

# Trade law and trade flows

Salvador Gil-Pareja  | Rafael Llorca-Vivero  | Jordi Paniagua 

University of Valencia, Valencia, Spain

## Funding information

Research Challenges Programme of MICINN (Spanish Government & FEDER), Grant/Award Number: RTI2018-100899-B-I00; Generalitat Valenciana, Grant/Award Number: GV/2017/052 and PROMETEO 2018/102

## KEYWORDS

conciliation, gravity equation, international commercial arbitration, international trade, international trade law, model law

## 1 | INTRODUCTION

Much like trade economists in the late 1990s and early 2000s, who studied the effect of trade-focused agreements (e.g. regional trade agreements, currency unions and GATT/WTO) on international trade, today's international economists are confronted with the trade effects of a wider range of economic agreements. Additionally, empirical evidence using enhanced methodological techniques has challenged the findings of well-established references in this literature. For example, Larch, Wanner, Yotov, and Zylkin (2019) flip Glick and Rose's (2002, 2016) results on the Euro effects on trade. In this spirit, we join the current re-assessment wave in empirical trade analysis, which revisits the effects of economic integration agreements (e.g. Baier, Yotov, & Zylkin, 2019; Dai, Yotov, & Zylkin, 2014; Larch et al., 2019), with a theoretical and empirical contribution to the literature.

It is an admitted fact in the literature that institutional quality and incomplete contracts have an effect on trade flows (Anderson & Marcouiller, 2002; Levchenko, 2007; Nunn, 2007). The take-away from this strand of the literature is that increasing institutional contractual quality fosters trade. However, the process of achieving a higher level of institutional quality is not a simple or particularly fast process in many countries with deficient institutions. For example, trade law reform involves several stages of preconsultation, research, drafting, legislative and government approval and enforcement, which might take years. A fast track to enhance institutional quality is to ratify international agreements aimed precisely at increasing contract enforcement.

Enforcing laws that allow a private resolution of commercial disputes, for example international commercial arbitration and conciliation, reduces the role of the quality of domestic courts in trade disputes. Consequently, a positive shock on a country's trade law quality should have a positive effect on bilateral trade via better contract enforcement by reducing exporters' risk of not getting compensated for disputes and, at the same time, increasing the institutional credibility of the importing country.

Empirical evidence confirms this view. According to Berkowitz, Moenius, and Pistor (2006), the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards (NY Convention, henceforth) had a positive and significant effect on bilateral trade with an increase of

116% of exports.<sup>1</sup> Research shows that specific country characteristics, like institutional environment, condition the effects. Berkowitz et al. (2006) argued that ratifying the NY Convention can act as a substitute of deficient domestic institutions, and report that the effect of arbitration on trade is stronger in countries with weak legal systems and also for complex products.<sup>2</sup> However, their estimates incur the most common biases of the early 2000s gravity estimations.

This paper offers two main contributions that provide a better understanding of the economic impact and mechanisms of international trade law on trade flows. First, the paper develops a model that helps to explain the aforementioned empirical findings. The model starts by explaining how the decision to choose a dispute resolution mechanism (litigation, arbitration and conciliation) is governed by contractual quality and informational frictions. The model predicts that countries enforcing arbitration increase their exports, and this effect is enhanced by weaker (stronger) institutions on importing (exporting) markets and by the remoteness of markets.

Second, the paper tests empirically the predictions of the model, overcoming most of the known empirical biases related to bilateral trade estimates. One of the most severe bias stems from ignoring multilateral resistance terms that arise from the theoretical assumption of global market clearance. Structural gravity estimates correct this by adding country fixed effects (Fally, 2015). However, the price to pay of this high-dimensional fixed-effects estimation is the exclusion of any country-specific monotonic variables. Therefore, any theoretical predictions for single-country characteristics stand at odds with a bias-free empirical verification in a structural gravity setup.<sup>3</sup>

Keeping these facts in mind while developing the theory, we made use of bilateral constructs like contractual distance (the difference in exporter and importer institutional contractual quality) and contractual noise (informational frictions related to market distance) to allow a smooth transition between theory and empirics. On the empirical front, we go beyond revisiting previous results by examining several ways to increase contractual quality. Improvements may come from adapting domestic laws to international standards (like Model Laws) or ratifying international conventions aimed towards a better resolution of commercial disputes (like arbitration and conciliation). We also take action to control for potential endogeneity bias in our results by leading our variables and by a placebo test using an international law convention unrelated to private resolution of trade disputes.

The rest of the paper is structured as follows: the next section offers a short overview and stylised facts on the topic, Section 3 presents the model, Section 4 details the methodology and data, Section 5 reports the results and the last section concludes.

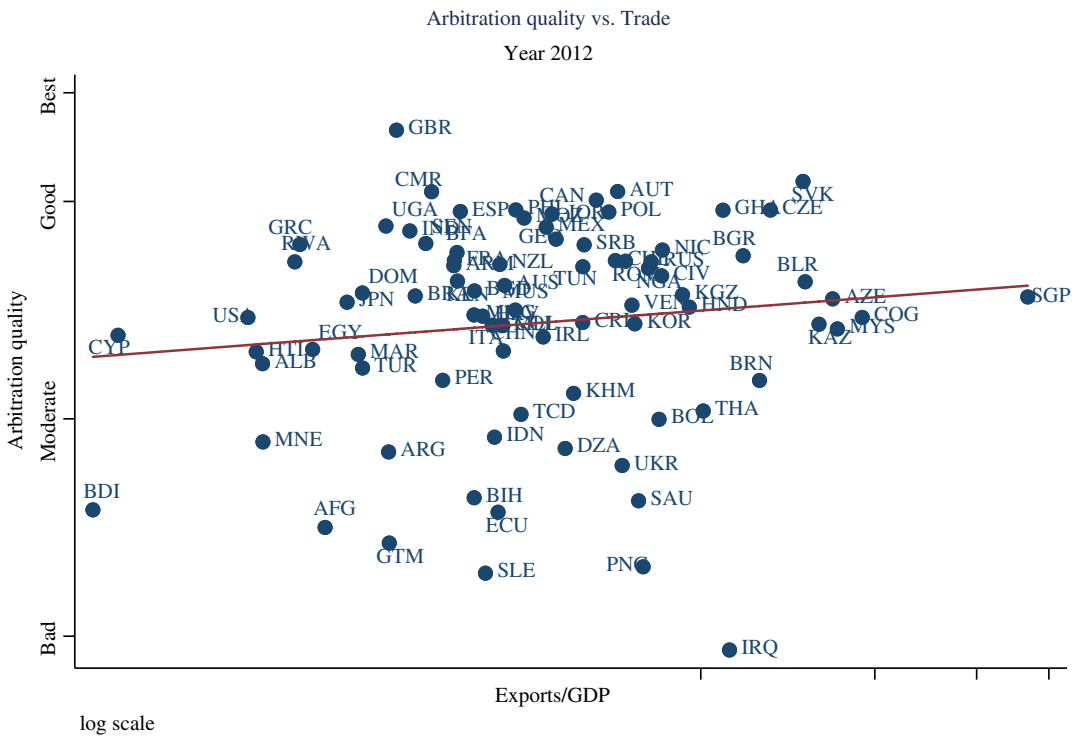
## 2 | BACKGROUND

Several stylised facts suggest that a country's trade law quality is positively correlated with trade flows. The Investment Across Borders survey (World Bank, 2012) collects data on arbitration quality on 90 territories. Figure 1 shows that the perceived arbitration quality of a country is positively

<sup>1</sup>Calculated by  $(\exp(0.73) - 1) \times 100 = 116\%$  for complex products in Berkowitz et al. (2006, p. 371).

<sup>2</sup>Myburgh and Paniagua (2016) report similar results for FDI: arbitration's effect is stronger in weaker institutional environments and stronger in distant countries. The authors develop a model that explains these theoretical mechanisms and estimate, correcting the gravity mis-specification, a positive impact on FDI flows of the New York Convention.

<sup>3</sup>This means that we cannot estimate the individual importer or exporter's institutions like in Berkowitz et al. (2006). A recent paper by Beverelli et al. (2018) attempts to provide a workaround to estimate importer or exporter variables in a structural gravity setup with the use of intra-country trade.



**FIGURE 1** Arbitration quality and trade/GDP [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

correlated with its exports to GDP ratio. However, as it often the case, there is some heterogeneity in the correlation cloud.

This figure invites us to perform a deeper economic analysis to understand the contingencies of this relationship. The aim of this paper was to go beyond an empirical exercise to try to clean this pairwise correlation from confounding factors. We also want to understand the theoretical mechanisms that might drive the effects of trade law on trade flows.

In this sense, this paper relates to three corners of the literature that examine the effect on trade of institutional quality, incomplete contracts and international trade law. Using a gravity model, Anderson and Marcouiller (2002) find that bilateral trade volumes are positively influenced by the trading countries' institutional quality. Their argument is that a lack of contract enforcement adds to the transaction cost between North–South trade and significantly reduces the trade volume. Nunn (2007) and Levchenko (2007) develop further the idea that contract enforcement and institutional quality are important sources of comparative advantage. Nunn (2007) finds that contract enforcement explains more of the pattern of trade than physical capital and skilled labour combined. Levchenko's (2007) results suggest that institutional differences are an important determinant of trade flows.

