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The role of regime types on bilateral trade levels

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Abstract

The purpose of this thesis is to combine an extensive literature review with an empirical analysis to test the effect of a change in regime type on bilateral trade flows. For the empirical study, a gravity-theory trade model and global trade data for the period 1992-2012 are used. The methodology controls for country-pair-specific and year-specific fixed effects. Furthermore, three different regime type indicators are used to cope with selection bias. The literature study shows that common interests, trade policy liberalization, and product and institutional quality result from democratization and contribute positively to trade levels. Furthermore, the study recognizes a reversed causality. The empirical study confirms positive relations between democratization and higher trade levels, but they are not so clear cut anymore as in earlier works which leaves ample room for further research.

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1. Introduction

In his 1994 State of the Union Address, William Jefferson Clinton expressed the words "Democracies don't attack each other. They make better trading partners and partners in diplomacy". This passage evidently emphasized the priority for the United States of America to support young democracies abroad in establishing higher levels of trade integration. I acknowledge there are numerous factors influencing trade levels, such as real GDP growth and transport costs. However, the regime type effect received a great amount of attention in the past decades from policy makers such as the Clinton administration and from researchers who often find that democratization significantly contributes to a portion of trade growth.

Given the Direction Of Trade Statistics dataset compiled by the International Monetary Fund, nominal total global exports increased with 328% over the period 1992-2012. Also the levels of democracy have been on the rise according to multiple indicators. The Polity IV index, which measures democracy on a scale from -10 to 10 for 167 countries, increased from an average 2.03 in 1992 to 4.06 in 2012. To find if democratization contributes to growing trade levels, this thesis explores the existing literature in-depth and tests the statistical and economic significance of the regime type effect to answer the following question.

Is there a relationship between political regime types and bilateral trade levels?

This thesis contributes to a growing field of research on this topic, by covering a modern timespan and an increase in the countries covered. Seminal works in the field, such as Mansfield et al (2000), Eichengreen and Leblang (2008), and Yu (2009) use samples of trade until 1991, 2000 and 1998 respectively. A majority of the literature uses the bilateral trade dataset compiled by Feenstra *et al* (2005), which limits their sample to the years 1962-2000. Additionally, most previous works included a limited set of countries. This work starts with a sample of 167 countries and focuses on the past two decades (1992-2012). Therefore I am able to test if previous findings hold while using a global sample and a modern time frame. A global sample is vital, as continents, such as Africa and Asia, which do not always appear in the datasets of previous works, have seen their export levels soar well above an average 500% over the past two decades. It is essential to estimate the contribution of democratization on this growth. The modern timeframe adds to the existing literature, as critics have argued that the association between regime type and trade levels might have been driven by a specific

period in the samples. According to Siverson and Emmons (1991) countries with equal regime type were prone to cooperate during the cold war period after the Second World War. Furthermore, I control for causality issues in this work by lagging the explanatory variables for an extended period, as the majority of the literature does not acknowledge the reverse effect of trade on regime type.

This thesis has the following structure. After the introduction, section 2 summarizes the political and economic factors that affect trade levels, which form the basis for the empirical section of this thesis. It also contains descriptive statistics on the relation between export levels and regime type indicators. Section 3 introduces the data and the empirical specification. I use a gravity-theory trade model with panel data covering 167 countries over 1992-2012. Section 4 discusses the sign, magnitude and economic significance of the estimation results. Finally, section 5 concludes this thesis.

2. Literature review

2.1 The link between political regime type and trade

In previous literature multiple factors have been described to explain trade growth. Notably, Krugman *et al* (1995) describes two arguments which are commonly used in the discussion on why world trade grows: the political influence on trade liberalization and the effect of technology. Baier and Bergstrand (2001) estimated the magnitude of these two arguments and found that trade growth is explained, in decreasing order of magnitude, by the following factors: real GDP growth, tariff rate reductions and preferential trade agreements, and transport-cost declines. Yu (2009) identifies that democracy, which belongs to the second group, fosters trade and estimates it contributes 3-4% to the total bilateral trade growth. Other works in this field confirm the positive relation between democracies and economic integration: Jensen (2003) finds that democracies attract 70% more FDI/GDP than autocracies, Decker and Lim (2009) find that democracy is positively related to trade flow, and Aidt and Gassebner (2010) find that individual autocracies import less than democracies.

2.1.1 Common interests and alliances

Throughout the literature, several mechanisms have been discussed to explain the effect of a political regime type on trade growth. Firstly, the degree of common interests and alliances has a major influence on trade levels. Morrow *et al* (1998) estimated this by testing the correlation of the alliance portfolios, defense pacts etc. of 6 major powers against their trade flows and confirmed a strong positive relation. Moreover, their findings show that changing a dyad from a non-democratic pair to a democratic pair results in an estimated 133% theoretical increase in trade level. Very similar results were found by Mansfield *et al* (2000), who found that a democratic dyad has more open trade relations and higher trade levels than a mixed pair consisting of a democratic and autocratic state. Their results show that a pair consisting of a democracy and autocracy trade 15-20% less than two democracies. According to them this is explained by the high costs of a trade war for a democratic pair, leading to a faster agreement on lower trade barriers during a negotiation. Very similar results have been found by Polachek (1997), but then for trading partners in general and for the effect of trade on regime types. His work states that trading partners are less likely to be involved in combat, as they both try to protect the wealth gained through mutual trade. Martin *et al* (2008) confirm these findings for bilateral trading partners, but add that the probability of war increases for countries with open

multilateral trade relations since this decreases bilateral dependences. Later, I will elaborate on the effect of trade on regime type, as it might form a causality issue.

2.1.2 Product and institutional quality

Secondly, product and institutional quality are important mechanisms in explaining the role of a regime type on trade growth. Democracies build good institutions (Rodrik, 2000), and these democratic institutions maintain stronger rule of law and property rights (Barro, 1996), which positively relate to R&D expenditures (Clarke, 2001). For countries with high R&D expenditures, this leads to improved product quality and therefore the country is able to increase the value of exports. There might be an opposite effect for imports, as high quality domestic products provide a substitute for foreign products and lead to less imports.

