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Article

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Assessing the possibility of winning a WTO dispute before being involved

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Abstract

Purpose – This article focuses on whether there is a chance to win a World Trade Organization (WTO) trade dispute at the consultation stage. The study suggests an approach to resolving trade disputes on a bilateral level before involving formal WTO resolution procedures.

Design/methodology/approach – The model describes the determinants of the probability of winning a trade dispute. The econometric model estimates two different groups of factors available during the consultation period – macroeconomic factors and the institutional features of the trade dispute, such as the number of third parties. The data includes WTO trade disputes from 1995 to 2014.

Findings – The suggested model predicts the result of trade disputes with a probability of 76.64%. The research proves that institutional factors such as the number of third parties and the subject of the trade dispute influence the probability of winning.

Practical implications – The results of the study help predict the probability of winning a trade dispute at the consultation stage so that countries can decide whether to pursue a trade dispute.

Originality/value – The research presents several new hypotheses on the results of trade disputes. The authors show that the higher the number of countries involved, the higher the chance of the complainant winning and that if major parties such as the US or the European Union (EU) are involved as third parties, the chance of the complainant winning increases.

Keywords WTO, Trade disputes, Dispute settlement, Tariffs, Macroeconomic factors, Trade policy

Paper type Research paper

1. Introduction

This study examines which factors affect the probability of winning a trade dispute with the data available at the consultation stage. Participation in the World Trade Organization (WTO) allows countries to defend their trade interests by using the WTO mechanism to resolve such disputes. Private companies cannot directly become members of a trade dispute, and they are excluded from the process according to WTO regulations [1]. By initiating trade disputes, the government signals to enterprises that it supports them (Betz and Kerner, 2016). The choice of the optimal strategy for participating in a trade dispute and the ensuing result determine the level of trust between the government and economic agents participating in international trade. It is significant to optimize the country's participation strategy in WTO trade disputes.

Trade disputes are initiated when one WTO member believes another member has violated a WTO agreement or commitment. The protection of domestic producers in the WTO can help to prevent companies from sustaining losses and guard against trade barriers on the international level. Countries regularly use this method of resolving trade

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disputes. Even during the COVID-19 pandemic, there were eight trade disputes in 2021 and five trade disputes in 2020 (WTO, 2020a). For example, the latest DS606 trade dispute is related to Saudi Arabia requesting consultations with the European Union (EU) concerning EU anti-dumping duty on imports of mono-ethylene glycol by Saudi Arabia. The applied trade measures systematically restrict the development of economic relations between different categories of entities. This harms economic development by limiting the impact of free competition between national producers. The high diversification of trade cooperation within the WTO determines the need to improve approaches to protecting the trade interests of countries and the system of multilateral trade regulation within the WTO (Prazeres, 2020). Maintaining countries' trust in the mechanism for resolving trade disputes within the WTO, which should be ensured through political consensus between countries, is also important (Isachenko and Saveliev, 2019). The development of methodological approaches to the settlement of trade disputes contributes to the development of the whole WTO system.

Countries can participate in trade disputes in three main capacities: as a respondent, complainant or third party. In modern practice, countries can use a variety of theoretical and practical approaches to develop optimal strategies for the resolution of trade disputes. For example, participation as a third-party gives a country the right to receive information about the trade dispute (Dimulen, 2012; Johns and Pelc, 2016). This right is crucial for new members of the WTO to get information, which is usually confidential, instead of experience and to be more effective in future trade disputes. The participation as respondent and complainant makes it possible to protect or abolish trade barriers if they do not meet WTO rules. Understanding the prospects of WTO trade disputes helps to optimize the costs of participating in the trade dispute resolution system. Countries should participate in those trade disputes which bring them the maximum economic benefit.