The cornerstone of the international agreements aimed at increasing contract enforcement and institutional quality is international commercial arbitration,<sup>4</sup> which is an alternative method to rely on domestic courts to resolve commercial disputes. Without provisions of dispute settlement, parties must rely on domestic litigation. Domestic litigation provides leverage on one of the two parties, depending on whether the domestic courts are those of the exporter or the importer.

<sup>4</sup>We will refer to international commercial arbitration as “arbitration” for succinctness.

Several authors have studied the effects on trade of increasing trade law quality via arbitration. Berkowitz et al. (2006) came with the idea that international and domestic institutions could act as substitutes and were the first to report positive effects of the NY Convention on trade flows. In particular, they show that making use of international commercial arbitration increases trade flows and insulates trading partners from deficient institutional settings. The scope of their findings was widened to economic development by Moenius and Berkowitz (2011).

Similar research on FDI shows similar patterns, showing additionally that the effect of arbitration is augmented by the remoteness of markets. Myburgh and Paniagua (2016) find that international arbitration has a positive effect on FDI.

In arbitration, disputes are adjudicated before private international tribunals and the resulting awards are enforced in domestic courts. According to Casella (1996), the benefits of arbitration stem from the independence of where the dispute may arise, more flexibility than domestic courts, specialised lawyers and the facilitation of the parties' choice over the law under which the contract is heard. The procedural costs of engaging in nuisance suits are substantial, however. One of the main advantages of arbitration is that the verdict is final and binding.<sup>5</sup> This fact significantly shortens the legal process and reduces the legal costs of the parties. Upon the verdict, the winning party may execute the arbitration award against assets located in any country that has ratified the NY Convention.

Regarding arbitration, the NY Convention sets the basic guidelines, rules and procedures that parties should follow for dispute settlement. In the event of a commercial dispute, the parties can appoint an international tribunal to arbitrate their differences. The parties have a say in the tribunal composition and the applicable law. Each party appoints one judge and these two elect an independent judge to act as the president of the tribunal. Most of the hearings take place in international arbitration centres like London or New York.

In line with our earlier discussion, one of the reasons to ratify the NY Convention is to give foreign partners a stable legal framework. Another option to increase institutional contractual quality would be to reform domestic trade law. Countries that enforce the NY Convention are expected to adapt their domestic legislation to abide by the general arbitration framework. The NY Convention is, however, vague in certain aspects. It is a *one-suit-fits-all* legal umbrella, which does not consider legal contingencies of the countries which are further away to this legal standard. To help alleviate these issues, the United Nations Commission on Trade Law (UNCITRAL) provides a portfolio of legal options to implement arbitration commercial law. The Arbitration Model Law (AML) is the baseline standard proposed by UNCITRAL to adapt domestic laws to the NY Convention. The Arbitration Model Law is more specific than the NY Convention. For example, it determines the period by which the tribunal should deliver a verdict (6 months).

Arbitration is, nonetheless, not the only option to increase institutional quality with international institutions. Conciliation is becoming a growing alternative way to settle commercial disputes. Conciliation shares several traits with arbitration, but has important differences. Like arbitration, conciliation is a flexible and private dispute resolution mechanism. However, conciliation is voluntary, confidential and amicable. Conciliation occurs in private hearings with the assistance of a neutral third-party conciliator, who is expected to provide them with a non-binding settlement proposal. The proposal should take into account in addition to legal considerations, commercial, financial and personal interests of the parties.

Conciliation attempts to pick the best from arbitration (private dispute settlement, fast resolution) without the main drawback: its costly fees. Arbitration costs may represent a significant amount of the value under dispute, and this prevents its wider use. With conciliation, parties are invited to conciliate their disputes without the nuisance of an international process in an arbitration court.

---

<sup>5</sup>More specifically, there is a very limited number of circumstances when the parties may challenge or appeal to other higher instances.

We want to exploit the variation in terms of trade law and contractual quality to uncover heterogeneous effects in a theory-driven setup. To that aim, we first provide some background on trade law, more specifically on trade law aimed to settle commercial disputes. UNCITRAL supports countries which want to implement this initiative through the Conciliation Model Law (CML). Myburgh and Paniagua (2017) report heterogeneous effects of UNCITRAL's arbitration and Conciliation Model Laws on FDI. According to the authors, UNCITRAL's initiatives have two benefits: the first is to make arbitration a more effective and predictable form of contract enforcement than using the domestic courts. The second is to reduce the procedural costs of arbitration through the Model Law on Conciliation.

International economists have begun to realise that the deepness of institutional agreements may be a source of heterogeneous effects on bilateral trade (see, e.g. Vicard, 2009; Ahcar & Siroën, 2017 or Falvey & Foster-McGregor, 2018). Trade law is no different; we can expect heterogeneous effects of the different initiatives to increase institutional quality. We will focus on trade law aimed to resolve commercial disputes: litigation, international commercial arbitration and conciliation. Countries may choose the options that best serve their interests from the available catalogue of dispute settlement mechanisms. For example, governments increase contractual quality by reforming domestic law by adapting Model Laws or ratifying international treaties. Therefore, we dispose of certain trade law heterogeneity, which we can exploit to examine more precisely the effects of trade law on trade flows.

### 3 | THE MODEL

#### 3.1 | Setup

We start with an exporter that produces a set of products within an industry. The revenue of a representative firm from an exporter country  $i$  in an importer country  $j$  is an increasing and concave function of the quantity sold, a demand shifter across products, and its productivity:

$$R_{ij} = R(x_{ij}, \theta, \varphi), \quad (1)$$

where  $x_{ij}$  is the quantity produced,  $\theta$  is a demand shifter related to product quality,  $\varphi$  is a specific productivity of the firm. As in Melitz (2003), this parameter is only learned after the firm incurs a separate entry cost. After this, the firms weigh whether or not to pay a destination-specific fixed costs of  $f_{ij}$ .<sup>6</sup> Products are shipped at a particular time and consumed one period afterwards.

The exporter cannot access the foreign market in country  $j$  directly, and it must contract a local representative importer for every product, who has direct access to consumers. We assume that the contract between the exporter and the importer is subject to contractual frictions. Particularly, the contract is breached when one of the parties does not stand by the initial terms of the contract. For example, the exporter might not send the agreed quality or quantity of goods or the importer might not satisfy the payment in the terms of the contract.

The nature of the breach is not relevant in the model, and it might happen due to expropriation risks (Thomas & Worrall, 1994) or institutional hazards (Acemoglu & Johnson, 2005; Van Assche & Schwartz, 2013). As it is standard in this literature, the contract is enforced by the exporter or importer with probability  $\gamma_i, \gamma_j \in (0, 1)$ , where  $\gamma$  is a country-wide measure of contractual or legal quality (Antràs

<sup>6</sup>The parameters  $\varphi$  and  $f_{ij}$  play no essential role in the model. They are introduced for consistency with canonical trade models with heterogeneous firms and for compatibility with patterns in trade data, like the presence of zeros.

& Foley, 2015). Institutional contractual environment is fixed at country level and captures the probability of a breach in the contract by the representative firm. It is therefore correlated with the level of trade law quality, for example whether the countries ratified the NY Convention or adopted model laws. States with full institutional support of contract enforcement have  $\gamma_j = 1$ .

We assume that the dispute arises when the shipment arrives at the importer's border. The parties have two mechanisms to settle commercial disputes: litigation in the importer's domestic courts or arbitration in an international court.<sup>7</sup> The parties face uncertainty on the preferred resolution mechanism after a contract breach due to informational frictions as in Wickelgren (2016). Our objective is to explore the contingencies of each mechanism, in particular the likelihood that arbitration will be preferred over litigation and how this will translate to volume of exports.

## 3.2 | Dispute resolution with exogenous arbitration costs

### 3.2.1 | Litigation

We start by studying the choice of arbitration over litigation while taking the costs of both as exogenous as in the first papers that analysed arbitration versus litigation (Hylton, 2000; Shavell, 1995). We do so to gain intuition on the model and provide a basic framework from which to develop a more realistic and complex scenario. Treating dispute resolution costs as exogenous has the advantage of reducing the ambiguity of the party that breaches the contract. However, arbitration costs are endogenised later as in Wickelgren (2016).