As mentioned, democratic governance improves institutional quality. Using empirical evidence, Paldam (2003) confirms that liberal governance contributed to the economic growth of the four Asian tigers and Japan, and De Haan and Sturm (2003) confirm these findings for developing countries between 1975 and 1990. On the other hand, these results find their nuance in a new study by Balding (2011: 12), who doubts the relation between democracy and trade through institutions. Balding argues that international trade is promoted by institutional factors in the form of "well-managed and governed economic environment", but finds that democracy is a fragile estimator for institutional quality.

2.1.3 Trade policy liberalization

Thirdly, higher trade levels result from the liberalization of trade policies. Milner and Kubota (2005) focused their work on the causes of increased openness in trade policies. Their main result is the positive relation between a regime type change towards democracy and the liberalization of trade policies for 100 least developed countries. In their discussion, these findings are backed by the argument that the political power shifts from the elites to the working class, who favor trade liberalization. Prior to this work, Fidrmuc (2003) found that democracy had a positive impact on trade through the liberalization of trade policies during post-communist transition. The explanation for these findings might have been provided by the work of Hillman and Ursprung (2000), who use a political model to prove that without economic liberalization during a transition, rent seeking behavior will sustain in a society where insiders profit from political decisions. There are two mechanisms through which autocracies sustain higher trade barriers than democracies according to findings from Aidt and Gassebner (2010): "the lack of political accountability and external monitoring". The lack of

those two instruments enables rent-seeking behavior among politicians in autocracies through imposing monetary tariffs and not reducing bureaucratic and other trade barriers.
Considering a work on the reversed causality of trade on democracy, López-Córdova and Meissner (2008) empirically prove that, for a global sample covering 130 years, increased trade openness leads to a substantial democratization.

However, contrary to all these findings, there is also a vast amount of literature which considers that democracy leads to an increase in trade barriers and protectionism, specifically in the more developed countries. More developed countries mostly export capital-intensive products and import labor-intensive products, vice-versa for least developed countries. Hence, there is a possible difference in trade liberalization policies when these countries experience democratization. As found by the aforementioned Milner and Kubota (2005), democratization impacts trade liberalization positively for least developed countries, because the electoral power shifts from the elite to the working class. The working class demands open trade policies, which lowers the price of the imported capital-intensive goods and leads to a decrease in the real return on capital and an increase in the real return on labor (Stolper and Samuelson, 1941).[1] For a more developed country, importing labor-intensive goods, this works the other way around and open trade policies lead to a decrease in the real return on labor. To protect their working class voters, politicians use protectionism. This theorem is confirmed by the findings of various works, such as from Kono (2006) who finds that although democracy leads to lower tariffs, it leads to higher core and quality non-tariff barriers across 70 countries in the 1990s. O'Rourke and Taylor (2006) remain ambivalent on the topic, since they find that the influence of democracy on trade policy varies too much between countries and time. A later work from Galiani, Schofield and Torrens (2014), on the ideals and voting behavior of different socioeconomic groups, confirms that countries with capital scarcity have liberal trade policies and countries with an "import-competing industry" are likely to act more protective.

2.1.4 Reversed causality

Works by early researchers do not acknowledge the likelihood of causality between trade levels and regime types. As this might give rise to endogeneity issues, more recent works address the influence of trade on democracy by lagging the regime type variable or including

[1] This is known, within the Heckscher-Ohlin trade theory, as the Stolper-Samuelson theorem published in 1941 in The Review of Economic Studies Vol. 9 No. 1 pp. 58-73

instrument variables. However, there is not yet a completely adequate instrument within the used methodology to address the issue. There are two contrary beliefs on the influence of trade on democracy. Traditional beliefs are that increased trade relations lead to the spillover effect of ideologies or simply a tool for putting pressure on the non-democratic trading partner. According to Lipset (1960) in his award winning political science book *Political Man*, it creates a channel in which the rich country's ideology is communicated to its trading partner. This is confirmed by the empirical findings of Nash and Andriamananjara (1999) for Asian and African developing countries. Contrary results are presented in the economic-based book *The Economic Origins of Dictatorship and Democracy* by Acemoglu and Robinson (2006: 253). Their argument includes the acknowledgement of benefits from international trade in land-abundant (or capital-scarce) countries, but that the elites or autocratic regime halts the democratic process and institutional openness in fear of land and tax reforms. Therefore, it remains undetermined from the literature if the effect from trade on democracy leads to a positive or negative relation.

2.1.5 Trade openness in illiberal regimes

Finally, over the past decades there is an increasing group of countries (e.g. China, Saudi Arabia, and Singapore) which show a liberalization of trade policies and an associated increase in trade levels, but with no observable democratization in their regime type. A possible explanation is that these open, autocratic regimes developed the tendency to formulate policies which are effective on the longer run. By means of this, they recognize the strength of trade liberalization as a policy tool to reach economic growth, one of the demands of their voters. This development might also lead to increased trade levels between autocratic regimes. To explain this phenomenon in the case of China, Chris Alden (2007: 70) describes in his book *China in Africa* that "*there are fewer obstacles to rapid investment in the resource sector"* than there might be in states with a more democratic regime. Other works argue it is not the designed trade policy, but just the indifference of China's regime in judging other regimes, following the Principles of Peaceful Coexistence (Taylor 2004, Tull 2006). The aforementioned countries are mostly major contributors to world trade and this thesis thus adds to the existing literature by acknowledging these new political trends as contributors to the portion of trade growth.

Summarizing section 2.1, there are several mechanisms responsible for the effect of regime types on a portion of total trade growth. We find that common interests, trade policy liberalization, and product and institutional quality contribute positively. There is also a positive reversed causality. However the reversed causality and the trade policy liberalization also contribute in a negative way to trade growth. Following these observations and the descriptive statistics in section 2.2, I develop a model and rerun tests from existing papers to empirically test the sign and magnitudes of these mechanisms.

