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JEL Codes: F1, F5

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Trade and diplomacy

Economic determinants of international cooperation agreements and
its effect on international trade in the post World War II era: 1945-2022

Antoni Esteveordal*

Gastón Nieves[†]

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Abstract

We study the determinants of international cooperation and its effect on trade. We rely on a unique database of 31,982 International Cooperation Agreements (ICAs) signed between 1945-2022 by 193 countries. Estimating bilateral gravity equations, we find that trade follows the flag: ICAs increase bilateral exports by around 3-11%. We provide complementary results using firm level exporting data and address potential endogeneity through panel approach and an instrumental variable that exploits the network structure of international relations. Further, using LPM we find that gravity forces explain country pairs entering an ICA, as well as their similarity in UNGA voting and democratic levels. Importantly, we find that ICAs serve as stepping stones towards Regional Trade Agreements, with stronger effects for North-South relations. Our results shed new light on the international relations-trade nexus and contribute to the current debate on friendshoring.

Keywords: International cooperation agreements, International trade flows, Regional trade agreements, Gravity equation

JEL classification: F1, F5

*Georgetown/Institut Barcelona d'Estudis Internacionals

[†]Corresponding author at 48 Bd Jourdan, Paris School of Economics, Paris, France. Contact: gaston.nieves@psemail.eu
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1 Introduction

Ever since the end of WWII, the world has experienced almost eighty years of -imperfect- cooperation. This cooperation seems to be crumbling in the light of recent conflicts such as the Israel-Palestine war or the Russian invasion of Ukraine. To preserve the international rules-based order it is key to pinpoint what permitted its proliferation and how it has impacted economic outcomes, such as trade. These fundamental questions have remained unanswered in the international studies¹ -until today- and demand closer scrutiny, particularly in light of current global developments. The aftermath of the COVID-19 pandemic and the repercussions of the military conflicts have prompted countries to hastily re-establish alliances (e.g., the China-US relationship post-Trump), forge new ones, or seek membership in international governmental organizations (IGOs) like the EU or NATO; geopolitical decisions with meaningful economic consequences.

The rules-based international system was built under the umbrella of the United Nations, an improved version of the League of Nations, which facilitated an unprecedented diplomatic exchange worldwide. To keep track of this formal diplomatic relations, the Charter of the United Nations² establishes that any formal agreement between two countries should be officially recorded with the organization.

Article 102 United Nations Charter:

1. Every treaty and every international agreement entered into by any Member of the United Nations after the present Charter comes into force shall as soon as possible be registered with the Secretariat and published by it.

2. No party to any such treaty or international agreement which has not been registered in accordance with the provisions of paragraph 1 of this Article may invoke that treaty or agreement before any organ of the United Nations.

This consistent formal diplomatic cooperation resulted in an extensive network of more than 30,000 ICAs and more than 300 IGOs. To the best of our knowledge, no comprehensive empirical study has undertaken a global analysis of such an extensive time span as the one examined in this article. While economists have diligently scrutinized Regional Trade Agreements (RTAs) in detail, they have often overlooked the critical mechanisms of how political decisions spill over into economic outcomes. By constructing a new worldwide database of International Cooperation Agreements categorized according to their objectives, we aim to furnish the evidence required to address vital questions.

Our contribution is two-fold. First, we put together a new historical dataset of valuable interest for International Studies, as used in a sister paper (Acharya et al., 2023). Treaties were classified under 6 categories, according to the scope of the cooperation, as shown in Table 1 (a more complete explanation, as well as how we deal with successor states, are included in the Appendix). The database includes historical agreements that signaled a turning point in geopolitics as it is the case of the "Sino-Soviet Treaty of Friendship, Alliance and Mutual Assistance" signed in Mao Zedong's visit to the Soviet Union between December 1949 and February 1950, the Agreement on the mutual establishment of consular relations and the opening of consulates general signed between the US and China in Deng Xiaoping's visit to the US in January 1979, the Paris Peace Accords (officially the Agreement on Ending the War and Restoring Peace in Vietnam) negotiated by Henry A. Kissinger and signed by the Democratic Republic of Vietnam (North Vietnam), The Republic of Vietnam (South Vietnam), the United States and the Provisional Revolutionary Government of the Republic of South Vietnam, as well as more day-to-day agreements. For the purposes of this paper, we do not include 1,684 trade related agreements to restrict our analysis to non-trade cooperation, but complement our data with popular Regional Trade

¹We refer to international studies in a broad sense, including International Relations, International Political Economy, Geoeconomics, and other subfields.

²The Charter of the United Nations is the founding document of the organization and was signed in June 1945 at the United Nations Conference on International Organizations.

Agreements³ datasets. Whenever we refer to “Economic Cooperation” we are talking about category 2 and when referring to “Non-Economic Cooperation” we aggregate the rest of the categories.

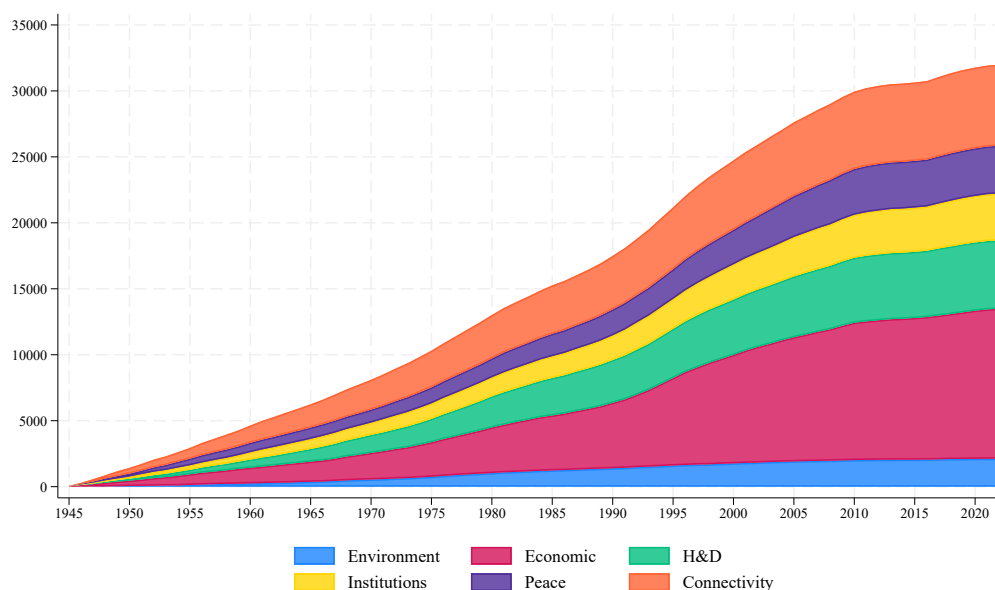
Table 1: Main Functions of International Cooperation

| Functions | Examples |
|---|---|
| 1. Natural Resources and Environment | <i>Energy, environmental protection</i> |
| 2. Economic Cooperation and Integration | <i>Trade, taxation, investment</i> |
| 3. Human and Social Development | <i>Education, culture, science, health</i> |
| 4. Governance and Institutions | <i>General cooperation, legal issues</i> |
| 5. Peace and Security | <i>Military alliance, crime control</i> |
| 6. Connectivity | <i>Transportation network, visa, infrastructure</i> |

Examples of agreements: 1. Natural Resources and Environment: Agreement on cooperation in the area of environment between the Government of the State of Israel and the Government of the Czech Republic (2018), Agreement between the Government of the Republic of Poland and the Government of the United States of America on cooperation towards the development of a civil nuclear power program and the civil nuclear power sector in the Republic of Poland (2020) 2. Economic Cooperation and Integration: Agreement on the promotion and the reciprocal protection of investments between the Government of the Republic of Cyprus and the Council of Ministers of the Republic of Albania (2010), Agreement between the Federal Republic of Germany and the Republic of Albania for the avoidance of double taxation and of tax evasion with respect to taxes on income and on capital (2010) 3. Human and Social Development: Basic Agreement on cooperation in peaceful applications of space science and technology between the Government of the Federative Republic of Brazil and the Government of the Argentine Republic (1996) Agreement between the Government of the Republic of South Africa and the Government of the Republic of Zimbabwe on health matters (2009) 4. Governance and Institutions: Agreement between Denmark, Finland, Iceland, Norway and Sweden on the implementation of certain provisions concerning nationality (2002) Administrative Agreement between the Delegation of the European Union to the Republic of Peru and the Government of the Republic of Peru concerning the observation of the extraordinary congressional elections of 26 January 2020 (2019) 5. Peace and Security: Treaty on extradition between Australia and the State of the United Arab Emirates (2007) Agreement between the Government of the French Republic and the Government of Australia regarding the provision of mutual logistics support between the Australian defence force and the French armed forces (2018) 6. Connectivity: Agreement between the Government of the United Mexican States and the Government of Australia relating to air services (2010) Agreement between the Government of the Republic of Estonia and the Government of the Republic of Austria concerning the abolition of visa requirements (1999)

³We refer to Regional Trade Agreements (RTA), Preferential Trade Agreements (PTA) and Free Trade Agreements (FTA) indistinctly.

Figure 1: International Cooperation Agreements by function



Graph shows the evolution of ICAs by its 6 classifications. Economic agreements have been the majority of signed agreements throughout the period, constituting 32% in 1945, 28% in 1990 and 36% in 2022. Environmental agreements went from being 3,3% of total agreements in 1945, to being 8% in 1990 and 6,6% in 2022. Human and Social Development went from 6,8% in 1945, to 18,5% in 1990 to 16,2% in 2022. Governance and Institutions went from being 15% in 1945, to 11% in 1990 and remained almost constant until 2022. Peace and Security went from being 22% in 1945, 11% in 1990 and remained almost constant until 2022. Connectivity were 20% in 1945, 23% in 1990 and 19% in 2022.

Our second contribution is to exploit the database at the bilateral level to establish a number of new results. We first document that gravity forces play an important role in the formation of ICAs. As theoretically expected, we find that closer countries tend to participate in more agreements, especially if they share a border, as well as countries sharing commonalities such as religion, legal systems or having ever been in a colonial situation. Importantly, countries with bigger economic or population size also have a higher probability of entering an ICA, as do countries with more similar UNGA voting patterns. We then investigate the sequencing of international cooperation (Estevadeordal and Suominen, 2008; Balassa, 1961) and find evidence for International Cooperation Agreements increasing the likelihood of future Regional Trade Agreements, driven by Economic ICAs. On the other hand, we find that countries that are involved in an RTA are less likely to enter ICAs in the future, which we interpret as consistent with Mattoo et al. (2020) findings that nowadays PTAs have expanded their scope and cover a wide range of areas besides trade.

We second document the commercial spillovers of ICAs through the estimation of gravity equations, where we find that a 1% increase in ICAs implies a 0.2% increase in exports, which is an inelastic but non negligible effect. The average number of ICAs in a country pair in 2020 is 1.84, signing a new agreement in this case would result in a 54% increase in ICAs, which would be translated in an increase of around 11% of exports. Considering the average number of ICAs in dyads with a positive number of agreements (6.31), signing a new one would translate into a 3% increase in exports. Taking into account the extensive margin (having or not an ICA in the country pair), results in an increase of 30% in exports. We do not assume ICAs are an exogenous random variable since countries likely select endogenously into them, for reasons we might not observe and that could be trade related. Thus, we apply what are by now common panel techniques in the trade literature to estimate the effects of ICAs on export flows, using differenced data at five-year intervals from 1945 to 2020. Aggregate shocks to a country's exports can be large relative to the effects of an international cooperation agreement and it is impossible to establish a counterfactual level of trade for the absence of agreement case. In

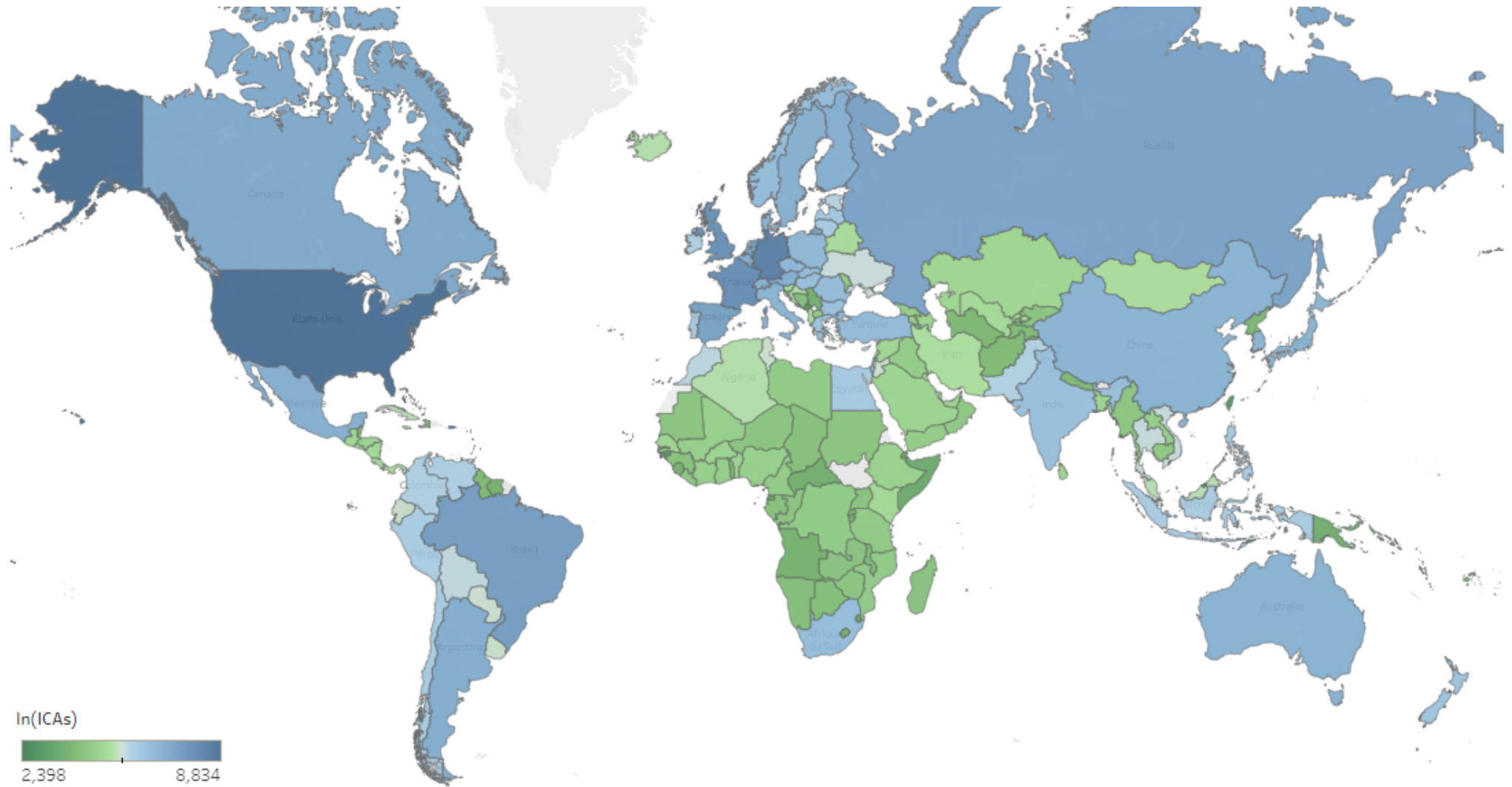
addition, the impact of an ICA can vary across parties in the agreement. To purge our results from such issues, the estimates provided make use of a set of fixed effects (reporter-year, partner-year and partner-reporter) to account for historical trade patterns and for aggregate shocks to countries, which allow to measure the within dyad trade effect in a dynamic framework. Despite potential endogeneity, results are robust to a series of techniques, different specifications and the inclusion of an instrument exploiting the network structure of international agreements and a shift-share instrument⁴. Importantly, developing countries experienced more trade-gains from international cooperation than the developed world, which is partly explained by the fact that South countries have more potential reputational gains than the Global North. It is also explained by the importance and diffusion they assign to securing diplomatic allies (see Brazilian official coverage of [Agreements with China and UAE](#)). We confirm our hypothesis by testing it in a subset of country-years and relying on firm level data. We find that ICAs increase the number of exporter firms from home country i in counterpart j market.

The empirical results of the article suggest two important conclusions. First, trade follows the flag, countries that intensify their cooperation relations experience increases in bilateral trade. The effects are higher when at least one of the parties is a Global South country, suggesting bigger reputational gains, and driven by economic and connectivity agreements. Second, we find that on average, having an ICA increases the probability of having an RTA by around 0.3% (extensive margin), controlling by all the relevant variables. Such results are stronger for economic than non economic agreements but, also positive for Connectivity agreements, when completely decomposing the functionalities of the agreements. Finally, when counterparts are North-South, the likelihood of them entering an RTA conditional of being part of an ICA is positive and significant even when including all sets of controls. This suggests that South countries wanting to deepen their trade relations with North countries should start by establishing confident cooperation channels on other economic areas.

The paper is organized as follows. Section 2 summarizes the related literature. Section 3 develops the structural gravity model we estimate and the more general empirical strategy of our subsequent regressions. Section 4 describes the data used, including the construction of the ICAD and the sources on which we rely for international trade and controls, and shows descriptive statistics. In Section 5 we document the economic determinants of ICAs and the sequencing of international cooperation. In Section 6 we discuss the main findings for the effect of ICAs on trade, explore its heterogenous effects and argue there is a causal effect through the inclusion of lead variables, a network instrument, a bartik (shift-share) instrument and all the robustness shown. Section 7 concludes.

⁴Although we acknowledge and discuss that given the nature of gravity equations, it would be naive to think there is a suitable instrument to precisely estimate a causal effect. All results provided should be seen as giving robust evidence proving that ICAs increase trade rather than perfectly identifying a causal effect and magnitude.

Figure 2: Cumulative number of ICAs in 2022



The geographical distribution of ICAs is concentrated in Western rich democracies. The Top 10 countries with most agreements at the end of the period are the United States (6862), Germany (4202), France (2683), the United Kingdom (2482), the Netherlands (1745), Brazil (1649), Spain (1514), Russia (1397), Canada (1206) and Belgium (1073). China is the 21th country with most agreements (847), being the second in Asia after Israel (918), and quite ahead from India (589). Africa is a relatively disconnected region from the international order, with the lowest regional average (115 agreements). The most active country in the continent is South Africa (628) while the least active is Sao Tome and Principe (16).

2 Related literature

The literature focusing on international cooperation and trade is divided into two. On the one hand, scholars (mainly economists) have extensively studied the impacts of Preferential Trade Agreements (PTAs) on economic outcomes such as trade, foreign direct investment (FDI), growth or welfare. On the other hand, other authors (political economists, political scientists or international relations (IR) scholars) have focused on non-economic outcomes from trade: democratization level, conflict risks, lobbying power. Our study aims at filling the gap between both literatures, providing a link across disciplines by shedding light on how the economic and non-economic forces work together. The following literature review collects the main efforts in these fields, placing the reader at the gap we aim to fill. As the absence of a comprehensive database covering the cooperation efforts of non-trade agreements (until now) prevented related research from proliferating, we will mainly refer to studies on RTAs to support our claims.

2.1 The formation of RTAs

2.1.1 Economics

One of the foundational studies in the formation of RTAs is [Baldwin \(1993\)](#), which presents the domino theory, stating that countries join a PTA as a result of anti-membership and pro-membership forces reaching a political equilibrium because the cost of not joining -related to trade diversion⁵- is too high. [Baldwin and Jaimovich \(2012\)](#) departs from the domino theory to generate a *contagion index* of FTAs, a measure that links this degree of contagion to the importance of the partners' market, finding empirical support.

Alternatively, [Baier and Bergstrand \(2004\)](#) find that the likelihood of a dyad entering a PTA is tied to the potential welfare gains derived from the agreement. These gains will be higher depending on: their economic size and similarity among economies, the closer the countries are to each other -trade creation-, the farther the dyad is from the rest of the world -trade diversion-, the greater is the difference in capital-labor endowment ratios in the dyad -traditional gains from comparative advantages in a Heckscher-Ohlin model- and the smaller is this endowment ratios difference relative to the rest of the world -what would mean fewer inter-industry trade diversion. On their revision of the study, [Baier et al. \(2014\)](#) introduce the concept of FTAs' *interdependence*, identifying two possible channels: *own-FTA* and *cross-FTA* effect. While the former refers to the case where one of the members has an FTA with a third country, the latter alludes to the situation where a different country-pair has already entered an FTA. In a way, own-FTA is related to the domino theory while cross-FTA it's a competitive liberalization approach. Studies such as [Egger and Larch \(2008\)](#) confirm the cross-FTA effect.

Finally, [Chen and Joshi \(2010\)](#) build a theoretical model where given that *country i* has an existing FTA with *country k*, it has stronger incentives to enter a new FTA with *country j* when comparing with the case of a no pre-existing FTA_{ik} situation. They argue this is because the potential losses that *country i* could experience in its home market from the new FTA_{ij} are appeased by the presence of the third country *k*. However, this means that potential gains in the export market for *country j* will also be smaller because of *country k*. As a result, the new FTA will be signed if *country i*'s market size and marginal costs are big enough to allow gains for *country j*. Incentives increase if both countries *i* and *j* hold FTAs with third country *k*. They find empirical evidence to support their hypothesis.

2.1.2 International relations/political economy

The decision to join a PTA could be driven by political, besides economic, forces. [Grossman and Helpman \(1993\)](#) finds that an FTA would be the equilibrium of a game with an incumbent government and industry special interest groups if the welfare gains for the median voter are substantial enough. [Mansfield \(1993\)](#) points out

⁵Trade creation is defined as consumption shifts from a producer with high costs to one with lower, thus expanding trade. Opposite, trade diversion is defined as trade shifts from a lower cost producer from outside the trade union to a high cost producer inside the union.

that many PTAs have been formed under countries considered political allies. In a valuable summary, [Ravenhill \(2008\)](#) explains that the reasons for a government signing a trade agreement could go from security issues to creating a negotiation channel that could work better than the ones within the WTO, including strengthening their bargaining power or giving a certain "seriousness" signal to the rest of the world, particularly to investors. According to [Mansfield and Reinhardt \(2003\)](#) the international system's activity -GATT/WTO- results in an increase in the likelihood of members signing a PTA so as to secure more bargaining power within the system.

[Mansfield et al. \(2002\)](#) describe a mechanism where more democratic states are more keen on signing a PTA. Politicians send a sign of competence to the electorate when entering a PTA, which translates into confidence among the voters. This implies within country institutions play a big role in the formation of PTAs. Going from voters to lobby groups, [Mansfield et al. \(2008\)](#) consider veto players will have a final saying on which type of integration countries are binding to. They argue that the higher the number of veto players and the more heterogeneous their preferences, then the less probable will be to reach integration, or, if reached, the more superficial it will be.

[Dür \(2007\)](#) emphasizes the lobbying power of domestic interests in the formation of certain agreements, where exporters pressure in favor of a *protection-for-exporters* strategy, pushing for the creation of PTAs with third pairs so as not to lose foreign market access (exporters forcing the domino or own-FTA effect). Using a Principal-Agent framework, [Elsig and Dupont \(2012\)](#) introduce bureaucratic interests in the process and outcome of a PTA.

2.2 Effects of RTAs

2.2.1 Economics

The study of the economics effects of free trade agreements goes back to [Viner \(1950\)](#), who divides their welfare impact in terms of trade creation and trade diversion, arguing that effects apply to member and nonmember countries although it is not clear if they end up better or worse of. Using a static monopolistically-competitive framework [Krugman et al. \(1991\)](#) argues that, in spite of beliefs that a free trade area would result in more trade diversion than trade creation, the overall effect would be positive due to the economic geography behind agreements. Most of trading blocs are formed of neighbor countries that would be mainly trading with themselves even without the FTA, resulting in few trade diversion losses outweighed by large trade creation gains. They acknowledge that countries outside big blocs could be worse off, resulting in distributional concerns. [Summers et al. \(1991\)](#) find regional liberalization a second best -given the inability to reach global liberalization- due to the fact that PTAs create more trade than what they divert, that their trade diversion could increase welfare, that they would impact positively on non-trade aspects and that regionalization could accelerate the general liberalization process. Although they also point out that existing arrangements take place between countries that are already natural partners, resulting in more trade creation than diversion.

Oppositely, [Bhagwati \(1999\)](#) argues that some PTAs could result in trade diversion -and protectionism against third parties- even if the PTA itself didn't seem to produce worrying trade diversion effects. Using detailed trade and tariff data, [Romalis \(2007\)](#) finds that both NAFTA and CUPSTA have substantially increased trade quantities although their effects on prices and members or non-members welfare have been little. He finds a trade diversion effect where imports from non-member countries were driven out and North American output and prices have increased in highly-protected sectors.

Research on how PTAs promote trade is abundant: [Aitken \(1973\)](#) finds that PTAs have promoted trade among the EEC and EFTA members during their respective integration periods, thanks to a cumulative growth in gross trade creation (GTC). Using differenced panel data and gravity equation regressions [Baier and Bergstrand \(2007\)](#) find free trade agreements actually increase trade among its members. In a later study, [Baier and Bergstrand \(2009\)](#) use a matching estimator as an alternative to gravity equations and find again a significant positive impact of FTAs over trade in the long run. [Goldstein et al. \(2007\)](#) evaluates the effects of the GATT/WTO and other PTAs in post-WWII trade. Using gravities estimations, they find that

countries with *institutional standing* -rights and obligations even if the country does not formally belong to the GATT/WTO- result in more trade. They find a similar positive effect for the other PTAs. Magee (2008) uses gravity estimations and finds effects to be different depending on the member, depending on the time frame -with more positive long-run impacts than short-run- and depending on the type of integration. Customs Unions present the largest long-run positive effect in members' trade on average, while FTAs have a smaller one and they fail to find a significant effect for PTAs. In addition, he finds an increase in trade the previous years an agreement is actually signed, going along the lines of Krugman et al. (1991) and Summers et al. (1991) "natural trading partners" theory. Rose (2004) analyzes the effects of the GATT/WTO and the Generalized System of Preferences (GSP) on trade over 50 years and 175 countries and -surprisingly- finds that members of the GATT/WTO have no different trade patterns than non-members, attributing lack of positive results to the impossibility of building a counterfactual non-GATT world.

Regarding the effects regionalism has in unilateral trade liberalization, Estevadeordal et al. (2008) studies Latin American countries over the period 1990-2001 using industry-level data on applied MFN tariffs and bilateral preferences and find FTAs (RTAs) to induce a faster decline in external tariffs, although this is not the case for CUs. Pelzman (1977) finds a cumulative growth in GTC among the members of the Council for Mutual Economic Assistance (CMEA) in the integration period 1965-1970.

Finally, the effects of PTAs on FDI have also been studied. Büthe and Milner (2008) use a gravity model for 122 developing countries for the period 1970 to 2000 and find that developing countries belonging to the GATT/WTO and having more PTAs have greater FDI inflows than otherwise. They argue trade agreements build a more credible image than domestic policy, providing with the necessary information for foreign investors to rely on members.

2.2.2 Political outcomes

As policymakers and politicians, scholars also believe PTAs have effects going beyond direct economic gains. Pevehouse (2005) argues that PTAs increase the probability of democratization. Fernandez and Portes (1998) believes RTAs help increase credibility in the signatory countries, providing them with insurance against possible future events, stronger bargaining power and sending a signal to the world. Mansfield and Pevehouse (2000) find that countries belonging to the same PTA are less likely to start a military conflict, and that this likelihood has an inverse relation with trade. However, they find trade has little effect if countries don't share a PTA. Similarly, Martin et al. (2008) study the contrasting effects of bilateral and multilateral trade openness on the probability of military conflict. Hafner-Burton (2005) argues that PTAs improve signatory members' human rights. Ingram et al. (2005) find that countries connected to international governmental organization experienced more bilateral trade.

2.3 How politics affects trade

Pollins (1989a) and Pollins (1989b) use a public choice approach to predict the level of imports using international conflict, cooperation and income as the explanatory variables of the model. Both studies find that the effects of diplomacy on commerce is significant, thus indicating that trade follows the flag. Gowa and Mansfield (1993) finds political-military alliances having a positive impact on bilateral trade flows. Kono (2006) finds that democracy leads to lower trade tariffs and higher quality NTBs. Similarly, Milner and Kubota (2005) argue that democratization leads to trade globalization. Finally, Goldberg and Reed (2023) argue that the US tends to trade more with countries which their citizens label as "friendly" or "allies".

2.4 Trade and Cooperation

2.4.1 Economy

Our concern refers to the links and dynamics that exist in international cooperation and trade, in its foundation and its effects. To the best of our knowledge, there is not yet a study that answers directly this question, but some have gotten close to it. [Balassa \(1961\)](#) argues that FTAs start the path toward regional integration, allowing for the future formation of a Customs Union a common market and, finally, a monetary union. Although [Devlin and Estevadeordal \(2004\)](#) pose the theoretical possible mechanisms of this relation, it was never empirically tested.

2.4.2 Political science

The political science field has focused on this aspect with more attention. [Axelrod and Hamilton \(1981\)](#), [Keohane \(2005\)](#), [Oye \(1985\)](#) and [Pastor et al. \(2001\)](#) use game theoretical approaches to conclude that a more cooperative equilibrium could be reached by repeated interactions solving the Prisoner's Dilemma. [Fearon \(1997\)](#) and [Morrow \(1992\)](#) introduce strategic factors into their games that explain when cooperating is a better outcome than not doing so. [Frieden \(1996\)](#), as [Balassa \(1961\)](#), believes that it exists a progression from trade integration towards monetary cooperation. Studying the European case, he gets to the conclusion that the more integrated a nation is into EU trade and finance the more it would desire to acquire monetary integration, so as to stabilize exchange rates among the partners. This belief of a path from FTAs to monetary unions is also shared by [Maxfield \(1990\)](#).

3 Empirical strategy

This paper presents empirical findings on the impact of cooperation agreements on trade, its determinants, and sequencing. We acknowledge potential endogeneity in our results due to confounding factors and/or reverse causality, which may bias our estimates. Bilateral relations involve complex decisions where politicians use diplomacy to enhance trade and commerce to influence diplomatic negotiations. Identifying exogenous mechanisms is challenging, but we argue that our complementary approaches provide robust evidence. With countries entering and exiting the international system during the study period, we deal with an unbalanced panel of 193 countries.

This section is divided into two parts. First, we describe the linear probabilistic model used to understand the economic determinants of International Cooperation Agreements (ICAs) and to test the hypothesis by [Estevadeordal and Suominen \(2008\)](#) on the sequencing between trade agreements and cooperation agreements. We analyze the likelihood of a country with a Regional Trade Agreement (RTA) entering an ICA (extensive margin) and how an RTA strengthens cooperative relations (intensive margin) within a country pair. It is uncommon for a bilateral pair with an RTA to sign a new one, typically occurring only if they modify existing terms or join a multilateral agreement. Thus, we consider RTAs as non-randomly assigned 'treatments', addressing endogeneity with complementary techniques: staggered differences-in-differences regression and an event study of ICA evolution in bilateral relations.