First, consider that parties use litigation as their resolution mechanism. This might be the case if arbitration laws are not enforced in either country. In this case, the importer observes directly the terms of the contract and, similarly to the models with informed customers and exogenous arbitration costs (Shavell, 1995), the exporter faces optimal incentives to reduce the probability of breach. It is not in the exporter's best interest to breach when disputes are litigated in the domestic courts of the importer's country. Particularly, we assume that the exporter does not breach the contract in this scenario. Therefore, a breach in the contract occurs with a probability  $(1 - \gamma_j)$ , which captures the probability that the importer breaches the contract.<sup>8</sup>

In a transaction governed by domestic litigation, the exporter that anticipates a breach has an incentive to reduce the value of the shipment in terms of quality or complexity. Therefore, the exporter responds to the litigation scenario by shaving the value of shipment by a share  $1 - \delta_j^L$ , and  $\delta_j^L \in (0, 1)$ . The costs of domestic litigation are inversely proportional to  $\delta_j^L$ , which captures the amount of revenue that the exporter anticipates to recoup after litigating in the importer's domestic courts.

Additionally, the exporter faces uncertainty on the loss of revenue related to knowledge of the legal system of the importer and the value of foreign exogenous litigation costs. It is costly more for an exporter to litigate against an importer who is located in a distant country with a different legal system and with limited insider information about procedural costs. As it is common in the literature, we assume that these information costs or contractual noise are proportional to the distance between the exporter and the importer. In particular, the revenue share decreases with iceberg type cost  $\tau_{ij}^{-\mu}$ ,  $\mu \geq 0$ . The parameter  $\mu$

<sup>7</sup>Later in the model, we allow a third option: conciliation.

<sup>8</sup>We assumed that the probability of breach of the representative firm is correlated with national contract enforcement.



controls the intensity of informational frictions regarding dispute resolution between exporter and importer. Higher values of  $\mu$  are associated with a higher degree of trade law uncertainty.

We can summarise these assumptions of litigation with the participation constraint of the exporter that is expressed by the importer's payment of the shipped goods:

$$P^{LT} = (\gamma_j + (1 - \gamma_j)\delta_j^L \tau_{ij}^{-\mu})R(x_{ij}, \theta). \quad (2)$$

With this payment constraint, the exporter adjusts its export production to solve:

$$\pi_{ij}^{LT} = \max_{x_{ij}} \left[ (\gamma_j + (1 - \gamma_j)\delta_j^L \tau_{ij}^{-\mu})R(x_{ij}, \theta) - \tau_{ij}x_j - f_{ij} \right]. \quad (3)$$

### 3.2.2 | Arbitration

Next, consider that dispute resolution may occur under international commercial arbitration while taking arbitration costs as exogenous for the importer. Differently from the previous case, the importer faces informational asymmetries (similarly to the case of customers in Hylton, 2000). More specifically, the importer can infer the effect of arbitration but cannot directly observe it since the courts are not domestic. When arbitration is not used, the importer acts as an informed customer (litigation is on their ground). Additionally, when parties are able to arbitrate, the importer is uninformed (arbitration occurs on a third country), affecting the exporter's behaviour.

Wickelgren (2016) shows that when customers (i.e. importers) are uninformed, firms (i.e. exporters) are unable to commit not to choose an arbitration procedure in their favour. His paper extends the literature of fine-print contracts and warranties, initiated by Schwartz and Wilde (1983), by showing that the selling firm does not have optimal incentives to reduce the probability of breach under arbitration. For us, this implies that the assumption that the exporter does not breach the contract is no longer valid in the arbitration scenario.

Furthermore, exogenous arbitration costs lead us to the assumption that importer no longer has optimal incentives to breach the contract. The importer has nothing to gain from a breach before opening the box of imported goods. The costs of doing so are assumed to be very high, and the importer cannot optimally adapt to them. Therefore, the exporter does not anticipate a contract breach from the importer in this case. This reasoning is similar to Myburgh and Paniagua (2016), who supported the idea that arbitration costs are a strong commitment signal in FDI.

Therefore, we model only a breach from the exporter (e.g. in a weak institutional environment) with a probability  $1 - \gamma_j$ . Recall that with litigation, the exporter had no incentives to breach the contract and litigate on foreign rules. With arbitration, exporters can strategically reduce the shipment value if they foresee and weight arbitration costs. Arbitration is called upon once the importer opens the box and discovers that the value is less than stipulated. Exporters can anticipate and weight arbitration costs since they know in advance the share of missing value. We assume that the exporter shaves the value of shipment by a share  $1 - \delta^A$ , and  $\delta^A \in (0, 1)$ . Again,  $\delta^A$  is inversely proportional to the costs of arbitration procedures.<sup>9</sup>

Additionally, the degree of informational frictions regarding dispute resolution is minimum in arbitration, meaning that  $\mu \approx 0$ . Therefore, under arbitration the payment share does not depend on the distance since there are no informational frictions for the exporter. The participation constraint of the importer is as follows:

<sup>9</sup> $\delta^A$  has no country subscript since the arbitration court is on neutral grounds.

**TABLE 1** Expected use of arbitration

	High importer contractual quality $\gamma_j$	Low importer contractual quality $\gamma_j$
High exporter contractual quality $\gamma_i$	?	+
Low exporter contractual quality $\gamma_i$	—	?

$$P^{ARB} = (\gamma_i + (1 - \gamma_i)\delta^A)R(x_{ij}, \theta). \quad (4)$$

The expected returns of the exporter for this payment constraint are as follows:

$$\pi_{ij}^{ARB} = \max_{x_{ij}} [(\gamma_i + (1 - \gamma_i)\delta^A)R(x_{ij}, \theta) - \tau_{ij}x_j - f_{ij}]. \quad (5)$$

Applying the envelope theorem to (3) and (5), for given transaction costs and institutional quality parameters, the exporter prefers arbitration over litigation if and only if,

$$(\gamma_j + (1 - \gamma_j)\delta_j^L \tau_{ij}^{-\mu}) < (\gamma_i + (1 - \gamma_i)\delta^A). \quad (6)$$

The choice between arbitration and litigation is governed by the institutional quality of the importer and exporter, the exogenous costs of litigation and arbitration and the distance between countries. Equation (6) reads that the likelihood that a dispute is resolved with arbitration as opposed to litigation is increasing in the institutional contractual environment in the exporter country ( $\gamma_i$ ), decreasing in the institutional contractual environment in the importer country ( $\gamma_j$ ) and increasing in the distance between countries. A decrease in  $\gamma_j$ , or an increase in  $\gamma_i$  and  $\tau_{ij}^\mu$  (associated with larger asymmetries) would make arbitration more appealing.

Our model predicts that arbitration is more appealing in importing (exporting) countries with lower (higher) institutional quality. However, market remoteness might make a case for arbitration even in importing countries with high institutional quality. We appreciate two contending effects: contractual distance (the difference between  $\gamma_i$  and  $\gamma_j$ ) and contractual noise ( $\tau_{ij}^\mu$ ). This result is in line with the empirical studies that report that the effect of arbitration on trade (and FDI) depends on the countries' legal environments (Berkowitz et al., 2006; Myburgh & Paniagua, 2016).

An intuitive way to think about this result is that international legal institutions serve as substitutes of weak foreign institutions. On the one hand, firms choose international legal protection when exporting to countries where the trust in the importer is weak. On the other hand, firms exporting to trusted importer environments may rely on domestic litigation at lower procedural costs. Table 1 summarises the expected use of arbitration depending on the partner's contractual quality.

### 3.3 | Dispute resolution with endogenous arbitration costs

It is instructive to endogenise arbitration costs. We do so by relaxing the assumption that the importer does not breach a contract under arbitration terms. Assume that under arbitration, the importer weighs its arbitration and decides to breach the contract. Therefore, exporter anticipates a payment that equals a fraction  $(\gamma_j + (1 - \gamma_j)\delta^A)$  of the revenues. Recall that the revenues under arbitration are given by  $(\gamma_i + (1 - \gamma_i)\delta)R(x_j, \theta)$ . Therefore, the participation constraint is as follows:



$$P^{ARB} = (\gamma_j + (1 - \gamma_j)\delta^A)(\gamma_i + (1 - \gamma_i)\delta^A)R(x_j, \theta), \tag{7}$$

and

$$\pi_{ij}^{ARB} = \max_{x_j} [(\gamma_i + (1 - \gamma_i)\delta^A)(\gamma_j + (1 - \gamma_j)\delta^A)R(x_{ij}, \theta) - \tau_{ij}x_j - f_{ij}]. \tag{8}$$

Using the envelope theorem reveals that, with endogenous arbitration costs, the exporter prefers arbitration over litigation if and only if,  $(\gamma_j + (1 - \gamma_j)\delta_j^L \tau_{ij}^{-\mu}) < (\gamma_j + (1 - \gamma_j)\delta_A)(\gamma_i + (1 - \gamma_i)\delta_A)$ . Rearranging terms, we get that the preference of arbitration over litigation is governed by:

$$\frac{(\gamma_j + (1 - \gamma_j)\delta_j^L \tau_{ij}^{-\mu})}{(\gamma_j + (1 - \gamma_j)\delta^A)} < (\gamma_i + (1 - \gamma_i)\delta^A). \tag{9}$$

Differentiating Equation (9) with respect to institutional contract environments delivers our first proposition.