Several studies elucidate the inefficient organization of the WTO trade dispute mechanism. The mechanism is not effective because of poor organization in trade compensation for the complainant (Mercurio, 2009). The current system does not provide trade dispute members with effective reparation for damages (Bronckers and Broek, 2005). The respondent gains more by breaking WTO rules rather than by adhering to them. We assume that the WTO trade dispute mechanism is effective, and the respondent is afraid of being punished. In practice, a country that regularly breaks the WTO rules loses its reputation and the opportunity to negotiate. Nobody wants to be labelled as an "outlaw" in the WTO. Overall, the most experienced complainants tend to achieve reconciliation (Conti, 2010). The violation of WTO rules harms the reputation and trade position of a country.

From this point of view, taking part in a trade dispute is a liability, particularly for the respondent. If there is little chance of success for the complainants, sometimes it is better not to become embroiled in a trade dispute. An example of one of the longest series of trade disputes is the 20-year EU-Latin American banana dispute, finally resolved in 2012. This series of trade disputes included: DS16, DS27, DS105, DS158, DS361 and DS364, each of which took significant financial resources and was the object of close attention from different countries (WTO, 2012). If the participating countries had known that the disputes would continue for 20 years, they would have tried to reach an agreement at an early stage. The respondent needs to analyse the possibility of winning at the consultation stage. The complainant should also decide if it is worthwhile initiating a trade dispute. Before initiating a trade dispute, countries try to negotiate using bilateral diplomacy outside the WTO (Gray and Potter, 2020). Our research determines the main factors that can predict the result at the consultation stage of a trade dispute.

[Maggi and Staiger \(2018\)](#) examine the same issue. They predict the outcome and duration of trade disputes. They consider factors leading to an early resolution of a trade dispute, a Dispute Settlement Body (DSB) decision or a conclusion at other stages. They use factors related to uncertainty and the subject of the trade dispute, which are also available at the consultation stage. Our study is based on the previous results but formulates all hypotheses in predicting the outcome of a trade dispute at the consultation stage. We focus on the consultation stage because at this stage countries can optimize the costs of participation in WTO trade disputes. If they decide to conclude a bilateral agreement, the DSB can deal with disputes that cannot be resolved at the bilateral level and can become more efficient.

Our model is applied at the consultation stage. The complainant starts a consultation with the respondent. The respondent must decide whether to accept the requirements or contest them, also estimating the probability of winning based on the data available at the consultation stage: macroeconomic and institutional factors. International studies confirm the significance of macroeconomic parameters for predicting the outcome of a trade dispute ([Bown, 2004b](#)). In this regard, our model focuses on assessing the significance of institutional parameters. We find that the number of third parties, the subject matter of the trade dispute and previous experience influence the outcome of a trade dispute.

The remainder of this paper is organized as follows: [Section 2](#) provides a literature review on the factors that influence the result of a trade dispute. [Section 3](#) describes the empirical strategy and the data of the model. [Section 4](#) provides the econometric estimations. It describes the factors affecting the result of a trade dispute. [Section 5](#) demonstrates the practical implication of the model and describes further directions for research. [Section 6](#) concludes.

2. Literature review

A trade dispute contains several stages. The first one is consultation. According to WTO rules, the consultation stage can continue for up to 60 days ([WTO, 2020b](#)). This stage is necessary for parties to talk to each other to understand if there is a possibility of settling the problem without the participation of the other members of the WTO. If the consultation stage fails, the DSB organizes a trade dispute resolution. The DSB creates a commission of experts who prepare a panel report. This report should be prepared within six months, and for urgent disputes, this period could be reduced to three months. After the report submission, there are two possibilities: the first is that the report conclusion identifies that the trade measures break WTO rules. In this case, the panel of experts should recommend how to harmonize the inappropriate trade measures according to WTO rules. The second possibility is that these measures comply with the WTO rules. After this stage, the DSB can adopt or reject the panel's report and can impose the final report as recommendations to the counterparties. Each side has the possibility to appeal the panel's recommendations. The appeals can modify or reject the recommendations. The period of appeal is 60–90 days. After this, both parties should apply the panel's recommendations. Parties determine a reasonable period for such implementation. Trade disputes are costly for the participants and damage the economy of the complainant. The complainant could not carry out fair trade in the respondent's internal market because of measures that are inconsistent with WTO rules, sustaining real losses ([Disdier and Fontagne, 2010](#)). Because of the inability to abolish the measures before the DSB's decision, they continue to affect the complainant's trade. As a result, the complainant could lose the competitive advantage for three to four years. Finally, the DSB monitors the implementation of the final decision. If the complainant wins a trade dispute, there are several possible consequences. The first includes the abolishment of trade measures violating WTO rules. The second is the application of countermeasures authorized by the DSB. The abolishment of trade measures is applied most often. It is