2.2 Descriptive statistics

For 150 countries the mean exports and imports (as % of gdp) for the period 1992-2012 are plotted against their own mean regime type score over this period according to the three regime type indicators used in this thesis. The mean regime score is on the x-axis with higher values corresponding to more autocratic regimes, and the mean imports and exports over gdp are on the y-axis. The positive influence of a democratic regime type on trade is mostly observed for the levels of imports, whereas we see a negative influence for the level of exports. For the moment I contribute these differences to the soaring export levels of more autocratic countries over the past decades (e.g. China, Saudi Arabia and the United Arab Emirates), but further empirical analysis should test these findings.

Figure 2 Imports & Polity IV score

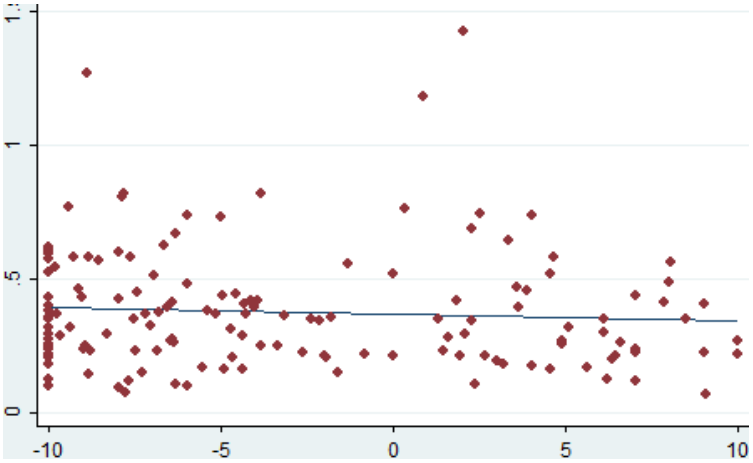


Figure 1 Exports & Polity IV score

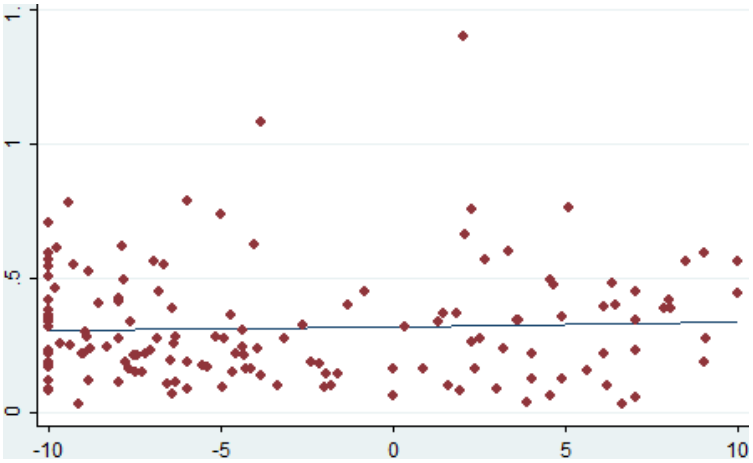


Figure 3 Imports & Cheibub score

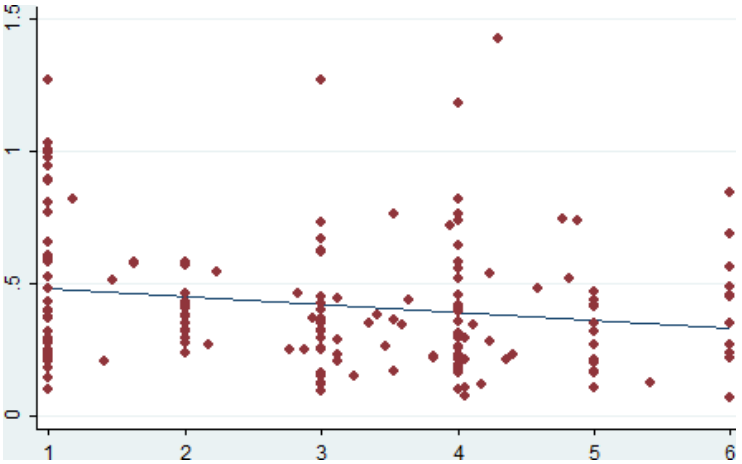


Figure 4 Exports & Cheibub score

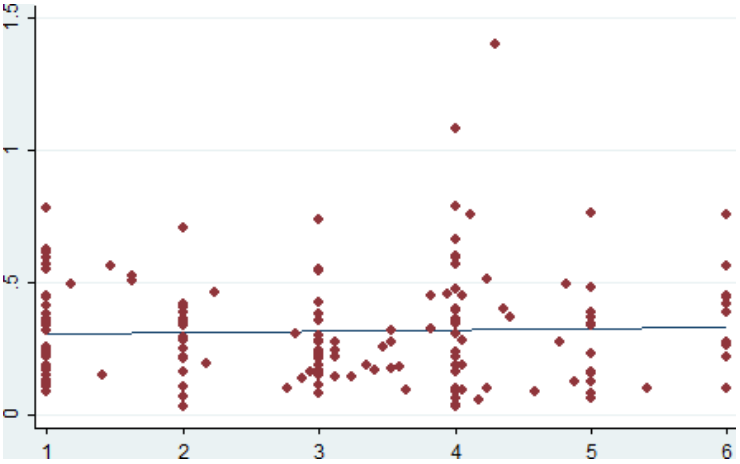


Figure 5 Imports & Freedom House score

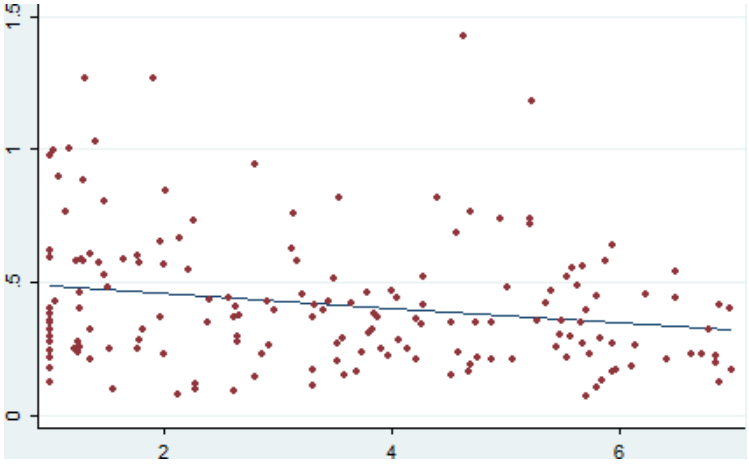
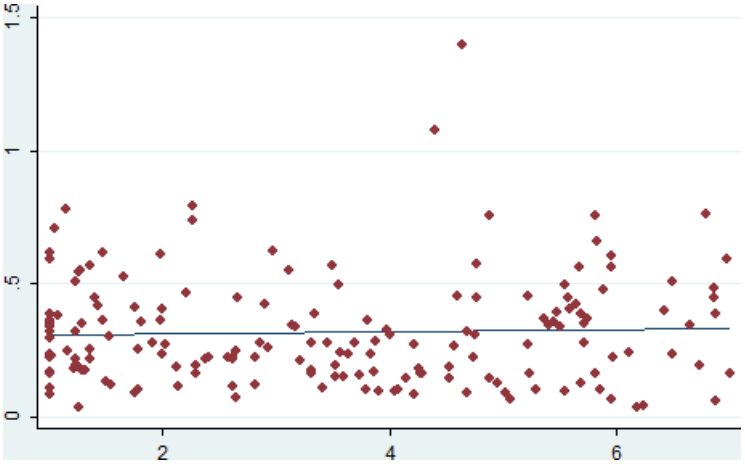


Figure 6 Exports & Freedom House score



3. Data and Methodology

3.1 Data

3.1.1 Regime type indicators

It is complicated to assess which approaches are appropriate to include as a measurement for regime type, as to the extent of my knowledge not one can objectively capture the full range of measurements for a stable, free, and democratic governed country. In my work I choose to include three indicators which have been used most frequently in the past literature on this subject.

The main indicator used in this thesis for measuring regime type is the Polity IV index, which is compiled by Monty G. Marshall from the Center for Systemic Peace and Societal-Systems Research (with Ted Gurr, one of the initiators of the index, as consultant). The 2013 version consists of all independent countries with a population above 500,000 (167 countries). The regime indicator is compiled from a subset of criteria ranging from i) Competitiveness and Openness of Executive Recruitment ii) Constraint on Chief Executive and iii) Regulation and Competitiveness of Political Participation. The polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic), but for comparison reasons I turned the scale upside down, so that higher values are assigned to more autocratic regimes. Additionally, I rescaled the index to 1-21, which enables me to take the logarithm if needed. It is the most used indicator for democracy in International Relations, but it also received criticism on its current analyses since it assigns high values to very autocratic, but stable regimes, while countries situated within the middle-range values often face unrest.

To control for potential bias resulting from the choice of regime type indicator, I also include data from researchers who use a different conceptualization. The second indicator is the revised version of Adam Przeworski's *Democracy and development* (2000). The latest version has been compiled by José Cheibub in 2010, which means that the dataset misses observations for the years 2009-2012. However, the indicator has been used often in the previous literature and this thesis aims to develop models comparable to the methodology in these works to present results accordingly while using data for the years after 1990. The dataset provides us with a six-fold regime indicator ranging from Parliamentary Democracy to Royal