**Proposition 1 :** *With endogenous arbitration costs, the likelihood that a dispute is resolved with arbitration as opposed to litigation is increasing in the institutional contract environment in the exporter country ( $\gamma_i$ ); and decreasing in the institutional contract environment in the importer country ( $\gamma_j$ ) if and only if  $\delta_j^L \tau_{ij}^{-\mu} < \delta^A$ , this is, if and only if arbitration costs are lower than the litigation costs (that increase with distance).*

Proposition 1 indicates that previous findings in the literature can be explained by the model, but only when litigation costs are higher than arbitration costs. Or, more precisely, when the expected revenue share obtained from litigation is lower than the one obtained from arbitration,  $\delta_j^L \tau_{ij}^{-\mu} < \delta^A$ . This term can be rearranged as:

$$\underbrace{\frac{\delta_j^L}{\delta^A}}_{\text{Contractual cost ratio}} < \underbrace{\tau_{ij}^{-\mu}}_{\text{Contractual noise}}. \tag{10}$$

The first term of Equation (10) is the ratio of legal costs associated with contractual breach. We have tagged this ratio as the contractual cost ratio. The second term is what we called contractual noise, the extent of informational frictions regarding contractual disputes between partners. Basically, the results of modelling arbitration costs exogenously hold whenever the informational frictions between partners are higher than the ratio of arbitration to litigation costs in terms of revenue shares.

Arbitration costs might represent a considerable share of the amount disputed. Arbitration costs stem from various sources: expenditures on specialised lawyers, experts, travel and arbitrator's fees. Myburgh and Paniagua (2016) report that arbitration procedural costs could multiple litigation costs from five to thirty times. Casella (1996) suggests that parties tend to use arbitration only for disputes over large amounts.

Therefore, it is plausible to assume that although arbitration procedural costs are higher than litigation costs, the overall expected revenue loss is lower in arbitration. The parameters  $\delta^A$  and  $\delta_j^L$  were

modelled as the amount of revenue recouped in the event of a dispute. Therefore, even if arbitration procedural costs are higher, it is natural to assume that expected revenue loss from arbitration is lower. For example, the decisions of an arbitration court are final. This would represent a costs advantage over several appeals in domestic courts.

Furthermore, the inequality in Equation (10) seems as natural assumption when the export revenue  $R_{ij}$  is high. Wickelgren (2016) shows that endogenously biased arbitration provides incentives for firms to invest in quality, which would increase firm's revenues via the quality demand shifter  $\theta$ , for example by increasing the complexity of products where arbitration is known to be more useful for trade (Berkowitz et al., 2006).

Still, there might be circumstances when this is not the case, for instance, trade in durable or simple products between countries with low contractual frictions. However, the share of the world's trade of these products (like low valued natural resources) among countries with strong institutions (full democracies) is relatively low.

Another case is when the contractual noise is very low. Let us consider the extreme case of intra-country trade ( $\tau_{ii} = 1$ ). In this case, the inequality in Equation (10) is not likely to hold in line with the evidence that shows that most commercial disputes are settled in domestic courts (Eisenberg, Miller, & Sherwin, 2008).<sup>10</sup>

Therefore, the modelling of endogenous arbitration costs lead to a relevant qualification of the effect of the importer's institutional contractual quality. However, the conclusions of the case of exogenous costs remain unchanged with practical assumptions, leading to the following proposition and corollary.

**Proposition 2 :** *With endogenous arbitration costs, the likelihood that a dispute is resolved with arbitration as opposed to litigation is increasing in the institutional contract environment in the exporter country ( $\gamma_i$ ), decreasing in the institutional contract environment in the importer country ( $\gamma_j$ ) and increasing in the contractual noise between countries ( $\tau_{ij}^H$ ).*

**Corollary :** *The level of exports is higher when disputes are resolved with arbitration as opposed to litigation. However, the effect of international commercial arbitration in exports is increasing in the institutional contract environment in the exporter country ( $\gamma_i$ ), decreasing in the institutional contract environment in the importer country ( $\gamma_j$ ) and increasing in the contractual noise between countries ( $\tau_{ij}^H$ ).*

*Proof* The corollary follows directly from the fact that if Equation (10) holds, then  $\pi_{0,ij}^{ARB} > \pi_{0,ij}^{LIT}$ , which implies, *ceteris paribus*, that  $E(x_{0,ij}^{ARB}) > E(x_{0,ij}^{LIT})$ , where the subscript zero indicates the institutional quality at  $t = 0$ . If the institutional quality of the importer increases in  $t = 1$ , the level of exports is still higher in arbitration  $E(x_{1,ij}^{ARB}) > E(x_{1,ij}^{LIT})$ , but since it is less likely that arbitration is chosen in a better contractual environment at country  $j$  (according to Proposition 2), it follows that:

$$E(x_{0,ij}^{ARB} - x_{0,ij}^{LIT}) > E(x_{1,ij}^{ARB} - x_{1,ij}^{LIT}).$$

The same reasoning follows if the institutional contractual quality of the exporter or the contractual noise between countries decreases.

<sup>10</sup>Another extreme case is when domestic investors are forced to litigate since they cannot make use of investor-state arbitration mechanisms against their own state (Paniagua, 2018).



### 3.4 | Dispute resolution with conciliation

Conciliation seeks the same objectives as arbitration: to resolve disputes outside domestic courts. The difference between conciliation and arbitration is that the conciliator provides a non-binding settlement offer to the parties, which can then litigate in court if the offer is not accepted by either of them. We model as litigation, but with lower costs ( $\delta^A < \delta^L < \delta^C$ ). We assume that conciliation has the lowest expenses, but adds a degree of uncertainty that increases in the distance between countries. The cost that the importer does not accept the settlement and decides to litigate is assumed to be the same as when importer breaches the contract. The lower the legal quality of the importer's country, the higher the probability that the representative importer will not accept the conciliator's offer and will end up litigating after all.

Following the same modelling choices as above, the profits for conciliation are as follows:

$$\pi_{ij}^{CON} = \max_{x_j} \left[ (\gamma_j + (1 - \gamma_j)^2 \delta^C \tau_{ij}^{-\mu}) R(x_{ij}, \theta) - \tau_{ij} x_{ij} - f_{ij} \right].$$

Comparing  $\pi_{ij}^{CON}$  and  $\pi_{ij}^{LIT}$  reveals that the exporter would prefer conciliation if and only if  $\delta_j^L < \delta^C (1 - \gamma_j)$ . That is, conciliation is preferred over litigation when the ratio of litigation to conciliation costs is lower than the probability of breach of contract. If the contractual environment of the importer country is high ( $\gamma_j$  close to one), litigation is the preferred choice.

However, comparing  $\pi_{ij}^{CON}$  and  $\pi_{ij}^{ARB}$  reveals that conciliation is preferred over litigation whenever:

$$(\gamma_j + (1 - \gamma_j)^2 \delta^C \tau_{ij}^{-\mu}) < (\gamma_i + (1 - \gamma_i) \delta^A). \quad (11)$$

Note that from this inequality, we can basically draw the same conclusions regarding arbitration and litigation. Therefore, we can obtain the following proposition regarding conciliation,

**Proposition 3 :** *Conciliation is preferred over litigation in weak contractual environments at the importer (lower  $\gamma_j$ ) and strong at the exporter (higher  $\gamma_i$ ). The likelihood that a dispute is resolved in arbitration as opposed to conciliation is similar to the choice between arbitration and litigation, increasing in the institutional contract environment in the exporter country ( $\gamma_i$ ), decreasing in the institutional contract environment in the importer country ( $\gamma_j$ ) and increasing in the contractual noise between countries ( $\tau_{ij}^\mu$ ).*

Conciliation lies between arbitration and litigation. It would only have a positive effect on exports over litigation in weak institutional environments. However, in these environments, arbitration is preferred to conciliation. That would help explain why UNCITRAL's Conciliation Model Law has fewer participants than the Arbitration Model Law.

## 4 | METHODOLOGY AND DATA

The empirical literature on the determinants of bilateral trade flows using the gravity equation has progressively improved the econometric specification to account for potential sources of bias, such as those derived from unobserved bilateral heterogeneity, multilateral resistance terms, zero trade flows or heteroskedastic residuals. The estimation strategy used in this paper follows that recently proposed

by Larch et al. (2019) which, through an iterative PPML algorithm, accounts for all the above issues in large data sets that require computing three types of high-dimensional fixed effects: country-pair, exporter-time and importer-time fixed effects.

Our baseline gravity equation is the following:

$$X_{ijt} = \exp(\beta_1 RTA_{ijt} + \beta_2 CU_{ijt} + \beta_3 TL_{ijt} + \chi_{it} + \lambda_{jt} + \eta_{ij}) \times \varepsilon_{ijt}, \quad (12)$$

where  $i$  denotes the exporter,  $j$  denotes the importer and  $t$  is time. The dependent variable is the value of bilateral export flows (in levels), and in the set of independent variables, we include binary dummy variables for common membership in regional trade agreements (RTA) and currency unions (CU), and a set of variables that capture trade law (TL): the NY Convention (NYC), Arbitration Model Law (AML) and Conciliation Model Law (CML) as well as exporter-time fixed effects ( $\chi_{it}$ ), importer-time fixed effects ( $\lambda_{jt}$ ) and country-pair fixed effects ( $\eta_{ij}$ ). Finally,  $\varepsilon_{ijt}$  is the error term.