Second, we employ a gravity equation to estimate the impact of ICAs on trade. Our empirical design aligns with current state-of-the-art gravity regressions, incorporating relevant controls from International Relations and variables constructed using Social Network Analysis (SNA) techniques. To identify a causal effect of ICAs on trade, we use two strategies. First, we introduce a lead of our independent variable into our main specification, following [Baier and Bergstrand \(2007\)](#). Second, we exploit the network structure of international relations to design an instrumental variable that relies on peers' connections. Finally, we provide robust evidence for an alternative instrumental variable. All of the econometric techniques applied throughout

the paper have limitations, so the results should be viewed as complementary, collectively providing robust evidence.

3.1 Economic determinants of International Cooperation Agreements

We use a linear probability model to study the economic determinants of International Cooperation Agreements (ICAs). We choose a linear model over a log-linear model because the latter is restricted to prediction analysis, whereas our focus is on the causal effects of the independent variables (Hellevik, 2009). Additionally, linear regressions provide easier interpretative results, which are of interest to policymakers and the public. They also allow us to control for restrictive fixed effects, which is crucial for identifying causal effects. We estimate the following equation:

$$P(ICA_{ij,t}) = \beta_0 + \beta_1 RTA_{ij,t-5} + \beta_2 \ln GDP_{i,t} \times \ln GDP_{j,t} + \beta_3 Diff Y_{ij,t-5} + \beta_4 \ln POP_{i,t} \times \ln POP_{j,t} + \delta X_{ij,t} + \zeta_{ij} + \gamma_{i,t} + \psi_{j,t} \quad (1)$$

The left-hand side measures the probability of entering an ICA for a particular country pair in a specific year. Subscripts i , j , and t denote the exporter, importer, and year, respectively. $RTA_{ij,t-5}$ is a dummy variable equal to one if the pair signed a Regional Trade Agreement, with a 5-period lag to avoid endogeneity concerns. $Diff Y_{ij,t}$ is the absolute difference in the pair's natural log of GDP. ζ , γ , and ψ are the pair, Reporter-Year, and Partner-Year fixed effects, respectively.

We study the intensive margin of RTAs over ICAs with the following specification:

$$ICA_{ij,t} = \beta_0 + \beta_1 RTA_{ij,t-5} + \beta_2 \ln GDP_{i,t} \times \ln GDP_{j,t} + \beta_3 Diff Y_{ij,t-5} + \beta_4 \ln POP_{i,t} \times \ln POP_{j,t} + \delta X_{ij,t} + \zeta_{ij} + \gamma_{i,t} + \psi_{j,t} + \epsilon_{ij,t} \quad (2)$$

Where $ICA_{ij,t}$ refers to the number of ICAs entered by the dyad in a year. We include international relations controls and show results using lagged variables and differenced regressions. We also explore heterogeneous effects in subsequent regressions, distinguishing by type of cooperation agreement and type of country.

Finally, we examine if pairs that are part of an ICA are more likely to enter (or have) an RTA by running the following specification:

$$P(RTA_{ij,t}) = \beta_0 + \beta_1 ICA_{ij,t-1} + \beta_2 \ln GDP_{i,t} \times \ln GDP_{j,t} + \beta_3 Diff Y_{ij,t-5} + \beta_4 \ln POP_{i,t} \times \ln POP_{j,t} + \delta X_{ij,t} + \zeta_{ij} + \gamma_{i,t} + \psi_{j,t} \quad (3)$$

Where $P(RTA_{ij,t})$ refers to the probability of entering an RTA in year t or the probability of being part of an RTA in year t , depending on the specification. Our preferred specification is the former, but we report both.

3.2 International agreements effects on trade

We rely on the workhorse tool of trade research, the gravity equation, to evaluate the impact ICAs have on trade. Our econometric methods build upon the structural gravity derived by Anderson (1979), popularized in Eaton and Kortum (2002) and Anderson and Van Wincoop (2003), adapted to panel data in Baier and Bergstrand

(2007) and carefully detailed in subsequent works like [Piermartini and Yotov \(2016\)](#) or [Baier et al. \(2019\)](#):⁶

$$X_{ij,t} = \frac{Y_{i,t}E_{j,t}}{Y_t} \left(\frac{\tau_{ij,t}}{P_{j,t}\Pi_{i,t}} \right)^{1-\sigma} \quad (4)$$

Where subindexes i , j and t represent origin, destination and time respectively. X refers to exports, E to total expenditure, Y to total production and τ to the bilateral trade frictions in the dyad. While $\sigma > 1$ is the elasticity of substitution among goods from different countries, P and Π represent the multilateral resistance terms and are defined by

$$\Pi_{i,t}^{1-\sigma} = \sum_j \left(\frac{\tau_{ij,t}}{P_{j,t}} \right)^{1-\sigma} \frac{E_{j,t}}{Y_t}, \quad P_{j,t}^{1-\sigma} = \sum_i \left(\frac{\tau_{ij,t}}{\Pi_{i,t}} \right)^{1-\sigma} \frac{Y_{i,t}}{Y_t}$$

International Cooperation Agreements' purposes are varied and treaty specific. Their provisions cover a wide range of topics, from changes on visa policies to rules on nuclear weapons. Even though ICAs are not purposely designed to do so, they may lower bilateral trade costs between the signatory parties. The process of country pairs negotiating and signing non-trade agreements results in the creation of a legal infrastructure that "closes the distance" between them, promoting bilateral trade. The mechanism through which ICAs affect trade is microfounded on the basis that international agreements increase trust between citizens (firms) in signatory countries, allowing them to engage in deeper and riskier relations such as trade, increasing bilateral flows.

Our interest is in estimating if such a decrease in bilateral trade costs actually happens and impacts trade flows. For such, we focus on the term $\tau_{ij,t}$ from equation 4, from which we can go to

$$\ln X_{ij,t} = \ln Y_{i,t} + \ln E_{j,t} - \ln Y_t + (1 - \sigma) \ln \tau_{ij,t} - (1 - \sigma) \ln P_{j,t} - (1 - \sigma) \ln \Pi_{i,t} + \epsilon_{ij,t} \quad (5)$$

By log-linearizing and including the error term $\epsilon_{ij,t}$. Defining our term of interest, $\tau_{ij,t}$, as it is common practice in gravities, we have

$$(1 - \sigma) \ln \tau_{ij,t} = \beta_1 \ln DIST_{ij} + \beta_2 CNTG_{ij} + \beta_3 LANG_{ij} + \beta_4 CLNY_{ij} + \beta_5 RTA_{ij,t} + \beta_6 \ln ICA_{ij,t} \quad (6)$$

Where $DIST$ refers to the physical distance between country i and j , $CNTG$ is a dummy variable equal to 1 if countries are contiguous to each other, $LANG$ is a dummy variable equal to 1 if countries share the same language, $CLNY$ is a dummy variable equal to 1 if country i is a former colony of country j . Many other general determinants of trade frictions could be included in the equation above, which have been deeply study by the gravity literature. However, the main focus of this paper is the effect of ICA -which represents the number of International Cooperation Agreements in which the dyad take part- on trade costs. Thus, we include dyad-time varying controls in our estimations, such as RTA -which accounts for the presence of regional trade agreements in the country pair- and we capture the bilateral non-time varying trade frictions using pair fixed effects.

The structural gravity resulting from the theoretical model needs to be modified in order to be estimated, so as to take into account common caveats of gravity equations and trade data, in accordance to the technical progress the literature has made over decades of practice.

First, as briefly mentioned above, there is no need to actually estimate the multilateral resistance (MR) terms or the time-invariant bilateral trade costs as they will be accounted for what is now the golden rule in a dynamic gravity estimation framework with panel data: reporter-year, partner-year and pair fixed effects. Reporter-year and partner-year fixed effects will account for the unobservable MR and any other time-varying characteristics affecting trade, which means they capture historical shocks affecting all dyads as well as country-specific shocks that affect a subset of dyads. These include discrete events of global relevance for cooperation such as the

⁶It is not the goal of this paper to prove how or why gravities are useful to measure trade costs. There is a broad literature that argue in favor of these models, see for instance [Head and Mayer \(2014\)](#), [Baldwin and Taglioni \(2006\)](#), [Baltagi et al. \(2014\)](#), [Piermartini and Yotov \(2016\)](#) among others.

end of the URSS and the fall of the Berlin Wall, the 9/11, the Great Recession, as well as trends such as the development of the global governance, the increases on international trade due to globalization and the Global Value Chains revolution. Even more, there is no need to deflate nominal trade flows since every bilateral trade flow would be divided by the same price index and the time dummy accounts for it, thus avoiding any possible mistake in the deflation procedure (Baldwin and Taglioni, 2006). Finally, we take into account country-specific shocks such as the massive economic growth in China, changes in political regimes or natural disasters. Pair fixed effects are controlling for time invariant unobserved pair-characteristics that simultaneously influence trade and ICAs, such as distance, sharing common language, contiguity, same religion, if they had -or not- any type of colonial relationship. This strict set of fixed effects is controlling for all of the unobservables impacting bilateral trade except the characteristics varying within a dyad and across time.

Second, our main explanatory variable has a significant amount of zero values that carry valuable information: they represent the case of existing countries that actively decide not to sign a treaty with one another. As the residuals when using the ICA variable have a skewed distribution, taking its logarithm would be desired since it allows to obtain residuals that are approximately symmetrically distributed, as shown in Appendix 3, and linearizes the relationship. However, these valuable zero values would be lost if we plainly use its logarithm. Thus, we use as independent variable another transformation of the cumulative number of bilateral ICAs. Namely, as it is increasing practice in applied econometrics, we use the inverse hyperbolic sine transformation. The transformation results similar to a logarithm and allows to retain zero values (Bellemare and Wichman, 2020), specifically:

$$\widehat{ICA} = ihs(ICA) = \ln(ICA + \sqrt{ICA^2 + 1})$$

Robustness checks using other measures such as simply the number of agreements or its natural logarithm are included in Appendix.

Further, the number of ICA in a bilateral relationship is not always an integer due to the presence of both, bilateral and multilateral treaties. Out of a total of 31,982 agreements we collected in the database, 835 are multilateral ones (including more than two counterparts). As considering these treaties without any adjustment would result in inflating the diplomatic relations of a given country, we include only a portion of each multilateral agreement in the bilateral relation, corresponding to

$$b_{ij} = \frac{1}{(\text{nr of countries} - 1)}$$

With b_{ij} = the portion of the multilateral treaty that will be added to the bilateral relation of country i and country j , countries = the number of countries that signed the multilateral agreement. This way, multilateral relations don't get over-represented in bilateral ones, and when adding all the bilateral relations of a country one gets its total number of agreements. Robustness regressions using only the bilateral agreements yield similar results.

Third, our dependent variable it is also the inverse hyperbolic sine transformation of the exports flows from country i to country j . The only reason why we use such transformation is because it allows for a straightforward interpretation of the estimated coefficients as elasticities in an ihs-ihs model. Results hold when using the natural logarithm of exports, but its numerical interpretation would not be as straightforward. In addition, we also run a set of robustness regressions using as dependent variable the average of the log of the pair's trade flow, following Baldwin and Taglioni (2006), "correctly averaged" as they suggest, to avoid what they call the silver medal mistake⁷.

⁷The gravity equation explains uni-directional bilateral trade. However, it is possible to estimate the average of two-way exports but, in doing so, the authors highlight the importance of not mistaking the log of the average for the average of the logs, the latter being the correct form.

Specifically, we empirically estimate the following benchmark model

$$X_{ij,t} = \beta_0 + \beta_1 ICA_{ij,t} + \beta_2 RTA_{ij,t} + \beta_3 Y_{ij,t} + \delta C_{ij,t} + \zeta_{ij} + \gamma_{i,t} + \psi_{j,t} + \epsilon_{ij,t} \quad (7)$$

Where, in addition to the terms explained above, $Y_{ij,t} = \ln\left(\frac{GDP_{i,t}}{population_{i,t}}\right) \times \ln\left(\frac{GDP_{j,t}}{population_{j,t}}\right)$, ζ are the pair fixed effects, γ the Reporter-Year fixed effects, ψ the Partner-Year fixed effects and ϵ is the error term.

Following [Baier and Bergstrand \(2007\)](#) we use panel regressions every 5 years and 5 year differences to estimate our OLS regressions, for the period 1945-2020. We also show first differences, level regressions and Poisson estimations as a robustness check in the appendix.

Econometric analysis of panel data treating endogeneity focus on either fixed effects estimators or first-differenced estimators. Differencing the panel data increases estimation efficiency if the unobserved heterogeneity in trade flows, $\epsilon_{ij,t}$, is correlated over time, which is likely. In addition, differencing data yields deviations from previous periods, which converts the series of trade flows or GDP into closer to unit-root process. Moreover, it allows to take into consideration “phasing-in” of ICAs, in the same sense that [Baier and Bergstrand \(2007\)](#) consider “phasing-in” of FTAs. However, even when differenced panel data allows to deal with endogeneity concerns, we are not oblivious of that the OLS estimates could still be biased due to the presence of reverse causality or confounding factors. In order to address potential omitted variable bias arising from confounding factors, we combine differenced regressions with fixed effects as it is now the Gold standard in gravity estimations, taking into account multilateral resistance terms. Further, in [Section 6.1](#) we implement several identification strategies that confirm our main results. Namely, we introduce a lead of our independent variable as [Baier and Bergstrand \(2007\)](#) do, and we use an instrumental variable that exploits the network structure of ICAs. The latter consists on the number of agreements signed by counterparts of country i that not include either i nor j . The instrument exploits spillovers of peers into the bilateral cooperation relation of countries ij and is not predetermined by the bilateral level of trade between ij , as it is unlikely that the dependent variable would affect the diplomatic actions of the rest of the world. Finally, we test an alternative shift-share instrument of the like introduced in the literature by [Bartik \(1991\)](#), and used in studies such as [David et al. \(2013\)](#), consisting of the initial share of the bilateral number of ICAs per type on the world’s aggregate interacted with the world’s growth rate of ICAs. Additionally, we introduce the same control variables as above to reduce potential bias arising from omitted variable.

3.3 Control variables

As the subject of our study is intertwined with many aspects of international relations, we include in $X_{ij,t}$ control variables at the dyad-year level that allow us to capture other political determinants of bilateral relations, which help to better identify a causal effect, dealing with potential omitted variable bias arising from the correlation of $ICA_{ij,t}$ and the error term. These are:

- $UNVoting_{ij,t}$ is the Ideal Point Distance taken from [Bailey et al. \(2017\)](#), because countries with more affinity in the UN General Assembly will tend to sign more treaties and trade more. A higher ideal point distance reflects countries voting further apart in the UNGA.
- $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project. We introduce this variable for historical reasons: post-WW2 era was the time when countries started to develop their international network of treaties. In parallel, they spent resources in the construction of the international governmental sector, with reasonable implications in bilateral relations. We also expect countries being part of more IGOs to trade more and engage in more bilateral agreements.

- $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project. The data on military alliances goes only until 2013, we assume 2013 values remain constant for the last year of our panel, 2020. Running the same regression without year 2020 yields qualitatively and quantitatively similar results.
- $Centrality_{ij,t}$ is the Eigenvector Centrality⁸ score of country i times the Eigenvector Centrality of country j , in the network of international agreements. Centrality is included to capture if countries decide to trade/sign agreements with other important players in the network of agreements, i.e. more central countries. As centrality is a measure of importance in the world political game, our hypothesis is that countries will look for more central ones and will engage in trade (or treaty negotiations) because they believe this will secure themselves a better position in the international chessboard.
- $StrucEquiv_{ij,t}$ ⁹ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations. In Social Network Analysis, the Structural Equivalence measures the degree of similarity between two nodes, in terms of their relations with other nodes. Its value goes from +1 to -1, where +1 is total positive linear correlation, 0 is no linear correlation, and -1 is total negative linear correlation.
- $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. As [Ingram et al. \(2005\)](#) do, we include this control since democracies are expected to trade more and sign more agreements.

4 Data

The core of our analysis is relying on a novel database, the International Cooperation Agreements Database (ICAD). The ICAD gathers 31,982 international agreements signed between 1945-2022. Data comes from a variety of sources: the United Nations Treaty Collection (UNTC), the Treaty Secretariat of the World Intellectual Property Organization (WIPO), the United Nations Conference on Trade and Development (UNCTAD), and the World Treaty Index (WTI). 97 percent of the agreements in the data are bilateral (have only two parties) while the rest 3 percent are multilateral (have at least three parties).

The primary data comes from the UNTC, more specifically the United Nations Treaty Series (UNTS). UNTS contains both bilateral and multilateral treaties. Under Article 102 of the Charter of the United Nations, every treaty and every international agreement signed by a UN Member after the coming into force of the Charter must be registered with the Secretariat, which then publishes it. No party can invoke an agreement before any organ of the UN until the agreement is registered. The main objective of this requirement is to avoid “secret diplomacy” between states. Due to this requirement, the UNTC is likely the most comprehensive source of international agreements encompassing formal, legally binding international agreements (rather than informal documents), which then makes the ICAD the most comprehensive database of international agreements. However, several caveats within the ICAD are worth mentioning. First, it does not hold the complete universe of agreements as we acknowledge a minor number could be published in other sources -like national institutions of specific countries- and missing from our sources consulted. Second, there is no clear deadline for registration, which means that, at any given date, some active agreements have not been recorded. In some cases, there is a lag of years between an agreement entering into force and being registered with the UN. Third, there is no data on if the registered agreements are no longer in place. We acknowledge these limitations could result in measurement error biasing our results, although we believe such limitations are not worrisome given the extensive coverage of the data we gathered. The ICA Database also includes international

⁸For a given country i , the eigenvector, x_i , will be $x_i = \frac{1}{\lambda} \sum_{j \in N} a_{i,j} x_j$ Where: $a_{i,j} = 1$ if country i is linked to country j and zero otherwise, x_j is the centrality of country j and λ is a constant. This means that we are measuring the country's influence in the network based on the concept that connections to high-scoring countries contribute more to the score in question than equal connections to low-scoring countries. See [Newman \(2008\)](#).

⁹Equivalent to what [Ingram et al. \(2005\)](#) do with IGOs.

agreements from two additional sources: the Treaty Secretariat of the World Intellectual Property Organization (WIPO) and the United Nations Conference on Trade and Development (UNCTAD). In total, these sources added roughly 3,000 unique international agreements to the ICA database. For the purposes of this study, the ICAD was complemented with data on Regional Trade Agreements (RTAs) coming from the Economic Integration Agreement Dataset ¹⁰ (a joint work from Jeffrey Bergstrand and Scott Baier).

Within our framework, International Cooperation Agreements (ICAs) and Official Development Assistance (ODA) are distinguished based on level of interdependence and mutuality of benefits. First, ODA is a one-way flow of assistance from donors to beneficiaries, namely developing countries. These recipient countries depend on donors to achieve development outcomes, but not the other way around. In contrast, ICA involves two or more parties acting together to create outcomes. In this process, the parties rely on each other to contribute funds, technical expertise, and human resources to obtain these outcomes. Further, producing mutual and relatively equal benefits is another key characteristic of ICA. ODA generally provides concessional funding (or soft loans) with a grant component of at least 25% to support development projects. The benefits of ODA are mainly channeled to recipients/developing countries. In comparison, the outcomes of ICA should be desirable for all those involved, whether they are developed or developing countries. For example, funding and technical assistance provided by a donor agency to cure animal diseases is clearly ODA, in that it only benefits the recipient country. However, collaboration between countries on controlling animal diseases in the frontier region is ICA. As our intention is to measure cooperation between countries, we do not include ODAs in our database. Accordingly, we only include RTAs coded 2 or higher in the EIA dataset, given that they refer to reciprocal agreements. The treaties in our analysis were sorted into six distinct categories, each reflecting the level and nature of cooperation involved, as outlined in Table 1 (a more detailed version is available in the Appendix). When we make reference to “Economic Cooperation”, we are specifically addressing treaties falling into category 2. On the other hand, when we use the term “Non-Economic Cooperation”, we are encompassing all the remaining treaty categories. For a detailed explanation of how functions were coded please refer to Methodology paper.

Data on trade flows, GDP, and gravity variables comes from the historic trade and the gravity databases of the CEPII. For exports, CEPII trade data (Conte et al., 2021) is taken from 3 sources: IMF DOTS, BACI and UN COMTRADE. We first rely on IMF data, if an observation is not available we complete it with COMTRADE data and if this is not available we use what is reported from BACI. For years 1945-1948 we complement with the TRADHIST data set (Fouquin et al., 2016). We also exclude these first 3 years in a subsequent set of robustness regressions and show that results hold.

On political controls: Data on UN voting and ideal point estimates comes from Voeten et al. (2009). Data on IGO membership is taken from the Correlates of War project (Pevehouse et al., 2015). Data on military alliances comes from Gibler (2008). We take data on democracy/autocracy scores from the Polity5 database (Marshall and Gurr, 2021).

4.1 The emergence of the network of International Cooperation Agreements

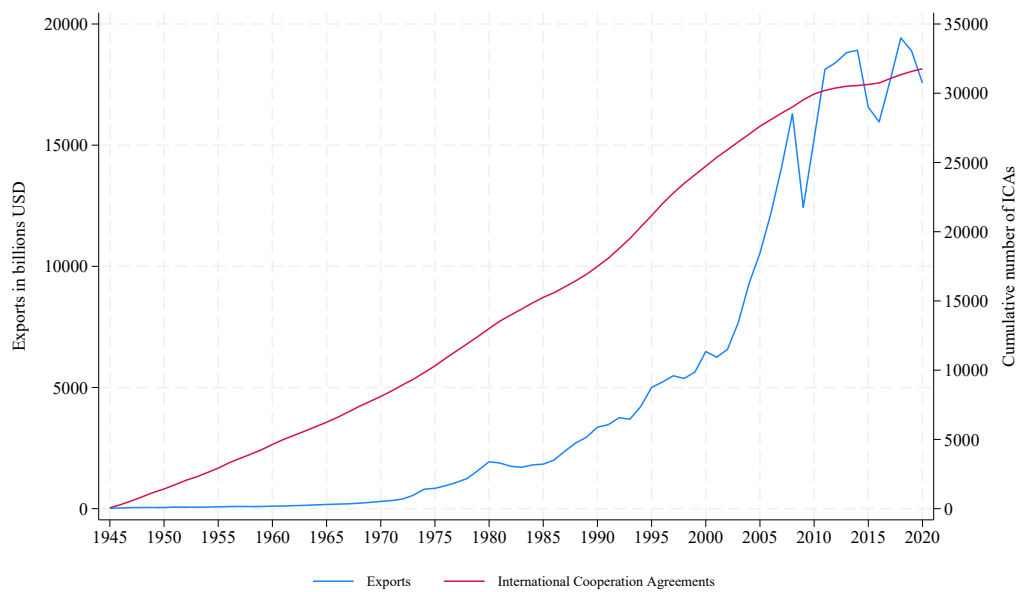
The post-WWII recovery was arguably possible thanks to the establishment of multilateral institutions that were purposely designed in 1944 to safeguard global peace (the United Nations), regulate the financial and monetary system (the International Monetary Fund) and assist in the reconstruction and development of the world (the World Bank). Almost simultaneously, the General Agreement on Tariffs and Trade (GATT) was signed, on October 1947, coming into force on January 1, 1948.

These founding stones of the new world order were necessary but not sufficient to achieve the levels of global diplomatic and commercial cooperation of our times. As peaceful cooperation among countries

¹⁰Given the historical extent of our study and the various transformations the world experienced, the set of countries included in this paper slightly differs with the country pairs reported in the EIA dataset, specially for conflicted situations such as former Soviet countries, former Yugoslavia and so on. In the cases where countries are not present in the EIA we complement with data from the CEPII Gravity database. Robust regressions are run using only one source.

was facilitated, countries realized there were several other issues where they could cooperate at the bilateral or multilateral level. Hence, soon after the end of WWII, they started building a network of International Cooperation Agreements to deal with topics as they arose. The establishment of such a set of diplomatic rules ensured that globalization could take place in a peaceful manner, facilitating countries' reliable interactions with each other.¹¹ Figure 3 illustrates how rapidly international cooperation rose in the aftermath of WWII, at higher rates than world trade for the initial decades. From 1945 to 1975, the number of International Cooperation Agreements (ICAs) surged by 173 times, rising from 59 to 10,309, while exports grew by 43 times, increasing from 19 to 839 billion USD. Following the Oil crisis, trade experienced a resurgence, with total exports growing 300% (3,362 billion USD) from 1975 to 1990. In contrast, the number of ICAs grew by only 70% (reaching 17,494). The 1990s marked a period of liberalization, reduced trade barriers, and the proliferation of Regional Trade Agreements (RTAs). During this phase, ICAs grew by 58% (27,619) from 1990 to 2005, while total exports increased by 214% (10,543 billion USD). The post-Financial crisis era has been described as the onset of *slowbilization*, and this trend is also reflected in international cooperation patterns. From 2005 to 2020, the number of ICAs grew by a modest 15% (reaching 31,764), whereas exports surged by 66% (17,565 billion USD). During the same period, the cumulative number of Regional Trade Agreements reached 313 (Figure 4), which undoubtedly played a crucial role in the globalization process.

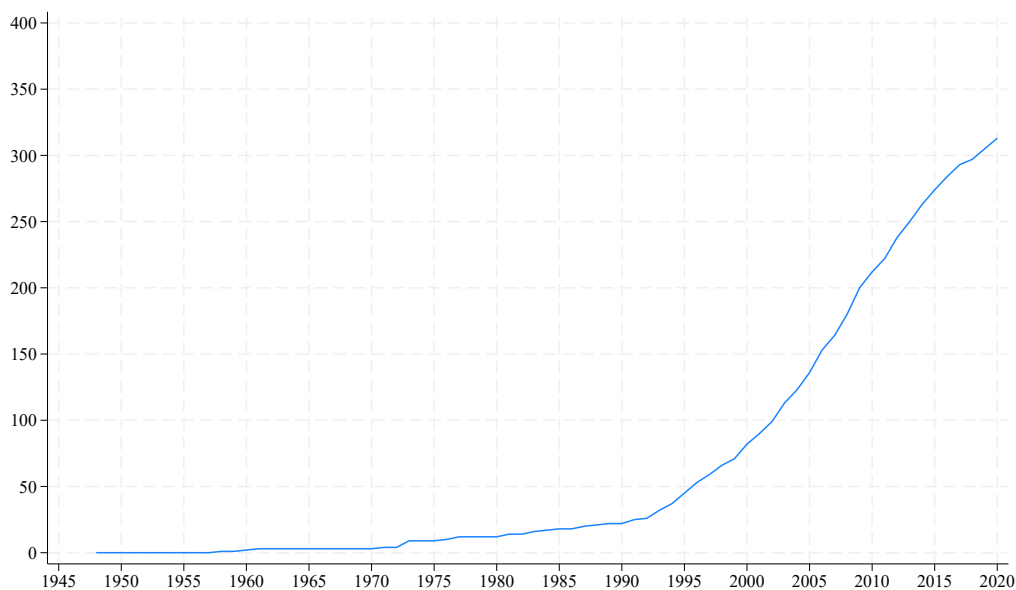
Figure 3: Globalization was possible thanks to the international legal infrastructure



Cumulative number of International Cooperation Agreements (right axis) refers to the entirety of ICAs that have been registered until a certain year. Exports (left axis) is the totality of world's exports by year, in current USD. In the post-WWII era (1945-1975), ICAs increased by 173 times (59 to 10,309), while exports grew by 43 times (19 to 839 billion USD). After the Oil Crisis (1975-1990), ICAs grew 70% (17,494), and exports surged by 300% (3,362 billion USD). In the liberalization era (1990-2005), ICAs rose by 58% (27,619), and exports by 214% (10,543 billion USD). Post-Financial crisis (2005-2020) saw *slowbilization*: ICAs up 15% (31,764), exports up 66% (17,565 billion USD).

¹¹We abstract here from any judgement of value with respect to this being a "fair" or "safe" way for less powerful countries, although we anticipate it might have not been always the case. Further research should deal with such question.

Figure 4: Regional Trade Agreements increased sharply during the 90s



Source: [World Trade Organization](#)

Already by the 1960s, 88% of global trade was happening between countries that had signed -at least- one ICA with each other. This meant that ICAs expanded rapidly to cover almost the entire value of international commerce while, at the same time, the share of trade within partners that were involved in an RTA was only 17% (Figure 5). As RTAs became more common and boosted trade, the share of trade within RTAs counterparts steadily increased until reaching 60% of global trade today. Coincident with such proliferation of RTAs, the share of trade that happens between countries that are part of an ICA but not part of an RTA has been steadily declining from 80 to 36% of global trade, while the share of trade that happens between countries that are part of an ICA (regardless of them being or not part of an RTA) has remained steady at 90%. Importantly, the share of trade that occurs between country pairs that are only part of an RTA remains very low, at 5% of global trade. Figure 13 in the Appendix shows the same indicators at the country level. Naturally, drawing clear distinctions on the type of bilateral diplomatic relation (either commercial or cooperational) is not straightforward, as countries that are involved in an RTA are likely involved in an ICA (Figure 6). In 2020, the global average number of ICA counterparts is 55, while the global average for RTA counterparts with an ICA is 26 and the average for RTA counterparts without an ICA is 18. This reflects the fact that international trade, international cooperation and trade agreements are interlinked and likely endogenously determined.