Dictatorship. The disadvantage is that this measurement only looks at political indicators and not economic or social.

The third indicator is the *Freedom in the World*, compiled by the Freedom House annually since 1972. It scales the Political Rights and Civil Liberties of inhabitants from 1(most free) to 7(least free). For application in this thesis the two indicators are averaged to have a single 1-7 scale with higher values assigned to non-free states.

Table 1 presents a simple correlation check for the three regime type indicators:

Table 1: Simple correlation check regime type indicators

Variable	(1)	(2)	(3)
(1) Polity IV	1.0000		
(2) Cheibub	0.8272	1.0000	
(3) Freedom House	0.9261	0.7830	1.0000

Correlation of the average regime type indicator scores over 1992-2012 for unique countries (153 obs.)

3.1.2 Trade data

The dependent variable used in the empirical work in this thesis is the natural logarithm of trade from exporting to importing country. To measure this, I use the Data Of Trade Statistics database from the International Monetary Fund. The coverage of the dataset is adequate to cover all imports and exports for a country from and to all partnering countries. This dataset measures the trade flow from one country to another country. Therefore, the results are not prone to be exposed to the so-called 'Silver-medal of gravity mistakes' (Baldwin and Taglioni, 2006), which states that combining bilateral trade flows pushes those countries in each other direction, especially if the two economies are different of size. To enhance the facilitation of discussion, the natural logarithm of the exports is used. Hence, the parameter of an independent variable is the elasticity of trade to a change in that variable.

3.1.3 Control variables

Following the literature, I use the gravity-theory of trade in this thesis, which controls for the size of economies and the distance between two countries when predicting the bilateral trade flows. The trade theory is a framework that derives its success from many empirical works used to predict trade. It was first proposed by Tinbergen (1962) and described by Bergstrand (1985) as a "log-linear equation" that uses countries' GDP and distance between each other to

specify economic flows. In previous seminal works on the effect of regime type on trade flows, the gravity-theory of trade has been used successfully in controlling for these economic and geographical effects. I include GDP and population in the equation, and expect GDP to have a positive effect on trade and population negative. There are works that include distance, common border, common language, legal origin etc. in the equation as control variables for trade, but the country-pair specific fixed effects in my model will omit these variables. Furthermore, I include a dummy variable for the World Trade Organization (or its predecessor GATT) membership, a dummy variable for a (bilateral) regional trade agreement, and a dummy for common currencies. Following the literature, I expect the three dummy variables to have a positive effect on exports. All control variables have been derived from the World Development Indicators compiled by the World Bank.