As discussed earlier, the inclusion of exporter-time fixed effects and importer-time fixed effects prevents us from testing directly our corollary since the institutional contract environment in the importer and exporter countries is totally collinear with these fixed effects. Consequently,  $\gamma_i$  and  $\gamma_j$  cannot be directly included in Equation (12). Additionally, the inclusion of country-pair fixed effects ( $\eta_{ij}$ ) prevents the inclusion of any measure of distance between country pairs. Relaxing any of these fixed effects would lead to biased results. Therefore, we should construct a measure that captures  $\gamma_i$ ,  $\gamma_j$  and  $\tau_{ij}^H$  as a time-varying difference between exporter and importer. We opt to use the GDP per capita (GDPpc) as an adequate measure for two reasons. First, GDPpc is highly correlated with institutional quality. The correlation between the logarithm of GDP per capita and government effectiveness, regulatory facility and rule of law (Doing Business, World Bank) is very high (between 0.75 and 0.79). Second, GDPpc provides the longest time-span of all measures that capture institutional quality. The World Bank's Doing Business record is available only from 1996, while GDPpc is available from 1960. Considering that the NY Convention was first ratified in 1959, using alternative measures would impose a much shorter sample period.

Considering these arguments, in order to test the model results regarding the moderating effect of contractual distance and contractual noise, we interact TL with the absolute difference in the log of GDPpc between the exporter and the importer:

$$X_{ijt} = \exp \left( \begin{array}{c} \beta_1 RTA_{ijt} + \beta_2 CU_{ijt} + \beta_3 TL_{ijt} + \\ + \beta_4 TL_{ijt} \times |\ln GDPpc_{it} - \ln GDPpc_{jt}| \\ \chi_{it} + \lambda_{jt} + \eta_{ij} \end{array} \right) \times \varepsilon_{ijt}. \quad (13)$$

The price to pay for unbiased estimates is certain ambiguity in our prognosis of the sign of  $\beta_4$ . Recall from Table 1 that high contractual distance could be associated with an increase or decrease of arbitration. However, in Equation (13)  $\beta_4$  is estimated with higher precision than in Equation (12) since we control for all the elements proposed by the model.

In this paper, we use Glick and Rose (2016) data set extended to include the trade law dummies. The sample covers bilateral trade for more than 200 IMF country codes over the period 1948–2013 (with gaps). The dependent variable (bilateral exports flows in US dollars) come from *Direction of Trade* data set assembled by the International Monetary Fund. Currency union data rely on the IMF's *Schedule of Par Values* and issues of the IMF's *Annual Report on Exchange Rates Arrangements and Exchange Restrictions*, supplemented with information from the *Statesman's Yearbook*. Data on regional trade agreements are taken from the World Trade Organization's website. The model law data come from the United Nations Commission on International Trade Law

**TABLE 2** Descriptive statistics

	Mean	SD	Min	Max
RTA	0.012	0.109	0	1
Currency union	0.077	0.266	0	1
NY convention	0.461	0.466	0	1
Arbitration Model Law	0.043	0.203	0	1
Conciliation Model Law	0.001	0.027	0	1

(UNCITRAL). Data from NY signatories came from the NY Convention website. GPDpc came from the World Bank.

The descriptive statistics are displayed in Table 2. We observe that the NY Convention is the most popular economic agreement. In the Appendix, we report the list countries which have ratified the NY Convention and adopted arbitration and model laws. There is a great overlap between the trade law agreements. Nearly, all countries that adopted CML also adopted AML and the NY Convention. Therefore, we cannot introduce all three variables simultaneously in the regression. However, this is not inconvenient because the countries that are left out from the NY Convention have no mechanisms to resolve disputes other than litigation. This means that when we introduce the NY Convention into the regression, the base category is litigation. When we introduce the AML, the base category is litigation and arbitration without domestic arbitration law reform. For CML, the base category is litigation and other types of arbitration.

A usual concern about this type of empirical setup is the question of endogeneity. It would be normal to suspect that the estimation of trade law conventions is not exogenous and should be treated with the appropriate methods. This argument would gain momentum if we would examine trade law as a monodic variable. We are not interested in measuring the effect of, for instance, Spanish trade law on Spanish trade, but rather the similarities in Spanish trade law with its trading partners. Our setting and arguments to contest this claim are similar to those found in Baier and Bergstrand (2007) or Rose (2018); the use of structural gravity, with importer-year, exporter-year and country-pair fixed effects, leaves little room for endogeneity concerns related to dyadic variables.

However, there is still a possibility that our variables of interest are correlated with an omitted variable. To contest this caveat, we take several actions, which are described after the text below that reports our empirical results.

## 5 | RESULTS

We present in Table 3 estimates for the two different selected trade dispute mechanisms: arbitration with the NY Convention (NYC) and Arbitration Model Law (AML) and conciliation with Conciliation Model Law (CML). The results reported in this table are estimated with the high-dimensional fixed-effects Poisson pseudo-maximum likelihood (PPML) procedure detailed in the previous section. It constitutes our baseline results, and we focus first on the interpretation of the few control variables allowed in the specification. As expected, the gravity equation works well showing sensible estimated values for the impact of currency unions and regional trade agreements in the different specifications, in particular, two countries sharing a currency trade around 11.5% more than otherwise. Two countries belonging to the same regional trade agreement trade 22% more than otherwise. Focusing on our four variables of interest, none of them show a statistical significant impact on bilateral trade flows. That is, on average it seems that common arbitration laws to solve disputes do not reduce barriers

**TABLE 3** Impact of arbitration and conciliation on trade

	Arbitration				Conciliation	
	NY convention		Model law		Model law	
	(1)	(2)	(3)	(4)	(5)	(6)
ComCurr	0.114 (0.041)***	0.072 (0.039)*	0.111 (0.041)***	0.068 (0.039)*	0.112 (0.041)***	0.071 (0.039)*
RTAs	0.198 (0.038)***	0.189 (0.037)***	0.199 (0.038)***	0.188 (0.037)***	0.197 (0.038)***	0.185 (0.037)***
TL	0.055 (0.043)	0.172 (0.056)***	-0.013 (0.032)	0.069 (0.037)*	0.063 (0.050)	0.105 (0.057)*
TL*IndifGDPpc		-0.124 (0.026)***		-0.093 (0.026)***		-0.148 (0.074)**
Observations	731,826	635,128	731,826	635,128	731,826	635,128

Notes: PPML estimation with importer\*year, exporter\*year and country-pair fixed effects. Robust standard errors in parentheses, clustered by country pairs.

TL: New York Convention (NYC), Arbitration Model Law (AML) and Conciliation Model Law (CML).

IndifGDPpc =  $\ln \text{GDPpc}_{it} - \ln \text{GDPpc}_{jt}$ .

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

enough in order to increase bilateral trade in a relevant manner. These results seem to stand at odds with our corollary, which predicted that enhancing trade law should increase exports, as reported by previous studies.

The non-significance of the variables of interest could stem from two sources: the inclusion of high-dimensional fixed effects<sup>11</sup> or an omitted variable bias along with endogeneity bias. Recalling that our corollary stated that the effect of arbitration on trade depended on institutional distance and contractual noise. We therefore introduce the interactive term discussed in the previous section in the even columns (2), (4) and (6) of Table 3. This specification is our preferred one, since it contains the main features of the model and helps to correct endogeneity bias by introducing an additional time-varying dyadic variable. Our variables of interest have now a positive and significant value at conventional levels in the three measures considered. The estimated impact goes from around the 7% for AML to the 19% for NYC (in this last case the estimated coefficient is significant at 1% level). The model delivered an ambiguous prediction regarding the specific effect of GDP per capita differences as it captures both contractual distance and contractual noise. The estimate delivers a negative and significant sign. Arbitration (with a stronger effect on NYC than AML) has a positive impact on trade which is reduced as countries differ in their degree of development and possibly when they trade less complex products. As proposed in Proposition 3, conciliation has a positive but lower effect on trade. Overall, the NY Convention seems to have a stronger commitment signal than both arbitration and Conciliation Model Laws.

To disentangle the individual importer and exporter effects that were hidden in GDP per capita differences, we turn to Table 4. Here, we have decomposed our variable of interest considering all the possible country-pair income combinations according to the World Bank classification into low-,

<sup>11</sup>In the Appendix, we show that a low-dimensional fixed-effects estimation delivers positive and significant results as reported by the previous literature.

lower-middle (LMidd)-, upper-middle (UMidd)- and high-income countries. The model's prediction (summarised in Table 1) is that the positive effect of better contractibility should come from high-income exporters to low-income importers. The effect of better contract enforcement should be lower from low-income exporters to high-income importers.

