



# Democratization, contracts and comparative advantage

Felix Samy Soliman<sup>a</sup>, Jan Schymik<sup>b,\*</sup>

<sup>a</sup> Department of Economics, University of Oxford, Oxford OX1 3UQ, United Kingdom

<sup>b</sup> Department of Economics, University of Mannheim, L7, 3-5, 68161, Mannheim, Germany



## HIGHLIGHTS

- We study how democracy affects comparative advantage.
- Our sample covers the Third Wave of Democratization between 1976 and 2000.
- Democratization shifts exports towards contract intensive industries.
- Rybczynski effect across goods with different contract intensities.

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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.

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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

\* Corresponding author.

E-mail addresses: [felix.samysoliman@sant.ox.ac.uk](mailto:felix.samysoliman@sant.ox.ac.uk) (F. Samy Soliman), [jschymik@mail.uni-mannheim.de](mailto:jschymik@mail.uni-mannheim.de) (J. Schymik).

<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 favour of reallocation of economic activity, from less to more financially dependent sectors.

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.

## 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’s 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. (2018). 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 the most from democratization, we expect  $\beta_2 > 0$ .

<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.

## 3. Results

### 3.1. Graphical evidence

To illustrate the regression results, we divide industry-level exports into terciles according to their contract intensity. Fig. 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>

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 Fig. 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

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

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

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