3.1.4 Data summary table

TABLE 2. Summary Statistics

Variable	(a)	Obs.	Mean	Std. Dev.	Min.	Max.
Natural log of nominal exports in U.S dollars		411,456	14.72	3.97	-14.15	26.82
Democracy index: Polity IV	i	358,678	6.77	6.54	1	21
1 = most democratic, 21 = most autocratic	j	356,337	6.84	6.51	1	21
Democracy index: Cheibub	i	321,204	2.90	1.57	1	6
1 = democracy, 6 = dictatorship	j	321,301	2.91	1.58	1	6
Democracy index: Freedom House	i	401,100	3.24	1.97	1	7
1 = least free, 7 = most free	j	401,526	3.25	1.95	1	7
Natural log of nominal GDP	i	404,265	24.37	2.29	16.08	30.42
	j	405,431	24.26	2.34	16.08	30.42
Natural log of population	i	411,258	16.11	1.84	9.12	21.02
	j	411,231	16.02	1.88	9.12	21.02
Membership of the GATT/WTO	i	396,383	0.81	0.39	0	1
	j	396,383	0.81	0.39	0	1
Regional Trade Agreement between pairs		396,383	0.09	0.29	0	1
Common currency between pairs		396,383	0.01	0.12	0	1

(a) 'i' = exporting country & 'j' = importing country

Reflects authors' analysis based on the sources described in sections 3.1.1 until 3.1.3

3.2 Methodology

3.2.1 Base model specification

(1) $$\text{Ln } Y_{ij,t} = \beta_1 \ln D_{i,t-1} + \beta_2 \ln D_{j,t-1} + \beta_3 \ln gdp_{i,t-1} + \beta_4 \ln gdp_{j,t-1} + \beta_5 \ln pop_{i,t-1} + \beta_6 \ln pop_{j,t-1} + \beta_7 gatt_{i,t-1} + \beta_8 gatt_{j,t-1} + \beta_9 rta_{t-1} + \beta_{10} comcur_{t-1} + \gamma_{ij} + \delta_t + \varepsilon_{ij,t}$$

Where:

$Y_{ij,t}$:	Natural logarithm of nominal exports in U.S. dollars from state i to state j
ln $D_{i,t-1}$	Natural log of democracy level of exporting country, one year lag
ln $D_{j,t-1}$:	Natural log of democracy level of importing country, one year lag
ln $gdp_{i,t-1}$:	Natural log of nominal GDP in U.S. dollars exporting country, one year lag
ln $gdp_{j,t-1}$:	Natural log of nominal GDP in U.S. dollars importing country, one year lag
ln $pop_{i,t-1}$:	Natural log of population level in exporting country, one year lag
ln $pop_{j,t-1}$:	Natural log of population level in importing country, one year lag
$gatt_{i,t-1}$:	Dummy variable =1 if exporting country is WTO/GATT member, one year lag
$gatt_{j,t-1}$:	Dummy variable =1 if importing country is WTO/GATT member, one year lag
rta_{t-1}:	Dummy variable =1 if pair has a regional trade agreement, one year lag
$comcur_{t-1}$:	Dummy variable =1 if pair shares common currency, one year lag
γ_{ij}:	Country-pair-specific effects
δ_t:	Year-specific effects
$\varepsilon_{ij,t}$:	The error term

A Fixed-Effects regression model with robust standard errors will be used.[2] The regressions include fixed effects estimation to control for unobserved country-pair-specific effects (γ_{ij}) and year-specific effects (δ_t). The pair-specific fixed effects account for characteristics that do not vary over time between country pairs, such as distance, common border, common language, legal origin etc. Including only a pair-specific fixed effects estimate captures just the time-invariant effects and is therefore called "the gold- and bronze-medal of gravity mistakes" by Baldwin and Taglioni (2006). To overcome this, I also use year-specific fixed

[2] In this work all regression are run with Stata/SE 13.0 for Windows

effects by including annual dummy variables, which capture unobserved time-varying specific characteristics.

3.2.2 Further model specifications

The base model predicts the unique effect on exports caused by a change of the regime type indicators for the exporting and importing countries. The effect from one country's regime type indicator may as well depend on the indicator of the other country. To test if the effect changes for different values of the partner country's regime indicator, an interaction variable has been included in equation 2. The results from this equation can be found in the even numbered columns in table 3.

$$(2)\quad \text{Ln } Y_{ij,t} = \beta_1 \ln D_{i,t-1} + \beta_2 \ln D_{j,t-1} + \beta_3 (\ln D_{i,t-1} * \ln D_{j,t-1}) + \beta_4 \ln gdp_{i,t-1} + \beta_5 \ln gdp_{j,t-1} + \beta_6 \ln pop_{i,t-1} + \beta_7 \ln pop_{j,t-1} + \beta_8 gatt_{i,t-1} + \beta_9 gatt_{j,t-1} + \beta_{10} rta_{t-1} + \beta_{11} comcur_{t-1} + \gamma_{ij} + \delta_t + \varepsilon_{ij,t}$$

Following section 2.1.4 in the literature review, table 4 shows the results for the base model (1) after correcting for the aforementioned causality issues. I run the basic model with extra lags for two and three years to check if the results from the regime type variable remain stable after an extended period. Although this is a partial solution, it has been used by previous studies[3] and to my knowledge the most accessible method to answer the simultaneity bias. Further it provides information on the longer lasting effects of the regime type variable.

The base model (1) measures the effect of a change in the regime type indicator of one of the two partnering countries. Following the literature, I also run a regression on the effects of pairs classified as autocratic, mixed or incoherent against democratic pairs. The difference with the base model is that this equation uses dummy variables for different pairs. This is in line with the methodology from Mansfield *et al* (2000), but for a different coverage and time period. The data has been modified to provide a classification for every indicator (Polity IV, Cheibub, and Freedom House) which indicates if the country is democratic or autocratic. Note that within the data for the Polity IV indicator there is a subcategory called anocratic / incoherent. The legend for sorting the data on regime type indicators can be found in figure 7. Following the individual classification, the country-pairs are binary classified as a democratic, mixed, autocratic or incoherent pair. Equation 3 formally captures the aforementioned, where

[3] For example in Milner and Kubota (2005), and Li and Reuveny (2003)

the democratic pair acts as the reference category for the other three dummies. Results are presented in table 5.