Overall, our theoretical prediction seems to be supported by the data, especially in the case of arbitration. First, it seems that the strongest impact occurs when the importer pertains to low- or low-middle-income levels. Second, we observe that when the exporter is a high-income country, the effect of arbitration is negative (with the exception when the importer is also a high-income country). As expected, conciliation follows this same pattern, but with only two significant high-income groups. The results seem to suggest that conciliation is appealing only when the importer and exporter have a high contractual quality.

The last testable hypothesis to be considered relates to how preferences for litigation depend on trade costs. Equation (6) implies that arbitration is more likely to be used when informational frictions are higher, proxied here by distance. The use of high-dimensional fixed effects impedes us to

**TABLE 4** Impact of arbitration and conciliation on trade by income levels of the partners

Exporter–importer	Arbitration		Conciliation
	NY convention	Model law	Model law
	(1)	(2)	(3)
Low_Low	0.571 (0.302)***	1.999 (0.435)***	
LMidd_LMidd	0.904 (0.169)***	0.342 (0.214)	0.408 (0.396)
UMidd_UMidd	0.186 (0.143)	0.033 (0.086)	−0.164 (0.102)
High_High	0.088 (0.046)*	0.041 (0.037)	0.085 (0.052)*
Low_LMidd	0.115 (0.176)	0.202 (0.272)	
Low_UMidd	−0.099 (0.231)	0.225 (0.262)	
Low_High	−0.430 (0.134)***	−0.313 (0.127)**	
LMidd_UMidd	0.334 (0.127)***	0.111 (0.091)	0.014 (0.529)
LMidd_High	0.024 (0.073)	−0.113 (0.069)*	0.115 (0.141)
UMidd_High	−0.006 (0.080)	−0.104 (0.051)***	−0.225 (0.082)***
Observations	731,826	731,826	731,826

Notes: PPML estimation with importer\*year, exporter\*year, and country-pair fixed effects. RTA and CU included, but not reported. Robust standard errors in parentheses, clustered by country pairs.

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

TABLE 5 Impact of arbitration and conciliation on trade by distance quartiles

	Arbitration				Conciliation				
	NY convention				Model law				
	$\tau_{ij} < Q_1$	$Q_3 < \tau_{ij} < Q_3$	$\tau_{ij} > Q_3$	$\tau_{ij} < Q_1$	$Q_3 < \tau_{ij} < Q_3$	$\tau_{ij} > Q_3$	$\tau_{ij} < Q_1$	$Q_3 < \tau_{ij} < Q_3$	$\tau_{ij} > Q_3$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
ComCurr	-0.002 (0.058)	0.637 (0.158)**	0.415 (0.010)**	-0.009 (0.059)	0.637 (0.159)**	0.403 (0.010)**	-0.001 (0.058)	0.639 (0.158)**	0.401 (0.010)**
RTAs	0.138 (0.027)**	0.008 (0.038)	-0.056 (0.073)	0.145 (0.026)**	0.013 (0.037)	-0.054 (0.074)	0.140 (0.027)**	0.010 (0.037)	-0.047 (0.074)
TL	0.099 (0.067)	-0.081 (0.070)	0.548 (0.160)**	0.072 (0.040)	0.056 (0.050)	-0.075 (0.082)	-0.175 (0.093)*	0.172 (0.092)*	0.370 (1.081)
TL*IndiGDPpc	-0.085 (0.029)	-0.023 (0.030)	-0.148 (0.029)**	-0.142 (0.038)**	-0.093 (0.031)**	0.001 (0.065)	0.034 (0.062)	0.021 (0.162)	0.079 (0.903)
Observations	215,574	315,671	103,883	215,574	315,671	103,883	215,574	315,671	103,883

Notes: PPML estimation with importer\*year, exporter\*year and country-pair fixed effects. Robust standard errors in parentheses, clustered by country pairs.

TL: New York Convention (NYC), Arbitration Model Law (AML) and Conciliation Model Law (CML).

IndiGDPpc =  $\ln \text{GDPpc}_{it} - \ln \text{GDPpc}_{jt}$ ,  $Q_1 = 2,779 \text{ km}$ ,  $Q_3 = 7,074 \text{ km}$ .

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .



**TABLE 6** Placebo test: Hague Services Convention (HC)

	(1)	(2)	(3)	(4)	(5)	(6)
				$\tau_{ij} < Q_1$	$Q_3 < \tau_{ij} < Q_3$	$\tau_{ij} > Q_3$
HC	-0.011 (0.028)	0.044 (0.032)		-0.024 (0.037)	0.026 (0.046)	-0.053 (0.098)
HC*difGDPpc		-0.115 (0.029)**		-0.127 (0.042)***	-0.133 (0.045)***	-0.166 (0.066)**
LMidd_LMidd			-0.253 (0.151)*			
UMidd_UMidd			-0.108 (0.141)			
High_High			0.039 (0.031)			
Low_LMidd			0.200 (0.407)			
Low_UMidd			-0.219 (0.409)			
Low_High			-0.379 (0.305)			
LMidd_UMidd			-0.499 (0.168)***			
LMidd_High			-0.351 (0.086)***			
UMidd_High			-0.071 (0.069)			
Observations	731,826	635,128	731,826	215,574	315,671	103,883

Notes: PPML estimation with importer\*year, exporter\*year and country-pair fixed effects. Robust standard errors in parentheses, clustered by country pairs. RTA and CU included, but not reported.

$\ln \text{difGDPpc} = \ln \text{GDPpc}_{it} - \ln \text{GDPpc}_{jt}$ .  $Q_1 = 2,779$  km  $Q_3 = 7,074$  km.

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

introduce an interaction of distance with the TL variables.<sup>12</sup> To overcome this issue, we have separately estimated the effect of arbitration by grouping country pairs according to distance quartiles in Table 5.

In the first place, we observe that our control variables have an heterogeneous effect depending on the distance between country pairs. Common currency is positive and significant only for countries above the third distance quartile (7,074 km) and RTAs below the first distance quartile (2,779 km). Regarding our variables of interest, as expected, the NY Convention and its interaction with GDP per capita differences are significant and with the expected signs for distant country pairs (above the third distance quartile). In line with our previous results, Arbitration Model Law seems to be less effective in promoting trade and we do not observe any significant results by distance quartiles. Finally, the

<sup>12</sup>Myburgh and Paniagua (2016) use a low-dimensional estimation to show that the NY Convention's effect on FDI increases with distance.

Conciliation Model Law estimates follow our predictions that were a lower effect than arbitration that increases with distance. We observe that conciliation has a moderately positive and mildly significant effect only between the first and third distance quartiles. This result is line with our previous result that showed that conciliation is effective only between similar countries.

## 5.1 | Placebo test and endogeneity

As a placebo test, we introduce the Hague Services Convention (HC) which conveys international trade for the service of legal documents but not private resolution of conflicts. Additionally, the set of countries that ratified the HC convention is similar to those that joined NY Convention. Therefore, it is a good candidate to serve as a placebo test, since it is in appearance similar to our measures, but with a substantially different aim.

Recall that arbitration and conciliation had a positive and significant value at conventional levels in the three measures considered. The Hague Services Convention does not have a significant impact on trade as reported in Table 6, confirming our hypothesis that it is precisely international trade law aimed towards dispute resolution which has a positive effect on trade flows. In the first two columns, we run our baseline regressions. In column (3), we separate the effect by income partners, where we do not appreciate a positive effect of this convention on trade. The last three columns of Table 6 repeat the exercise of examining the effect of distance, and we also obtain non-significant results for the HC.

A second strategy for endogeneity is to lead the variables one year. There is no reason to suspect that the trade law agreements would have an effect one year earlier than enforcement (other than reputation gains if the signature was broadcasted and anticipated by trading partners). The results shown in Table 7 indicate that when we lead the variables, we do not obtain the expected significant results in any of the leaded variables of interest, whereas the contemporary variables have significant results. This suggests a high degree of confidence in our empirical identification strategy.

**TABLE 7** Results with leaded variables

	Arbitration		Conciliation
	NY convention	Model law	Model law
	(1)	(3)	(5)
TL	0.176 (0.050)***	0.070 (0.037)*	0.110 (0.058)*
TL*difGDPpc	-0.124 (0.026)***	-0.091 (0.025)***	-0.160 (0.075)**
TL (1 year lead)	-0.001 (0.041)	0.002 (0.037)	0.001 (0.021)
TL*difGDPpc (1 year lead)	0.001 (0.040)	0.001 (0.008)	-0.025 (0.036)
Observations	482,101	482,101	482,101

Notes: PPML estimation with importer\*year, exporter\*year and country-pair fixed effects. Robust standard errors in parentheses, clustered by country pairs. RTA and CU included, but not reported.

$\text{IndifGDPpc} = \ln \text{GDPpc}_{it} - \ln \text{GDPpc}_{jt}$ .