Figure 5: 90% of global trade happens within counterparts that are involved in an ICA

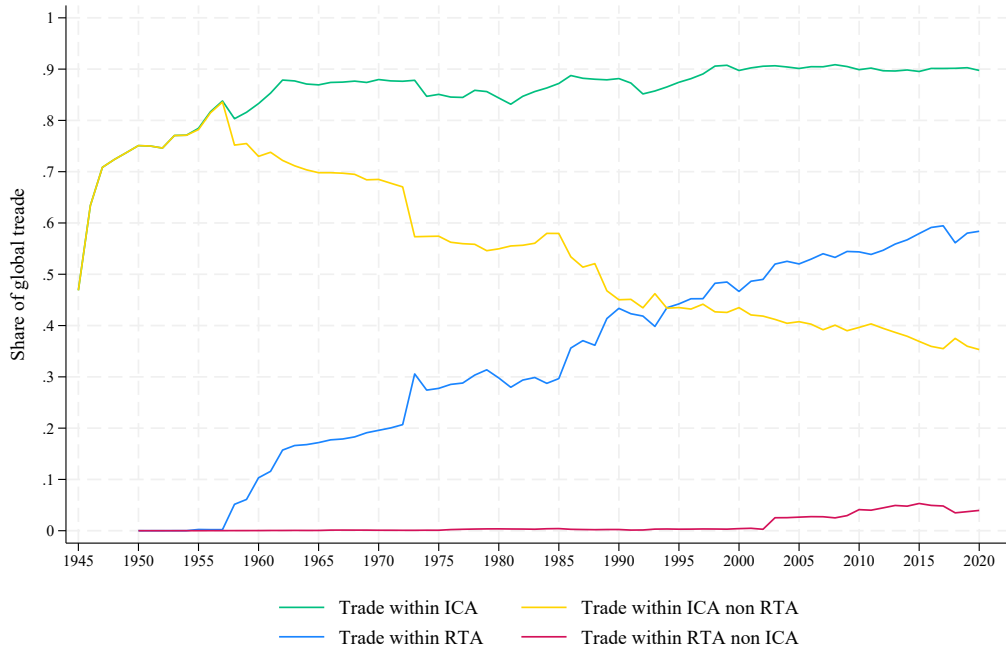
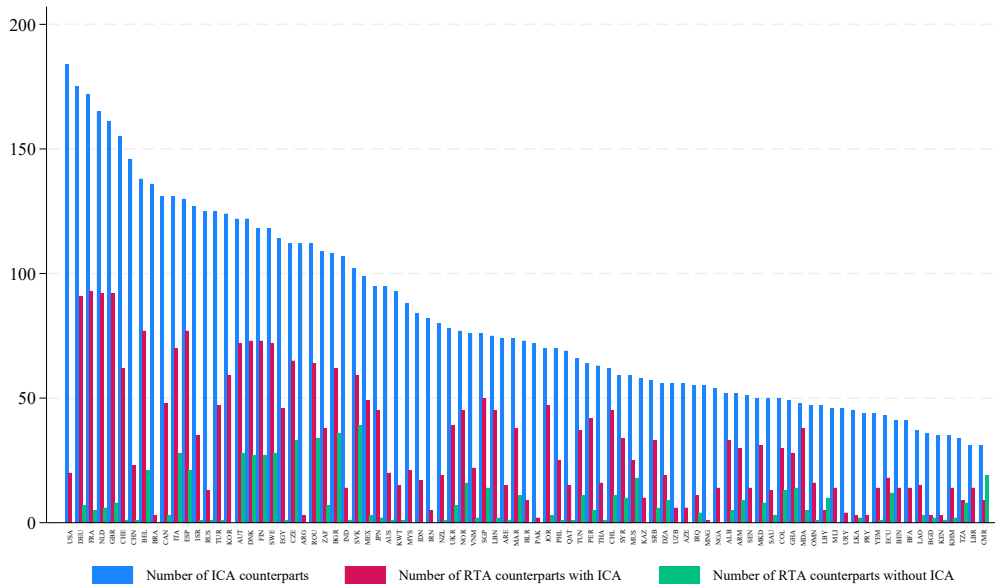


Figure shows the share of global trade that happens between (green) country pairs that are part of an ICA -independently of them being part of an RTA or not-, (yellow) country pairs that are part of an ICA but not part of an RTA, (blue) country pairs that are part of an RTA -independently of them being part of an ICA or not- and (red) country pairs that are part of an RTA but not part of an ICA.

Figure 6: Most of RTA partners are also involved in at least one ICA

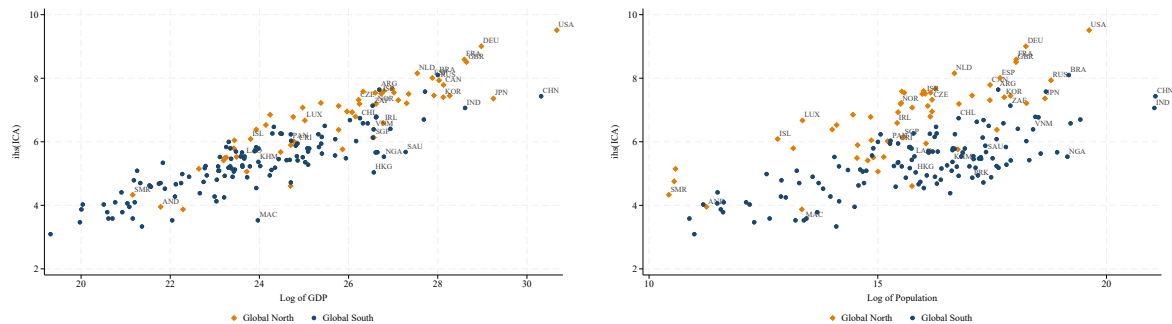


Number of counterparts displayed for year 2020. Countries displayed have at least 100 cumulative ICAs. The global average number of ICA counterparts is 55, while the global average for RTA counterparts with an ICA is 26 and the average for RTA counterparts without an ICA is 18.

The post-WWII, commonly known as the Liberal Hegemonic Order (LHO) in international relations

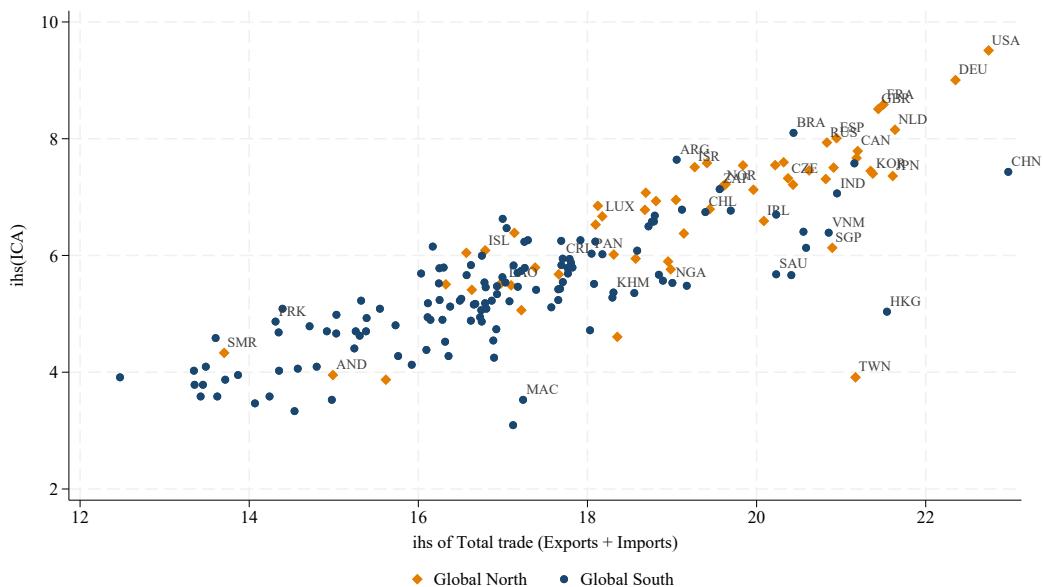
(Ikenberry, 2011), was characterized by a strong Western dominance in multilateral institutions and global trade. This pattern replicates for ICAs, the countries that have accumulated the most amount of agreements belong mostly to the Global North¹². In Figure 7 we show that countries with bigger GDP and bigger population tend to sign more ICAs and, for a given level of GDP/population, Global North countries tend to have more agreements than Global South ones. As trade theory points GDP and Population as important determinants of gravity forces, we expect countries with higher levels of trade to have also signed more agreements. Figure 8 confirms that there is a positive relation with trade by country and the number of ICAs they are part of, with a clear dominance of the Global North.

Figure 7: Size matters: countries with bigger GDP and bigger Population sign more ICAs



Scatter plot of the inverse hyperbolic sine of GDP and the inverse hyperbolic sine of cumulative ICAs for year 2020 (left panel). Scatter plot of the inverse hyperbolic sine of population and the inverse hyperbolic sine of cumulative ICAs for year 2020 (right panel). Countries are coloured based on Global North and Global South grouping, refer to Table 20.

Figure 8: International cooperation and international trade go hand by hand



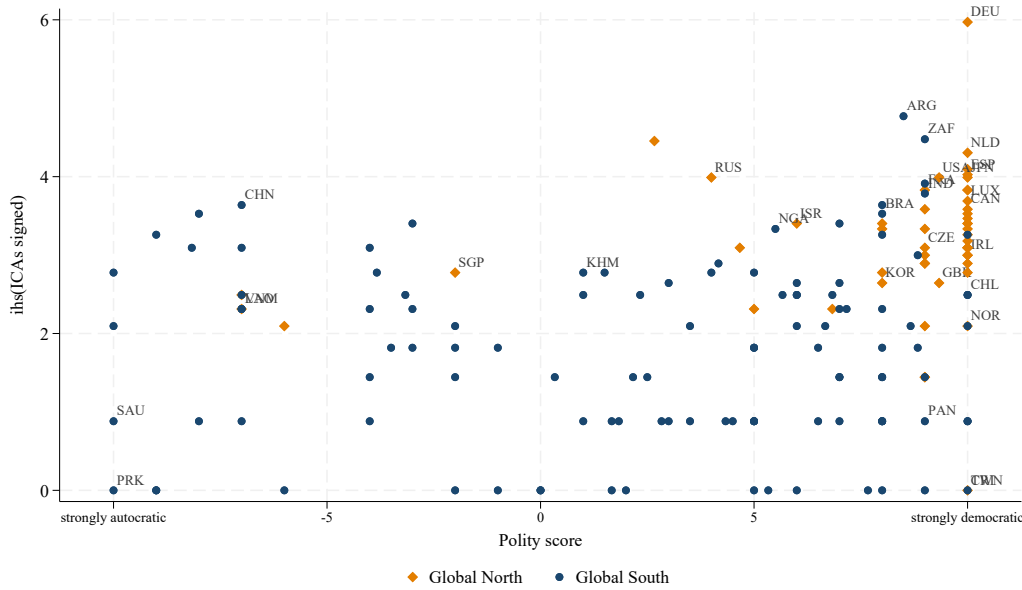
Scatter plot of the inverse hyperbolic sine of total trade (exports + imports) and the inverse hyperbolic sine of cumulative ICAs for year 2020. Countries are coloured based on Global North and Global South grouping, refer to Table 20.

We argue that economic forces are not the only ones behind the creation of ICAs, as they are the result of

¹²We classify countries into two world groups, Global North and Global South, a common classification in the developing and trade literature, and display the full list of countries for each group in Table 20

complex geopolitical processes. Thus, we include in our analysis variables that would be more common in international relations than in economics. One of them is the democratic level of the country, which we draw from the Polity V database. As more democratic countries understand the importance of reaching commonly agreed policy decisions through consensus and concessions, we expect them to rely on similar principles in the international arena. Figure 9 shows that more democratic countries tend to have more agreements, although the slope is not as clear as when it comes to trade, GDP or population. This suggests that non-democracies are not completely marginalized from the international system.

Figure 9: Democracies tend to sign more agreements



Scatter plot of the 5 year average (2012-2017) of polity score and the change in the inverse hyperbolic sine of cumulative ICAs (2012-2017). Countries are coloured based on Global North and Global South grouping, refer to Table 20.

The evolution of ICAs can be pictured as the creation of a network of international cooperation, where players/nodes (countries) are linked through agreements. This allows to study its network structure to understand who are the dominant players, and which country groups cooperate the most.

Dominant players in SNA are identified through centrality measures. We compute the Eigenvector Centrality and find the United States as the most central country in 2020, followed by Germany and, with a significant difference, the United Kingdom. For a given country i , the eigenvector, x_i , is $x_i = \frac{1}{\lambda} \sum_{j \in N} a_{i,j} x_j$ Where: $a_{i,j} = 1$ if country i is linked to country j and zero otherwise, x_j is the centrality of country j and λ is a constant. Eigenvector Centrality assumes that countries connected to high-scoring countries have a stronger influence in the network (Newman, 2008). Figure 10 depicts how North dominated is the international cooperation arena, where only 4 of the top20 most central countries come from the Global South (Brazil, Mexico, China and Argentina).

To identify country groups that interact the most with each other, we run an algorithm for community detection in networks, the Louvain Method (Blondel et al., 2008). The Louvain Method is an efficient algorithm that detects communities or clusters within complex networks by optimizing modularity. Modularity is a measure of the quality of a network partition into communities that quantifies the difference between the observed number of edges within communities and the links between communities. A sister paper (Acharya et al., 2023), analyzes how this community formation has evolved through time and what does it entail for the international order from an International Relations theoretical perspective. Here, we restrict ourselves to

Figure 11: Network of International Cooperation Agreements in 2022

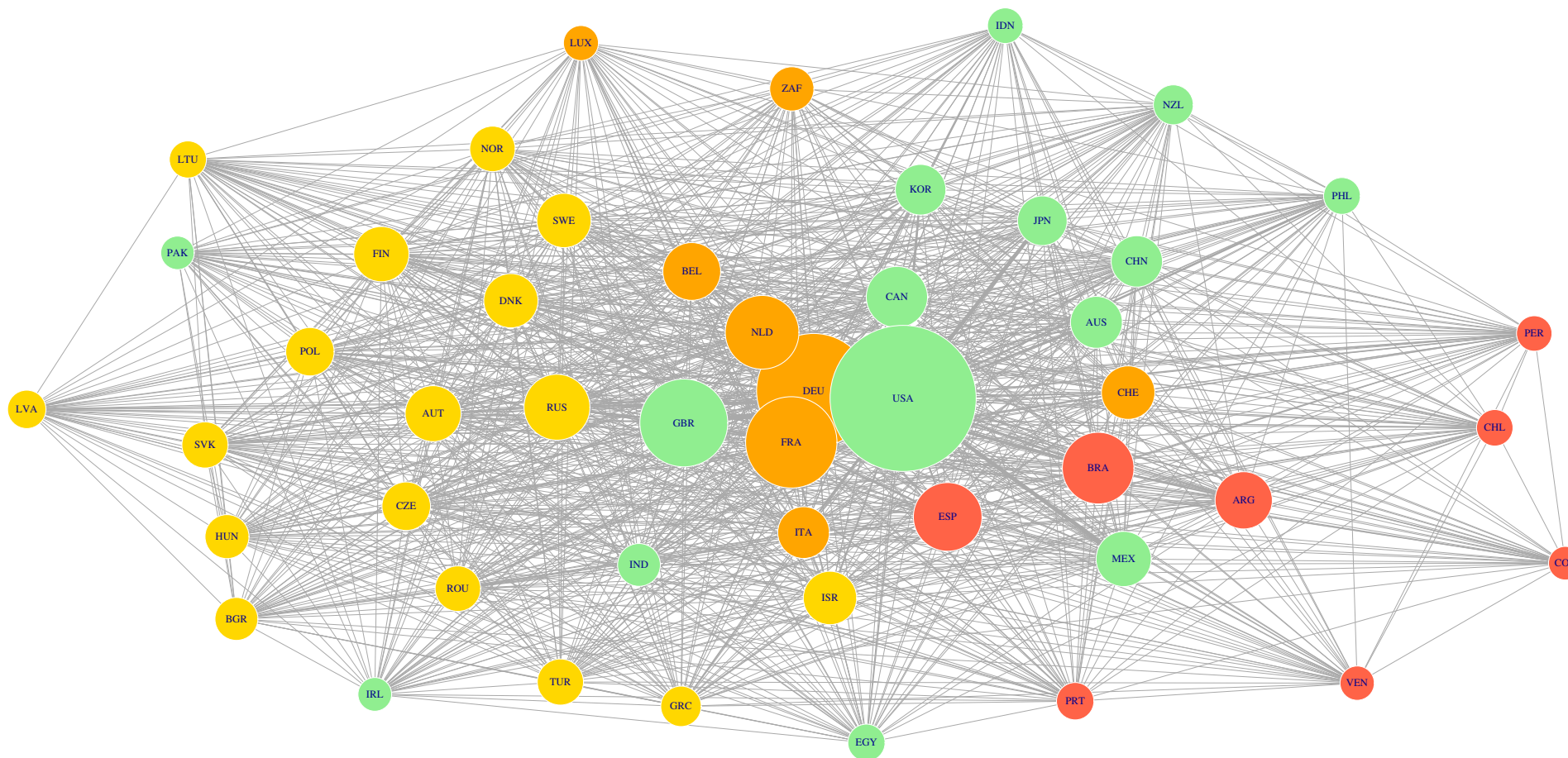


Figure depicts countries with cumulative ICAs above the mean. Size of the bubble represents cumulative number of ICAs. Relative position of the bubble to the center depicts Eigenvector centrality. Thickness of lines show number of bilateral agreements between two countries. Colors depict countries' membership to clusters.

5 Economic determinants of International Cooperation Agreements

In this section, we delve into the determinants of signing of International Cooperation Agreement (ICA) at the extensive margin and the quantity of ICAs country pairs co-sign at the intensive margin. Unless otherwise stated, all regressions account for pair, reporter-year, and partner-year fixed effects, addressing the nonindependence of observations. The coefficients reported reflect the expected percentage increase in the likelihood of ICA signing (extensive margin) and the percentage change in the growth of ICAs (intensive margin) for a given country pair in a given year. This approach eliminates correlations between variables across country pairs or time. Additionally, we employ two-way clustering of standard errors, by both origin and destination countries.

Two main results are displayed in this section, i) we confirm that gravity forces play a role in the creation of ICAs and ii) we provide evidence in favor of ICAs being a previous step than international trade agreements. The literature discussing the sequencing of international cooperation was initiated by [Balassa \(1961\)](#) and focused mainly in the European Union (EU), arguing for the role of trade in commencing cooperative relations.

We commence by replicating results in the spirit of [Baier et al. \(2014\)](#) Table 2 -where they investigate the economic determinants of free trade agreements- and show them in our Table 2. We find somehow conflicting findings between the models that estimate the probability of having an ICA with respect to the ones that estimate the probability of signing an ICA in year t , although not drastically opposite, as shown in columns (1)-(5) and (6)-(10). Having such a long panel, we prefer to focus on the likelihood of signing an ICA in year t rather than the likelihood of having an ICA in year t , which could have been signed more than 60 years ago. Our findings indicate that gravity forces play a significant role in explaining countries' entry into ICAs. Closer countries tend to participate in more agreements, especially if they share contiguous borders. Moreover, countries sharing commonalities such as religion, or legal systems as well as countries that were ever in a colonial situation, tend to enter more ICAs.

We include variables such as $DIST_{ij}$ (natural log of distance between the most populated city of each country), $CONTIG_{ij}$ (a dummy variable indicating contiguity), $LANG_{ij}$ (a dummy variable for common language), $RELIGION_{ij}$ (a religious proximity index), $Legal_{ij}$ (a dummy variable for common legal origins), $ComColonizer_{ij}$ (a dummy variable for sharing common colonizer post 1945), $CLNY_{ij}$ (a dummy variable for a pair ever in colonial or dependency bilateral, including before 1948), $Siblings_{ij}$ (a dummy variable for pair ever having the same colonizer, including before 1948), $DiffY_{ij}$ (the absolute difference of the pair's natural log of GDP). To account for multilateral resistance terms, we introduce $MDIST_{ij}$ and $MCONTIG_{ij}$, constructed in the same manner as [Baier et al. \(2014\)](#)¹³. These terms are included in our preliminary regressions to consider the classical determinants of gravity equations in understanding their influence on the probability of signing International Cooperation Agreements. In subsequent regressions, multilateral resistance terms are addressed through fixed effects.

We present results for both the probability of dyads having/signing ICAs at the extensive margin and the change in (ICA_{ij}) at the intensive margin. Our findings align with those of [Baier et al. \(2014\)](#), with some exceptions. Notably, the positive sign in $MCONTIG_{ij}$ reflects the complex interplay between security concerns and regional external partnerships, countries sharing more borders need to establish relations with their neighbours for security reasons at the same time they will seek for external partnerships to establish themselves within the region. Of importance, common legal origins increase the likelihood of pairs entering ICAs as well as the amount of ICAs they enter. Regarding GDP and population variables, we find that bigger countries in economic and population size correlate with signing more agreements, as countries with a smaller difference in GDP size. However, we are not accounting for pair fixed effects because these would absorb the variation of the typical gravity controls. Thus, we prefer to interpret such variables in the regressions below. Importantly, nations that were ever in a colonial relation tend to sign more agreements.

¹³ $MX_{ij} = \frac{1}{2N} \left(\sum_{k=1}^N X_{ik} + \sum_{jk}^N X_{jk} \right)$. Where $X = DIST, CONTIG$.

Table 2: Gravity forces explain International Cooperation Agreements

| | Extensive margin: having an ICA | | | | | Extensive margin: entering an ICA | | | | | Intensive margin | | | | |
|------------------------------|---------------------------------|------------------------|-------------------------|--------------------------|--------------------------|-----------------------------------|-------------------------|-------------------------|--------------------------|---------------------------|-------------------------|-------------------------|-------------------------|--------------------------|---------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| $DIST_{ij}$ | -0.104*** (0.00727) | -0.104*** (0.00718) | -0.0965*** (0.00682) | -0.105*** (0.00723) | -0.115*** (0.00972) | -0.0241*** (0.00324) | -0.0233*** (0.00317) | -0.0238*** (0.00348) | -0.0251*** (0.00344) | -0.0387*** (0.00483) | -0.0171*** (0.00259) | -0.0207*** (0.00299) | -0.0210*** (0.00350) | -0.0190*** (0.00300) | -0.0219*** (0.00456) |
| $MDIST_{ij}$ | | -1.695*** (0.217) | -1.900*** (0.217) | -0.997*** (0.205) | -0.317 (0.207) | | -0.0841 (0.0599) | -0.0934 (0.0642) | 0.00211 (0.0735) | -0.203* (0.104) | | 0.127 (0.109) | 0.124 (0.116) | 0.223 (0.156) | 0.128 (0.226) |
| $CONTIG_{ij}$ | 0.200*** (0.0356) | 0.231*** (0.0276) | 0.193*** (0.0278) | 0.199*** (0.0356) | 0.0598 (0.0443) | 0.0658*** (0.0111) | 0.0737*** (0.0116) | 0.0612*** (0.0111) | 0.0646*** (0.0112) | 0.0771*** (0.0170) | 0.126*** (0.0243) | 0.129*** (0.0235) | 0.114*** (0.0235) | 0.124*** (0.0248) | 0.176*** (0.0389) |
| $MCONTIG_{ij}$ | | -7.469** (3.650) | -7.905** (3.630) | -0.378 (3.042) | 3.613 (3.277) | | 0.269 (0.655) | 0.363 (0.679) | 1.992*** (0.649) | 3.282*** (0.820) | | -0.0658 (1.274) | -0.00870 (1.315) | 2.806* (1.445) | 3.634*** (1.049) |
| $\ln GDP_i \times \ln GDP_j$ | 0.00697** (0.00278) | | | 0.00241*** (0.000365) | 0.00151*** (0.000560) | 0.00447*** (0.000735) | | | 0.000214** (8.28e-05) | 0.000395*** (0.000150) | 0.00898*** (0.00280) | | | 0.000362** (0.000141) | 0.000682*** (0.000210) |
| $DiffY_{ij}$ | -0.00993 (0.00715) | | | -0.0199*** (0.00414) | -0.00620 (0.00764) | 0.00148 (0.00194) | | | -0.00919*** (0.00136) | -0.0124*** (0.00167) | 0.00859* (0.00482) | | | -0.0132*** (0.00404) | -0.0213*** (0.00754) |
| $\ln POP_i \times \ln POP_j$ | 0.000632 (0.00125) | | | 0.000837 (0.000800) | 0.00140 (0.00143) | -0.00125*** (0.000369) | | | 0.000295 (0.000345) | -0.000205 (0.000656) | -0.000808 (0.000550) | | | 0.00233*** (0.000694) | 0.00421** (0.00171) |
| $Democ_{ij}$ | | | | | 0.0106*** (0.00361) | | | | | 0.00255 (0.00184) | | | | | 0.00106 (0.00347) |
| $LANG_{ij}$ | 0.0590*** (0.0103) | | 0.0491*** (0.00823) | 0.0585*** (0.0102) | 0.0507*** (0.0186) | -0.00302 (0.00286) | | -0.00229 (0.00219) | -0.00454 (0.00295) | 1.96e-05 (0.00608) | 0.00243 (0.00363) | | 0.000614 (0.00221) | -0.000455 (0.00351) | 0.0172** (0.00831) |
| $ComColonizer_{ij}$ | -0.0306** (0.0147) | | 0.0105 (0.0148) | -0.0237 (0.0148) | -0.0409* (0.0237) | -0.00337 (0.00317) | | 0.0121** (0.00590) | 0.000389 (0.00341) | -0.00261 (0.00501) | -0.00234 (0.00825) | | 0.0253 (0.0168) | 0.00459 (0.0107) | 0.00286 (0.0144) |
| $RELIGION_{ij}$ | 0.0683*** (0.0126) | | 0.0477*** (0.0107) | 0.0635*** (0.0123) | 0.0693*** (0.0239) | 0.0169*** (0.00551) | | 0.0117** (0.00461) | 0.0155*** (0.00549) | 0.0336*** (0.0122) | 0.0185*** (0.00660) | | 0.0130** (0.00552) | 0.0169** (0.00684) | 0.0476** (0.0193) |
| $Legal_{ij}$ | -0.00159 (0.00781) | | -0.00139 (0.00661) | 0.000605 (0.00783) | -0.00212 (0.0135) | 0.00860*** (0.00298) | | 0.00650** (0.00260) | 0.00924*** (0.00301) | 0.0151*** (0.00557) | 0.00796*** (0.00252) | | 0.00621** (0.00247) | 0.00907*** (0.00271) | 0.0170*** (0.00584) |
| $CLNY_{ij}$ | 0.233*** (0.0296) | | 0.166*** (0.0265) | 0.228*** (0.0270) | 0.217*** (0.0367) | 0.0549*** (0.0109) | | 0.0352** (0.0136) | 0.0507*** (0.0117) | 0.0533*** (0.0125) | 0.114*** (0.0254) | | 0.0779*** (0.0288) | 0.106*** (0.0286) | 0.0856*** (0.0246) |
| $Siblingever_{ij}$ | 0.0772*** (0.0132) | | 0.0480*** (0.0120) | 0.0712*** (0.0133) | 0.121*** (0.0221) | 0.00523* (0.00275) | | -0.00304 (0.00427) | 0.00196 (0.00311) | -0.00219 (0.00654) | -0.00377 (0.00974) | | -0.0169 (0.0143) | -0.00941 (0.0119) | -0.0327 (0.0257) |
| Constant | -0.745 (0.700) | 15.98*** (1.922) | 17.68*** (1.918) | 9.150*** (1.817) | 3.482* (1.853) | -0.843*** (0.194) | 0.955* (0.527) | 1.033* (0.565) | 0.134 (0.641) | 2.028** (0.923) | -2.130*** (0.734) | -0.896 (0.957) | -0.875 (1.019) | -2.037 (1.351) | -1.421 (1.938) |
| Observations | 1,642,358 | 2,313,808 | 2,119,464 | 1,642,358 | 394,548 | 1,642,358 | 2,313,808 | 2,119,464 | 1,642,358 | 394,548 | 1,635,824 | 2,276,864 | 2,086,926 | 1,635,824 | 392,852 |
| R-squared | 0.528 | 0.439 | 0.456 | 0.500 | 0.543 | 0.220 | 0.126 | 0.129 | 0.151 | 0.183 | 0.147 | 0.081 | 0.084 | 0.100 | 0.096 |
| Reporter-year FE | YES | NO | NO | NO | NO | YES | NO | NO | NO | NO | YES | NO | NO | NO | NO |
| Partner-year FE | YES | NO | NO | NO | NO | YES | NO | NO | NO | NO | YES | NO | NO | NO | NO |
| Reporter FE | NO | YES | YES | YES | YES | NO | YES | YES | YES | YES | NO | YES | YES | YES | YES |
| Partner FE | NO | YES | YES | YES | YES | NO | YES | YES | YES | YES | NO | YES | YES | YES | YES |
| Year FE | NO | YES | YES | YES | YES | NO | YES | YES | YES | YES | NO | YES | YES | YES | YES |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Columns 1-5 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has at least one ICA in year t . Columns 6-10 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has entered an ICA in year t . Columns 11-15 display results of a first differences model where the dependent variable is the change in the number of ICAs in year t with respect to year $t-1$. $DIST_{ij}$ is the natural log of the distance between most populated city of each country (km), $CONTIG_{ij}$ is a dummy equal 1 if countries are contiguous, $LANG_{ij}$ is a dummy equal 1 if countries share common official or primary language, $ComColonizer_{ij}$ equals 1 if countries share a common colonizer post 1945, $RELIGION_{ij}$ is a religious proximity index, $Legal_{ij}$ equals 1 if countries share common legal origins, $CLNY_{ij}$ equals 1 if pair ever was in colonial or dependency bilateral (including before 1948), $Siblingever_{ij}$ equals 1 if pair ever had the same colonizer (including before 1948). $DiffY_{ij}$ is the absolute difference of the pair's natural log of GDP. $MDIST_{ij}$ and $MCONTIG_{ij}$ are constructed in the same way as Baier et al. (2014): $MX_{ij} = \frac{1}{2N} (\sum_{k=1}^N X_{ik} + \sum_{k=1}^N X_{jk})$, where $X = DIST, CONTIG$, they are included to account for multilateral resistance terms. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.1 What comes first, trade or cooperation?

Trade agreements and international cooperation agreements have spread worldwide in recent decades. We believe these trends are endogenous of each other and determined by historical as well as contextual events, rather than exogenously by external factors. However, little is known about the dynamics of the evolution of bilateral relations among different cooperation areas. In this section we analyze how these two types of cooperation affect each other. Specifically, we examine whether trade agreements trigger a cooperative sequence in international relations, assessing the impact of RTA_{ij} on the evolution of ICA_{ij} . To mitigate endogeneity concerns arising from simultaneity or reverse causality, we incorporate a 5-period lags/differences of our independent variables, depending on the model. Economists have focused on the deepening role that trade cooperation has in forming a customs union, a common market and a monetary union (Balassa, 1961), which has gain acceptance in light of the EU experience, while leaving aside other Pareto-improving outcomes related to environment, security, peace and non trade in general.

We aim to shed light on this question in Table 3, where we present our first findings. First, we provide extensive margin results regarding the probability of having an International Cooperation Agreement (ICA). However, as mentioned previously, we prefer to focus on the probability of entering an ICA to avoid comparing events that occurred with a significant time discrepancy. Contrary to the prevailing belief that trade sparks a cooperation sequence, our analysis reveals that being part of a Regional Trade Agreement (RTA) decreases the probability of signing an ICA by approximately 1-2%¹⁴. Importantly, economic and population size still exhibit positive and statistically significant coefficients even after introducing pair fixed effects. However, we cannot draw definitive conclusions about the effect of $DiffY_{ij}$. To account for potential bias, we introduce international political variables as controls since they may influence both the probability of a country pair entering an ICA and the likelihood of them being part of a trade agreement.