(3) $$\text{Ln}(Y_{ij,t}) = \beta_1 mixed_{ij,t-1} + \beta_2 autoc_{ij,t-1} + \beta_3 incoh_{ij,t-1} + \beta_4 \ln gdp_{i,t-1} + \beta_5 \ln gdp_{j,t-1} + \beta_6 \ln pop_{i,t-1} + \beta_7 \ln pop_{j,t-1} + \beta_8 gatt_{i,t-1} + \beta_9 gatt_{j,t-1} + \beta_{10} rta_{t-1} + \beta_{11} comcur_{t-1} + \gamma_{ij} + \delta_t + \varepsilon_{ij,t}$$

Figure 7 Legend for the classification of individual countries per year in a democracy, incoherent or autocratic regime according to their regime indicator scores

Indicator / Classification	**Democracy**	**Incoherent**	**Autocracy**
Polity IV Score range: -11, 11	-11 → -6	-5 → 5	6 → 11
Cheibub Score range: 1, 6	1 → 3		4 → 6
Freedom House Score range: 1, 7	1 → 3		4 → 7

The previous equation (3) measures the effect on trade using pairs with matching regime types, the following equation (4) takes the difference in the regime indicator scores to test if country pairs with different regimes trade less than pairs with a more similar regime. The difference is calculated by subtracting the regime type indicator score of the importing country from the score of the exporting country and taking the absolute value. The higher the new score, the higher the discrepancy between the partners' regime types. This is an extension to the previous literature, where Mansfield (2000) presented the results that democratic pairs trade more than autocratic pairs, and Morrow *et al* (1998) found that the existence of common interests between countries has a positive effect on bilateral trade. On the other hand I expect that other factors, such as resources, play a more important role in the modern trade dynamics. Equation 4 formally describes the above and the results are presented in table 6.

(4) $$\text{Ln}Y_{ij,t} = \beta_1 dif_{ij,t-1} + \beta_2 \ln D_{i,t-1} + \beta_3 \ln D_{j,t-1} + \beta_4 \ln gdp_{i,t-1} + \beta_5 \ln gdp_{j,t-1} + \beta_6 \ln pop_{i,t-1} + \beta_7 \ln pop_{j,t-1} + \beta_8 gatt_{i,t-1} + \beta_9 gatt_{j,t-1} + \beta_{10} rta_{t-1} + \beta_{11} comcur_{t-1} + \gamma_{ij} + \delta_t + \varepsilon_{ij,t}$$

4. Results and discussion of empirical study

The regression analyses test the effect of the explanatory variable regime type on log nominal exports from different angles, their results are in tables 3 until 6, and it adheres to the following structure. Table 3 shows the effect of an increase in autocracy level from one of the partnering countries on the exports from state "i" to state "j". This is followed by the results in table 4, but then the regime type variable is lagged for an extended period to check if the results are long-lasting and to cope with the simultaneity bias. Table 5 shows the effects of a mixed, autocratic or incoherent pair of countries against a democratic pair as benchmark. Finally, table 6 shows the results of an increase in the discrepancy between two states' regime type on their trade level.

4.1 Base model: Effect of individual regime type scores on bilateral trade levels

Let us first look at the results from equation 1 presented in table 3. The explanatory variable regime type takes higher values for autocratic regimes. Following the literature I expect an increase in this variable to have a negative effect on the trade level. According to the regression results there is a significant (.01%) negative result for an increase in the Polity IV indicator of the importing country, but the result for the exporting country remains ambiguous. The same applies if I use the Cheibub indicator. Contradictory, for the Freedom House indicator there is a significant (.01%) negative effect for the exporting country's regime, but no significant effect for the importing country. These results follow my expectations, although not all effects are significant and there is no consistent pattern which leads to a possible distinction of the effects between importing and exporting countries.

Table 3

Base model: Effect of individual regime type scores on bilateral trade levels

Indicators	Polity IV (1)	Polity IV (2)	Cheibub (3)	Cheibub (4)	Freedom House (5)	Freedom House (6)
Ln exporters regime L1 $ln\ D_{i,t-1}$	0.0225	0.0557***	0.0319	0.0773**	-0.181***	-0.173***
	(0.0164)	(0.0212)	(0.0245)	(0.0343)	(0.0275)	(0.0372)
Ln importers regime L1 $ln\ D_{j,t-1}$	-0.0515***	-0.0193	-0.0547**	-0.00999	0.0368	0.0441
	(0.0170)	(0.0182)	(0.0246)	(0.0297)	(0.0275)	(0.0324)
Ln regime interaction L1 $ln\ D_{i,t-1}$* $ln\ D_{j,t-1}$		-0.0251**		-0.0521*		-0.00831
		(0.0107)		(0.0270)		(0.0270)
Ln GDP of exporters L1	0.451***	0.450***	0.378***	0.378***	0.446***	0.446***
	(0.0302)	(0.0302)	(0.0270)	(0.0270)	(0.0269)	(0.0269)
Ln GDP of importers L1	0.579***	0.577***	0.558***	0.558***	0.603***	0.602***
	(0.0229)	(0.0229)	(0.0218)	(0.0218)	(0.0211)	(0.0211)
Ln population of exporters L1	0.0961	0.0868	0.0252	0.0252	0.188**	0.187**
	(0.0819)	(0.0820)	(0.0873)	(0.0873)	(0.0765)	(0.0767)
Ln population of importers L1	0.679***	0.671***	0.724***	0.725***	0.678***	0.677***
	(0.0675)	(0.0674)	(0.0769)	(0.0769)	(0.0640)	(0.0643)
Exporter is GATT/WTO member L1	0.192***	0.190***	0.133***	0.133***	0.183***	0.182***
	(0.0309)	(0.0309)	(0.0274)	(0.0274)	(0.0289)	(0.0289)
Importer is GATT/WTO member L1	0.125***	0.124***	0.139***	0.139***	0.125***	0.125***
	(0.0284)	(0.0284)	(0.0248)	(0.0248)	(0.0264)	(0.0264)
Regional trade agreement L1	0.197***	0.202***	0.180***	0.180***	0.175***	0.176***
	(0.0264)	(0.0265)	(0.0234)	(0.0234)	(0.0250)	(0.0252)
Common currency L1	0.0927***	0.0875***	0.0900***	0.0893***	0.0701**	0.0716**
	(0.0315)	(0.0314)	(0.0336)	(0.0336)	(0.0334)	(0.0337)
Observations	263,021	263,021	284,002	284,002	328,441	328,441
Number of pair	17,254	17,254	22,338	22,338	22,090	22,090
Pair FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: The dependent variable is the natural log of exports: $ln\ (Y_{ij,t})$
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

When the interaction variable is introduced, the results experience a change. For the exporting country, the Polity IV and Cheibub indicators now have negative estimators, but the estimator for the importing country lost its statistical significance. The interaction variable itself has a significant negative coefficient for these two indicators, which means there is not only a unique effect from the regime type of one of the partnering countries, but also a dependency or interaction between the two indicators. The effect of the exporting / importing country regime on trade is different for different values of the importing / exporting regime type indicator. However, using the third indicator Freedom House does not yield the same results.
Almost all control variables, such as GDP or GATT membership, regional trade agreement and common currency have their expected positive coefficient and are highly significant. Only the population variable, which was expected to be negative, shows either an insignificant or positive effect on trade. The literature states that a smaller country is often more involved in trade, but this remains unclear from our regressions. Removing population from the equation does not alter the other more important estimators.