especially important to complete it at the consultation stage owing to the length of a trade dispute finalization process.

Research in trade disputes focuses on the prediction of the result and length of a trade dispute (Maggi and Staiger, 2018). The research estimates different factors affecting this process (Kuenzel, 2017). Most studies attempt to estimate the result by using macroeconomic and trade factors, supporting the hypothesis that the more opportunities a country has in international trade, the more likely they are to win a trade dispute (Table 1). It is complicated to collect aggregate data on trade disputes. Most of the research does not provide a clear methodology for their empirical strategy and data construction, particularly, how they define the result of trade disputes (Horn *et al.*, 2011).

It is possible to single out two main groups of factors influencing the results of trade disputes, namely macroeconomic factors and institutional factors. These groups of factors are crucial for conducting the empirical assessment.

Macroeconomic factors help analyse the economic strength of the country, which may relate to the level of influence in a trade dispute (Ziaul and Sumimaru, 2005). Macroeconomic policy determines the state of the economy of any country (Dey and Tareque, 2020). If a country has large international trade and GDP, another country may influence it by applying various economic sanctions (Karaganov and Suslov, 2019). An economically strong country can also influence the respondent. Some researchers prove that there is strategic interaction between countries in international trade (Bechtel and Sattler, 2015; Kuenzel, 2017). Several papers prove the connection between financial market development and economic growth (Guru and Yadav, 2019). A trade dispute's result depends on the trade conditions. Our model predicts the possible influence of exports and GDP. A range of seminal studies confirms the importance of macroeconomic factors for trade dispute resolutions, e.g. Bown (2002).

Institutional factors can influence the result of trade disputes. For example, there is a correlation between elections, macroeconomic tendencies and trade disputes (Chaudoin, 2014). It is possible to predict that an increase in the number of interested parties decreases the possibility of agreement before a final decision (Johns and Pelc, 2014). This is caused by the necessity to communicate with all the parties and take into consideration all their opinions. An increase in the number of third parties will lengthen the time necessary to reach an agreement. Third parties could support the settlement, legally supporting the trade dispute process (Johns and Pelc, 2014). The experience and authority of a participant in a trade dispute is also important issue. Major players such as the EU and the US may influence the result of trade disputes as third parties, creating a biased effect. Legal regulation is significant for trade dispute initiation as countries may have constraints under GATT/WTO rules (Bown, 2004a). Furthermore, a country's experience in WTO is significant for winning trade disputes (Conti, 2010).

Each country possesses different resources to analyse the counterparty's trade policy. For example, not having an embassy in the respondent's country may impair the analysis or distort the meaning of the documents translated from one language to another owing to a lack of local expertise. A lack of the necessary social capital among trade dispute experts will prevent them from having meaningful discussions. The challenges of analysing original documentation may be related to the "lost-in-translation" effect. If the documents are written in English, then such documents will be easier to analyse. This factor may also affect the outcomes of trade disputes. To accumulate the necessary human and social capital, WTO members should create a pool of trade policy experts, well-versed in economics and law, and possess the authority and necessary experience in negotiating trade disputes (Pauwelyn, 2002).