Notably, $UNVoting$ - measured as the absolute value of the bilateral IdealPointDistance in the UNGA voting records - exhibits a positive and statistically significant effect on the probability of entering an ICA, although it shows a negative coefficient for the intensive margin. To consider multilateral indexes of each of i 's and j 's other ICAs, in the spirit of the approach of Baier et al. (2014), we include our Social Network Analysis (SNA) variables. Specifically, $Centrality_{ij,t-5}$ measures the relative position of each party in the network of agreements, while $StructuralEquivalence_{ij,t-5}$ refers to the similarity of their third-party relations. Our analysis finds no significant effects from these variables. Importantly, we observe that more democratic countries tend to sign more agreements.

¹⁴Semi-elasticity is calculated as $\frac{\hat{p}}{100} \approx \exp(\hat{\beta}) - 1$, as proposed in Bellemare and Wichman (2020).

Table 3: What comes first, trade or cooperation?

| | Extensive margin | | | | | | | | Intensive margin | |
|----------------------------------|------------------------|--------------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|--------------------------|------------------------|--------------------------|
| | Having an ICA | | Entering an ICA | | | | | | $\Delta_1(ICAs)$ | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| $RTA_{ij,t-5}$ | 0.0476*** (0.0146) | 0.0245 (0.0156) | -0.0141** (0.00575) | -0.0186*** (0.00608) | -0.0182*** (0.00506) | -0.0201*** (0.00615) | -0.0185*** (0.00510) | -0.0168** (0.00695) | -0.0400*** (0.0114) | -0.0371*** (0.0111) |
| $\ln GDP_i \times \ln GDP_j$ | 0.000243 (0.00138) | -0.00206 (0.00154) | | 0.00136** (0.000600) | 0.000989 (0.000708) | 0.00180*** (0.000637) | 0.00110 (0.000722) | 0.00259*** (0.000806) | 0.00127* (0.000730) | 0.00121 (0.00189) |
| $DiffY_{ij}$ | -0.00500 (0.00447) | -0.0127*** (0.00464) | | 0.00103 (0.00180) | -0.00128 (0.00193) | 0.000982 (0.00201) | -0.000988 (0.00197) | -9.35e-05 (0.00249) | 0.00247 (0.00221) | 0.00268 (0.00523) |
| $\ln POP_i \times \ln POP_j$ | 0.0250*** (0.00511) | 0.0326*** (0.00759) | | 0.00396*** (0.00147) | 0.00575*** (0.00193) | 0.00401** (0.00172) | 0.00603*** (0.00196) | 0.00731*** (0.00236) | 0.00172 (0.00262) | 0.0115** (0.00569) |
| $UNVoting_{ij,t-5}$ | | 0.00258 (0.00564) | | | 0.00944*** (0.00346) | | 0.00952*** (0.00353) | 0.00198 (0.00296) | | -0.0118*** (0.00415) |
| $IgoMemb_{ij,t-5}$ | | 0.00108 (0.000783) | | | 4.03e-05 (0.000247) | | 2.84e-05 (0.000259) | -0.000458* (0.000268) | | -0.000817* (0.000474) |
| $Alliance_{ij}$ | | 0.0273 (0.0173) | | | | | | -0.00543 (0.00917) | | -0.00769 (0.00842) |
| $StructuralEquivalence_{ij,t-5}$ | | 0.0659** (0.0266) | | | | 0.00902 (0.00608) | -0.00213 (0.00671) | 0.000722 (0.00949) | | 0.0290 (0.0224) |
| $Centrality_{ij,t-5}$ | | 0.535 (0.698) | | | | -0.0476 (0.178) | -0.219 (0.375) | -0.199 (0.371) | | -0.108 (0.808) |
| $Democ_{ij}$ | | 0.00289*** (0.000782) | | | | | | 0.00190*** (0.000401) | | 0.00363*** (0.000733) |
| Constant | -1.664*** (0.426) | -1.902*** (0.528) | 0.0243*** (0.000329) | -0.619*** (0.237) | -0.664** (0.268) | -0.764*** (0.259) | -0.714*** (0.272) | -1.287*** (0.311) | -0.426* (0.239) | -1.272** (0.521) |
| Observations | 358,142 | 155,108 | 447,534 | 358,142 | 275,662 | 316,398 | 271,928 | 155,108 | 358,142 | 155,108 |
| R-squared | 0.825 | 0.862 | 0.341 | 0.356 | 0.368 | 0.369 | 0.369 | 0.355 | 0.279 | 0.343 |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Columns 1-2 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has at least one ICA in year t . Columns 3-8 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has entered an ICA in year t . Columns 9-10 display results of a first differences model where the dependent variable is the change in the number of ICAs in year t with respect to year $t-1$. We restrict regressions to every 5 years (from 1945 to 2020) but results hold if using the whole sample. $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017). $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.1.1 Event study

Classical concerns about endogeneity issues such as reverse causality and simultaneity arise in our effects estimated above. The sequencing of international relations could well be trade giving place to cooperation or viceversa, $T \rightarrow C$ or $C \rightarrow T$ (Estevadeordal and Suominen, 2008). We will purge our results from potential endogeneity by exploiting the specificities of RTAs. It is very rare for country pairs with an RTA to embark in the process of negotiating and signing a new one. It usually takes place only if they are deepening/modifying the trade terms of the first one or if they are joining a multilateral one. Thus, given the nature of RTAs, we can think of them as non-randomly assigned 'treatments', where the treated groups are the country pairs that signed an RTA somewhere in the period 1945-2020 and the control group are those that did not at that point in time. This allows us to deal with endogeneity using a series of complementary techniques. First, we argue that the intensive margin regressions of last section constitute what is known as a staggered differences-in-differences. Then, as it is common practice in applied econometrics when dealing with different treatment timing, we perform an event study of the evolution of ICAs in the bilateral relation and its changes.

As assignment of 'treatment' across country pairs followed differential timing over the period, we can think of our study in the previous subsection as a staggered framework. Following this reasoning, the results shown above correspond to a Two-Way Fixed Effects Difference-in-Difference (TWFEDD), where the Fixed Effects

account for country pair (units), reporter-year and partner-year (time). However, as a twoway fixed effects estimator is a weighted average of all potential 2x2 DD estimates, we acknowledge there are some issues to take into account as these weights are based on group sizes and variance in treatment. The variance weighted ATT is a weighted average of all plausible ATTs only if we assume Variance Weighted Common Trends and time invariant treatment effects¹⁵. However, if treatment effects vary in time then the estimates could be biased (De Chaisemartin and d'Haultfoeuille, 2020). Then, the time a treated group spends in treatment will define its treatment variance, which has an impact in its weight when computing the DD estimate (Cunningham, 2021). In essence, group variation matters in calculating the twoway fixed effects, the more country pairs signed an RTA at the same time the bigger their weight in the final aggregate estimate. Then, within-group treatment variance also plays a role in the weights. As groups are 'treated' on different periods, they have differing post-treatment windows, meaning some groups spend more time 'treated' than others. This results in earlier-treated groups using as controls later-treated groups and vice-versa (once later-treated groups are treated then they use the earlier-treated as controls). The consequence of this is cross-group heterogeneity, which could be a particular problem in our framework since RTAs date of entrance is dyad-specific -with some exceptional cases where there are more than one RTA per year or the RTA includes more than 2 partners- implying there are more than three treatment periods (before, after-early, after-late).

We now analyze the event study for the TWFEDD specification above. As we are dealing with a different timing in the 'treatment', event studies are useful to test the parallel trend assumption (the treated and control group were comparable on dynamics in the pre-treatment period), which holds if the pre-treatment estimates are statistically zero. As it is common in DD designs, identification can come from the fact that the counterfactual trend and the observable trend are parallel, eliminating the selection bias. In staggered DD, identification only requires variance weighted common trends to hold, which is weaker than the requirement for DD (Goodman-Bacon, 2021). The estimated effect will be causal under two assumptions, variance-weighted average of untreated potential outcome changes equals zero and constant treatment effects (Cunningham, 2021).

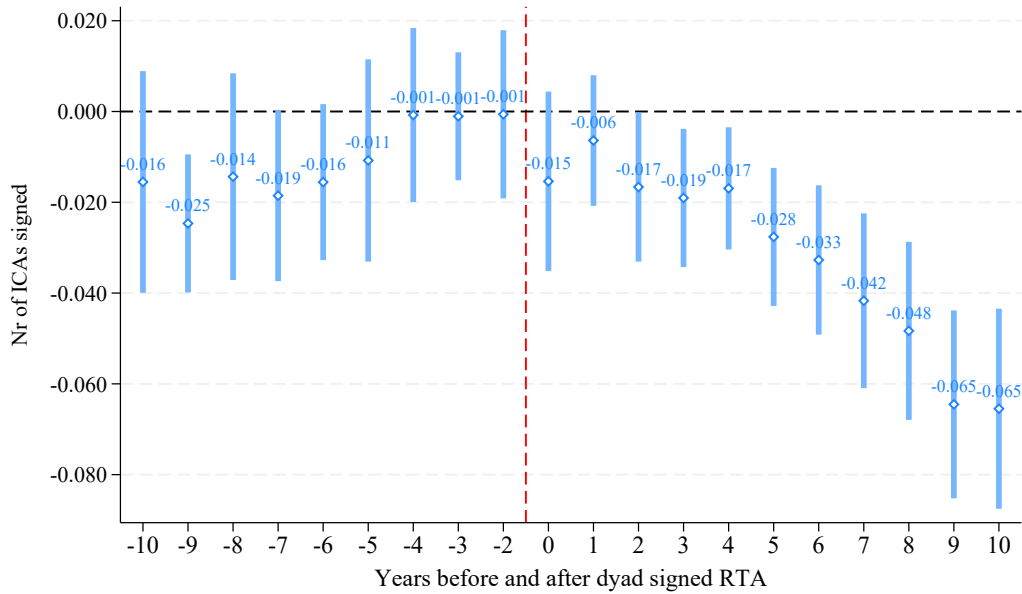
Figure 12 plots the coefficients of the leads and lags of the year a dyad entered an RTA regressed against the number of ICAs entered by the country pair, with a confidence interval of 95%, a window of 10 years before and after and including controls and fixed effects. We normalize to the year before the RTA was entered in the EIA database¹⁶ since we expect country pairs to sign less cooperation agreements the year they are busy signing a trade agreement. For parallel trends to hold, we would need to see coefficients near to zero before the time when the RTA took place, which we observe.

We find that the number of agreements signed decreases after three years of entering into an RTA. We argue this decline happens because of how highly binding are RTAs, generating strong enough relations between countries, reducing the need for them to sign additional agreements. This finding is also consistent with Mattoo et al. (2020), where they show that PTAs have expanded their scope almost doubling the number of policy areas they address, and some even dealing with topics far beyond traditional trade issues, such as labor, environment, movement of people, competition policy and intellectual property rights.

¹⁵Introducing more restrictive assumptions the variance weighted ATT could even be equal to the ATT.

¹⁶For a small number of country pairs which had an RTA that dropped at certain point in time and then signed a new one, we normalize to their first RTA.

Figure 12: Countries enter less ICAs once they have signed an RTA



Includes pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering-. Dependent variable is the change in the number of ICAs in year t with respect to year $t-1$. Controls include $\ln GDP_i \times \ln GDP_j$, $Diff Y_{ij}$, $\ln POP_i \times \ln POP_j$, $UN Voting_{ij,t-1}$, $Igo Memb_{ij,t-1}$, $Structural Equivalence_{ij,t-1}$, $Centrality_{ij,t-1}$, a dummy for periods further in the past than the 10 years before the RTA was entered and a dummy for periods further in the future than the 10 years after the RTA was entered.

5.1.2 Cooperation leads to trade

Having found that RTAs do not increase the probability of signing a cooperation agreement, we explore in Table 4 the opposite sequencing channel: if ICAs affect the probability of entering an RTA in the country pair. We found no relation between having an ICA 5 periods before year t and the probability of entering an RTA in year t (Columns 1-2) but we do find that there is a positive significant relation between having an ICA the period before and entering an RTA in year t , increasing the probability around 0.3%. Although we focus on the probability of entering an RTA, it is noteworthy that being part an ICA increases the probability of having an RTA in between 3-7%. We find again that more democratic countries and countries more aligned in the UNGA correlate with a higher probability of entering an RTA.

Table 4: International cooperation precedes trade

| | Entering an RTA, 5 year lag | | Having an RTA, 1 year lag | | | Entering an RTA, 1 year lag | | | | |
|---|-----------------------------|--------------------------|---------------------------|-------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|---------------------------|---------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| <i>Dummy(ICA_{ij,t-x})</i> | 0.00133 (0.00154) | 0.00294 (0.00204) | 0.0782*** (0.0108) | 0.0484*** (0.0101) | 0.0367*** (0.0113) | 0.00315*** (0.000668) | 0.00313*** (0.000667) | 0.00257*** (0.000787) | 0.00226*** (0.000782) | 0.00240*** (0.000869) |
| <i>ICA_{ij,t-x}</i> | | | 0.00588*** (0.00188) | | | | -0.000219* (0.000118) | | | |
| <i>lnGDP_i × lnGDP_j</i> | -0.000113 (0.000261) | 0.000178 (0.000581) | | 0.00451*** (0.00155) | 0.00609*** (0.00211) | | | -4.34e-05 (0.000112) | -7.29e-05 (0.000126) | -6.17e-05 (0.000156) |
| <i>DiffY_{ij}</i> | 0.000647 (0.000797) | 4.81e-05 (0.00153) | | -0.00172 (0.00377) | -0.00308 (0.00469) | | | 0.000752** (0.000355) | 0.000534 (0.000397) | 0.000334 (0.000485) |
| <i>lnPOP_i × lnPOP_j</i> | 0.00115 (0.000722) | 0.00104 (0.00141) | | 0.00311 (0.00444) | -0.0129* (0.00717) | | | 0.00140*** (0.000382) | 0.000801 (0.000537) | 0.000877 (0.000634) |
| <i>UNVoting_{ij,t-x}</i> | | -0.00240 (0.00158) | | | 0.0438*** (0.00872) | | | | 0.00251*** (0.000619) | 0.00270*** (0.000693) |
| <i>IgoMemb_{ij,t-x}</i> | | -0.000218 (0.000231) | | | 0.00310*** (0.000935) | | | | -0.000228** (9.76e-05) | -0.000194** (9.66e-05) |
| <i>Alliance_{ij}</i> | | -0.0882*** (0.0241) | | | 0.227*** (0.0404) | | | | | -0.0147*** (0.00375) |
| <i>StructuralEquivalence_{ij,t-x}</i> | | -0.0142* (0.00796) | | | -0.00519 (0.0199) | | | | -0.00198 (0.00165) | -0.00285 (0.00207) |
| <i>Centrality_{ij,t-x}</i> | | 0.284*** (0.108) | | | -1.270* (0.709) | | | | 0.183** (0.0728) | 0.164** (0.0642) |
| <i>Democ_{ij}</i> | | 0.000634** (0.000249) | | | 0.00368*** (0.000898) | | | | | 0.000389*** (0.000114) |
| Constant | -0.0516 (0.0957) | -0.116 (0.217) | 0.0441*** (0.00273) | -1.328** (0.524) | -0.495 (0.813) | 0.00235*** (0.000114) | 0.00258*** (0.000141) | -0.0900* (0.0464) | -0.0327 (0.0541) | -0.0452 (0.0756) |
| Observations | 358,142 | 155,108 | 2,277,010 | 1,745,266 | 813,235 | 2,277,010 | 2,277,010 | 1,745,266 | 1,298,028 | 813,235 |
| R-squared | 0.227 | 0.281 | 0.592 | 0.656 | 0.695 | 0.136 | 0.136 | 0.141 | 0.139 | 0.141 |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. x refers to 1 or 5 year lag depending on the column. Columns 1-2 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has entered an RTA in year t , we restrict regressions in these two columns to every 5 years (from 1945 to 2020) but results hold if using the whole sample. Columns 3-5 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has at least one ICA in year t . Columns 6-10 display results of a Linear Probability Model where the dependent variable equals 1 if the dyad has entered an ICA in year t . $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from [Bailey et al. \(2017\)](#), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to *other* nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2 Heterogenous effects

The subsequent results will explore the heterogenous effects of the sequencing between International Cooperation Agreements and Regional Trade Agreements. First, we replicate the previous analysis distinguishing in Economic and Non-Economic ICAs. We then decompose into the 5 subcategories of Non-Economic ICAs. Importantly, we find that having an Economic ICA increases the probability of entering an RTA, which suggests a previous step to the theory posited by [Balassa \(1961\)](#). We later study how the results change while studying Global North and Global South countries, and found that having an ICA increases the probability of entering an RTA for every type of country pair except for South-South relations.

5.2.1 Functionalities of International Cooperation Agreements

We first compare the heterogenous effects between “Economic Cooperation”, which is category 2 in Table 1, with “Non-Economic Cooperation”, which is the aggregate of the other 5 categories. Table 5 shows that having an Economic Agreement increases the likelihood of signing an RTA between the country pair more than any other type of cooperation agreement, which could complement the theory posited by [Balassa \(1961\)](#) adding a previous degree of Economic cooperation, before trade. Importantly, having a Connectivity agreement has also

a positive influence on the likelihood of entering an RTA, although the effect vanishes when introducing the International Relations controls. Surprisingly, Governance and institutions and Peace and Security agreements decrease the probability of signing an RTA. As Peace agreements are typically signed by countries that are ending a conflictive relation, we interpret the fact that they decrease the probability of signing an RTA as these parties not being ready to embark in deeper trade relations.

Table 6 confirms the fact that an RTA mostly decreases the likelihood of entering an ICA, showing that having an RTA decreases the probability of signing an Economic, an Human and social development and a Connectivity agreement but increases the likelihood of signing a Governance and Institutions agreement. These results confirm the hypothesis that trade integration is a step forward into economic integration, and that once it is achieved the remaining steps to follow are towards deeper relations (customs union, common market, monetary union). It also presents evidence to believe that embarking in trade relations drives countries into working towards other institutional arrangements.

Table 5: Heterogenous effects in the extensive margin of an RTA

| | Entering an RTA | | | | | |
|-------------------------------|--------------------------|------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $D(EconICA_{ij,t-1})$ | 0.00220** (0.000912) | 0.00189* (0.00106) | 0.00301** (0.00123) | | | |
| $D(Non - EconICA_{ij,t-1})$ | 0.000822 (0.000620) | 7.16e-05 (0.000777) | -0.000814 (0.000824) | | | |
| $D(EnvironmentICA_{ij,t-1})$ | | | | -0.000155 (0.00150) | -0.00130 (0.00158) | -0.00227 (0.00207) |
| $D(EconICA_{ij,t-1})$ | | | | 0.00346*** (0.000867) | 0.00311*** (0.000998) | 0.00395*** (0.00122) |
| $D(H\&DICA_{ij,t-1})$ | | | | -0.000550 (0.000810) | -0.000705 (0.000992) | -0.000582 (0.000938) |
| $D(InstitutionsICA_{ij,t-1})$ | | | | -0.00485*** (0.00144) | -0.00654*** (0.00177) | -0.00424** (0.00176) |
| $D(PeaceICA_{ij,t-1})$ | | | | -0.00800*** (0.00144) | -0.00962*** (0.00164) | -0.00964*** (0.00217) |
| $D(ConnectivityICA_{ij,t-1})$ | | | | 0.00192*** (0.000554) | 0.00147** (0.000653) | 3.78e-05 (0.000756) |
| Constant | 0.00253*** (0.000151) | -0.0920** (0.0466) | -0.0444 (0.0752) | 0.00302*** (0.000183) | -0.0910* (0.0465) | -0.0406 (0.0747) |
| Observations | 2,277,010 | 1,745,266 | 813,235 | 2,277,010 | 1,745,266 | 813,235 |
| R-squared | 0.136 | 0.141 | 0.141 | 0.136 | 0.141 | 0.142 |
| GDP and POP controls | NO | YES | YES | NO | YES | YES |
| IR controls | NO | NO | YES | NO | NO | YES |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. All columns show results of a Linear Probability Model where the dependent variable equals 1 if the dyad has entered an RTA in year t . Type of agreements are as displayed in Table 1. GDP and POP controls include: $\ln GDP_i \times \ln GDP_j$, $DiffY_{ij}$ and $\ln POP_i \times \ln POP_j$. International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Linear Probability Model for the 6 functions

| | Economic ICAs | Non-Economic ICAs | Environment | Economic | H&D | Institutions | Peace | Connectivity |
|------------------------------|-------------------------|--------------------------|------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $RTA_{ij,t-5}$ | -0.0120*** (0.00318) | -0.00721 (0.00618) | 0.00128 (0.00159) | -0.0120*** (0.00318) | -0.0189*** (0.00468) | 0.0191*** (0.00496) | 0.000228 (0.00204) | -0.0147*** (0.00274) |
| $\ln GDP_i \times \ln GDP_j$ | -0.000116 (0.000598) | 0.00223*** (0.000697) | 0.000357 (0.000283) | -0.000116 (0.000598) | 0.000340 (0.000570) | 0.00145*** (0.000483) | 0.00125*** (0.000477) | -0.000265 (0.000355) |
| $Diff Y_{ij}$ | 0.000525 (0.00137) | -0.00122 (0.00217) | 0.000927 (0.000660) | 0.000525 (0.00137) | 0.000643 (0.00114) | -0.00200 (0.00125) | 0.00114 (0.000704) | -8.92e-06 (0.000708) |
| $\ln POP_i \times \ln POP_j$ | 0.00151 (0.00130) | 0.00603** (0.00232) | 0.00277** (0.00125) | 0.00151 (0.00130) | 0.00241 (0.00164) | -0.000929 (0.00130) | 0.000391 (0.00122) | 0.00268*** (0.000848) |
| Constant | -0.0872 (0.150) | -1.082*** (0.284) | -0.332** (0.134) | -0.0872 (0.150) | -0.299* (0.181) | -0.303** (0.151) | -0.376* (0.202) | -0.136 (0.110) |
| Observations | 155,108 | 155,108 | 155,108 | 155,108 | 155,108 | 155,108 | 155,108 | 155,108 |
| R-squared | 0.248 | 0.341 | 0.242 | 0.248 | 0.243 | 0.280 | 0.229 | 0.207 |
| Controls | YES | YES | YES | YES | YES | YES | YES | YES |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. All columns show results of a linear probability model where the dependent variable equals 1 if the dyad has entered an ICA in year t . Type of agreements are as displayed in Table 1. International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.3 Global South and Global North

This part of the paper focuses on the heterogeneous effects of the sequencing between International Cooperation Agreements and Regional Trade Agreements by group of countries. We divide the world into two groups, Global North and Global South, a common classification in the developing and trade literature (Table 20). We then create dummy variables for each possible combination of origin country-destination country, resulting in 4 variables: *SouthSouth*, *NorthNorth*, *SouthNorth* and *NorthSouth*, where the first category refers to the exporter country while the second one refers to the importer. Finally, we interact these dummies with our variables of interest, and estimate their effect in a single regression. Importantly, country groups do not vary in time.

We find in Table 7 that an ICA predicts North South countries embark in an RTA more than any other combination, which could be explained by the fact that South countries need to gain the confidence of North countries before meriting the built of a trade relationship. Importantly, results are driven by the countries having signed an economic agreement, which again provides evidence for a previous step in Balassa's theory. We confirm the fact that RTAs decrease the probability of entering an ICA in Table 8, regardless of the type of countries.

Table 7: Global North and Global South in the extensive margin of an RTA

| | Entering an RTA | | | | | |
|-----------------------------|-----------------|------------|------------|------------|------------|-------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $D(ICA_{ij,t-1})$ | 0.00105 | -0.00241* | 0.000126 | | | |
| $x_{SouthSouth}$ | (0.00127) | (0.00138) | (0.00155) | | | |
| $D(ICA_{ij,t-1})$ | 0.00705*** | 0.00723*** | 0.00175 | | | |
| $x_{NorthNorth}$ | (0.00185) | (0.00244) | (0.00369) | | | |
| $D(ICA_{ij,t-1})$ | 0.00354*** | 0.00438*** | 0.00443*** | | | |
| $x_{SouthNorth}$ | (0.00101) | (0.00117) | (0.00152) | | | |
| $D(ICA_{ij,t-1})$ | 0.00354*** | 0.00438*** | 0.00418*** | | | |
| $x_{NorthSouth}$ | (0.00101) | (0.00117) | (0.00152) | | | |
| $D(EconICA_{ij,t-1})$ | | | | -0.000495 | -0.00345** | 0.000505 |
| $x_{SouthSouth}$ | | | | (0.00148) | (0.00143) | (0.00156) |
| $D(EconICA_{ij,t-1})$ | | | | 0.00274 | 0.00300 | 0.00110 |
| $x_{NorthNorth}$ | | | | (0.00237) | (0.00275) | (0.00334) |
| $D(EconICA_{ij,t-1})$ | | | | 0.00368** | 0.00458*** | 0.00591** |
| $x_{SouthNorth}$ | | | | (0.00144) | (0.00164) | (0.00263) |
| $D(EconICA_{ij,t-1})$ | | | | 0.00368** | 0.00458*** | 0.00524** |
| $x_{NorthSouth}$ | | | | (0.00144) | (0.00164) | (0.00256) |
| $D(Non - EconICA_{ij,t-1})$ | | | | 0.000313 | -0.00239 | -0.00212 |
| $x_{SouthSouth}$ | | | | (0.00148) | (0.00189) | (0.00192) |
| $D(Non - EconICA_{ij,t-1})$ | | | | -0.000225 | -0.00190 | -0.00674*** |
| $x_{NorthNorth}$ | | | | (0.00161) | (0.00213) | (0.00215) |
| $D(Non - EconICA_{ij,t-1})$ | | | | 0.00131 | 0.00164 | 0.00177 |
| $x_{SouthNorth}$ | | | | (0.000836) | (0.00108) | (0.00126) |
| $D(Non - EconICA_{ij,t-1})$ | | | | 0.00131 | 0.00163 | 0.00140 |
| $x_{NorthSouth}$ | | | | (0.000836) | (0.00108) | (0.00123) |
| Constant | 0.00221*** | -0.0897* | -0.0450 | 0.00250*** | -0.0964** | -0.0483 |
| | (0.000124) | (0.0465) | (0.0746) | (0.000162) | (0.0469) | (0.0733) |
| Observations | 2,277,010 | 1,745,266 | 813,235 | 2,277,010 | 1,745,266 | 813,235 |
| R-squared | 0.136 | 0.141 | 0.141 | 0.136 | 0.141 | 0.141 |
| GDP and POP controls | NO | YES | YES | NO | YES | YES |
| IR controls | NO | NO | YES | NO | NO | YES |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. All columns show results of a Linear Probability Model where the dependent variable equals 1 if the dyad has entered an RTA in year t . Type of agreements are as displayed in Table 1. GDP and POP controls include: $\ln GDP_i \times \ln GDP_j$, $DiffY_{ij}$ and $\ln POP_i \times \ln POP_j$. International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Global North and Global South countries are displayed in Table 20. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: Global North and Global South in the extensive margin of an ICA

| | All ICAs | | Economic ICAs | | Non-Economic ICAs | |
|------------------------------|------------|------------|---------------|------------|-------------------|------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $RTA_{ij,t-5}$ | -0.00826* | -0.0259*** | -0.00391 | -0.00742* | -0.00356 | -0.0164*** |
| $x_{SouthSouth}$ | (0.00462) | (0.00709) | (0.00247) | (0.00395) | (0.00335) | (0.00537) |
| $RTA_{ij,t-5}$ | -0.0215 | -0.0438** | -0.0398*** | -0.0338*** | 0.00402 | -0.0293 |
| $x_{NorthNorth}$ | (0.0236) | (0.0190) | (0.00697) | (0.00942) | (0.0244) | (0.0196) |
| $RTA_{ij,t-5}$ | -0.0282** | 0.00806 | -0.0110*** | -0.00674 | -0.0191* | 0.0154 |
| $x_{SouthNorth}$ | (0.0113) | (0.0138) | (0.00348) | (0.00420) | (0.0106) | (0.0120) |
| $RTA_{ij,t-5}$ | -0.0282** | 0.0129 | -0.0110*** | -0.00475 | -0.0191* | 0.0191 |
| $x_{NorthSouth}$ | (0.0113) | (0.0132) | (0.00348) | (0.00401) | (0.0106) | (0.0117) |
| $\ln GDP_i \times \ln GDP_j$ | 0.00136** | 0.00256*** | 0.000298 | -0.000116 | 0.000958* | 0.00221*** |
| | (0.000602) | (0.000801) | (0.000289) | (0.000602) | (0.000495) | (0.000690) |
| $DiffY_{ij}$ | 0.00106 | -2.57e-05 | 0.00153 | 0.000574 | -0.000275 | -0.00116 |
| | (0.00181) | (0.00250) | (0.000995) | (0.00135) | (0.00145) | (0.00219) |
| $\ln POP_i \times \ln POP_j$ | 0.00394*** | 0.00735*** | 0.00202*** | 0.00157 | 0.00233* | 0.00605** |
| | (0.00144) | (0.00238) | (0.000630) | (0.00129) | (0.00133) | (0.00234) |
| Constant | -0.618*** | -1.284*** | -0.219** | -0.0908 | -0.398** | -1.078*** |
| | (0.235) | (0.308) | (0.0892) | (0.146) | (0.197) | (0.283) |
| Observations | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 |
| R-squared | 0.356 | 0.356 | 0.203 | 0.248 | 0.355 | 0.342 |
| IR controls | NO | YES | NO | YES | NO | YES |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. All columns show results of a linear probability model where the dependent variable equals 1 if the dyad has entered an ICA in year t . Type of agreements are as displayed in Table 1. International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Global North and Global South countries are displayed in Table 20. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6 International cooperation agreements effects on trade

We just shown that gravity forces explain the formaton of ICAs, and that the latter increases the likelihood of a pair entering an RTA. We study in this section if the ICAs do also influence bilateral trade. We find that International Cooperation Agreements increase exports by around 30%, with two thirds of that effect coming from the extensive margin while one third comes from the intensive margin. All regressions are reported with pair, reporter-year and partner-year fixed effects -unless otherwise stated- which account for the nonindependence of observations. With such fixed effects, the coefficients reported avoid correlations between variables across country pairs or time. Moreover, we use two-way clustering of standard errors, by origin and destination, robustness with other clustering specifications are provided in Appendix 4 Table 30.