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

## 6 | CONCLUSIONS

The paper examines the effect of improving international trade law on bilateral trade. We developed a model that guided us to a structural gravity estimation of the heterogeneous effects of legal mechanisms aimed at private dispute resolution (arbitration and conciliation). The theory developed in this paper aids us to understand previous empirical results in this topic and provides new insights. The paper estimates with higher precision the effects of increasing institutional contractual quality on international trade.

The main novelty of the model is to put forward the tension between the differences in the contractual quality of importer and exporter (contractual distance) in an environment with informational frictions (contractual noise), which was overlooked in previous research. By endogenising arbitration costs, we show that the theoretical results rest on the natural assumption that expected gains from arbitration are higher than litigation. Using the most consistent empirical methods, we show how these elements interrelate with bilateral trade flows. Contractual distance appears to be relevant to observe the effects of enforcing better international trade law.

Our empirical results confirm two important traits: (a) arbitration has a positive and significant effect on international trade; (b) the effect of increasing trade law quality via arbitration has a positive effect that decreases with the quality contractual importing environments, and reveal new evidence; (c) the effect of arbitration on trade increases with market remoteness; (d) conciliation has a positive and significant effect on trade, but only for trading partners with high levels of income; and (e) domestic trade law reform via Model Laws is an effective way to foster international trade, but their impact is lower than the NY Convention.

The paper has interesting policy implications regarding the economic effects of improving trade law. This can be achieved by ratifying international treaties (like the NY Convention) or reforming domestic regulations (e.g. model laws). Results suggest that both Arbitration Model Law and the NY Convention have a positive effect, but the latter has a larger effect on trade. However, we show that similar international agreements not focused on private commercial conflict resolution do not appear to increase exports in the same way as arbitration and conciliation. Other kind of agreements that increase institutional quality might serve broader purposes, but when it comes to promote trade, conflict resolutions seem to be the trick.

New research that studies the deepness of the trade law agreements and legal reforms as well as the use of regional trade flows to study individual country characteristics is likely to be an interesting avenue for future research in this area. New research could also attempt to explain why RTA and common currency had heterogeneous effects depending on the distance between country pairs.

## ACKNOWLEDGEMENTS

This study was financially supported by the Research Challenges Programme of MICINN (Spanish Government & FEDER) through grant RTI2018-100899-B-I00 and by the Generalitat Valenciana (GV/2017/052 and PROMETEO 2018/102). The authors are grateful for the constructive comments of participants in the XIX Conference on International Economics in Vila-Real and two anonymous referees.

## ORCID

Salvador Gil-Pareja  <https://orcid.org/0000-0003-3746-2228>

Rafael Llorca-Vivero  <https://orcid.org/0000-0003-1729-4204>

Jordi Paniagua  <https://orcid.org/0000-0002-8859-0775>

## REFERENCES

- Acemoglu, D., & Johnson, S. (2005). Unbundling Institutions. *Journal of Political Economy*, 113(5), 949–995.
- Ahcar, J., & Siroën, J.-M. (2017). Deep integration: Considering the heterogeneity of free trade agreements. *Journal of Economic Integration*, 32(3), 615–659. <https://doi.org/10.11130/jei.2017.32.3.615>
- Anderson, J. E., & Marcouiller, D. (2002). Insecurity and the pattern of trade: An empirical investigation. *Review of Economics and Statistics*, 84(2), 342–352.
- Antràs, P., & Foley, C. F. (2015). Poultry in motion: A study of international trade finance practices. *Journal of Political Economy*, 123(4), 853–901.
- Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics*, 71(1), 72–95. <https://doi.org/10.1016/j.jinteco.2006.02.005>
- Baier, S. L., Yotov, Y. V., & Zylkin, T. (2019). On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration. *Journal of International Economics*, 116, 206–226.
- Berkowitz, D., Moenius, J., & Pistor, K. (2006). Trade, law, and product complexity. *The Review of Economics and Statistics*, 88(2), 363–373.
- Beverelli, C., Keck, A., Larch, M., & Yotov, Y. (2018). *Institutions, trade and development: A quantitative analysis*. Technical Report 2018-3, LeBow College of Business, Drexel University.
- Casella, A. (1996). On market integration and the development of institutions: The case of international commercial arbitration. *European Economic Review*, 40(1), 155–186.
- Dai, M., Yotov, Y. V., & Zylkin, T. (2014). On the trade-diversion effects of free trade agreements. *Economics Letters*, 122(2), 321–325.
- Eisenberg, T., Miller, G. P., & Sherwin, E. (2008). Arbitration's summer soldiers: An empirical study of arbitration clauses in consumer and nonconsumer contracts. *University of Michigan Journal of Legal Reform*, 41, 871–896.
- Fally, T. (2015). Structural gravity and fixed effects. *Journal of International Economics*, 97(1), 76–85.
- Falvey, R., & Foster-McGregor, N. (2018). On the relationship between the breadth of preferential trading arrangements and trade flows. *The World Economy*, 41(4), 1088–1110.
- Glick, R., & Rose, A. K. (2002). Does a currency union affect trade? The time-series evidence. *European Economic Review*, 46(6), 1125–1151.
- Glick, R., & Rose, A. K. (2016). Currency unions and trade: A post-EMU reassessment. *European Economic Review*, 87, 78–91.
- Hylton, K. N. (2000). Agreements to waive or to arbitrate legal claims: An economic analysis. *Supreme Court Economic Review*, 8, 209–263. <https://doi.org/10.1086/scer.8.1147075>
- Larch, M., Wanner, J., Yotov, Y. V., & Zylkin, T. (2019). Currency unions and trade: A PPML re-assessment with high-dimensional fixed effects. *Oxford Bulletin of Economics and Statistics*, 81(3), 487–510.
- Levchenko, A. A. (2007). Institutional quality and international trade. *The Review of Economic Studies*, 74(3), 791–819.
- Melitz, M. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695–1725.
- Moenius, J., & Berkowitz, D. (2011). Law, trade, and development. *Journal of Development Economics*, 96(2), 451–460.
- Myburgh, A., & Paniagua, J. (2016). Does international commercial arbitration promote foreign direct investment? *Journal of Law and Economics*, 59(3), 597–627. <https://doi.org/10.1086/689188>
- Myburgh, A., & Paniagua, J. (2017). The impact of UNCITRAL on foreign direct investment. In *Modernizing International Trade Law to Support Innovation and Sustainable Development, Proceedings of the Congress of the United Nations Commission on International Trade Law* (pp. 1–10). Vienna, Austria: United Nations.
- Nunn, N. (2007). Relationship-specificity, incomplete contracts, and the pattern of trade. *The Quarterly Journal of Economics*, 122(2), 569–600.
- Paniagua, J. (2018). Arbitraje internacional e inversión extranjera: El caso de las energías renovables. In J. A. Martínez-Serrano (Ed.), *El gobierno de la globalización. A propósito del septuagésimo aniversario del GATT* (pp. 129–141). Madrid: Funcas.
- Rose, A. K. (2018). *Currency wars? Unconventional Monetary policy does not stimulate exports*. National Bureau of Economic Research Working Paper 24817. <https://www.nber.org/papers/w24817>
- Schwartz, A., & Wilde, L. L. (1983). Warranty markets and public policy. *Information Economics and Policy*, 1, 55–67.
- Shavell, S. (1995). Alternative dispute resolution: An economic analysis. *Journal of Legal Studies*, 24, 1–28.



- Thomas, J., & Worrall, T. (1994). Foreign direct investment and the risk of expropriation. *The Review of Economic Studies*, *61*, 81–108.
- Van Assche, A., & Schwartz, G. A. (2013). Contracting institutions and ownership structure in international joint ventures. *Journal of Development Economics*, *103*, 124–132.
- Vicard, V. (2009). On trade creation and regional trade agreements: Does depth matter? *Review of World Economics*, *145*(2), 167–187. <https://doi.org/10.1007/s10290-009-0010-9>
- Wickelgren, A. L. (2016). An economic analysis of arbitration versus litigation for contractual disputes. *The Journal of Law and Economics*, *59*(2), 393–410.
- World Bank (2012). *Investing across borders*. Retrieved from <http://iab.worldbank.org/>

**How to cite this article:** Gil-Pareja S, Llorca-Vivero R, Paniagua J. Trade law and trade flows. *World Econ.* 2020;43:681–704. <https://doi.org/10.1111/twec.12886>

## APPENDIX A

We present in Table A1 additional empirical results. The first four columns of Table A1 exclude high-dimensional fixed effects in PPML estimates and OLS estimations including high-dimensional fixed effects. In the first set of results, we control for country-pair heterogeneity with the usual control variables, like distance, colony, common language. We do not control for multilateral resistance, and therefore, we can include the importer and exporter GDPs. The signs and magnitudes of these variables match the theoretical expectations. As it is usual in this specification, most variables of interest appear to be positive and highly significant. In the last four columns, the bias that stems from not including the whole array of fixed effects becomes evident. Here, only the AML is significant to the 5%, which much lower order of magnitude than in the first four columns. However, these results are estimated with OLS, which deliver correlated residuals and ignore zeros.