Another example of institutional parameters is the subject of a trade dispute. It is much easier to prove a violation of agreements related to tariff restrictions than with non-tariff ones.

The possibility
to win a WTO
dispute

| Author and article | Main idea | Significant results for our research |
|------------------------------|--|--|
| Haftel (2004) | States that strengthen trade blocs face an increasing number of complainants | Deeper economic integration results in more complainants Improvements in legal procedures increase the number of complainants |
| Bown (2004b) | Defining what factors stimulate the respondent to commit to liberalization | The authors used the following variables: size of exports, real income growth, the size of imports before and after the trade dispute in the respondent country, etc |
| Bown (2005) | Defining factors influencing the degree of participation | The article proves the importance of the complainant's share of the respondent's market, the share of the respondent in the exports of the complainant, the level of gross domestic product (GDP) and the presence of a preferential agreement |
| Ziaul and Sumimaru (2005) | Defining the factors that influence whether a country is involved in a trade dispute and what factors define the possibility of winning it | The rate of winning for developed countries is higher than for developing countries The size of the GDP influences the result The size of exports influences the level of participation in trade disputes |
| Guzman and Simmons (2005) | Countries with low incomes tend to initiate disputes | Low-income countries initiate a trade dispute to get a higher expected return in the future. The authors used the following variables: GDP, number of embassies, exports, etc |
| Conti (2010) | The experience of a participant influences the process and result | Previous experience in the WTO trade disputes is significant |
| Lee (2012) | How macroeconomic factors influence decisions on initiating trade disputes | Macroeconomic factors determine trade dispute activity. The paper examines GDP, global imports, balance of goods and services, etc. It also confirms that there are different effects for high-, middle- and low-income countries |
| Johns and Pelc (2014) | WTO members might manipulate the trade dispute process | The complainant could increase the number of third parties to increase the probability of winning |
| Poletti <i>et al.</i> (2015) | The ability to impose retaliatory measures increases the complainant's bargaining power | The complainant's trade power may influence the result |
| Johns and Pelc (2016) | The number of third parties reduces the likelihood of an early conclusion of a trade dispute. Therefore, some states decide not to participate in a trade dispute as a third party | The number of third parties defines the duration of the trade dispute |
| Maggi and Staiger (2018) | The type of trade dispute affects the possibility of its early conclusion and the outcome | It is necessary to include variables that consider different types of trade disputes. It is possible to add a type of trade dispute depending on the category of the contested measure (tariff/non-tariff) |

Source(s): Own elaboration

Table 1.
Factors predicting the probability of winning a trade dispute

To identify non-tariff restrictions, countries analyse incoming requests from exporters, use the services of trade representative offices, etc. The identification of illegal non-tariff restrictions requires an appropriate level of training of national specialists, the organization

of a system of regular monitoring of emerging restrictions through the analysis of national reports, requests from national companies, etc (Santana and Jackson, 2012). Thus, the subject of a trade dispute and its industry orientation directly affects the expected result of a trade dispute.

As a result of the literature review, we formulated the key hypotheses of the study:

- H1. The more countries involved in the trade dispute, the more likely it is to be won by the complainant.
- H2. A trade dispute related to the introduction of a tariff is more likely to be won by the complainant.
- H3. Participation in a trade dispute between major actors such as the US and the EU might affect the outcome of the trade dispute.
- H4. The “lost-in-translation” effect means a trade dispute is more likely to be won by the complainant.

2.1 Hypothesis 1

The more countries are involved and interested in a trade dispute, the higher the level of supervision of the trade dispute investigation. As a result, the complainant wins trade disputes more often. A similar hypothesis was tested by Busch and Reinhardt (2006). The third parties are also interested in the abolishment of trade measures, meaning that the respondent cannot easily stop the trade dispute, especially when third parties are actively involved (Beshkar, 2016). It is more difficult for more parties to agree among themselves. Ignoring the wishes of third parties may lead to a similar trade dispute with another complainant or increase its duration.