The main hypothesis underlying our study is that the diplomatic relation of two countries will positively affect bilateral trade due to a “confident effect”. The mechanism through which ICAs affect trade is micro-founded on the basis that international agreements increase trust between citizens (firms) in signatory countries, allowing them to engage in deeper and riskier relations such as trade, increasing bilateral flows. Economic agents will rely more on their counterparts if they know they are trustworthy from previous experiences, even if such past experiences go beyond trade. Importing and exporting firms incur in high costs when deciding whether or not to start trading with a new partner (Bernard et al., 2007), the fact that the partner has well established relations with the country where the firm is based decreases this uncertainty cost. The process of country pairs negotiating and signing non-trade agreements results in the creation of a legal infrastructure that “closes the distance” between them, promoting bilateral trade.

We explore two explanatory variables, a dummy equals 1 if the pair has entered an ICA (extensive margin) and the inverse hyperbolic sine transformation of the cumulative number ICAs within the dyad (intensive margin). We show that results hold when using the logarithm and other specifications in Appendix. However, we don't rely in such specifications as the former only allows to study positive values and observations drop considerably, although the magnitude, significance and interpretation of these results is almost identical.

Our dependent variable it is also the inverse hyperbolic sine transformation of the Exports flows from country i to country j . We use such transformation because it allows for a straightforward interpretation of the estimated coefficients as elasticities in an arcsinh-arcsinh model. In the Appendix we show results hold when using other trade measures, such as the natural logarithm of exports and the average of the log of the pair's trade flow, but interpreting such results demands some unnecessary math.

We find in Table 9 that pairs that share an ICA trade around 30% more than pairs without one¹⁷. In columns (4)-(6) we show that a 1% increase in ICAs in the dyad is associated with a 0.2% increase in exports. Although this coefficient indicates an inelastic relation, it is non negligible. The average number of ICAs in a bilateral relation with a positive number of agreements in 2020 is 6.31, signing a new cooperation agreement for this average dyad would mean a 15% increase, which would be associated with a 3% increase in exports. If we take the average number of ICAs in every country pair for the year 2020 (1.84), signing a new agreement would result in a 54% increase, which would be translated in an almost 11% increase in exports. From columns (7)-(9) we can decompose what part of this effect is due to the extensive and what part is due to the intensive margin (two thirds vs one third). Importantly, we confirm the fact that countries with an RTA trade more between each other (Baier and Bergstrand, 2007), as well as richer countries. We also find that countries sharing a military alliance or an UN agenda trade more but failed to find an effect for the Social Network Analysis

¹⁷ Again, semi-elasticity is calculated as $\frac{\hat{\beta}}{100} \approx \exp(\hat{\beta}) - 1$, as proposed in Bellemare and Wichman (2020).

variables.

Table 9: International Cooperation Agreements increase bilateral trade flows

| | <i>ihs(Exports)</i> | | | | | | | | |
|---|----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|----------------------|-----------------------|------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| <i>Dummy(ICA_{ij})</i> | 0.334*** (0.0417) | 0.303*** (0.0407) | 0.319*** (0.0504) | | | | 0.237*** (0.0481) | 0.198*** (0.0449) | 0.226*** (0.0527) |
| <i>ihs(ICA_{ij})</i> | | | | 0.204*** (0.0358) | 0.200*** (0.0319) | 0.203*** (0.0355) | 0.0997** (0.0424) | 0.111*** (0.0365) | 0.0995*** (0.0368) |
| <i>RTA_{ij}</i> | | 0.346*** (0.0497) | 0.481*** (0.0652) | | 0.326*** (0.0490) | 0.456*** (0.0640) | | 0.332*** (0.0491) | 0.467*** (0.0644) |
| <i>Y_{ij}</i> | | 0.0695*** (0.0120) | 0.0420*** (0.0138) | | 0.0669*** (0.0121) | 0.0385*** (0.0138) | | 0.0683*** (0.0120) | 0.0406*** (0.0138) |
| <i>UNVoting_{ij}</i> | | | 0.173*** (0.0314) | | | 0.169*** (0.0313) | | | 0.171*** (0.0312) |
| <i>IgoMemb_{ij}</i> | | | 0.00618 (0.00400) | | | 0.00559 (0.00405) | | | 0.00585 (0.00402) |
| <i>StructuralEquivalence_{ij}</i> | | | 0.00881 (0.205) | | | 0.0467 (0.205) | | | 0.0189 (0.204) |
| <i>Centrality_{ij}</i> | | | 0.717 (2.349) | | | -0.468 (2.372) | | | 0.105 (2.349) |
| <i>Alliance_{ij}</i> | | | 0.262*** (0.0970) | | | 0.261*** (0.0975) | | | 0.260*** (0.0969) |
| <i>Democ_{ij}</i> | | | 7.44e-05 (0.00491) | | | 4.74e-05 (0.00496) | | | -0.000118 (0.00493) |
| Constant | 7.619*** (0.0137) | 7.565*** (0.0245) | 8.002*** (0.149) | 7.608*** (0.0211) | 7.551*** (0.0281) | 7.987*** (0.150) | 7.592*** (0.0204) | 7.536*** (0.0282) | 7.975*** (0.150) |
| Observations | 241,297 | 225,544 | 122,096 | 241,297 | 225,544 | 122,096 | 241,297 | 225,544 | 122,096 |
| R-squared | 0.846 | 0.852 | 0.854 | 0.846 | 0.852 | 0.854 | 0.846 | 0.852 | 0.854 |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j - two way clustering- in parentheses. We restrict sample to every 5 years (from 1945 to 2020), but results hold when using the full sample. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

We now exploit the panel dimension of our data and estimate differenced regressions every 5 years. Although technically these regressions should be interpreted as the effect that changes in the inverse hyperbolic sine has on the changes of the inverse hyperbolic sine, we could intuitively think of them as growth rates and interpret elasticities as the percent change in Exports growth associated to a 1% change in ICAs growth. We stress that mathematically this is not entirely accurate, but it allows to understand to what extent the results in the previous table hold. We find that for every specification the positive and significantly different from zero coefficients hold, although coefficients are almost three times smaller. The reason of such a small result in absolute values is that, by differencing the data, the effect on exports we are studying is only over a five-year

period of diplomatic relations.

Using five year differenced data allows us to study the effects of lagged changes in ICA on bilateral exports, in the same manner [Baier and Bergstrand \(2007\)](#) do for FTA. The economic reasoning behind their specification relies on the assumption that FTAs have *phase-in* periods, meaning the full effect of the agreement takes longer than 5 years. We explore similar specifications in Table 27 in the Appendix. We find lagged changes in ICAs have no economic or statistical significant effect. Moreover, adding up the estimates for current changes and lagged changes gives almost the same results as in the benchmark regression. This suggests that cooperation agreements have a level effect on exports but do not impact its long-run growth, unlike FTAs.

Table 10: Differenced regressions confirm ICAs positive impact on bilateral trade

| | $\Delta_5 ihs(Exports)$ | | | | | |
|----------------------------------|-------------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\Delta_5 Dummy(ICA_{ij})$ | 0.0861*** (0.0253) | 0.102*** (0.0247) | 0.129*** (0.0347) | | | |
| $\Delta_5 ihs(ICA_{ij})$ | | | | 0.0744*** (0.0204) | 0.0795*** (0.0198) | 0.0963*** (0.0253) |
| $\Delta_5 RTA_{ij}$ | | 0.107*** (0.0297) | 0.210*** (0.0447) | | 0.105*** (0.0297) | 0.207*** (0.0448) |
| $\Delta_5 Y_{ij}$ | | 0.0128 (0.0102) | 0.00457 (0.0133) | | 0.0125 (0.0102) | 0.00451 (0.0133) |
| Constant | 0.377*** (0.000941) | 0.362*** (0.00461) | 0.386*** (0.0136) | 0.375*** (0.00154) | 0.360*** (0.00482) | 0.383*** (0.0139) |
| Observations | 194,123 | 181,140 | 96,069 | 194,123 | 181,140 | 96,069 |
| R-squared | 0.193 | 0.180 | 0.191 | 0.193 | 0.180 | 0.191 |
| International relations controls | NO | NO | YES | NO | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. We restrict sample to every 5 years (from 1945 to 2020), but results hold when using the full sample. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . International relations controls include $\Delta_5 UNVoting_{ij}$, $\Delta_5 IgoMemb_{ij}$, $\Delta_5 StructuralEquivalence_{ij}$, $\Delta_5 Centrality_{ij}$, $Alliance_{ij}$ and $Democ_{ij}$. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6.0.1 Firm level evidence

In this subsection we provide evidence that confirms our hypothesis using firm level data. The study is based on the hypothesis that the diplomatic relationships between two countries positively impact bilateral trade through a “confidence effect”. This effect is rooted in the idea that international agreements foster trust between citizens and firms in the participating countries, enabling them to engage in more profound and riskier activities such as trade, thereby enhancing bilateral trade flows, even when the purpose of such agreements was not trade formally.

Economic agents are more likely to rely on their counterparts if they have established trust from previous interactions. Importing and exporting firms face significant costs when deciding to trade with a new partner ([Bernard et al., 2007](#)), uncertainty costs that are reduced when their potential partner and their home country have strong diplomatic ties. We argue that the process of countries negotiating and signing non-trade agreements creates a legal framework that closes the “distance” between them, thereby facilitating bilateral

trade.

To support our results above, we test the mechanism relying on data on the microstructure of trade flows between countries, using the Exporter Dynamics Database (EDD) ([Fernandes et al., 2016](#)). The EDD draws on datasets covering the universe of exporter transactions obtained directly from customs agencies, allowing for comparability across developed and developing countries. It provides data for 70 countries from the 1990s up to 2014 -although with different country coverage-¹⁸.

In Table 11 we regress the Net number of firm creation against our main independent variable, the ICA. Net firm creation is defined as the number of firms from country i that enter country j minus the number of firms from country i that exit country j in period t (in other words, $firms_{ij,t} - firms_{ij,t-1}$). Results hold if we simply use the number of entrants (without netting out exiters) as calculated in the EDD. The main takeaway is that International Cooperation Agreements have a positive -and statistically significantly different from zero- impact on the number of exporting firms in the counterpart market.

¹⁸For detailed information of the EDD consult [Exporter Dynamics Database - World Bank](#)

Table 11: ICAs facilitate firms entering a destination market

| | Net firm creation | | | | | |
|---|-------------------|---------|----------|---------|----------|---------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>ihs(ICA_{ij})</i> | 9.686** | 9.799** | 9.692*** | 10.29** | 9.924*** | 11.12** |
| | (3.820) | (3.835) | (3.630) | (4.221) | (3.530) | (4.532) |
| <i>RTA_{ij}</i> | | | 4.077 | 2.973 | 4.932 | 4.669 |
| | | | (7.369) | (7.837) | (7.182) | (8.340) |
| <i>Y_{ij}</i> | | -4.181 | -4.259 | -2.769 | -3.555 | -3.153 |
| | | (3.949) | (3.897) | (3.756) | (3.867) | (4.387) |
| <i>UNVoting_{ij}</i> | | | | 3.799 | | 4.345 |
| | | | | (3.635) | | (3.831) |
| <i>IgoMemb_{ij}</i> | | | | -0.429 | | -0.409 |
| | | | | (0.663) | | (0.671) |
| <i>StructuralEquivalence_{ij}</i> | | | | | -33.75 | -38.83 |
| | | | | | (37.12) | (40.98) |
| <i>Centrality_{ij}</i> | | | | | -3,211 | -1,201 |
| | | | | | (2,753) | (1,695) |
| <i>Alliance_{ij}</i> | | | | -8.374 | | -9.305 |
| | | | | (6.159) | | (6.244) |
| <i>Democ_{ij}</i> | | | | | | -0.353 |
| | | | | | | (0.520) |
| Constant | 1.989 | 11.74 | 11.18 | 22.48 | 57.87 | 57.24 |
| | (2.978) | (10.53) | (11.17) | (20.00) | (39.42) | (36.27) |
| Observations | 69,248 | 68,415 | 68,415 | 54,201 | 68,415 | 50,036 |
| R-squared | 0.492 | 0.493 | 0.493 | 0.491 | 0.493 | 0.496 |
| Pair FE | YES | YES | YES | YES | YES | YES |
| Reporter#year FE | YES | YES | YES | YES | YES | YES |
| Partner#year FE | YES | YES | YES | YES | YES | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country *i* and country *j* -two way clustering- in parentheses. The dependent variable is the net firm creation (entrants - exitters). Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

6.1 Causal effect

As in the previous section, we are concerned about endogeneity issues such as reverse causality, simultaneity, and omitted variable bias. Simultaneity is a plausible problem when estimating the effects of ICAs, a dyadic number of agreements signed may be the result of the change in trade flows at the same time that the change in trade flows might be consequence of diplomatic interactions. As we acknowledge the explanatory variable might be endogenous, OLS regressions are subject to bias and the estimates of the causal effect are likely to be inconsistent. Bias could also arise from confounding unobserved factors.

To ensure our results are robust to such problems we employ two approaches. First, in the spirit of [Baier and Bergstrand \(2007\)](#), we include a lead of the change on ICA in our regression to ensure there are no “feedback effects”. Using future change of the potentially endogenous variable to test for exogeneity is common practice in the trade literature (see, for instance, [De Loecker et al. \(2016\)](#)). In a panel context, if ICA changes are strictly

exogenous to trade flow changes then the lead of the ICA change should not be correlated with the current exports change. Such an intuition is confirmed in Table 12. In addition, including such a variable barely affects the previously estimated effect of ICAs on exports, suggesting concurrent changes in trade are uncorrelated with future decisions to sign an International Cooperation Agreement.

Table 12: Future change in agreements signed does not affect exports

| | $\Delta_5 \text{arsinh}(Exports)$ | | | | | |
|----------------------------------|-----------------------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\Delta_5 Dummy(ICA_{ij})$ | 0.0981*** (0.0246) | 0.114*** (0.0237) | 0.139*** (0.0350) | | | |
| $\Delta_{t+5} Dummy(ICA_{ij})$ | 0.0441 (0.0293) | 0.0441 (0.0318) | 0.0804* (0.0413) | | | |
| $\Delta_5 ihs(ICA_{ij})$ | | | | 0.0761*** (0.0199) | 0.0799*** (0.0193) | 0.0994*** (0.0254) |
| $\Delta_{t+5} ihs(ICA_{ij})$ | | | | 0.0178 (0.0226) | 0.0105 (0.0229) | 0.0370 (0.0276) |
| $\Delta_5 RTA_{ij}$ | | 0.132*** (0.0372) | 0.210*** (0.0446) | | 0.130*** (0.0373) | 0.208*** (0.0448) |
| $\Delta_5 Y_{ij}$ | | 0.0166 (0.0118) | 0.0107 (0.0153) | | 0.0165 (0.0118) | 0.0106 (0.0153) |
| Constant | 0.430*** (0.00136) | 0.406*** (0.00570) | 0.380*** (0.0142) | 0.427*** (0.00243) | 0.404*** (0.00591) | 0.377*** (0.0145) |
| Observations | 166,552 | 155,091 | 95,539 | 166,552 | 155,091 | 95,539 |
| R-squared | 0.209 | 0.196 | 0.192 | 0.209 | 0.196 | 0.192 |
| International relations controls | NO | NO | YES | NO | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. We restrict sample to every 5 years (from 1945 to 2020), but results hold when using the full sample. The dependent variable is the changes in the inverse hyperbolic sine of export flows from country i to country j . Variables Δ_5 indicate 5 years differences, variables Δ_{t+5} indicate 5 years future differences, whereas other variables are level value in year t . International relations controls include $\Delta_5 UNVoting_{ij}$, $\Delta_5 IgoMemb_{ij}$, $\Delta_5 StructuralEquivalence_{ij}$, $\Delta_5 Centrality_{ij}$, $Alliance_{ij}$ and $Democ_{ij}$. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Further, we design an instrumental variable approach exploiting the network structure of ICAs. The instrument consists on the number of agreements signed by counterparts of country i in period $t - 1$, not including agreements that involve either i nor j . We argue that diplomatic relations between third countries have spillover effects on the diplomatic relations of countries ij , but are not influenced by bilateral trade between ij . We use the lagged value of other-partners connections since there is a possibility that the rest of the world may chose to sign cooperative agreements based on the level of current trade of ij . We discard the possibility of current bilateral trade ij affecting past rest of the world connections. Simply put:

$$Z_{ij,t}^{SNA} = \sum_p ICA_{rp,t-1}$$

With $p \neq j$ being all the partners connected to i , and $r \neq i$.

In Table 13 we report the results of our main instrumental variable, which confirms the results shown above. Importantly, the sign and significance are the same as the main regressions in Table 9, and the magnitudes are

extremely comparable, with the IV showing slightly higher estimates.

This could be caused by several reasons. For instance, an omitted variable that could be negatively correlated with the change in agreements signed, which would lead to a downward bias of the OLS estimation. We acknowledge we are not including all the confounding factors varying at the dyadic-time level due to data availability; a variable measuring number of diplomatic missions sent from country i to country j would, for example, reduce this bias but such database does not exist. Further, measurement error in an explanatory variable could be cause of attenuation bias, driving the OLS estimate toward zero. Since the IV estimate is unaffected by the measurement error, they will be larger. This measurement error could come from diplomatic secrecy or from delayed/failed registration of treaties. Although the UN Charter demands countries to report every international agreement signed, there are still many cases where countries report the agreement years after it took place, or decide to report it in other official non-UN sources -as it is the case with European Union countries reporting treaties to the European Commission-. We acknowledge that measurement error is likely to be one of the reasons for OLS estimates to be biased but that it surely is not the most important one. Finally, the IV estimate could be larger because, while OLS is estimating the Average Treatment Effect across the entire population, the IV estimates the Local Average Treatment Effect among compliers. This implies that IV estimates will be larger than OLS estimates due to heterogeneity in the studied population.

Additionally, the instrument proves to fulfill the validity condition. As we drop the i.i.d. assumption on the errors and clustered them by exporter and importer, the relevant F statistic to check in the second stage is the Kleinbergen-Paap which allows for heteroskedasticity. For information purposes we include the Cragg-Donald F statistic, although the reader should remind it relies on the i.i.d. assumption. The F statistics are bigger than 10 and the 1st stage regression is significantly different from zero, which means the relevance condition is fulfilled.

Since we have argued that the exclusion restriction holds and shown that the relevance condition holds, we conclude the instrument is a valid one, and our estimates for the IV are consistent. Interpreting column (1) of Table 13: a 1% increase in bilateral ICAs implies a 0.313% increase in bilateral exports.

Table 13: Instrumental approach confirms the results

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|-------------------------------------|-----------------------|------------------------|------------------------|-----------------------|--------------------------|------------------------|-----------------------|-------------------------|------------------------|
| | 2nd stage | 1st stage | Reduced form | 2nd stage | 1st stage | Reduced form | 2nd stage | 1st stage | Reduced form |
| $ihs(ICA_{ij})$ | 0.313*** (0.0505) | | | 0.372*** (0.0638) | | | 0.363*** (0.0671) | | |
| IV_{ij} | | 0.0782*** (0.00205) | 0.0223*** (0.00362) | | 0.0713*** (0.00202) | 0.0242*** (0.00421) | | 0.0706*** (0.00215) | 0.0236*** (0.00444) |
| RTA_{ij} | 0.324*** (0.0485) | 0.0930*** (0.0114) | 0.353*** (0.0500) | 0.403*** (0.0597) | 0.107*** (0.0173) | 0.441*** (0.0626) | 0.450*** (0.0626) | 0.116*** (0.0187) | 0.489*** (0.0657) |
| Y_{ij} | 0.0650*** (0.0121) | 0.00688** (0.00277) | 0.0675*** (0.0120) | 0.0376*** (0.0135) | 0.00975*** (0.00325) | 0.0407*** (0.0133) | 0.0320** (0.0137) | 0.0148*** (0.00344) | 0.0366*** (0.0134) |
| $UNVoting_{ij}$ | | | | 0.165*** (0.0295) | 0.0229*** (0.00682) | 0.176*** (0.0306) | 0.173*** (0.0308) | 0.0236*** (0.00717) | 0.185*** (0.0318) |
| $IgoMemb_{ij}$ | | | | 0.00395 (0.00390) | 0.00284*** (0.000914) | 0.00497 (0.00384) | 0.00466 (0.00411) | 0.00310*** (0.00101) | 0.00566 (0.00405) |
| $Alliance_{ij}$ | | | | 0.219** (0.0974) | 0.0332 (0.0218) | 0.233** (0.0966) | 0.246** (0.0983) | 0.0193 (0.0236) | 0.255** (0.0979) |
| $StructuralEquivalence_{ij}$ | | | | | | | 0.0674 (0.213) | -0.0524 (0.0527) | 0.0333 (0.213) |
| $Centrality_{ij}$ | | | | | | | -1.867 (2.575) | 6.964*** (1.173) | 0.139 (2.403) |
| $Democ_{ij}$ | | | | | | | -0.00134 (0.00507) | 0.00217** (0.00101) | -0.000532 (0.00507) |
| Observations | 220,080 | 358,142 | 220,080 | 135,978 | 201,733 | 135,978 | 118,921 | 169,360 | 118,921 |
| Cragg-Donald Wald F statistic | 92818 | | | 48426 | | | 41991 | | |
| Kleibergen-Paap rk Wald F statistic | 1271 | | | 1112 | | | 1001 | | |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Main independent variable is the inverse hyperbolic sine of cumulative number of bilateral ICAs. IV is our Social Network instrument and is defined as $Z_{ij,t}^{SNA} = \sum_p ICA_{p,t-1}$, where $p \neq j$ being all the partners connected to i , and $t \neq i$. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Finally, we test an alternative shift-share instrument, introduced in the literature by [Bartik \(1991\)](#), for robustness. As defined in [Goldsmith-Pinkham et al. \(2020\)](#), a shift-share instrument is one that uses the inner product structure of the endogenous variable to be constructed. The differential impact of common shocks on units with different pre-determined exposures is what allows Bartik instruments to isolate the treatment variation from potential confounding factors, and thus reduce endogeneity (in a panel data context with fixed effects) ([Breuer \(2022\)](#)).

Bartik instruments are constructed in two steps, first decomposing the treatment variation to a common subdimension (k) and then focusing on the variation driven by common shocks and pre-determined characteristics. In our study, the first step corresponds to decomposing aggregate bilateral-level ICAs into bilateral-ICAs' function-shares and worldwide-ICAs' function growth rates. The second step corresponds to interacting the pre-determined bilateral-ICAs' function-shares (ij, k) and worldwide ICAs' function growth rates (t, k) to build our instrument. Thus, our instrument varies at the level of the identifying variation (ij, t) due to the differential impact of common trends in treatment units. Our Bartik-like instrument is then defined as

$$Z_{ij,t}^{BI} = \sum_k s_{ij,k} \times g_{t,k}$$

Where $s_{ij,k}$ is the initial share of the bilateral number of ICAs in the world's aggregate, per function k , and $g_{t,k}$ is the world's growth rate of ICAs per function k as in [Table 1](#). Importantly, instruments are constructed every 5 periods.

Pre-determined shares and worldwide rates are unlikely to be randomly assigned but exogeneity of the

instrument comes from the fact that they are also unlikely to reflect current bilateral decisions. For a Bartik instrument to fulfil the exclusion restriction, at least one of its two components should be exogenous (Borusyak et al., 2022; Goldsmith-Pinkham et al., 2020). We argue that, in our case, both components are. In other words, the initial dyadic-function share does not explain nor it is explained by the subsequent changes in the error term (i.e., changes on bilateral trade). Moreover, the world's growth rate of ICA is an indicator of globalization and decreasing communication costs which implies that, although it is not exogenous to aggregates levels of global trade, it is so to the change in bilateral trade of a specific pair. Hence, the exclusion restriction is fulfilled. By exploiting the fact that worldwide trends in type of cooperation agreements impact bilateral relationships differently -depending on their pre-existing cooperation structure- the exogenous instrument allows us to capture the variance of our endogenous explanatory variable into exogenous and endogenous components. The instrument can be expected to capture function-specific agreements shifts due to worldwide trends in international relations.

In Table 14 we report results for our alternative instrumental strategy. The F statistics are bigger than 10 and the 1st stage regression is significantly different from zero, which means the relevance condition is also fulfilled. Two caveats need to be pointed out. First, the 2nd stage coefficient is in between 4 to 8 times larger than the non-instrumented regression.

The second thing to point out in our instrumented regressions is that the 1st stage coefficient of the instrument shows a negative sign. A priori, we would have expected our instrumental approach to predict a higher change in agreements signed. Although this could make sense since lagging the shares by several periods reduces the prediction power of the shift-share instrument over the treatment (Borusyak et al., 2022), we argue this result comes from the dynamics of international relations: country pairs with a certain amount of agreements signed would prefer to diversify their portfolio and strengthen relations with other counterparts vis-a-vis deepening a bilateral one. In Table 15 we see that the probability of signing an agreement decreases with the number of treaties the dyad has already signed and, importantly, it is not significantly affected by the previous level of exports.

Given that -by design of Bartik instruments- the exclusion restriction holds and -by First stage regression results- the relevance condition holds, we can safely assume that the instrument is correlated with the endogenous explanatory variable but has not direct link with our outcome of interest, and our IV estimates are consistent. Specifically, from column (1) Table 14, an increase in the change on the inverse hyperbolic sine of ICAs implies a 0.436% increase in Exports growth.

Most importantly, although we are confident in the fact that the IV results presented are a powerful indicator of robustness of our main OLS estimates, using 2SLS in structural gravities does not necessarily solve biased estimates. From Equation 7, we are estimating β_1 and for such we seek an IV for $ICA_{ij,t}$. The problem is that any IV $z_{ij,t}$ is necessarily correlated with Fixed Effects $\zeta_{i,j}$, $\gamma_{i,t}$ and $\psi_{j,t}$, implying the effect is not truly identified even if the provided tests show strong results.

No instrumental variable is bullet-proof and we are still concerned about reverse causality, simultaneity and time-varying correlated omitted factors biasing our estimates. However, these identification strategies are well accepted to reduce important endogeneity concerns, and, even when it is theoretically impossible to completely identify the effect of an endogenous variable in a structural gravity equation, the overall evidence presented in this subsection is strong enough to suggest the impact of ICAs on trade is positive and significantly different from zero.

Table 14: Alternative instrumental approach confirms the results

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---------------------------------------|-----------------------|-------------------------|----------------------|-----------------------|--------------------------|-----------------------|-----------------------|--------------------------|-----------------------|
| | 2nd stage | 1st stage | Reduced form | 2nd stage | 1st stage | Reduced form | 2nd stage | 1st stage | Reduced form |
| $\Delta_5 ihs(ICA_{ij})$ | 0.436** (0.194) | | | 0.832*** (0.143) | | | 2.302 (2.891) | | |
| $ShiftShareInstrument_{ij}$ | | -0.0810*** (0.00829) | -0.0369* (0.0203) | | -5.708*** (1.290) | -6.456*** (1.509) | | 0.585 (1.857) | -3.355 (2.259) |
| $\Delta_5 RTA_{ij}$ | 0.0949*** (0.0312) | 0.0293*** (0.00443) | 0.107*** (0.0297) | 0.135*** (0.0426) | 0.0388*** (0.00717) | 0.168*** (0.0428) | 0.137 (0.104) | 0.0310*** (0.00786) | 0.211*** (0.0448) |
| $\Delta_5 Y_{ij}$ | 0.0119 (0.0103) | 0.00149* (0.000792) | 0.0127 (0.0102) | 0.00630 (0.0129) | 0.000915 (0.00113) | 0.00643 (0.0130) | 0.00369 (0.0133) | 0.00145 (0.00119) | 0.00460 (0.0133) |
| $\Delta_5 UNVoting_{ij}$ | | | | 0.0587*** (0.0206) | 0.0143*** (0.00270) | 0.0689*** (0.0204) | 0.0298 (0.0509) | 0.0158*** (0.00266) | 0.0649*** (0.0223) |
| $\Delta_5 IgoMemb_{ij}$ | | | | 0.00549 (0.00523) | 0.00262*** (0.000825) | 0.00775 (0.00515) | 0.000151 (0.00838) | 0.00253*** (0.000785) | 0.00540 (0.00508) |
| $Alliance_{ij}$ | | | | 0.140*** (0.0514) | -0.0131 (0.0104) | 0.128** (0.0503) | 0.157** (0.0628) | -0.0104 (0.0107) | 0.124** (0.0538) |
| $\Delta_5 StructuralEquivalence_{ij}$ | | | | | | | 0.497 (0.609) | -0.0154 (0.0476) | 0.0959 (0.226) |
| $\Delta_5 Centrality_{ij}$ | | | | | | | -14.75 (24.74) | 9.763*** (1.196) | 4.449* (2.534) |
| $Democ_{ij}$ | | | | | | | 0.00333 (0.00457) | 0.000444 (0.000545) | 0.00216 (0.00396) |
| Observations | 181,140 | 331,318 | 181,140 | 108,291 | 179,557 | 108,291 | 96,069 | 151,657 | 96,069 |
| Cragg-Donald Wald F statistic | 159.5 | | | 166.3 | | | 4.810 | | |
| Kleibergen-Paap rk Wald F statistic | 110.2 | | | 23.89 | | | 0.728 | | |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable is the changes in the inverse hyperbolic sine of export flows from country i to country j . Main independent variable is the inverse hyperbolic sine of cumulative number of bilateral ICAs. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . ShiftShareInstrument is our Bartik instrument and is defined as $Z_{ij,t}^{BI} = \sum_k s_{ij,k} \times g_{t,k}$, Where $s_{ij,k}$ is the initial share of the bilateral number of ICAs in the world's aggregate, per function k , and $g_{t,k}$ is the world's growth rate of ICAs per function k as in Table 1. Importantly, instruments are constructed every 5 periods. Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

Table 15: Linear Probability Model

| | Extensive margin: entering an ICA | | |
|---|-----------------------------------|--------------------------|--------------------------|
| | (1) | (2) | (3) |
| <i>TotalICA_{ij,t-5}</i> | -0.00436*** (0.000837) | -0.00433*** (0.00104) | -0.00756*** (0.00199) |
| <i>RTA_{ij,t-5}</i> | | -0.0117** (0.00579) | -0.0111** (0.00504) |
| <i>Y_{ij,t-5}</i> | | -0.00144** (0.000712) | -0.00114 (0.000726) |
| <i>UNVoting_{ij,t-5}</i> | | | 0.0112*** (0.00349) |
| <i>IgoMemb_{ij,t-5}</i> | | | 0.000378 (0.000252) |
| <i>StructuralEquivalence_{ij,t-5}</i> | | | -0.00578 (0.00536) |
| <i>Centrality_{ij,t-5}</i> | | | 0.152 (0.163) |
| Constant | 0.0278*** (0.000819) | 0.0375*** (0.00131) | 0.0863*** (0.0112) |
| Observations | 447,534 | 333,484 | 172,061 |
| R-squared | 0.345 | 0.369 | 0.389 |

Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable equals 1 if the dyad has entered an ICA in year t . *TotalICA_{ij,t-5}* refers to the cumulated number of agreements the dyad took part in. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6.2 Heterogenous effects

The subsequent results will explore the heterogenous effects of International Cooperation Agreements in bilateral trade. First, we will compare the impact of Economic vis a vis Non-Economic ICAs. Further, we will distinguish Non-Economic agreements in 5 subcategories, trying to understand the drivers of such heterogeneity. Finally, we will explore the heterogenous effects related to country groups, listed in Table 20.