4.2 Base model including two- and three-year lags

The estimators for the two and three years lagged explanatory variables can be found in table 4. The results are interesting, since the indicators for the importing and the exporting country show statistically significant values for both the second year lag and the third year lag. This differs from table 3, where I used the same variables in the equation with a single year lag and only half of them showed statistical significant results. Similar to the results from table 3, we find a negative effect from an increase in autocracy in the importing country for the Polity IV and the Cheibub indicator and a negative relation from an increase in autocracy in the exporting country for the Freedom House indicator.

The results from equation 1 including extra lags tell us that the effects from a regime type change from one of the partnering countries might take longer than one year to have an influence on their bilateral trade levels. Also, the results tell us that using different indicators for measuring political regime type yield different results. As long as there is no adequate and objective dataset capturing all information on a political regime type, researchers should use different indicators to test their results.

Table 4

Base model including two- and three-year lags

VARIABLES	Polity IV (1)	Polity IV (2)	Cheibub (3)	Cheibub (4)	Freedom House (5)	Freedom House (6)
Ln exporters regime L2 $\ln D_{i,t-2}$	0.0400**		0.0542**		-0.161***	
	(0.0161)		(0.0237)		(0.0273)	
Ln importers regime L2 $\ln D_{j,t-2}$	-0.0459***		-0.0648***		0.0508*	
	(0.0167)		(0.0237)		(0.0272)	
Ln exporters regime L3 $\ln D_{i,t-3}$		0.0400**		0.0531**		-0.144***
		(0.0160)		(0.0233)		(0.0269)
Ln exporters regime L3 $\ln D_{j,t-3}$		-0.0326**		-0.0485**		0.0589**
		(0.0163)		(0.0234)		(0.0267)
Log GDP of exporters L1	0.442***	0.445***	0.386***	0.401***	0.427***	0.421***
	(0.0308)	(0.0314)	(0.0278)	(0.0278)	(0.0276)	(0.0280)
Log GDP of importers L1	0.576***	0.581***	0.564***	0.586***	0.600***	0.599***
	(0.0233)	(0.0236)	(0.0221)	(0.0218)	(0.0214)	(0.0214)
Log population of exporters L1	0.0906	0.132	0.0819	0.187**	0.173**	0.214***
	(0.0843)	(0.0862)	(0.0839)	(0.0814)	(0.0785)	(0.0801)
Log population of importers L1	0.704***	0.736***	0.773***	0.750***	0.703***	0.734***
	(0.0680)	(0.0688)	(0.0714)	(0.0672)	(0.0643)	(0.0649)
Exporter is GATT/WTO member L1	0.211***	0.231***	0.192***	0.244***	0.224***	0.257***
	(0.0323)	(0.0339)	(0.0295)	(0.0320)	(0.0309)	(0.0327)
Importer is GATT/WTO member L1	0.138***	0.141***	0.165***	0.161***	0.147***	0.150***
	(0.0300)	(0.0322)	(0.0275)	(0.0304)	(0.0287)	(0.0312)
Regional trade agreement L1	0.185***	0.168***	0.163***	0.150***	0.160***	0.141***
	(0.0270)	(0.0279)	(0.0241)	(0.0250)	(0.0255)	(0.0261)
Common currency L1	0.0573*	0.0512*	0.0547*	0.0514*	0.0416	0.0418
	(0.0298)	(0.0281)	(0.0304)	(0.0278)	(0.0313)	(0.0286)
Observations	242,746	228,144	274,367	272,713	301,962	283,729
Number of pair	16,642	16,497	21,226	20,987	20,971	20,737
Pair FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: The dependent variable is the natural log of exports: *ln* ($Y_{ij,t}$)
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3 Trade between pairs of mixed and autocratic regimes against a benchmark of democratic pairs

To reproduce the seminal work by Mansfield *et al* (2000) while covering the last two decades with the new dataset, I have tested the effect of mixed, autocratic and incoherent country pairs against a benchmark of democratic pairs. The results can be found in table 5 and by looking at all three regime type indicators we can conclude that autocratic pairs trade on average 7.86 – 18.8 % less than democratic country pairs. The incoherent pairs do not significantly differ from a democratic pair, but this is not so important, as this variable only captures countries which could not be labeled as democratic or autocratic with regards to the Polity IV indicator. More important are the contradictory results for the effect of a mixed pair on trade compared to a democratic pair. A mixed pair, consisting of a democracy and an autocracy, following the literature (Mansfield *et al*, 2000), is expected to have a lower bilateral trade level than a pair consisting of democracies. However, according to the estimates in this thesis there is no uniform result for the mixed pair variable. A possible economic explanation is the rise of trade interaction between regimes indicated as autocratic (such as China, Saudi Arabia, United Arab Emirates, and Singapore) and the established democratic regions (such as the USA, European counties and Australia), which has been explained in section 2.1.5 on trade openness in illiberal regimes.