2.2 Hypothesis 2

This hypothesis assesses how the cause of a trade dispute affects the probability of winning. The subject of a trade dispute affects its result (Bearce *et al.*, 2015). Non-tariff measures are less clear and, therefore, more difficult to analyse (Niu *et al.*, 2018). To search for prohibited non-tariff restrictions, the national authority must receive an application from a company that has encountered a restriction or independently monitor the legislation. With tariff restrictions, the transaction costs of searching for information are significantly lower. Tariff restrictions are more transparent, and a complainant can easily prove a violation of WTO rules in a trade dispute.

2.3 Hypothesis 3

The participation of the EU or the US can bias the outcome. The involvement of parties with high human and economic potential has a substantial impact on the respondent. A similar idea was explored by Brutger and Morse (2015). Due to the significant experience of the US and the EU in participating in trade disputes, their position could significantly impact the outcome of the trade dispute. The positions of these stakeholders are of significant interest in the analysis of a trade dispute.

2.4 Hypothesis 4

Linguistic and economic experts determine the complexity of identifying a violation of WTO rules, connected with the language of national legislation. Difficulties may arise when analysing original documents written in another language; analysing a document written in English simplifies the process. Therefore, it is necessary to involve country experts who can

correctly evaluate incoming information. Translating and confirming the entire body of documentation can negatively affect the process of resolving a trade dispute. It may lengthen the process itself or create confusion stemming from inaccurate translation.

If these hypotheses are confirmed, they can be used to predict the outcome of a trade dispute. Our research focuses on deciding whether to participate in a trade dispute at an early stage. All factors used in the model are available to all parties at the consultation stage before countries proceed to the trade dispute resolution stage.

3. Method

We focus mostly on the institutional characteristics of a trade dispute and only consider the data available at the consultation stage. Predicting the outcome of a trade dispute at the consultation stage is more important to the respondent. The complainant has already started the consultation, which means it has assessed its chances of winning. At this point, the respondent must make a strategic decision to continue the trade dispute or to resolve it at the consultation stage. To do this, the respondent evaluates its chances of winning.

To analyse the factors affecting a trade dispute result, we propose an econometric model based on publicly available data on trade disputes on the WTO website (WTO, 2020a). Understanding whether a country has won the trade dispute or not is of the most significance. For our model, RESULT is a variable, which estimates the outcome of a trade dispute from the complainant's point of view. RESULT is represented as a dummy variable, which takes the value 1 if the complainant won, and 0 otherwise. If all the measures requested by the complainant were fulfilled, the trade dispute is considered won (for example DS87). If the parties reach an agreement during a trade dispute, the complainant has won the case. In other words, the complainant would not settle for an agreement without satisfying its demands. Agreement before the final decision is a win for the complainant (DS1). If the trade dispute has not been terminated, then the complainant loses the case (DS51). The trade measure is active throughout the trade dispute and is still in effect if the trade dispute has not ended. The cases for which a panel was established, but a report was not composed were considered a loss for the complainant (DS260).

Table 2 shows the two groups of variable macroeconomic factors and institutional features used in the model. All the data are available at the consultation stage. At this stage, the stakeholders can better assess the probability of winning a trade dispute with the data available. The data include a group of macroeconomic and institutional parameters. The institutional parameters contain information about the subject of the trade dispute, the presence of problems with a lack of human capital due to an insufficient number of necessary experts, etc. It is useful to assess the presence of distorting effects on the outcome of a trade dispute for countries (and unions) with significant experience in participating in WTO trade disputes. For example, as of 2021, the US has participated in the resolution of the trade dispute as a complainant 124 times and the EU 104 times. Such countries can influence the outcome of trade disputes as well as their duration. We used dummy variables, evaluating the type of participant depending on the target variable. Although continuous variables provide richer information than simple dummy variables, they are less relevant in terms of our hypotheses.