The next set of tables reports the signatories ordered by year of ratification of the NY and Hague convention, and adoption of UNCITRAL's Models Laws (Tables A2–A4).

TABLE A1 PPML without high-dimensional fixed effects and OLS results

	(1)	(2)	(3)	(4)	(5)	(6)
	PPML			OLS		
lnGDPi	1.180 (0.006)***	1.180 (0.006)***	1.172 (0.006)***			
lnGDPj	0.892 (0.006)***	0.891 (0.006)***	0.882 (0.006)***			
LnDist	−1.128 (0.017)***	−1.128 (0.017)***	−1.122 (0.017)***			
Contiguity	0.503 (0.081)***	0.502 (0.081)***	0.516 (0.081)***			
Colony	1.283 (0.097)***	1.284 (0.097)***	1.281 (0.097)***			
Language	0.597 (0.033)***	0.597 (0.033)***	0.602 (0.033)***			
Island	0.463 (0.028)***	0.462 (0.028)***	0.448 (0.028)***			
Landlocked	−0.418 (0.025)***	−0.419 (0.025)***	−0.431 (0.025)***			
ComCurr	1.060 (0.088)***	1.061 (0.088)***	1.060 (0.087)***	0.315 (0.026)***	0.315 (0.026)***	0.315 (0.026)***
RTAs	1.109 (0.035)***	1.108 (0.035)***	1.095 (0.035)***	0.387 (0.010)***	0.387 (0.010)***	0.387 (0.010)***
AML	−0.037 (0.038)			0.035 (0.015)**		
CML		0.755 (0.159)***			0.045 (0.074)	

(Continues)

**TABLE A1** (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)
	PPML			OLS		
NYC			0.176 (0.023)***			0.001 (0.012)
Year FE	Yes	Yes	Yes	No	No	No
Country*year FE	No	No	No	Yes	Yes	Yes
Country-pair FE	No	No	No	Yes	Yes	Yes
Observations	635,137	635,137	635,137	729,932	729,932	729,932

Notes: Robust standard errors in parentheses, clustered by country pair.

\* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ .

**TABLE A2** New York convention

Czechoslovakia (1959), France (1959), Israel (1959), Morocco (1959), Syria (1959), Belarus (1960), Cambodia (1960), India (1960), Thailand (1960), Austria (1961), Germany (1961), Japan (1961), Norway (1961), Bulgaria (1962), Ecuador (1962), Finland (1962), Hungary (1962), Madagascar (1962), Poland (1962), Sri Lanka (1962), Central African Republic (1963), Netherlands (1964), Tanzania (1964), Niger (1965), Switzerland (1965), Trinidad and Tobago (1966), Philippines (1967), Tunisia (1967), Ghana (1968), Italy (1969), Nigeria (1970), Mexico (1971), United States (1971), Botswana (1972), Sweden (1972), Denmark (1973), Korea (1973), Australia (1975), Belgium (1975), Chile (1975), Cuba (1975), German Dem. Rep.(1975), Vanuatu (1975), United Kingdom (1975), Djibouti (1977), Spain (1977), Kuwait (1978), Colombia (1979), San Marino (1979), Greece (1980), Jordan (1980), Cyprus (1981), Israel (1981), Yugoslavia (1982), Indonesia (1982), New Zealand (1983), Uruguay (1983), Guatemala (1984), Haiti (1984), Canada (1986), Malaysia (1986), Singapore (1986), Burkina Faso (1987), China (1987), Bahrain (1988), Cameroon (1988), Costa Rica (1988), Algeria (1989), Antigua and Barbuda (1989), Dominica (1989), Kenya (1989), Lesotho (1989), Ivory Coast (1991), Croatia (1991), Guinea (1991), Slovenia (1991), Macedonia (1991), Bangladesh (1991), Bosnia and Herzegovina (1992), Latvia (1992), Turkey (1992), Uganda (1992), Barbados (1993), Czech Republic (1993), Estonia (1993), Russia (1993), Georgia (1994), Mali (1994), Saudi Arabia (1994), Zimbabwe (1994), Bolivia (1995), Lithuania (1995), Luxembourg (1995), Mongolia (1995), Portugal (1995), Senegal (1995), Venezuela (1995), Brunei (1996), Kazakhstan (1996), Mauritius (1996), Uzbekistan (1996), Kyrgyzstan (1997), Mauritania (1997), Armenia (1998), Eslovenia (1998), Lao (1998), Lebanon (1998), Mozambique (1998), Nepal (1998), Paraguay (1998), Moldova (1998), Oman (1999), Azerbaijan (2000), Malta (2000), Romania (2000), St. Vincent and the Grenadines (2000), Albania (2001), Honduras (2001), Brazil (2002), Dominican Republic (2002), Iceland (2002), Iran (2002), Jamaica (2002), Zambia (2002), Nicaragua (2003), Qatar (2003), Moldova (2003), Afghanistan (2005), Liberia (2005), Montenegro (2006), United Arab Emirates (2006), Bahamas (2007), Gabon (2007), Marshall Islands (2007), Cook Islands (2009), Rwanda (2009), Fiji (2010), Tajikistan (2012), Myanmar (2013), Sao Tome (2013)

**TABLE A3** Model laws**Arbitration Model Law**

Canada (1986), Cyprus (1987), Nigeria (1990), Mexico (1993), Russia (1993), Tunisia (1993), Egypt (1994), Hungary (1994), Singapore (1994), Ukraine (1994), Guatemala (1995), Kenya (1995), Sri Lanka (1995), India (1996), Malta (1996), Zimbabwe (1996), Iran (1997), Oman (1997), Germany (1998), Macao (1998), Madagascar (1998), Venezuela (1998), Azerbaijan (1999), Belarus (1999), Greece (1999), Honduras (2000), Uganda (2000), Zambia (2000), Bangladesh (2001), Croatia (2001), Jordan (2001), Turkey (2001), Bulgaria (2001), Paraguay (2002), Thailand (2002), Spain (2003), Japan (2003), Chile (2004), Norway (2004), Philippines (2004), Denmark (2005), Malaysia (2005), Nicaragua (2005), Poland (2005), Armenia (2006), Austria (2006), Estonia (2006), Cambodia (2006), Macedonia (2006), Serbia (2006), New Zealand (2007), Dominican Republic (2008), Mauritius (2008), Peru (2008), Rwanda (2008), Slovenia (2008), Brunei (2009), Georgia (2009), Australia (2010), Honk Kong (2010), Ireland (2010), Costa Rica (2011), Lithuania (2012), Belgium (2013), Bhutan (2013), Maldives (2013)

**Conciliation Model Law**

Honduras (2000), Hungary (2002), Croatia (2003), Myanmar (2005), Nicaragua (2005), United States (2006), Canada (2008), Switzerland (2008), Slovenia (2009), Macedonia (2009), France (2011), Luxembourg (2012), Malaysia (2012), Bhutan (2013)

**TABLE A4** Hague convention

France (1965), Netherlands (1965), United Kingdom (1965), Barbados (1966), Botswana (1966), Lesotho (1966), Malawi (1967), Austria (1968), Malta (1968), Mauritius (1968), Swaziland (1968), Portugal (1969), Fiji (1970), Japan (1970), Tonga (1970), Bahamas (1973), Cyprus (1973), Hungary (1973), Switzerland (1973), Suriname (1975), Belgium (1976), Luxembourg (1976), Dominica (1978), Israel (1978), Italy (1978), Spain (1978), Luxembourg (1979), Saint Vincent and the Grenadines (1979), Seychelles (1979), Vanuatu (1980), Antigua and Barbuda (1981), United States (1981), Norway (1983), Greece (1985), Turkey (1985), Finland (1986), Brunei (1987), Argentina (1988), Slovenia (1991), Croatia (1991), Macedonia (1991), Belarus (1992), Bosnia (1992), Marshall Island (1992), Russia (1992), Serbia (1992), Belize (1993), Armenia (1994), St. Kitts and Nevis (1994), Australia (1995), Mexico (1995), San Marino (1995), Andorra (1996), Slovenia (1996), Latvia (1996), Liberia (1996), Lithuania (1997), Czech Republic (1999), Ireland (1999), Niue (1999), Samoa (1999), Sweden (1999), Venezuela (1999), Trinidad and Tobago (2000), Bulgaria (2001), Colombia (2001), Estonia (2001), Kazakhstan (2001), Namibia (2001), New Zealand (2001), Romania (2001), Granada (2002), Saint Lucia (2002), Slovakia (2002), Ukraine (2003), Albania (2004), Honduras (2004), Iceland (2004), Azerbaijan (2005), Cook Islands (2005), Ecuador (2005), Indonesia (2005), Polonia (2005), Montenegro (2006), Denmark (2006), Georgia (2007), Korea (2007), Moldova (2007), Sao Tome and Principe (2008), Dominican Republic (2009), Montenegro (2009), Cape Verde (2010), Peru (2010), Costa Rica (2011), Kyrgyzstan (2011), Oman (2012), Uruguay (2012), Uzbekistan (2012), Bahrain (2013), Nicaragua (2013)