Table 5

Trade between pairs of mixed and autocratic regimes against a benchmark of democratic pairs

Indicator	Polity IV (1)	Cheibub (2)	Freedom House (3)
Mixed regime pair L1	0.136***	0.00587	-0.0274**
	(0.0273)	(0.0217)	(0.0135)
Autocratic regime pair L1	-0.188***	-0.0786*	-0.133***
	(0.0635)	(0.0414)	(0.0242)
Incoherent regime pair L1	-0.0258		
	(0.0186)		
Log GDP of exporters L1	0.443***	0.376***	0.458***
	(0.0299)	(0.0270)	(0.0269)
Log GDP of importers L1	0.578***	0.558***	0.597***
	(0.0228)	(0.0218)	(0.0211)
Log population of exporters L1	0.0975	0.0144	0.127*
	(0.0816)	(0.0874)	(0.0762)
Log population of importers L1	0.687***	0.716***	0.679***
	(0.0674)	(0.0769)	(0.0638)
Exporter is GATT/WTO member L1	0.178***	0.133***	0.178***
	(0.0309)	(0.0274)	(0.0288)
Importer is GATT/WTO member L1	0.126***	0.140***	0.127***
	(0.0282)	(0.0248)	(0.0264)
Regional trade agreement L1	0.203***	0.179***	0.182***
	(0.0264)	(0.0234)	(0.0249)
Common currency L1	0.0825***	0.0882***	0.0767**
	(0.0313)	(0.0337)	(0.0332)
Observations	263,021	284,002	328,441
Number of pair	17,254	22,338	22,090
Pair FE	YES	YES	YES
Year FE	YES	YES	YES

Note: The dependent variable is the natural log of exports: $ln\ (Y_{ij,t})$
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.4 Effect of difference in regime type scores within pairs on bilateral trade levels

The last equation for which I analyzed the results measures the effect of regime type differences between two countries on their bilateral trade levels. The results may be found in table 6, which show us that the effects are small but highly significant (.01%). However, the sign of the estimators differ among the three different regime type indicators. If the discrepancy with regards to the Polity IV and Cheibub scores between the exporting and importing country grows bigger, the effect is an increase in trade level between the partnering countries. Contrary, using the Freedom House indicator we find a negative relation with trade if one partnering country changes their political regime in the opposite direction of their partnering country. That the first two indicators lead to slightly more trade is somewhat surprising, as we expected from the literature that countries with the same interests or regime type often have better trading relations. A possible economic explanation may be the aforementioned strengthened trade interaction between democratic and autocratic regimes in a world where not all trading decisions are made with regards to political alliances, and many autocratic regimes liberalize trade policies and face major economic growth. However, the Freedom House indicator shows a negative effect from discrepancies in the indicator's score between partnering countries. Probably the lack of civil rights, which is not measured in the other two indicators, stays a factor for countries to decrease trade integration with another country.

Table 6

Effect of difference in regime type scores within pairs on bilateral trade levels

Indicator	Polity IV (1)	Cheibub (2)	Freedom House (3)
Regime type difference within pair L1 $dif_{ij,t-1}$	0.00853***	0.0220***	-0.0176**
	(0.00203)	(0.00842)	(0.00704)
Ln exporters regime L1 $ln\ D_{i,t-1}$	0.00452	0.0222	-0.172***
	(0.0169)	(0.0246)	(0.0275)
Ln importers regime L1 $ln\ D_{j,t-1}$	-0.0706***	-0.0656**	0.0472*
	(0.0187)	(0.0259)	(0.0285)
Log GDP of exporters L1	0.448***	0.378***	0.446***
	(0.0302)	(0.0270)	(0.0269)
Log GDP of importers L1	0.576***	0.558***	0.603***
	(0.0229)	(0.0218)	(0.0211)
Log population of exporters L1	0.0935	0.0240	0.185**
	(0.0818)	(0.0873)	(0.0766)
Log population of importers L1	0.679***	0.724***	0.673***
	(0.0674)	(0.0769)	(0.0640)
Exporter is GATT/WTO member L1	0.187***	0.132***	0.184***
	(0.0309)	(0.0274)	(0.0289)
Importer is GATT/WTO member L1	0.122***	0.138***	0.127***
	(0.0284)	(0.0248)	(0.0264)
Regional trade agreement L1	0.199***	0.179***	0.173***
	(0.0264)	(0.0234)	(0.0250)
Common currency L1	0.0894***	0.0883***	0.0681**
	(0.0315)	(0.0336)	(0.0334)
Observations	263,021	284,002	328,441
Number of pair	17,254	22,338	22,090
Pair FE	YES	YES	YES
Year FE	YES	YES	YES

Note: The dependent variable is the natural log of exports: *ln* ($Y_{ij,t}$)
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Concluding remarks

A country's regime type plays a role on bilateral trade levels from the angle of different mechanisms. Common interests, product and institutional quality, and trade policy liberalization are results of democratization and contribute positively to trade levels. There is also a positive reversed causality of trade on regime type, but this and the trade policy liberalization also contribute in a negative way to trade levels. In this thesis I have estimated a gravity-theory trade model, using three different regime type indicators to estimate the effect on trade levels. After running different regressions, the results generally show that more democratic countries trade more than autocratic countries. However, the results are not always equally strong and sometimes show the opposite effect. A possible economic explanation is the rise of trade between democratic and autocratic regimes, and the decrease in importance of political alliances through trade integration.

However, there is ample room for further research as there are some limitations to the current methodology of research in this field. The first limitation is the risk that regime type might be endogenous and driven by trade, whereas most works assume it is exogenous. Controlling for the endogeneity of regime type and the accompanying correlation of regime type with the error term is not an easy task. I have limited myself to the inclusion of multiple time lags, but a better way to control this would be using instrumental variables. Finding an estimator which is correlated with regime type and affects trade through the regime type, but is not correlated with the error term, is challenging although necessary according to me.

The second limitation of this study is the assumed change in trade tendencies from political alliances to a more illiberal trade interaction, caused by trade liberalization in autocratic countries. However, there is to the extent of my knowledge no literature or empirical evidence for this trend. It is interesting to investigate this in the near future.

Finally, a limitation to this work and to other studies in this field of research is the lack of an adequate objective regime type indicator, which conceptualizes and defines the full extent of democratic governance.

To conclude, this thesis used a literature study combined with an empirical analysis to measure the role of regime type on bilateral trade levels. It is safe to say that the results mostly show positive results between democratization and higher trade levels, but not so clear cut anymore as in earlier works which leaves ample room for further research.

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