6.2.1 Functionalities of International Cooperation Agreements

Table 16 disentangles the heterogenous effects by type of agreement. As mentioned above, Economic ICAs refers to category 2 in Table 1, while Non-Economic ICAs refers to the aggregation of the other 5 categories. Importantly, Economic category does not include trade agreements -which are present in the RTA variable- but other sort of economic legal instruments, such as Bilateral Investment treaties, taxation schemes, monetary cooperation, property issues, payments.

Interestingly, we find coefficients for Economic agreements higher to those for Non Economic agreements, reassuring our previous beliefs. Even when treaties do not pursue as a primary goal to directly increase trade in a dyad, they have a positive impact on it. From column 5, a 1% increase in Economic ICAs growth implies a 0.0568% increase in Exports growth, while a 1% increase of Non-Econ ICAs growth implies a 0.0539% increase of Exports growth.

Zooming in into the different functions within Non-Economic ICAs, in columns 3 to 5 we find that its impact was driven by Connectivity agreements. Importantly, the estimate of Connectivity ICAs is higher than the one of Economic ICAs even when no control is included in the regressions, although it is less significant. Table 22 in the Appendix shows similar results for regressions in levels.

Table 16: Effects on trade by function - differenced regressions

| | Extensive: Explanatory variables are dummies | | | | Intensive: Explanatory variables are ihs | | | |
|--|--|----------------------------------|------------------------------------|----------------------------------|--|----------------------------------|------------------------------------|----------------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $\Delta_5 D/ihs(EconICA_{ij,t})$ | 0.0736*** (0.0240) | 0.0869*** (0.0282) | | | 0.0568*** (0.0199) | 0.0653** (0.0264) | | |
| $\Delta_5 D/ihs(Non - EconICA_{ij,t})$ | 0.0732*** (0.0274) | 0.108*** (0.0404) | | | 0.0539** (0.0228) | 0.0677** (0.0272) | | |
| $\Delta_5 RTA_{ij,t}$ | 0.106*** (0.0297) | 0.209*** (0.0446) | 0.106*** (0.0297) | 0.208*** (0.0446) | 0.105*** (0.0298) | 0.207*** (0.0448) | 0.105*** (0.0297) | 0.207*** (0.0449) |
| $\Delta_5 Y_{ij}$ | 0.0127 (0.0102) | 0.00447 (0.0133) | 0.0125 (0.0102) | 0.00411 (0.0133) | 0.0125 (0.0102) | 0.00447 (0.0133) | 0.0125 (0.0102) | 0.00437 (0.0133) |
| $\Delta_5 D/ihs(EnvironmentICA_{ij,t})$ | | | 0.0714* (0.0429) | 0.0868* (0.0466) | | | 0.0344 (0.0389) | 0.0440 (0.0408) |
| $\Delta_5 D/ihs(EconICA_{ij,t})$ | | | 0.0739*** (0.0238) | 0.0860*** (0.0279) | | | 0.0575*** (0.0199) | 0.0672** (0.0264) |
| $\Delta_5 D/ihs(H\&DICA_{ij,t})$ | | | -0.00665 (0.0355) | 0.0109 (0.0435) | | | 0.0130 (0.0331) | 0.0139 (0.0392) |
| $\Delta_5 D/ihs(InstitutionsICA_{ij,t})$ | | | -0.00250 (0.0333) | 0.0551 (0.0354) | | | -0.00312 (0.0256) | 0.0160 (0.0329) |
| $\Delta_5 D/ihs(PeaceICA_{ij,t})$ | | | 0.00236 (0.0278) | 0.0297 (0.0379) | | | -0.0101 (0.0198) | -0.00221 (0.0282) |
| $\Delta_5 D/ihs(ConnectivityICA_{ij,t})$ | | | 0.0883*** (0.0293) | 0.0835** (0.0351) | | | 0.0795*** (0.0304) | 0.0673* (0.0362) |
| Constant | 0.361*** (0.00475) (0.00475) | 0.384*** (0.0137) (0.0137) | 0.361*** (0.00477) (0.00478) | 0.384*** (0.0136) (0.0136) | 0.360*** (0.00485) (0.00485) | 0.383*** (0.0139) (0.0139) | 0.360*** (0.00482) (0.00482) | 0.383*** (0.0138) (0.0138) |
| Observations | 181,140 | 96,069 | 181,140 | 96,069 | 181,140 | 96,069 | 181,140 | 96,069 |
| R-squared | 0.180 | 0.191 | 0.180 | 0.191 | 0.180 | 0.191 | 0.180 | 0.191 |
| IR controls | NO | YES | NO | YES | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Type of agreements are as displayed in Table 1. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Explanatory variables are dummies for columns (1)-(4) and inverse hyperbolic sine of cumulative number of bilateral ICAs for columns (5)-(8). International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6.2.2 Global South and Global North

Exactly as in Section 5.3, this part of the paper focuses on the heterogeneous effects of ICAs by group of countries, dividing the world into two groups, Global North and Global South (Table 20) The first two columns of Table 17 present comparable results to Table 9, interacting the main independent variable. We find that, when estimating the classical gravity specification, the effects of ICAs in trade is significantly different from zero and positive for all of the cases although is stronger when both countries belong to the same group. Further,

its impact is the highest when both countries belong to the South, where an increase in 1% of agreements generates an increase of 0.45% in exports (column 4). This has important policy implications for developing countries, diplomatic activity pays off in trade increases and pays better if both countries are South.

We investigate the heterogenous effect of type of agreement by country groups in Table 18 and find that the positive South-South and North-North effect holds only for Economic agreements, while for every combination including a South counterpart Non Economic agreements present a positive and significant sign. This supports the hypotheses that ICAs close the distance between countries by conferring reputational gains, which are more needed for South than for North countries. As stated above, a mechanism for this result is that economic agents in the Global North get to know, and trust, the Global South countries through engaging in diplomatic relations and then trusting them enough to embark in riskier relations such as trade. Moreover, at the extensive margin the coefficient for Non-Economic agreements is higher than the one for Economic agreements for South-South relations. Finally, results for differenced regressions and for the interactions of the group of country dummies with each of the 6 functions are shown in the Appendix.

Table 17: Effects on trade by type of exporter-importer

| | Extensive: dummies | | Intensive: ihs | |
|----------------------------------|--------------------|-----------|----------------|-----------|
| | (1) | (2) | (3) | (4) |
| $D/ihs(ICA_{ij,t})$ | 0.578*** | 0.534*** | 0.491*** | 0.448*** |
| $xSouthSouth$ | (0.0808) | (0.0853) | (0.0601) | (0.0651) |
| $D/ihs(ICA_{ij,t})$ | 0.348*** | 0.295** | 0.181*** | 0.146** |
| $xNorthNorth$ | (0.0765) | (0.116) | (0.0602) | (0.0639) |
| $D/ihs(ICA_{ij,t})$ | 0.173** | 0.179* | 0.115** | 0.105* |
| $xSouthNorth$ | (0.0739) | (0.0931) | (0.0442) | (0.0584) |
| $D/ihs(ICA_{ij,t})$ | 0.121** | 0.154** | 0.0442 | 0.0280 |
| $xNorthSouth$ | (0.0555) | (0.0697) | (0.0417) | (0.0502) |
| $RTA_{ij,t}$ | 0.326*** | 0.463*** | 0.295*** | 0.427*** |
| | (0.0479) | (0.0637) | (0.0467) | (0.0621) |
| Y_{ij} | 0.0660*** | 0.0413*** | 0.0627*** | 0.0394*** |
| | (0.0118) | (0.0136) | (0.0116) | (0.0134) |
| Constant | 7.578*** | 8.012*** | 7.579*** | 8.005*** |
| | (0.0241) | (0.148) | (0.0272) | (0.146) |
| Observations | 225,544 | 122,096 | 225,544 | 122,096 |
| R-squared | 0.853 | 0.854 | 0.853 | 0.854 |
| International relations controls | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Explanatory variables are dummies for columns (1)-(2) and inverse hyperbolic sine of cumulative number of bilateral ICAs for columns (3)-(4). International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. North and South countries are defined in Table 20. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 18: Effects on trade by type of exporter-importer

| | Extensive: dummies | | Intensive: ihs | |
|----------------------------------|--------------------|-----------|----------------|-----------|
| | (1) | (2) | (3) | (4) |
| $D/ihs(EconICA_{ij,t})$ | 0.502*** | 0.453*** | 0.381*** | 0.348*** |
| $xSouthSouth$ | (0.0779) | (0.0833) | (0.0778) | (0.0825) |
| $D/ihs(EconICA_{ij,t})$ | 0.272*** | 0.259** | 0.192*** | 0.208*** |
| $xNorthNorth$ | (0.0767) | (0.110) | (0.0631) | (0.0760) |
| $D/ihs(EconICA_{ij,t})$ | 0.0176 | -0.00244 | -0.00467 | -0.0476 |
| $xSouthNorth$ | (0.0699) | (0.0845) | (0.0449) | (0.0498) |
| $D/ihs(EconICA_{ij,t})$ | -0.0665 | -0.0714 | -0.0800* | -0.111** |
| $xNorthSouth$ | (0.0545) | (0.0591) | (0.0416) | (0.0456) |
| $D/ihs(Non - EconICA_{ij,t})$ | 0.516*** | 0.477*** | 0.335*** | 0.289*** |
| $xSouthSouth$ | (0.0887) | (0.0942) | (0.0574) | (0.0626) |
| $D/ihs(Non - EconICA_{ij,t})$ | 0.126** | 0.0285 | 0.0261 | -0.0130 |
| $xNorthNorth$ | (0.0501) | (0.0760) | (0.0425) | (0.0583) |
| $D/ihs(Non - EconICA_{ij,t})$ | 0.221*** | 0.279*** | 0.112** | 0.148** |
| $xSouthNorth$ | (0.0601) | (0.0875) | (0.0505) | (0.0685) |
| $D/ihs(Non - EconICA_{ij,t})$ | 0.189*** | 0.216*** | 0.102** | 0.0955** |
| $xNorthSouth$ | (0.0459) | (0.0582) | (0.0397) | (0.0467) |
| $RTA_{ij,t}$ | 0.305*** | 0.439*** | 0.296*** | 0.428*** |
| | (0.0471) | (0.0621) | (0.0472) | (0.0620) |
| Y_{ij} | 0.0645*** | 0.0415*** | 0.0626*** | 0.0397*** |
| | (0.0117) | (0.0136) | (0.0117) | (0.0134) |
| Constant | 7.577*** | 8.001*** | 7.604*** | 8.016*** |
| | (0.0251) | (0.147) | (0.0260) | (0.146) |
| Observations | 225,544 | 122,096 | 225,544 | 122,096 |
| R-squared | 0.853 | 0.854 | 0.853 | 0.854 |
| International relations controls | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Explanatory variables are dummies for columns (1)-(2) and inverse hyperbolic sine of cumulative number of bilateral ICAs for columns (3)-(4). International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from [Bailey et al. \(2017\)](#), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. North and South countries are defined in [Table 20](#). Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

7 Discussion

This paper sheds light on the dynamics of international cooperation agreements (ICAs) and their impact on international trade. We answer a long posed question: does trade follow the flag? Yes! We find evidence that ICAs increase trade by around 11%. We confirm this evidence relying on firm level data, finding that ICAs increase exporting firms in counterpart countries. Importantly, developing countries experience more trade gains from international cooperation, suggesting that they benefit more from reputational gains. These results are of increasing importance given the current policy debates about friendshoring.

We also investigate the dynamics behind the formation of ICAs, finding that gravity forces play a significant role: countries that are closer, contiguous, bigger in terms of population or GDP, more democratic, sharing

religious or legal systems and similar voting patterns in the UNGA have a higher probability of entering an ICA. Further, we delve into the sequencing of international cooperation, revealing evidence that ICAs increase the likelihood of future Regional Trade Agreements, particularly those related to economic cooperation.

Some caveats are necessary to discuss. First, we do not have data on whether ICAs are still in place or not at the end of the period. Sources consulted only report when the agreement was signed/entered into force but not if it was withdrawn. Thus, we encourage countries on regularly reporting to the UN the international agreements to which they abide to at a certain point in time, which would also contribute to international transparency. Second, we do not assess at any time welfare or distributional effects of trade. There is a large related discussion in the literature from which we take distance, the goal of this study was to measure whether trade was increased or not instead of making a qualitative judgement on whether trade is positive or negative. Third, as repeated throughout the whole text, even when using the best techniques at hand, our estimates are subject to potential endogeneity. As of now, there is no better solution than to present all the different approaches above showing robustness and being transparent with their limitations.

In conclusion, our study sheds further light on the interplay of international relations and international trade. It contributes to the understanding of how political decisions influence economic outcomes and how different countries navigate the intricacies of international cooperation. Further research should explore the possibility of decomposing the broad Economic category into subcategories and replicating the main results on heterogeneous effects. We hope our database serves the purpose for future research on International Studies, such as the determinants of FDI, the creation of International Organizations, the nature of regionalization processes or the challenges of international taxation, among others.

During the preparation of this work the author(s) used ChatGPT in order to improve English readability. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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Appendices

A Database

Table 19: Treaty Functions and Keywords

| Function | Sub-Function | Coding Keywords |
|-------------------------------------|--------------------------|--|
| 1-Natural Resources and Environment | Energy | <ul style="list-style-type: none"> • Energy • Nuclear¹⁹ / uranium • Oil • Petroleum • Natural gas • Coal |
| | Environmental Protection | <ul style="list-style-type: none"> • Environment • Pollution • Climate change • Meteorological/ rawinsonde • Conservation • Plant protection • Forest |
| | Resource Management | <ul style="list-style-type: none"> • Mineral • Natural resource • Fishery/fisheries / fishing / tuna • Electric/electricity |
| | Water | <ul style="list-style-type: none"> • Water resources/water • River • Estuary |

Continued on next page

¹⁹Unless noted with terms such as “safe guards” and “anti-proliferation,” all nuclear treaties are coded within Function 1

Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|--|---|--|
| 2-Economic Cooperation and Integration | Agriculture | <ul style="list-style-type: none"> • Agriculture • Corn |
| | Financial and Monetary Cooperation | <ul style="list-style-type: none"> • Monetary • Investment • Financial • Currency • Money order |
| | Industry | <ul style="list-style-type: none"> • Industrial |
| | Intellectual Property Rights | <ul style="list-style-type: none"> • Copyright • Patent |
| | Economic Integration (General) and Regulatory Harmonization | <ul style="list-style-type: none"> • Economic • Customs • Antitrust • Economic and technical • "Economic, industrial and technical cooperation" • Enterprise • Property |
| | Services | |
| | Taxation | <ul style="list-style-type: none"> • Tax • Asset |

Continued on next page

Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|--------------------------------|--|--|
| | Trade | <ul style="list-style-type: none"> • Trade • Exchange/transfer of goods • Commerce / commercial commodity/commodities • Import • Tariff • Merchant |
| 3-Human and Social Development | Cultural Affairs | <ul style="list-style-type: none"> • Culture • Film/cinema /audio-visual • Sports |
| | Education | <ul style="list-style-type: none"> • Education • Student / Trainee • Youth • School • Diploma • Degree • University/universities |
| | Employment, Labor, and Social Security | <ul style="list-style-type: none"> • Social security • Employment/Unemployment • Pension • Insurance • Social/social development • Working holiday |
| | Gender | |

Continued on next page

Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|---|--|--|
| | Health, Medicine, and Disease Prevention | <ul style="list-style-type: none"> • Health • Sanitary • Disease • Vaccine • Medical/medicine • Veterinary |
| | Human Rights | |
| | Knowledge, Information, and Statistics Sharing | |
| | Research, Science and Technology | <ul style="list-style-type: none"> • Research • Science/scientific • Metrology • Space/outer space |
| | Urban and Rural Development | |
| 4-Governance and Institutions ²⁰ | Governance, General | <ul style="list-style-type: none"> • Friendship • Official / official publication • Public administration • Voting • Public officer |
| | Diplomatic and Consular Relations | <ul style="list-style-type: none"> • Diplomatic passports • Consular / consulate • Foreign affairs |
| | Civil Society | |

Continued on next page

²⁰Many treaties that do not have specific intents are categorized under this

Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|----------------------|--|--|
| | Institutional Building and General Cooperation | <ul style="list-style-type: none"> • Integration • Basic agreement • Consultation/political consultation • Establishment of a joint commission • Terminating/termination (previous treaties) • Continued application (previous treaties) |
| | Legal and Judicial System | <ul style="list-style-type: none"> • Judicial • Legal matter • Tribunal • Civil procedure • Restitution • Criminal investigation of corporations • Judicial cooperation in civil and criminal laws |
| 5-Peace and Security | Security and Military Cooperation | <ul style="list-style-type: none"> • Military • Defense/defence • Armed force • Navy/naval • Air force • Marine corps • Forces • Weapon(s) • Terrorism /anti-terrorism • Classified/secret information |

Continued on next page

Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|----------------|----------------------------------|--|
| | Peace and Conflict Resolution | <ul style="list-style-type: none"> • Ceasefire • Anti-proliferation • Safeguard • War / postwar / war damage |
| | Extradition and Criminal Matters | <ul style="list-style-type: none"> • Extradition / transfer of persons • Illicit/illegal • Penal sentence • Crime / criminal • Prisoner • Police |
| | Disaster Relief and Preparedness | <ul style="list-style-type: none"> • Emergency |
| | Drug Control | <ul style="list-style-type: none"> • Drug • Narcotics |
| 6-Connectivity | Border Cooperation | <ul style="list-style-type: none"> • Maritime • Boundary • Frontier • Border • Delimitation |
| | Infrastructure | |

Continued on next page

Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|----------|------------------------|--|
| | Migration | <ul style="list-style-type: none"> • Migration • Nationality / dual nationality • Readmission • Visa • Movement • Residence • Minors • Refugee |
| | Communication Networks | <ul style="list-style-type: none"> • Postal/mail / parcel • Telecommunication / Communications • Radio • TV / television • Media |
| | Tourism | <ul style="list-style-type: none"> • Travel |

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Table 19 – continued from previous page

| Function | Sub-Function | Coding Keywords |
|----------|------------------------------|--|
| | Transportation and Logistics | <ul style="list-style-type: none"> • Transport • Crew • Air transport / air service/civil aviation / airworthiness / flight • Driving/driver license • Rail • Road /highway • Bridge • Navigation / radar • Shipping • Satellite • Motor vehicle • Transit |

Table 20: Country list and end of the period ICAs

| Global North | | | | Global South | | | | | | | |
|--------------|--|-----------|------|--------------|------------------------------|-----------|------|-------|----------------------------------|-----------|-----|
| ISO 3 | Country | Period | ICA | ISO 3 | Country | Period | ICA | ISO 3 | Country | Period | ICA |
| ALB | Albania | 1945-2020 | 211 | AFG | Afghanistan | 1945-2020 | 66 | LBY | Libya | 1945-2020 | 114 |
| AND | Andorra | 1945-2020 | 26 | DZA | Algeria | 1945-2020 | 219 | MAC | Macao | 1945-2020 | 17 |
| ARM | Armenia | 1995-2020 | 123 | AGO | Angola | 1945-2020 | 56 | MDG | Madagascar | 1945-2020 | 89 |
| AUS | Australia | 1945-2020 | 865 | ATG | Antigua and Barbuda | 1945-2020 | 29 | MWI | Malawi | 1945-2020 | 69 |
| AUT | Austria | 1945-2020 | 996 | ARG | Argentina | 1945-2020 | 1040 | MYS | Malaysia | 1945-2020 | 230 |
| AZE | Azerbaijan | 1995-2020 | 146 | BHS | Bahamas | 1945-2020 | 36 | MDV | Maldives | 1945-2020 | 17 |
| BLR | Belarus | 1995-2020 | 191 | BHR | Bahrain | 1945-2020 | 83 | MLI | Mali | 1960-2020 | 127 |
| BEL | Belgium | 1945-2020 | 1070 | BGD | Bangladesh | 1975-2020 | 145 | MHL | Marshall Islands | 1995-2020 | 11 |
| BIH | Bosnia and Herzegovina | 1995-2020 | 79 | BRB | Barbados | 1945-2020 | 73 | MRT | Mauritania | 1960-2020 | 94 |
| BGR | Bulgaria | 1945-2020 | 591 | BLZ | Belize | 1945-2020 | 60 | MUS | Mauritius | 1945-2020 | 125 |
| CAN | Canada | 1945-2020 | 1206 | BEN | Benin | 1945-2020 | 148 | MEX | Mexico | 1945-2020 | 977 |
| HRV | Croatia | 1995-2020 | 205 | BOL | Bolivia | 1945-2020 | 322 | MNG | Mongolia | 1960-2020 | 201 |
| CYP | Cyprus | 1945-2020 | 297 | BWA | Botswana | 1970-2020 | 79 | MAR | Morocco | 1945-2020 | 332 |
| CZE | Czech Republic | 1995-2020 | 756 | BRA | Brazil | 1945-2020 | 1647 | MOZ | Mozambique | 1945-2020 | 118 |
| CSK | Czechoslovakia | 1945-1990 | 472 | BRN | Brunei | 1945-2020 | 35 | MMR | Myanmar | 1945-2020 | 98 |
| DNK | Denmark | 1945-2020 | 943 | BFA | Burkina Faso | 1960-2020 | 144 | NAM | Namibia | 1945-2020 | 81 |
| EST | Estonia | 1995-2020 | 342 | BDI | Burundi | 1965-2020 | 54 | NPL | Nepal | 1945-2020 | 70 |
| FIN | Finland | 1945-2020 | 981 | KHM | Cambodia | 1955-2020 | 107 | NIC | Nicaragua | 1945-2020 | 171 |
| FRA | France | 1945-2020 | 2681 | CMR | Cameroon | 1945-2020 | 117 | NER | Niger | 1960-2020 | 93 |
| GEO | Georgia | 1995-2020 | 125 | CPV | Cape Verde | 1945-2020 | 81 | NGA | Nigeria | 1945-2020 | 126 |
| DEU | Germany | 1945-2020 | 4069 | CAF | Central African Republic | 1960-2020 | 49 | PRK | North Korea | 1960-2020 | 65 |
| GRC | Greece | 1945-2020 | 523 | TCD | Chad | 1960-2020 | 81 | OMN | Oman | 1945-2020 | 106 |
| HUN | Hungary | 1945-2020 | 622 | CHL | Chile | 1945-2020 | 424 | PAK | Pakistan | 1945-2020 | 360 |
| ISL | Iceland | 1945-2020 | 220 | CHN | China | 1945-2020 | 845 | PAN | Panama | 1945-2020 | 208 |
| IRL | Ireland | 1945-2020 | 364 | COL | Colombia | 1945-2020 | 361 | PNG | Papua New Guinea | 1945-2020 | 47 |
| ISR | Israel | 1945-2020 | 916 | COM | Comoros | 1965-2020 | 22 | PRY | Paraguay | 1945-2020 | 262 |
| ITA | Italy | 1945-2020 | 858 | COG | Congo | 1945-2020 | 93 | PER | Peru | 1945-2020 | 399 |
| JPN | Japan | 1945-2020 | 787 | COK | Cook Islands | 1945-2020 | 25 | PHL | Philippines | 1945-2020 | 435 |
| KAZ | Kazakhstan | 1995-2020 | 159 | CRI | Costa Rica | 1945-2020 | 191 | QAT | Qatar | 1960-2020 | 131 |
| LVA | Latvia | 1995-2020 | 472 | CIV | Cote d'Ivoire | 1945-2020 | 128 | RWA | Rwanda | 1965-2020 | 61 |
| LIE | Liechtenstein | 1945-1945 | 0 | CUB | Cuba | 1945-2020 | 235 | KNA | Saint Kitts and Nevis | 1945-2020 | 18 |
| LTU | Lithuania | 1995-2020 | 441 | COD | Democratic Republic of Congo | 1945-2020 | 113 | LCA | Saint Lucia | 1945-2020 | 30 |
| LUX | Luxembourg | 1945-2020 | 394 | DJI | Djibouti | 1945-2020 | 46 | VCT | Saint Vincent and the Grenadines | 1945-2020 | 22 |
| MKD | Macedonia | 1995-2020 | 121 | DMA | Dominica | 1965-2020 | 28 | WSM | Samoa | 1945-2020 | 28 |
| MLT | Malta | 1945-2020 | 164 | DOM | Dominican Republic | 1945-2020 | 148 | STP | Sao Tome and Principe | 1945-2020 | 16 |
| MDA | Moldova | 1995-2020 | 112 | ECU | Ecuador | 1945-2020 | 256 | SAU | Saudi Arabia | 1945-2020 | 146 |
| MNE | Montenegro | 2010-2020 | 24 | EGY | Egypt | 1945-2020 | 442 | SEN | Senegal | 1945-2020 | 155 |
| NLD | Netherlands | 1945-2020 | 1740 | SLV | El Salvador | 1945-2020 | 170 | SYC | Seychelles | 1945-2020 | 41 |
| NZL | New Zealand | 1945-2020 | 512 | GNQ | Equatorial Guinea | 1945-2020 | 31 | SLE | Sierra Leone | 1945-2020 | 53 |
| NOR | Norway | 1945-2020 | 664 | ETH | Ethiopia | 1945-2020 | 139 | SLB | Solomon Islands | 1945-2020 | 18 |
| POL | Poland | 1945-2020 | 747 | FJI | Fiji | 1945-2020 | 55 | SOM | Somalia | 1960-2020 | 40 |
| PRT | Portugal | 1945-2020 | 446 | GAB | Gabon | 1960-2020 | 84 | ZAF | South Africa | 1945-2020 | 628 |
| ROU | Romania | 1945-2020 | 664 | GMB | Gambia | 1945-2020 | 55 | LKA | Sri Lanka | 1945-2020 | 163 |
| RUS | Russia | 1995-2020 | 1396 | GHA | Ghana | 1945-2020 | 124 | SDN | Sudan | 1945-2020 | 94 |
| SMR | San Marino | 2000-2020 | 38 | GRD | Grenada | 1945-2020 | 30 | SUR | Suriname | 1945-2020 | 55 |
| SRB | Serbia | 2010-2020 | 50 | GTM | Guatemala | 1945-2020 | 164 | SWZ | Swaziland | 1945-2020 | 36 |
| SCG | Serbia and Montenegro | 1995-2005 | 58 | GIN | Guinea | 1945-2020 | 87 | SYR | Syria | 1945-2020 | 162 |
| SGP | Singapore | 1965-2020 | 230 | GNB | Guinea-Bissau | 1945-2020 | 26 | TJK | Tajikistan | 1995-2020 | 70 |
| SVK | Slovak Republic | 1995-2020 | 684 | GUY | Guyana | 1945-2020 | 67 | TZA | Tanzania | 1945-2020 | 112 |
| SVN | Slovenia | 1995-2020 | 182 | HTI | Haiti | 1945-2020 | 67 | THA | Thailand | 1945-2020 | 303 |
| YUG | Socialist Federal Republic of Yugoslavia | 1945-1990 | 436 | HND | Honduras | 1945-2020 | 150 | TLS | Timor | 2005-2020 | 14 |
| KOR | South Korea | 1945-2020 | 820 | HKG | Hong Kong | 1945-2020 | 77 | TGO | Togo | 1945-2020 | 57 |
| SUN | Soviet Union | 1945-1990 | 927 | IND | India | 1945-2020 | 584 | TON | Tonga | 1945-2020 | 24 |
| ESP | Spain | 1945-2020 | 1505 | IDN | Indonesia | 1945-2020 | 406 | TTO | Trinidad and Tobago | 1945-2020 | 93 |
| SWE | Sweden | 1945-2020 | 948 | IRN | Iran | 1945-2020 | 206 | TUN | Tunisia | 1945-2020 | 262 |
| CHE | Switzerland | 1945-2020 | 908 | IRQ | Iraq | 1945-2020 | 120 | TKM | Turkmenistan | 1995-2020 | 65 |
| TWN | Taiwan | 1945-2020 | 25 | JAM | Jamaica | 1945-2020 | 164 | UGA | Uganda | 1945-2020 | 89 |
| TUR | Turkey | 1945-2020 | 678 | JOR | Jordan | 1945-2020 | 259 | ARE | United Arab Emirates | 1945-2020 | 144 |
| UKR | Ukraine | 1995-2020 | 294 | KEN | Kenya | 1945-2020 | 171 | URY | Uruguay | 1945-2020 | 255 |
| GBR | United Kingdom | 1945-2020 | 2480 | KWT | Kuwait | 1945-2020 | 190 | UZB | Uzbekistan | 1995-2020 | 178 |
| USA | United States | 1945-2020 | 6758 | KGZ | Kyrgyz Republic | 1995-2020 | 88 | VUT | Vanuatu | 1945-2020 | 18 |
| | | | | LAO | Laos | 1955-2020 | 127 | VEN | Venezuela | 1945-2020 | 378 |
| | | | | LBN | Lebanon | 1945-2020 | 163 | VNM | Vietnam | 1955-2020 | 298 |
| | | | | LSO | Lesotho | 1945-2020 | 51 | YEM | Yemen | 1945-2020 | 119 |
| | | | | LBR | Liberia | 1945-2020 | 104 | ZMB | Zambia | 1945-2020 | 92 |
| | | | | | | | | ZWE | Zimbabwe | 1945-2020 | 96 |

1.1 Dealing with Successor States

This subsection explains how we dealt with the Succession of States in respect to Treaties: States that are created from separations or dissolutions (like the former Soviet Union) or from the unification of two or more States (such as Yemen), and what to do with the obligations contracted by the previous state that ceases to exist.

Vienna Convention of 1978

The Vienna Convention (1978) ([link](#)) specifies that the new States automatically assume the obligations of the State that they replace. However, the Convention took 20 years to go into effect because it did not acquire the 15 necessary adhesions to do so. Additionally, none of the major powers joined the Convention, and most International Law experts agree that it has no effect in practice. We broadly follow the Council of Europe ([link](#)) who argued in 1998 that the Convention is not valid and that it must be taken on a case-by-case basis.

Trade Flows Consideration The decision on why we don't overlap the ending year of a country with the starting year of the succeeding state is based on trade flows. This will depend on the case. For instance, SCG stops recording treaties in 2005—a year before its formal dissolution—while the USSR stops recording in 1991, and Russia starts recording in 1992.

