***<br>(0.0181)<br>[0.0405]     |
| Skill interaction: $HC_{ct} \times skill_i$       |                                  | 0.616**<br>(0.260)<br>[0.991]     |                                     | 0.297***<br>(0.0435)<br>[0.196]      |
| Capital interaction: $C_{ct} \times capital_i$    |                                  | 0.0594<br>(0.0541)<br>[0.153]     |                                     | 0.00257<br>(0.00763)<br>[0.0176]     |
| GDP interaction: $Y_{ct} \times z_i$              |                                  | 2.175***<br>(0.143)<br>[0.418]    |                                     | 0.131***<br>(0.0195)<br>[0.0480]     |
| Herfindahl interaction: $P_{ct} \times (1 - H_i)$ |                                  | 0.658*<br>(0.366)<br>[0.670]      |                                     | 0.0119<br>(0.0470)<br>[0.0924]       |
| 80th vs. 20th percentile in $z_i$                 | 56%                              | 21%                               | 6.5%                                | 5.7%                                 |
| Observations                                      | 331458                           | 267011                            | 681528                              | 525081                               |
| Number of country-industry clusters               | 21846                            | 17008                             | 30441                               | 22806                                |
| <b>Panel B: Using data from 1977</b>              |                                  |                                   |                                     |                                      |
| Democracy: $D_{ct}$                               | -0.169***<br>(0.0453)<br>[0.112] |                                   | -0.0403***<br>(0.00589)<br>[0.0183] |                                      |
| Democracy interaction: $D_{ct} \times z_i$        | 0.623***<br>(0.0856)<br>[0.177]  | 0.263***<br>(0.0871)<br>[0.173]   | 0.110***<br>(0.0110)<br>[0.0231]    | 0.114***<br>(0.0114)<br>[0.0265]     |
| GDP interaction: $Y_{ct} \times z_i$              |                                  | 2.159***<br>(0.153)<br>[0.437]    |                                     | 0.151***<br>(0.0197)<br>[0.0445]     |
| Skill interaction: $HC_{ct} \times skill_i$       |                                  | 2.660***<br>(0.300)<br>[1.063]    |                                     | 0.456***<br>(0.0510)<br>[0.229]      |
| Capital interaction: $C_{ct} \times capital_i$    |                                  | -0.137***<br>(0.0213)<br>[0.0566] |                                     | -0.0129***<br>(0.00303)<br>[0.00624] |
| Herfindahl interaction: $D_{ct} \times (1 - H_i)$ |                                  | 1.166***<br>(0.194)<br>[0.281]    |                                     | 0.0524*<br>(0.0311)<br>[0.0590]      |
| 80th vs. 20th percentile in $z_i$                 | 24%                              | 10%                               | 4.2%                                | 4.3%                                 |
| Country-Industry F.E.                             | yes                              | yes                               | yes                                 | yes                                  |
| Year F.E.   | yes                              | no                                | yes                                 | no                                   |
| Country-Year F.E.                                 | no                               | yes                               | no                                  | yes                                  |
| Observations                                      | 316947                           | 265585                            | 700344                              | 559860                               |
| Number of country-industry clusters               | 21098                            | 17162                             | 30885                               | 24180                                |

In columns 1 and 2, the dependent variable is the log of total industry-level exports. In columns 3 and 4, the dependent variable takes the value 1 if a trade flow is recorded on the industry-level and otherwise zero. Zeros are imputed. Standard errors clustered at the country-industry level in parentheses; two-way cluster robust standard errors, clustered at the country and the industry level, in brackets. The Polity Score is rescaled between zero and one and comes from Marshall et al. (2016). See Table 1 for a description of the control variables. Specifications including GDP, Skill and Capital interaction terms also control for the respective country-level co-variate (output suppressed). “80th vs. 20th percentile” indicates how many percentage points larger the marginal effect of democratization is for the 80th percentile industry in contract intensity compared to the 20th percentile industry.  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*.

### A.3 Instrumental Variables Estimates

To address reversed causality and omitted factors we use an instrumental variable strategy based on regional democratization waves. The idea is that democratization is often caused by social unrest leading to a regime change and these social unrests often occur in regional waves. During the “Third Wave”, Latin American and the Caribbean reverted from democracy to non-democracy in the 1970s, then re-democratized in the 1980s and early 1990s. The fall of the Iron Curtain was followed by democratization waves in Eastern Europe. Furthermore, several democratizations occurred in Asian and African countries during the 1990s. As in Acemoglu et al. (forthcoming), we calculate our instrument as the share of democratic countries within a country-specific regional set  $I$  for country  $c$  which includes all countries within the same region as country  $c$  but excludes country  $c$  itself. There are seven distinct regional sets  $I$ : *i. Africa, ii. East Asia and Pacific, iii. Eastern Europe and Central Asia, iv. Latin America and Caribbean, v. Middle East and North Africa, vi. South Asia, vii. Western Europe and other developed countries.* We use the average regional share of these democratic regimes in a three year window between  $t - 1$  and  $t - 3$ . Summarizing, we define our instrument as

$$Z_{ct} = \frac{1}{3 |I_c|} \left( \sum_{c' \in I_c} D_{c't-1} + \sum_{c' \in I_c} D_{c't-2} + \sum_{c' \in I_c} D_{c't-3} \right). \quad (2)$$

As democracy waves might as well affect the regional demand for contract intensive goods, we adjust our dependent variable  $x_{cit}$  such that it excludes all exports to economies within the same region  $I_c$ .

Table A3 reports the estimation results. Our instrument is positively correlated with our democracy dummy  $D_{ct}$  leading to a Kleibergen-Paap first stage F-statistic of 1,995. The coefficient of interest  $\beta_2$  is positive and significant at the 1% level.

TABLE A3: INSTRUMENTAL VARIABLES ESTIMATION BASED ON DEMOCRACY WAVES

|  | (1)   |
|--|---|
|  | Wave  |
|  | Intensive Margin<br><i>Extra-Regional Exports</i> |
| Democracy interaction: $D_{ct} \times z_i$     | 1.394***<br>(0.225)<br>[0.543]                    |
| GDP interaction: $Y_{ct} \times z_i$           | 1.500***<br>(0.156)<br>[0.378]                    |
| Skill interaction: $HC_{ct} \times skill_i$    | -0.252<br>(0.278)<br>[0.881]                      |
| Capital interaction: $C_{ct} \times capital_i$ | 0.00804<br>(0.0595)<br>[0.130]                    |
| Country-Industry F.E.                          | yes   |
| Country-Year F.E.                              | yes   |
| Observations                                   | 231479  |
| Number of country-industry clusters            | 16043   |
| 1st Stage KP F-Stat.                           | 1995  |

The dependent variable is the log of total industry-level exports excluding exports within the same region  $I_c$ . Standard errors clustered at the country-industry level in parentheses; two-way cluster robust standard errors, clustered at the country and the industry level, in brackets. The democracy interaction is instrumented using democracy waves interacted with contract intensity. See the text in Appendix A.3 for details and Table 1 for a description of the control variables.  $p < 0.1$  \*,  $p < 0.05$  \*\*,  $p < 0.01$  \*\*\*.