USSR and Russian Federation

We assign USSR treaties to Russia after the dissolution of the USSR. This is because, according to the Council of Europe:

The situation was, however, nuanced by the claim of the Russian Federation to be the continuing State ("gosudarstvo-prodolzatel") of the former USSR instead of just a successor State similar to the other CIS member States. This claim, which must be taken to mean that the Russian Federation guarantees the continuity of all rights and obligations of the USSR under international law, was soon accepted by the international community. Hence, the Russian Federation simply took over the seat of the former USSR in many international organisations including the UN Security Council. The Russian Federation, consistent with this position, has declared that it will continue to honour the international treaties concluded by the former USSR.

Socialist Federal Republic of Yugoslavia (SFRY) Treaties for the Former Socialist Yugoslavia ceased with the dissolution of Socialist Yugoslavia. Below is why:

In July 1992, the Badinter Commission reached the conclusion that the process of dissolution had been completed. Consequently, the Commission found that "the SFRY no longer exists." Instead, a number of new States had been created. Croatia, Slovenia, and Bosnia and Herzegovina had met with general recognition and had been admitted as new members of the United Nations on 22 May 1992. These States have generally accepted *ipso facto* succession to treaties of the former SFRY, subject however to their constitutional provisions. In many cases, the fate of bilateral treaties has been decided between the parties concerned. Serbia and Montenegro too had, as the Commission underlined, created a new State, the Federal Republic of Yugoslavia (FRY). Thus, the Commission denied Serbian claims that the FRY is identical with or a continuation of the former SFRY: the FRY was to be regarded as merely one of the five successors to the SFRY.

The term "former Yugoslavia" is now commonly used retrospectively. In May 2006, Montenegro invoked its right under the Constitutional Charter of Serbia and Montenegro to hold a referendum on independence from the state union. The referendum was successful, and Montenegro declared itself an independent nation

on 3 June 2006. Two days later, Serbia declared that it was the successor state to the union of Serbia and Montenegro. In October 2006, the Serbian parliament unanimously approved—and a referendum confirmed—a new constitution for the country. ([Link to UN](#))

Recap: we keep treaties for SFRY as YUG for pre-1992. As YUG was not recognized as a continuing state of SFRY, the "new" Yugoslavia will be called SCG (Serbia and Montenegro) to merge it with the Gravity database. We assume all treaties signed by YUG (post-1992) and SCG are taken by Serbia in 2006 as per the continuation announced to the UN. YUG after 1992 will be SCG for simplicity. SFRY WILL BE CALLED YUG to merge with Gravity data pre-1992.

Unification of Germany We drop East Germany (GDR) treaties but keep the ones from West Germany (FRG). From the Council of Europe:

This Unification Treaty also details the various points of departure concerning issues related to succession. Thus, Articles 11 and 12 regulate the fate of treaties to which either of the two German States was a party with Article 11 basically continuing the treaties to which the old FRG was a party, and Article 12 providing for consultations with treaty partners with a view to deciding upon the fate of treaties to which the former GDR was a party.

United Arab Republic United Arab Republic agreements are assigned to Egypt. The United Arab Republic (UAR) was a sovereign state in the Middle East from 1958 to 1961. It was initially a political union between Egypt (including the occupied Gaza Strip) and Syria from 1958 until Syria seceded from the union after the 1961 Syrian coup d'état—leaving a rump state. Egypt continued to be known officially as the United Arab Republic until 1971.

Czechoslovakia As both the Czech Republic and Slovakia honored the Vienna Convention and respected the obligations emanating from agreements signed by Czechoslovakia, these two countries "inherit" such agreements (and the respective counterparts). Please note that this inheritance happens with the new appearance of the country (1993) and that doesn't create any link between them (i.e., An agreement between the USA and Czechoslovakia will become two separate agreements: one between the USA and the Czech Republic and another between the USA and Slovakia).

From the European Commission:

Finally, as regards the dissolution of the Czech and Slovak Federal Republic, where the two successor States have clearly favored the applicability of the rule contained in Art. 34 of the Vienna Convention on Succession of States in Respect of Treaties, i.e., automatic succession in regard of both bilateral and multilateral treaties of their predecessor State, it appears that a relatively large number of States have by and large accepted that approach. This seems to be true even for some third parties that had originally favored applying the clean-slate rule. And again, it has been accepted and confirmed that localized treaties have devolved upon the respective successor States.

Unification of Yemen We don't have data for South Yemen before the unification. All the agreements belong to a single Yemen in the database.

Sudan Sudan (SDN) maintains all country's agreements after the separation of South Sudan (SSD), which starts with a clean sheet.

Unification of Vietnam We don't have data for North Vietnam before the unification. All the agreements belong to a single Vietnam in the database.

Separation of Pakistan and Bangladesh Pakistan keeps all the country's agreements prior to the division, and Bangladesh starts with a clean sheet.

Separation of Malaysia and Singapore Malaysia keeps all the country's agreements prior to the division, and Singapore starts with a clean sheet.

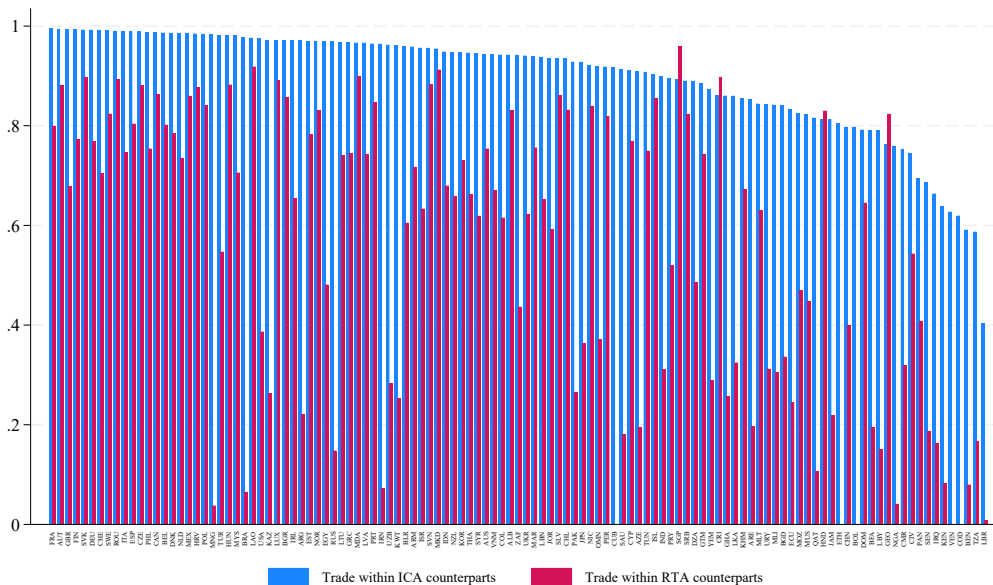
Separation of Ethiopia and Eritrea Ethiopia keeps all the country's agreements prior to the division, and Eritrea starts with a clean sheet.

1.2 Descriptive statistics

Table 21

| | count | mean | sd | min | max |
|---------------------------------------|---------|-----------|----------|-----------|-----------|
| Main variables in levels | | | | | |
| $Exports_{ij}$ | 1159734 | 319516.6 | 3996080 | 0 | 4.81e+08 |
| ICA_{ij} | 2313960 | 1.038558 | 6.012456 | 0 | 630.4724 |
| $ihs(Exports_{ij})$ | 1159734 | 7.693381 | 3.880894 | 0 | 20.68388 |
| $ihs(ICA_{ij})$ | 2313960 | .3035769 | .7989736 | 0 | 7.139617 |
| RTA_{ij} | 2313960 | .0625028 | .2420666 | 0 | 1 |
| Y_{ij} | 1753466 | 1.253065 | 3.425838 | -12.64076 | 27.03385 |
| Control variables | | | | | |
| $UNVoting_{ij}$ | 1560470 | -1.009275 | .8242232 | -5.784511 | -4.00e-07 |
| $IgoMemb_{ij}$ | 2039167 | 9.688344 | 14.75207 | 0 | 106 |
| $Alliance_{ij}$ | 1464976 | .0777569 | .2677888 | 0 | 1 |
| $StructuralEquivalence_{ij}$ | 1830556 | .4622644 | .2568913 | -.1776705 | 1 |
| $Centrality_{ij}$ | 1830556 | .0063114 | .019083 | 2.94e-09 | .9606631 |
| $Democ_{ij}$ | 1326208 | -2.549635 | 6.407906 | -10 | 10 |
| Variables in differences | | | | | |
| $\Delta_5 ihs(Exports_{ij})$ | 928206 | .3934907 | 2.00219 | -15.52935 | 13.83143 |
| $\Delta_5 ihs(ICA_{ij})$ | 2129400 | .0391147 | .1910686 | 0 | 3.829114 |
| $\Delta_5 RTA_{ij}$ | 2129400 | .0150033 | .1397994 | -1 | 1 |
| $\Delta_5 Y_{ij}$ | 1576236 | .246193 | 1.185616 | -14.42866 | 9.704025 |
| $\Delta_5 UNVoting_{ij}$ | 1360660 | .0252032 | .483397 | -4.457765 | 4.222781 |
| $\Delta_5 IgoMemb_{ij}$ | 1920840 | 1.537098 | 3.587673 | -20 | 60 |
| $\Delta_5 StructuralEquivalence_{ij}$ | 1646056 | .0163025 | .0972151 | -.8319933 | 1.030784 |
| $\Delta_5 Centrality_{ij}$ | 1646056 | .0002818 | .0033075 | -.3472611 | .3572903 |

Figure 13: The share of trade within ICA counterparts is higher than the share of trade within RTA counterparts for almost every country



Countries displayed have at least 100 cumulative ICAs. Most countries trade more within ICA counterparts than within RTA counterparts. Only countries trading more within RTA counterparts are Singapore, Costa Rica, Honduras and Georgia.

2 Additional results

2.1 Effects on trade

Table 22: Effects on trade by function

| | Extensive: Explanatory variables are dummies | | | | Intensive: Explanatory variables are ihs | | | |
|---------------------------------|--|-----------------------|-----------------------|-----------------------|--|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $D/ihs(EconICA_{ij,t})$ | 0.167*** (0.0404) | 0.164*** (0.0483) | | | 0.0682** (0.0318) | 0.0639* (0.0351) | | |
| $D/ihs(Non - EconICA_{ij,t})$ | 0.255*** (0.0355) | 0.282*** (0.0450) | | | 0.161*** (0.0298) | 0.165*** (0.0331) | | |
| $RTA_{ij,t}$ | 0.337*** (0.0496) | 0.471*** (0.0648) | 0.325*** (0.0487) | 0.458*** (0.0644) | 0.330*** (0.0493) | 0.461*** (0.0645) | 0.333*** (0.0496) | 0.465*** (0.0656) |
| Y_{ij} | 0.0692*** (0.0120) | 0.0414*** (0.0138) | 0.0667*** (0.0120) | 0.0388*** (0.0138) | 0.0659*** (0.0121) | 0.0375*** (0.0138) | 0.0669*** (0.0121) | 0.0383*** (0.0137) |
| $D/ihs(EnvironmentICA_{ij,t})$ | | | 0.0988* (0.0509) | 0.0558 (0.0556) | | | -0.0120 (0.0353) | -0.00399 (0.0390) |
| $D/ihs(EconICA_{ij,t})$ | | | 0.164*** (0.0405) | 0.165*** (0.0495) | | | 0.0903*** (0.0328) | 0.0852** (0.0378) |
| $D/ihs(H\&DICA_{ij,t})$ | | | 0.119*** (0.0421) | 0.137*** (0.0471) | | | 0.0648 (0.0392) | 0.0764* (0.0415) |
| $D/ihs(InstitutionsICA_{ij,t})$ | | | 0.160*** (0.0440) | 0.169*** (0.0536) | | | 0.0545 (0.0364) | 0.0551 (0.0471) |
| $D/ihs(PeaceICA_{ij,t})$ | | | 0.0251 (0.0389) | 0.0157 (0.0461) | | | -0.0605 (0.0384) | -0.0639 (0.0479) |
| $D/ihs(ConnectivityICA_{ij,t})$ | | | 0.129*** (0.0369) | 0.0988* (0.0516) | | | 0.0929*** (0.0330) | 0.0754* (0.0451) |
| Constant | 7.560*** (0.0261) | 8.000*** (0.149) | 7.566*** (0.0262) | 8.018*** (0.149) | 7.579*** (0.0275) | 8.008*** (0.149) | 7.607*** (0.0266) | 8.045*** (0.149) |
| Observations | 225,544 | 122,096 | 225,544 | 122,096 | 225,544 | 122,096 | 225,544 | 122,096 |
| R-squared | 0.852 | 0.854 | 0.852 | 0.854 | 0.852 | 0.854 | 0.852 | 0.854 |
| IR controls | NO | YES | NO | YES | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Type of agreements are as displayed in Table 1. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Explanatory variables are dummies for columns (1)-(4) and inverse hyperbolic sine of cumulative number of bilateral ICAs for columns (5)-(8). International Relations controls include: $UNVoting_{j,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 23: Effects on trade by type of exporter-importer

| | Extensive: dummies | | Intensive: ihs | |
|------------------------------|--------------------|----------|----------------|----------|
| | (1) | (2) | (3) | (4) |
| $\Delta_5 D/ihs(ICA_{ij,t})$ | 0.152*** | 0.143** | 0.155*** | 0.141** |
| $xSouthSouth$ | (0.0570) | (0.0681) | (0.0495) | (0.0556) |
| $\Delta_5 D/ihs(ICA_{ij,t})$ | 0.0257 | 0.192* | 0.00391 | 0.0376 |
| $xNorthNorth$ | (0.0715) | (0.104) | (0.0451) | (0.0478) |
| $\Delta_5 D/ihs(ICA_{ij,t})$ | 0.107** | 0.113* | 0.103*** | 0.120** |
| $xSouthNorth$ | (0.0437) | (0.0632) | (0.0273) | (0.0490) |
| $\Delta_5 D/ihs(ICA_{ij,t})$ | 0.0957*** | 0.0999* | 0.0634** | 0.0665 |
| $xNorthSouth$ | (0.0363) | (0.0540) | (0.0287) | (0.0423) |
| $\Delta_5 RTA_{ij,t}$ | 0.107*** | 0.209*** | 0.105*** | 0.207*** |
| | (0.0297) | (0.0447) | (0.0297) | (0.0449) |
| $\Delta_5 Y_{ij}$ | 0.0128 | 0.00454 | 0.0129 | 0.00470 |
| | (0.0102) | (0.0133) | (0.0102) | (0.0133) |
| Constant | 0.362*** | 0.386*** | 0.360*** | 0.383*** |
| | (0.00464) | (0.0136) | (0.00486) | (0.0139) |
| Observations | 181,140 | 96,069 | 181,140 | 96,069 |
| R-squared | 0.180 | 0.191 | 0.180 | 0.191 |
| IR controls | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Explanatory variables are dummies for columns (1)-(2) and inverse hyperbolic sine of cumulative number of bilateral ICAs for columns (3)-(4). Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from [Bailey et al. \(2017\)](#), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. North and South countries are defined in [Table 20](#). Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 24: Effects on trade by type of exporter-importer

| | Extensive: dummies | | Intensive: ihs | |
|--|--------------------|----------|----------------|----------|
| | (1) | (2) | (3) | (4) |
| $\Delta_5 D/ihs(EconICA_{ij,t})$ | 0.130** | 0.123* | 0.155** | 0.169** |
| <i>xSouthSouth</i> | (0.0658) | (0.0683) | (0.0652) | (0.0687) |
| $\Delta_5 D/ihs(EconICA_{ij,t})$ | 0.0541 | 0.175*** | 0.0303 | 0.0711* |
| <i>xNorthNorth</i> | (0.0510) | (0.0600) | (0.0330) | (0.0423) |
| $\Delta_5 D/ihs(EconICA_{ij,t})$ | 0.0683 | 0.0583 | 0.0570 | 0.0446 |
| <i>xSouthNorth</i> | (0.0440) | (0.0486) | (0.0352) | (0.0476) |
| $\Delta_5 D/ihs(EconICA_{ij,t})$ | 0.0479 | 0.0275 | 0.0285 | 0.00501 |
| <i>xNorthSouth</i> | (0.0302) | (0.0386) | (0.0295) | (0.0368) |
| $\Delta_5 D/ihs(Non - EconICA_{ij,t})$ | 0.154 | 0.118 | 0.120 | 0.0824 |
| <i>xSouthSouth</i> | (0.0978) | (0.113) | (0.0750) | (0.0766) |
| $\Delta_5 D/ihs(Non - EconICA_{ij,t})$ | -0.0272 | 0.0202 | -0.0327 | -0.0431 |
| <i>xNorthNorth</i> | (0.0455) | (0.0577) | (0.0399) | (0.0470) |
| $\Delta_5 D/ihs(Non - EconICA_{ij,t})$ | 0.0672 | 0.120* | 0.0942** | 0.126** |
| <i>xSouthNorth</i> | (0.0407) | (0.0725) | (0.0394) | (0.0577) |
| $\Delta_5 D/ihs(Non - EconICA_{ij,t})$ | 0.100** | 0.141** | 0.0644* | 0.103** |
| <i>xNorthSouth</i> | (0.0400) | (0.0567) | (0.0383) | (0.0511) |
| $\Delta_5 RTA_{ij,t}$ | 0.106*** | 0.208*** | 0.105*** | 0.207*** |
| | (0.0297) | (0.0446) | (0.0297) | (0.0448) |
| $\Delta_5 Y_{ij}$ | 0.0129 | 0.00466 | 0.0130 | 0.00515 |
| | (0.0102) | (0.0133) | (0.0102) | (0.0133) |
| Constant | 0.361*** | 0.384*** | 0.360*** | 0.383*** |
| | (0.00478) | (0.0137) | (0.00487) | (0.0139) |
| Observations | 181,140 | 96,069 | 181,140 | 96,069 |
| R-squared | 0.180 | 0.191 | 0.180 | 0.191 |
| IR controls | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. Explanatory variables are dummies for columns (1)-(2) and inverse hyperbolic sine of cumulative number of bilateral ICAs for columns (3)-(4). Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . International Relations controls include: $UNVoting_{ij,t}$ is the absolute value of the Ideal Point Distance taken from Bailey et al. (2017), $IgoMemb_{ij,t}$ is the number of International Governmental Organizations in which both countries are members, taken from the Correlates of War project, $Alliance_{ij,t}$ is a dummy equal 1 if the dyad is part of a military alliance, as reported by the Correlates of War project, $Centrality_{ij,t}$ is the Eigenvector Centrality score of country i times the Eigenvector Centrality of country j , in the network of international agreements, $StrucEquiv_{ij,t}$ is the Pearson product-moment correlation between the vectors of i and j 's relations to other nations, $Democ_{ij,t}$ is the minimum democracy/autocracy score in the dyad as reported in the Polity V database. North and South countries are defined in Table 20. Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

Table 25: Effects on trade by type of exporter-importer and type of function

| | <i>ihs(Exports)</i> | | | | | |
|--|--|-----------|-----------|--|-----------|-----------|
| | Extensive: Explanatory variables are dummies | | | Intensive: Explanatory variables are his | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>D/ihs(EnvironmentICA_{ij})</i> | 0.306** | 0.271** | 0.164 | -0.0991 | -0.160** | -0.175** |
| <i>xSouthSouth</i> | (0.131) | (0.137) | (0.134) | (0.0845) | (0.0796) | (0.0861) |
| <i>D/ihs(EnvironmentICA_{ij})</i> | -0.0116 | 0.0409 | 0.127* | -0.0873 | -0.0192 | 0.0991** |
| <i>xNorthNorth</i> | (0.0631) | (0.0610) | (0.0735) | (0.0615) | (0.0485) | (0.0492) |
| <i>D/ihs(EnvironmentICA_{ij})</i> | -0.176 | -0.111 | -0.228* | -0.153** | -0.134** | -0.196** |
| <i>xSouthNorth</i> | (0.140) | (0.128) | (0.121) | (0.0725) | (0.0667) | (0.0936) |
| <i>D/ihs(EnvironmentICA_{ij})</i> | -0.0403 | -0.00871 | -0.0744 | 0.00654 | 0.0123 | -0.0608 |
| <i>xNorthSouth</i> | (0.0490) | (0.0531) | (0.0577) | (0.0617) | (0.0646) | (0.0531) |
| <i>D/ihs(EconICA_{ij})</i> | 0.518*** | 0.454*** | 0.416*** | 0.485*** | 0.436*** | 0.399*** |
| <i>xSouthSouth</i> | (0.0830) | (0.0768) | (0.0839) | (0.0807) | (0.0769) | (0.0815) |
| <i>D/ihs(EconICA_{ij})</i> | 0.303*** | 0.232*** | 0.233** | 0.265*** | 0.205*** | 0.179** |
| <i>xNorthNorth</i> | (0.0744) | (0.0712) | (0.111) | (0.0655) | (0.0644) | (0.0805) |
| <i>D/ihs(EconICA_{ij})</i> | 0.0767 | 0.0458 | 0.0210 | 0.0315 | 0.0227 | -0.00639 |
| <i>xSouthNorth</i> | (0.0673) | (0.0680) | (0.0823) | (0.0434) | (0.0440) | (0.0513) |
| <i>D/ihs(EconICA_{ij})</i> | -0.0370 | -0.0297 | -0.0395 | -0.0623 | -0.0613 | -0.0791* |
| <i>xNorthSouth</i> | (0.0521) | (0.0523) | (0.0579) | (0.0420) | (0.0413) | (0.0471) |
| <i>D/ihs(H&DICA_{ij})</i> | 0.448*** | 0.493*** | 0.462*** | 0.218*** | 0.275*** | 0.269*** |
| <i>xSouthSouth</i> | (0.0855) | (0.0868) | (0.105) | (0.0697) | (0.0764) | (0.0866) |
| <i>D/ihs(H&DICA_{ij})</i> | -0.146*** | -0.108** | -0.166** | -0.152*** | -0.134*** | -0.155** |
| <i>xNorthNorth</i> | (0.0509) | (0.0515) | (0.0732) | (0.0442) | (0.0431) | (0.0676) |
| <i>D/ihs(H&DICA_{ij})</i> | 0.149** | 0.143* | 0.154* | 0.0928 | 0.110 | 0.145 |
| <i>xSouthNorth</i> | (0.0701) | (0.0729) | (0.0837) | (0.0778) | (0.0833) | (0.0899) |
| <i>D/ihs(H&DICA_{ij})</i> | 0.0796 | 0.0875 | 0.101 | 0.0497 | 0.0883* | 0.106** |
| <i>xNorthSouth</i> | (0.0684) | (0.0664) | (0.0658) | (0.0551) | (0.0526) | (0.0490) |
| <i>D/ihs(InstitutionsICA_{ij})</i> | 0.284** | 0.255* | 0.232* | 0.193 | 0.154 | 0.117 |
| <i>xSouthSouth</i> | (0.134) | (0.134) | (0.134) | (0.136) | (0.134) | (0.137) |
| <i>D/ihs(InstitutionsICA_{ij})</i> | 0.261*** | 0.213*** | 0.224*** | 0.0408 | 0.0725 | 0.0863 |
| <i>xNorthNorth</i> | (0.0591) | (0.0536) | (0.0588) | (0.0504) | (0.0447) | (0.0616) |
| <i>D/ihs(InstitutionsICA_{ij})</i> | 0.0649 | 0.115* | 0.188** | -0.0316 | 0.0205 | 0.0476 |
| <i>xSouthNorth</i> | (0.0633) | (0.0642) | (0.0788) | (0.0645) | (0.0563) | (0.0635) |
| <i>D/ihs(InstitutionsICA_{ij})</i> | -0.0168 | 0.0206 | 0.00453 | -0.0825* | -0.0524 | -0.0501 |
| <i>xNorthSouth</i> | (0.0466) | (0.0496) | (0.0657) | (0.0446) | (0.0401) | (0.0441) |
| <i>D/ihs(PeaceICA_{ij})</i> | 0.102 | 0.0874 | 0.0472 | -0.267* | -0.271* | -0.273** |
| <i>xSouthSouth</i> | (0.136) | (0.139) | (0.130) | (0.141) | (0.139) | (0.132) |
| <i>D/ihs(PeaceICA_{ij})</i> | 0.171*** | 0.123** | 0.0772 | 0.0574 | 0.0333 | 0.0664 |
| <i>xNorthNorth</i> | (0.0584) | (0.0587) | (0.0739) | (0.0514) | (0.0535) | (0.0731) |
| <i>D/ihs(PeaceICA_{ij})</i> | -0.125 | -0.116* | -0.0778 | -0.177*** | -0.172*** | -0.192*** |
| <i>xSouthNorth</i> | (0.0774) | (0.0631) | (0.0690) | (0.0601) | (0.0565) | (0.0617) |
| <i>D/ihs(PeaceICA_{ij})</i> | -0.0807 | -0.123* | -0.103* | -0.162*** | -0.163*** | -0.157*** |
| <i>xNorthSouth</i> | (0.0771) | (0.0663) | (0.0622) | (0.0602) | (0.0565) | (0.0572) |
| <i>D/ihs(ConnectivityICA_{ij})</i> | 0.200** | 0.194** | 0.159 | 0.170** | 0.196*** | 0.139* |
| <i>xSouthSouth</i> | (0.0898) | (0.0921) | (0.110) | (0.0765) | (0.0735) | (0.0820) |
| <i>D/ihs(ConnectivityICA_{ij})</i> | 0.128** | 0.101* | -0.00403 | 0.0795 | 0.0527 | 0.0386 |
| <i>xNorthNorth</i> | (0.0630) | (0.0580) | (0.0904) | (0.0609) | (0.0565) | (0.0677) |
| <i>D/ihs(ConnectivityICA_{ij})</i> | 0.0656 | 0.132* | 0.0815 | 0.0133 | 0.0482 | 0.0224 |
| <i>xSouthNorth</i> | (0.0659) | (0.0680) | (0.104) | (0.0641) | (0.0625) | (0.0898) |
| <i>D/ihs(ConnectivityICA_{ij})</i> | 0.0946* | 0.115** | 0.0916* | 0.0826 | 0.0870* | 0.0564 |
| <i>xNorthSouth</i> | (0.0495) | (0.0460) | (0.0545) | (0.0531) | (0.0505) | (0.0684) |
| <i>RTA_{ij}</i> | | 0.292*** | 0.423*** | | 0.307*** | 0.442*** |
| | | (0.0468) | (0.0621) | | (0.0474) | (0.0629) |
| <i>Y_{ij}</i> | | 0.0624*** | 0.0401*** | | 0.0641*** | 0.0400*** |
| | | (0.0117) | (0.0135) | | (0.0117) | (0.0136) |
| <i>UNVoting_{ij}</i> | | | 0.152*** | | | 0.146*** |
| | | | (0.0310) | | | (0.0302) |
| <i>IgoMemb_{ij}</i> | | | 0.00409 | | | 0.00416 |
| | | | (0.00389) | | | (0.00389) |
| <i>Alliance_{ij}</i> | | | 0.252*** | | | 0.272*** |
| | | | (0.0935) | | | (0.0938) |
| <i>StructuralEquivalence_{ij}</i> | | | 0.0405 | | | 0.0703 |
| | | | (0.208) | | | (0.207) |
| <i>Centrality_{ij}</i> | | | 1.945 | | | 2.454 |
| | | | (2.198) | | | (1.977) |
| <i>Democ_{ij}</i> | | | 0.000410 | | | 0.000930 |
| | | | (0.00490) | | | (0.00499) |
| Constant | 7.629*** | 7.588*** | 8.017*** | 7.673*** | 7.624*** | 8.024*** |
| | (0.0161) | (0.0249) | (0.146) | (0.0177) | (0.0258) | (0.145) |
| Observations | 241,297 | 225,544 | 122,096 | 241,297 | 225,544 | 122,096 |
| R-squared | 0.847 | 0.853 | 0.854 | 0.847 | 0.853 | 0.854 |
| Pair FE | YES | YES | YES | YES | YES | YES |
| Reporteryear FE | YES | YES | YES | YES | YES | YES |
| Partneryear FE | YES | YES | YES | YES | YES | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country *i* and country *j* -two way clustering- in parentheses. The dependent variable is the inverse hyperbolic sine of export flows from country *i* to country *j*. Main independent variable is the inverse hyperbolic sine of cumulative number of bilateral ICAs. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year *t*. Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

Table 26: Effects on trade by type of exporter-importer and type of function, difference regressions

| | $\Delta_5 \text{arsinh}(\text{Exports})$ | | | | | |
|---|--|-----------|-----------|--|-----------|-----------|
| | Extensive: Explanatory variables are dummies | | | Intensive: Explanatory variables are his | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\Delta_5 D/ihs(\text{EnvironmentICA}_{ij})$ | 0.0460 | 0.0729 | 0.0822 | -0.000833 | 0.00372 | 0.0408 |
| $x\text{SouthSouth}$ | (0.129) | (0.133) | (0.135) | (0.116) | (0.120) | (0.126) |
| $\Delta_5 D/ihs(\text{EnvironmentICA}_{ij})$ | 0.0464 | 0.0639 | 0.0653 | 0.0270 | 0.0299 | 0.00156 |
| $x\text{NorthNorth}$ | (0.0463) | (0.0440) | (0.0476) | (0.0419) | (0.0386) | (0.0478) |
| $\Delta_5 D/ihs(\text{EnvironmentICA}_{ij})$ | 0.127 | 0.156 | 0.164 | 0.112 | 0.124 | 0.155 |
| $x\text{SouthNorth}$ | (0.124) | (0.118) | (0.136) | (0.122) | (0.126) | (0.136) |
| $\Delta_5 D/ihs(\text{EnvironmentICA}_{ij})$ | 0.00990 | 0.0137 | 0.0749* | -0.0157 | -0.0124 | 0.0308 |
| $x\text{NorthSouth}$ | (0.0433) | (0.0404) | (0.0421) | (0.0340) | (0.0322) | (0.0426) |
| $\Delta_5 D/ihs(\text{EconICA}_{ij})$ | 0.114* | 0.123* | 0.116* | 0.159** | 0.157** | 0.171** |
| $x\text{SouthSouth}$ | (0.0678) | (0.0654) | (0.0678) | (0.0663) | (0.0647) | (0.0681) |
| $\Delta_5 D/ihs(\text{EconICA}_{ij})$ | 0.0619 | 0.0575 | 0.182*** | 0.0339 | 0.0264 | 0.0661 |
| $x\text{NorthNorth}$ | (0.0518) | (0.0510) | (0.0609) | (0.0369) | (0.0344) | (0.0430) |
| $\Delta_5 D/ihs(\text{EconICA}_{ij})$ | 0.0642 | 0.0645 | 0.0562 | 0.0491 | 0.0573 | 0.0468 |
| $x\text{SouthNorth}$ | (0.0431) | (0.0441) | (0.0477) | (0.0333) | (0.0350) | (0.0474) |
| $\Delta_5 D/ihs(\text{EconICA}_{ij})$ | 0.0675** | 0.0506* | 0.0275 | 0.0410 | 0.0308 | 0.00858 |
| $x\text{NorthSouth}$ | (0.0292) | (0.0304) | (0.0389) | (0.0303) | (0.0301) | (0.0376) |
| $\Delta_5 D/ihs(\text{H\&DICA}_{ij})$ | 0.194 | 0.194 | 0.0906 | 0.160 | 0.158 | 0.0542 |
| $x\text{SouthSouth}$ | (0.118) | (0.123) | (0.132) | (0.108) | (0.110) | (0.128) |
| $\Delta_5 D/ihs(\text{H\&DICA}_{ij})$ | -0.116*** | -0.0927** | -0.0776 | -0.0517 | -0.0400 | -0.0281 |
| $x\text{NorthNorth}$ | (0.0412) | (0.0420) | (0.0532) | (0.0355) | (0.0340) | (0.0392) |
| $\Delta_5 D/ihs(\text{H\&DICA}_{ij})$ | -0.0360 | -0.0181 | 0.00449 | -0.00557 | 0.00458 | 0.0261 |
| $x\text{SouthNorth}$ | (0.0637) | (0.0691) | (0.0853) | (0.0658) | (0.0723) | (0.0879) |
| $\Delta_5 D/ihs(\text{H\&DICA}_{ij})$ | 0.0223 | 0.00768 | 0.0403 | 0.0430 | 0.0209 | 0.0335 |
| $x\text{NorthSouth}$ | (0.0479) | (0.0512) | (0.0497) | (0.0415) | (0.0424) | (0.0395) |
| $\Delta_5 D/ihs(\text{InstitutionsICA}_{ij})$ | 0.0712 | 0.0417 | 0.0862 | 0.00267 | -0.0292 | 0.0240 |
| $x\text{SouthSouth}$ | (0.111) | (0.110) | (0.105) | (0.104) | (0.0953) | (0.0906) |
| $\Delta_5 D/ihs(\text{InstitutionsICA}_{ij})$ | -0.0446 | -0.0484 | 0.0274 | -0.0169 | -0.0235 | 0.00903 |
| $x\text{NorthNorth}$ | (0.0463) | (0.0462) | (0.0421) | (0.0406) | (0.0347) | (0.0467) |
| $\Delta_5 D/ihs(\text{InstitutionsICA}_{ij})$ | 0.0127 | 0.0266 | 0.0853 | 0.0515 | 0.0700 | 0.0471 |
| $x\text{SouthNorth}$ | (0.0849) | (0.0896) | (0.0986) | (0.0383) | (0.0447) | (0.0742) |
| $\Delta_5 D/ihs(\text{InstitutionsICA}_{ij})$ | -0.0146 | -0.00871 | 0.0280 | -0.0306 | -0.0235 | -0.00753 |
| $x\text{NorthSouth}$ | (0.0413) | (0.0420) | (0.0592) | (0.0390) | (0.0388) | (0.0538) |
| $\Delta_5 D/ihs(\text{PeaceICA}_{ij})$ | 0.0446 | -0.0177 | -0.0423 | -0.0388 | -0.0892 | -0.115 |
| $x\text{SouthSouth}$ | (0.0927) | (0.0937) | (0.103) | (0.0785) | (0.0813) | (0.105) |
| $\Delta_5 D/ihs(\text{PeaceICA}_{ij})$ | 0.0459 | 0.00995 | -0.00211 | 0.0510 | 0.0254 | 0.0308 |
| $x\text{NorthNorth}$ | (0.0409) | (0.0380) | (0.0509) | (0.0328) | (0.0285) | (0.0383) |
| $\Delta_5 D/ihs(\text{PeaceICA}_{ij})$ | 0.0839 | 0.0672 | 0.137** | 0.0317 | -0.00723 | 0.0270 |
| $x\text{SouthNorth}$ | (0.0514) | (0.0459) | (0.0590) | (0.0384) | (0.0367) | (0.0483) |
| $\Delta_5 D/ihs(\text{PeaceICA}_{ij})$ | 0.0404 | -0.0404 | 0.0461 | 0.0262 | -0.0368 | -0.00641 |
| $x\text{NorthSouth}$ | (0.0603) | (0.0579) | (0.0634) | (0.0446) | (0.0386) | (0.0410) |
| $\Delta_5 D/ihs(\text{ConnectivityICA}_{ij})$ | 0.154** | 0.167** | 0.163** | 0.148** | 0.150** | 0.123* |
| $x\text{SouthSouth}$ | (0.0689) | (0.0724) | (0.0779) | (0.0700) | (0.0730) | (0.0723) |
| $\Delta_5 D/ihs(\text{ConnectivityICA}_{ij})$ | -0.0522 | 0.00265 | -0.0122 | -0.0388 | 0.00247 | -0.0302 |
| $x\text{NorthNorth}$ | (0.0477) | (0.0467) | (0.0598) | (0.0415) | (0.0433) | (0.0538) |
| $\Delta_5 D/ihs(\text{ConnectivityICA}_{ij})$ | 0.138** | 0.118** | 0.0974 | 0.128** | 0.112* | 0.112 |
| $x\text{SouthNorth}$ | (0.0558) | (0.0552) | (0.0816) | (0.0588) | (0.0594) | (0.0919) |
| $\Delta_5 D/ihs(\text{ConnectivityICA}_{ij})$ | 0.109*** | 0.113*** | 0.0901 | 0.109*** | 0.115** | 0.0999* |
| $x\text{NorthSouth}$ | (0.0388) | (0.0428) | (0.0580) | (0.0399) | (0.0454) | (0.0590) |
| $\Delta_5 RTA_{ij}$ | | 0.105*** | 0.206*** | | 0.105*** | 0.207*** |
| | | (0.0295) | (0.0445) | | (0.0297) | (0.0449) |
| $\Delta_5 Y_{ij}$ | | 0.0130 | 0.00455 | | 0.0130 | 0.00501 |
| | | (0.0102) | (0.0133) | | (0.0103) | (0.0133) |
| $\Delta_5 UNVoting_{ij}$ | | | 0.0642*** | | | 0.0642*** |
| | | | (0.0223) | | | (0.0223) |
| $\Delta_5 IgoMemb_{ij}$ | | | 0.00500 | | | 0.00518 |
| | | | (0.00507) | | | (0.00507) |
| $Alliance_{ij}$ | | | 0.129** | | | 0.124** |
| | | | (0.0539) | | | (0.0538) |
| $\Delta_5 StructuralEquivalence_{ij}$ | | | 0.107 | | | 0.114 |
| | | | (0.225) | | | (0.225) |
| $\Delta_5 Centrality_{ij}$ | | | 4.815** | | | 4.562** |
| | | | (2.135) | | | (2.134) |
| $Democ_{ij}$ | | | 0.00213 | | | 0.00201 |
| | | | (0.00396) | | | (0.00396) |
| Constant | 0.376*** | 0.361*** | 0.383*** | 0.374*** | 0.360*** | 0.383*** |
| | (0.00141) | (0.00478) | (0.0137) | (0.00156) | (0.00482) | (0.0139) |
| Observations | 194,123 | 181,140 | 96,069 | 194,123 | 181,140 | 96,069 |
| R-squared | 0.193 | 0.180 | 0.191 | 0.193 | 0.180 | 0.191 |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Main independent variable is the inverse hyperbolic sine of cumulative number of bilateral ICAs. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

Table 27: Including lagged change of ICA

| | $\Delta_5 ihs(Exports)$ | | | | | | | |
|---------------------------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $\Delta_5 ihs(ICA_{ij})$ | 0.102*** (0.0194) | 0.102*** (0.0194) | 0.108*** (0.0269) | 0.108*** (0.0268) | 0.0959*** (0.0201) | 0.0958*** (0.0201) | 0.0938*** (0.0263) | 0.0934*** (0.0262) |
| $L5.\Delta_5 ihs(ICA_{ij})$ | -0.0217 (0.0149) | -0.0232 (0.0149) | -0.0253 (0.0188) | -0.0275 (0.0187) | -0.0177 (0.0149) | -0.0191 (0.0148) | -0.0235 (0.0199) | -0.0252 (0.0197) |
| $\Delta_5 RTA_{ij}$ | 0.0983*** (0.0306) | 0.108*** (0.0307) | 0.163*** (0.0454) | 0.186*** (0.0454) | 0.0980*** (0.0307) | 0.107*** (0.0308) | 0.210*** (0.0475) | 0.233*** (0.0474) |
| $L5.\Delta_5 RTA_{ij}$ | | 0.0731** (0.0313) | | 0.119*** (0.0397) | | 0.0696** (0.0318) | | 0.120*** (0.0403) |
| $\Delta_5 Y_{ij}$ | 0.0133 (0.0105) | 0.0129 (0.0104) | 0.00479 (0.0131) | 0.00392 (0.0130) | 0.0131 (0.0106) | 0.0127 (0.0105) | 0.00333 (0.0134) | 0.00241 (0.0133) |
| $\Delta_5 UNVoting_{ij}$ | | | 0.0667*** (0.0200) | 0.0679*** (0.0199) | | | 0.0624*** (0.0219) | 0.0636*** (0.0218) |
| $\Delta_5 IgoMemb_{ij}$ | | | 0.00697 (0.00520) | 0.00649 (0.00514) | | | 0.00403 (0.00521) | 0.00358 (0.00512) |
| $Alliance_{ij}$ | | | 0.128** (0.0504) | 0.128** (0.0499) | | | 0.124** (0.0536) | 0.124** (0.0533) |
| $\Delta_5 StructuralEquivalence_{ij}$ | | | | | 0.0618 (0.161) | 0.0626 (0.161) | 0.131 (0.230) | 0.127 (0.230) |
| $\Delta_5 Centrality_{ij}$ | | | | | 1.150 (1.683) | 1.206 (1.677) | 4.269* (2.161) | 4.405** (2.132) |
| $Democ_{ij}$ | | | | | | | 0.00272 (0.00395) | 0.00226 (0.00394) |
| Constant | 0.355*** (0.00511) | 0.353*** (0.00526) | 0.375*** (0.0126) | 0.372*** (0.0126) | 0.349*** (0.00534) | 0.347*** (0.00551) | 0.395*** (0.0140) | 0.391*** (0.0141) |
| Observations | 175,519 | 175,519 | 105,546 | 105,546 | 171,478 | 171,478 | 93,537 | 93,537 |
| R-squared | 0.174 | 0.174 | 0.188 | 0.188 | 0.174 | 0.174 | 0.194 | 0.194 |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Main independent variable is the inverse hyperbolic sine of cumulative number of bilateral ICAs. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . L5 indicates the lagged differenced variable. Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

2.2 Economic determinants of ICA

Table 28: LPM and intensive margin by type of exporter-importer and type of function

| | Linear Probability model | | | | | | | | | | | |
|----------------------------------|--------------------------|------------|------------|------------|------------|------------|--------------|------------|--------------------|------------|--------------|------------|
| | Environment | | Economic | | H&D | | Institutions | | Peace and Security | | Connectivity | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| RTA_{ijt-5} | -0.000511 | 0.00154 | -0.00383 | -0.00742* | -0.00123 | -0.00309 | 0.00332** | -0.00251 | 0.00107 | 0.000720 | -0.00556** | -0.0123*** |
| $\times SouthSouth$ | (0.00161) | (0.00239) | (0.00246) | (0.00395) | (0.00163) | (0.00287) | (0.00159) | (0.00298) | (0.00105) | (0.00173) | (0.00214) | (0.00389) |
| RTA_{ijt-5} | -0.00345 | 0.00578 | -0.0397*** | -0.0338*** | -0.0957*** | -0.0770*** | 0.117*** | 0.0681*** | -0.00649 | -0.0163* | -0.0384*** | -0.0425*** |
| $\times NorthNorth$ | (0.00235) | (0.00359) | (0.00698) | (0.00942) | (0.0158) | (0.0144) | (0.0198) | (0.0150) | (0.00526) | (0.00861) | (0.00760) | (0.00978) |
| RTA_{ijt-5} | -0.000261 | -0.000700 | -0.0112*** | -0.00475 | 0.00185 | -0.00630 | -0.0235** | 0.0195** | 0.00672*** | 0.0102** | -0.00112 | -0.00182 |
| $\times SouthNorth$ | (0.00146) | (0.00211) | (0.00348) | (0.00401) | (0.00272) | (0.00502) | (0.0108) | (0.00825) | (0.00212) | (0.00449) | (0.00207) | (0.00218) |
| RTA_{ijt-5} | -0.000263 | -0.00253 | -0.0112*** | -0.00674 | 0.00185 | -0.00712 | -0.0235** | 0.0192** | 0.00670*** | 0.00773** | -0.00111 | -0.00245 |
| $\times NorthSouth$ | (0.00146) | (0.00261) | (0.00348) | (0.00420) | (0.00272) | (0.00506) | (0.0108) | (0.00821) | (0.00212) | (0.00368) | (0.00207) | (0.00197) |
| $\ln GDP_i \times \ln GDP_j$ | 0.000496*** | 0.000359 | 0.000296 | -0.000116 | 0.000354 | 0.000343 | -0.000184 | 0.00143*** | 0.000807*** | 0.00124*** | 0.000193 | -0.000272 |
| | (0.000140) | (0.000284) | (0.000290) | (0.000602) | (0.000282) | (0.000562) | (0.000271) | (0.000465) | (0.000248) | (0.000474) | (0.000169) | (0.000357) |
| $DiffY_{ij}$ | 0.000586* | 0.000917 | 0.00151 | 0.000574 | 0.00113 | 0.000771 | -0.00153* | -0.00210* | 0.000766 | 0.00118* | 0.000344 | 5.49e-05 |
| | (0.000332) | (0.000662) | (0.000994) | (0.00135) | (0.000736) | (0.00115) | (0.000856) | (0.00123) | (0.000479) | (0.000708) | (0.000491) | (0.000716) |
| $\ln POP_i \times \ln POP_j$ | 0.00108** | 0.00276** | 0.00204*** | 0.00157 | 0.00241*** | 0.00256* | -0.00176* | -0.00107 | -0.000167 | 0.000426 | 0.00170*** | 0.00274*** |
| | (0.000487) | (0.00125) | (0.000631) | (0.00129) | (0.000776) | (0.00151) | (0.00101) | (0.00118) | (0.000514) | (0.00122) | (0.000339) | (0.000780) |
| Constant | -0.208*** | -0.332** | -0.220** | -0.0908 | -0.263** | -0.311* | 0.187 | -0.289** | -0.197** | -0.377* | -0.169*** | -0.138 |
| | (0.0641) | (0.135) | (0.0891) | (0.146) | (0.101) | (0.175) | (0.121) | (0.145) | (0.0869) | (0.200) | (0.0490) | (0.101) |
| Observations | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 |
| R-squared | 0.212 | 0.242 | 0.203 | 0.248 | 0.242 | 0.245 | 0.323 | 0.282 | 0.213 | 0.229 | 0.180 | 0.208 |
| Intensive margin | | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| RTA_{ijt-5} | 0.0702*** | 0.0732*** | 0.211*** | 0.220*** | 0.103*** | 0.109*** | 0.0940*** | 0.101*** | 0.0770*** | 0.0882*** | 0.118*** | 0.106*** |
| $\times SouthSouth$ | (0.0159) | (0.0211) | (0.0251) | (0.0311) | (0.0251) | (0.0289) | (0.0215) | (0.0266) | (0.0166) | (0.0209) | (0.0216) | (0.0258) |
| RTA_{ijt-5} | 0.137*** | 0.101*** | 0.0844* | 0.0359 | 0.204*** | 0.0989*** | 0.207*** | 0.197*** | 0.205*** | 0.183*** | 0.161*** | 0.144*** |
| $\times NorthNorth$ | (0.0249) | (0.0220) | (0.0437) | (0.0386) | (0.0280) | (0.0302) | (0.0222) | (0.0258) | (0.0291) | (0.0243) | (0.0259) | (0.0149) |
| RTA_{ijt-5} | 0.00598 | 0.0105 | 0.0978*** | 0.0964** | 0.0106 | 0.0313* | 0.0171 | 0.0162 | -0.0114 | -0.000829 | 0.0116 | 0.0137 |
| $\times SouthNorth$ | (0.0109) | (0.0111) | (0.0324) | (0.0404) | (0.0170) | (0.0172) | (0.0136) | (0.0159) | (0.0129) | (0.0148) | (0.0125) | (0.0138) |
| RTA_{ijt-5} | 0.00595 | 0.0161 | 0.0977*** | 0.0865** | 0.0106 | 0.0275 | 0.0170 | 0.0147 | -0.0114 | -0.00445 | 0.0116 | 0.00877 |
| $\times NorthSouth$ | (0.0109) | (0.0120) | (0.0324) | (0.0381) | (0.0170) | (0.0173) | (0.0136) | (0.0158) | (0.0129) | (0.0151) | (0.0125) | (0.0136) |
| $\ln GDP_i \times \ln GDP_j$ | 0.00309** | 0.00510*** | 0.00474 | 0.0105*** | 0.00596*** | 0.00763*** | 0.00252* | 0.00426** | 0.00271*** | 0.00464** | 0.00709*** | 0.00783*** |
| | (0.00129) | (0.00142) | (0.00330) | (0.00389) | (0.00184) | (0.00212) | (0.00140) | (0.00177) | (0.00104) | (0.00191) | (0.00163) | (0.00194) |
| $DiffY_{ij}$ | -0.00158 | 0.00250 | 0.000636 | 0.00422 | 0.00778** | 0.0106** | 0.00284 | 0.00226 | -0.000781 | -0.00203 | 0.00696** | 0.0104** |
| | (0.00297) | (0.00279) | (0.00603) | (0.00800) | (0.00360) | (0.00474) | (0.00286) | (0.00342) | (0.00209) | (0.00315) | (0.00313) | (0.00400) |
| $\ln POP_i \times \ln POP_j$ | -0.0218*** | -0.0313*** | -0.0216*** | -0.0273** | -0.0303*** | -0.0377*** | -0.0184*** | -0.0307*** | -0.0172*** | -0.0250*** | -0.0170*** | -0.0149*** |
| | (0.00477) | (0.00649) | (0.00769) | (0.0112) | (0.00489) | (0.00603) | (0.00373) | (0.00607) | (0.00370) | (0.00609) | (0.00415) | (0.00557) |
| Constant | 0.836** | 1.270** | 0.556 | -0.447 | 0.767* | 1.195* | 0.777** | 1.503*** | 0.625* | 0.886 | -0.466 | -0.782 |
| | (0.375) | (0.504) | (0.731) | (1.212) | (0.453) | (0.677) | (0.328) | (0.567) | (0.359) | (0.587) | (0.421) | (0.638) |
| Observations | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 | 358,142 | 155,108 |
| R-squared | 0.858 | 0.896 | 0.876 | 0.905 | 0.883 | 0.917 | 0.869 | 0.908 | 0.894 | 0.911 | 0.912 | 0.938 |
| Pair FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Reporter#year FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Partner#year FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| International relations controls | NO | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO | YES |

Robust standard errors clustered by country i and country j —two way clustering— in parentheses. The dependent variable for Linear Probability Model equals 1 if the dyad has an ICA. Dependent variable for Intensive Margin is the inverse hyperbolic sine of number of bilateral ICAs. We use lagged variables for RTA, Centrality, StructuralEquivalence, IgoMemb and UNVoting. Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.

3 Residuals

Figure 14: Residuals ICA

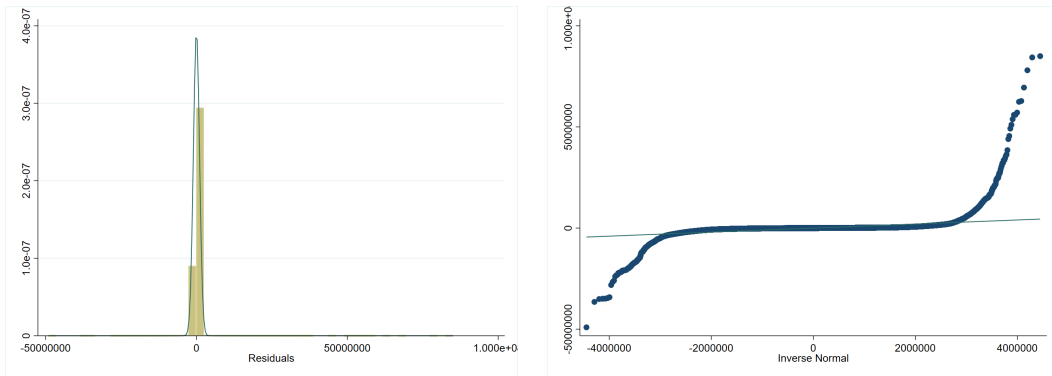


Figure 15: Residuals ln(ICA)

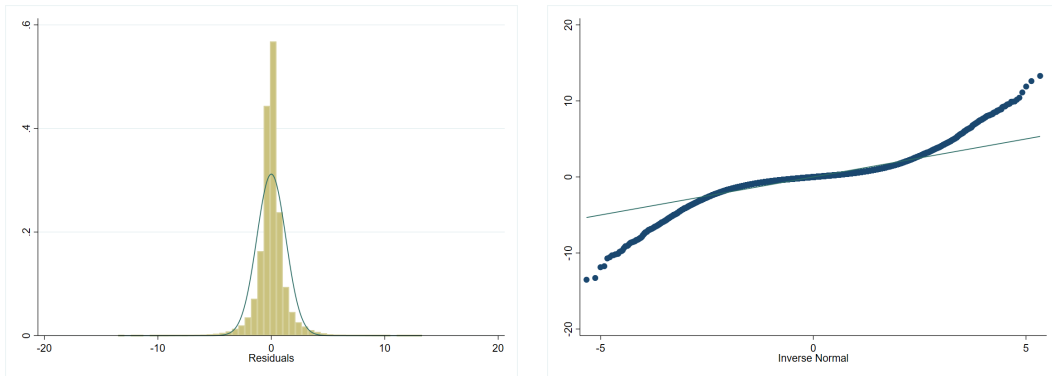


Figure 16: Residuals arcsinh(ICA)

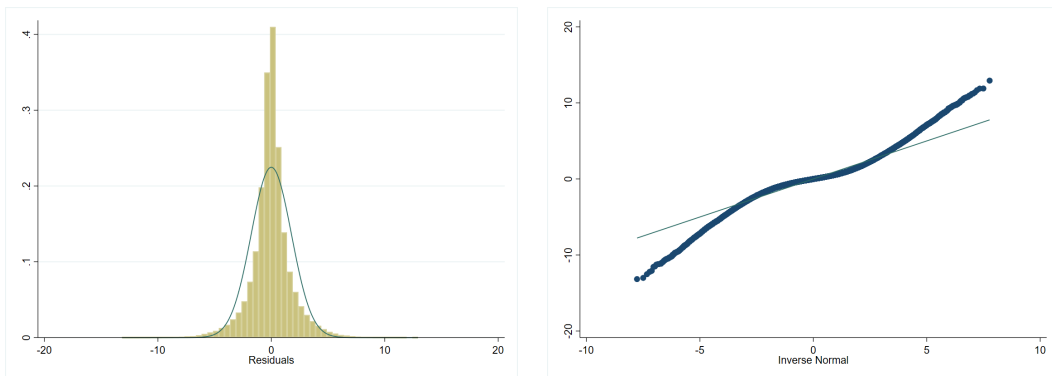


Table 29: Normality tests of the residuals

| | | Coefficient | Bootstrap s.e. | $P > z $ |
|--------------|---|--------------|----------------|-------------|
| ICA | Skewness.e | 2.18029E+19 | 1.00456E+19 | 0.029977198 |
| | Kurtosis.e | 1.90341E+27 | 9.41077E+26 | 0.043115486 |
| | Joint test for Normality on e: $\chi^2(2) = 8.80$ Prob > $\chi^2 = 0.0123$ | | | |
| ln(ICA) | Skewness.e | 0.002955672 | 0.095344699 | 0.975269656 |
| | Kurtosis.e | 25.83613255 | 1.760975885 | 0 |
| | Joint test for Normality on e: $\chi^2(2) = 215.25$ Prob > $\chi^2 = 0.0000$ | | | |
| arcsinh(ICA) | Skewness.e | -0.094512266 | 0.087151929 | 1.721836489 |
| | Kurtosis.e | 41.61935147 | 1.147112234 | 0 |
| | Joint test for Normality on e: $\chi^2(2) = 1317.55$ Prob > $\chi^2 = 0.0000$ | | | |

4 Robustness checks

4.1 Effects on trade

Table 30: Alternative standard errors

| | $\Delta_5 ihs(Exports)$ | | | | | | | |
|----------------------------------|---------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------------------|-----------------------|
| | No robust standard errors | | Robust standard errors | | Clustering by pair | | Clustering origin destination year | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $\Delta_5 ihs(ICA_{ij})$ | 0.200*** (0.0122) | 0.203*** (0.0166) | 0.200*** (0.0109) | 0.203*** (0.0148) | 0.200*** (0.0152) | 0.203*** (0.0195) | 0.200*** (0.0359) | 0.203*** (0.0417) |
| $\Delta_5 RTA_{ij}$ | 0.326*** (0.0187) | 0.456*** (0.0266) | 0.326*** (0.0173) | 0.456*** (0.0242) | 0.326*** (0.0226) | 0.456*** (0.0311) | 0.326*** (0.0887) | 0.456*** (0.0941) |
| $\Delta_5 Y_{ij}$ | 0.0669*** (0.00429) | 0.0385*** (0.00605) | 0.0669*** (0.00431) | 0.0385*** (0.00594) | 0.0669*** (0.00553) | 0.0385*** (0.00737) | 0.0669*** (0.0138) | 0.0385*** (0.0165) |
| Constant | 7.551*** (0.0107) | 7.987*** (0.0593) | 7.551*** (0.0103) | 7.987*** (0.0612) | 7.551*** (0.0130) | 7.987*** (0.0805) | 7.551*** (0.0328) | 7.987*** (0.151) |
| Observations | 225,544 | 122,096 | 225,544 | 122,096 | 225,544 | 122,096 | 225,544 | 122,096 |
| R-squared | 0.852 | 0.854 | 0.852 | 0.854 | 0.852 | 0.854 | 0.852 | 0.854 |
| Pair FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Reporteryear FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Partneryear FE | YES | YES | YES | YES | YES | YES | YES | YES |
| International relations controls | NO | YES | NO | YES | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable is the inverse hyperbolic sine of export flows from country i to country j . Main independent variable is the inverse hyperbolic sine of cumulative number of bilateral ICAs. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year t . Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 31: Alternative models

| | OLS in levels ln(exports) | OLS in levels av(ln(trade)) | Poisson No zeroes | Poisson No zeroes | Poisson Imputing zeroes | Poisson Imputing zeroes |
|-------------------|------------------------------|--------------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\ln(ICA_{ij})$ | 0.109*** (0.0281) | | | | | |
| $Dummy(ICA_{ij})$ | | 0.118*** (0.0353) | | | | |
| $ihs(ICA_{ij})$ | | 0.119*** (0.0299) | | | | |
| $TotalICA_{ij}$ | | | 0.000816*** (0.000144) | 0.000995*** (0.000160) | 0.000838*** (0.000149) | 0.00103*** (0.000167) |
| RTA_{ij} | 0.258*** (0.0624) | 0.292*** (0.0431) | 0.141*** (0.0306) | 0.105*** (0.0329) | 0.139*** (0.0293) | 0.102*** (0.0322) |
| Y_{ij} | 0.0731*** (0.0195) | 0.0819*** (0.0104) | 0.00685 (0.0197) | 0.00495 (0.0186) | 0.00675 (0.0200) | 0.00565 (0.0191) |
| Constant | 9.675*** (0.0724) | 7.323*** (0.0278) | 16.11*** (0.179) | 16.13*** (0.174) | 16.11*** (0.182) | 16.13*** (0.178) |
| Observations | 76,247 | 195,064 | 225,544 | 1,081,221 | 295,473 | 1,456,626 |
| R-squared | 0.900 | 0.901 | | | | |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country i and country j -two way clustering- in parentheses. The dependent variable for OLS models is the inverse hyperbolic sine of export flows from country i to country j . The dependent variable for Poisson models is the export flows from country i to country j . *Imputing zeros* refers to imputing zero trade values to missing bilateral trade following Fouquin et al. (2016), that is bilateral trade "is set to zero for trade with all the partners of a given reporting country for which information is missing, provided that the two following conditions are satisfied: i) the country reports trade with more than 30% of all the countries reported for the year of interest (by any other country) and ii) the country reports trade with at least 10 partners." Observation counts differ among columns based on the limited availability of data for the variables included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 32: Alternative periods

| | <i>ihs(Exports)</i> | | | | | | | |
|--------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|------------------------|-------------------------|------------------------|
| | All years | | | | 1st diff | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| <i>ihs(ICA_{ij})</i> | 0.203*** (0.0308) | 0.212*** (0.0343) | | | 0.0376*** (0.0110) | 0.0408*** (0.0140) | | |
| <i>Dummy(ICA_{ij})</i> | | | 0.306*** (0.0370) | 0.319*** (0.0431) | | | 0.0443*** (0.0150) | 0.0482** (0.0218) |
| <i>RTA_{ij}</i> | 0.336*** (0.0494) | 0.443*** (0.0623) | 0.358*** (0.0502) | 0.472*** (0.0634) | 0.00952 (0.0161) | 0.0339 (0.0236) | 0.00961 (0.0161) | 0.0340 (0.0236) |
| <i>Y_{ij}</i> | 0.0721*** (0.0125) | 0.0510*** (0.0146) | 0.0745*** (0.0124) | 0.0546*** (0.0146) | 0.0162* (0.00837) | 0.0131 (0.00949) | 0.0162* (0.00837) | 0.0131 (0.00949) |
| Constant | 7.503*** (0.0283) | 7.893*** (0.139) | 7.517*** (0.0242) | 7.911*** (0.137) | 0.0756*** (0.000683) | 0.0862*** (0.00292) | 0.0759*** (0.000678) | 0.0865*** (0.00292) |
| Observations | 1,081,221 | 576,876 | 1,081,221 | 576,876 | 977,816 | 516,291 | 977,816 | 516,291 |
| R-squared | 0.841 | 0.840 | 0.841 | 0.840 | 0.059 | 0.068 | 0.059 | 0.068 |
| IR controls | NO | YES | NO | YES | NO | YES | NO | YES |

All regressions include pair, reporter-year and partner-year fixed effects. Robust standard errors clustered by country *i* and country *j* -two way clustering- in parentheses. The dependent variable for OLS models is the inverse hyperbolic sine of export flows from country *i* to country *j*. Variables Δ_5 indicate 5 years differences whereas other variables are level value in year *t*. Observation counts differ among columns based on the limited availability of data for the variables included. *** p<0.01, ** p<0.05, * p<0.1.