The model was formed using the binary probit model (Agresti, 2007). A probit regression of the following type is used:

$$Y_i = \beta M_i + \gamma I_i + e,$$

where the dependent variable Y_i reflects the result of trade dispute i , M_i is the set of macroindicators for the trade dispute i , I_i is the set of institutional indicators for trade dispute i and e is the error term. The parameters β and γ determine the effect of the variables on

| Variable name | Definition and description | Source |
|--|--|----------------|
| <i>Macroeconomic factors</i> | | |
| LNEXPORT_COMPLAINANT | Logarithm of the merchandise complainant's export | UNCTAD website |
| LNEXPORT_RESPONDENT | Logarithm of the merchandise respondent's export | UNCTAD website |
| LNGDP_COMPLAINANT | Logarithm of the complainant's GDP | UNCTAD website |
| LNGDP_RESPONDENT | Logarithm of the respondent's GDP | UNCTAD website |
| <i>Institutional features of trade dispute</i> | | |
| NUMBER_OF_THIRD_PARTIES | Number of countries participating in a trade dispute as third parties | WTO website |
| COMPLAINANT_ENGLISH | Whether the mother tongue in the complainant country is English or not | WTO website |
| RESPONDENT_ENGLISH | Whether the mother tongue in the respondent country is English or not | WTO website |
| EU_PARTICIPATION | Participation of the EU in the trade dispute as a third party (0 – no, 1 – yes) | WTO website |
| US_PARTICIPATION | Participation of the US in the trade dispute as a third party (0 – no, 1 – yes) | WTO website |
| GATT_WTO_COMPLAINANT | Whether the complainant participated in GATT (0 – no, 1 – yes) | WTO website |
| GATT_WTO_RESPONDENT | Whether the respondent participated in GATT (0 – no, 1 – yes) | WTO website |
| TARIFF_1_OT_NON_TARIFF | Whether the trade dispute is associated with tariff restrictions or not. (0 – no, 1 – yes) | WTO website |
| Type_goods | Whether the trade dispute relates to trade of goods (0 – no, 1 – yes) | WTO website |
| Type_services | Whether the trade dispute relates to trade of services (0 – no, 1 – yes) | WTO website |
| Type_interl_property | Whether the trade dispute connected with trade of intellectual property (0 – no, 1 – yes) | WTO website |
| Source(s): Own elaboration | | |

Table 2.
List and description of variables

the result of the trade dispute. Macroeconomic indicators pertain to the year when the consultations commenced.

All the data were taken from the UNCTAD website (UNCTAD, 2020) and WTO (WTO, 2020a). To build an econometric model, we collected 488 observations representing information about trade disputes and their participants from 1995 to 2014. This period was chosen because most trade disputes initiated after 2014 had not been resolved at the time of writing. Calculations were carried out for all available indicators during the analysed period.

4. Results

We formed a full model and then improved the model to get one with significant variables. We chose the model with significant variables as it provides better prediction results in terms of the classification table. The results of the full model (Model 1) and model with significant variables (Model 2) are in Table 3.

We have a low Prob (LR statistic) value. Most of the factors are significant at the 10% level. The level of McFadden *R*-squared can be described as normal and was better than

| Variable name | Full model (Model 1) | Model with significant variables (Model 2) | Marginal effects |
|-------------------------|----------------------|--|------------------|
| LNEXPORT_COMPLAINANT | -0.0613576 | | |
| LNEXPORT_RESPONDENT | 0.0347772 | | |
| LNGDP_COMPLAINANT | 0.0891994 | | |
| LNGDP_RESPONDENT | -0.0289486 | | |
| NUMBER_OF_THIRD_PARTIES | 0.074155*** | 0.0803761*** | 0.0243488*** |
| COMPLAINANT_ENGLISH | -0.0410067 | | |
| RESPONDENT_ENGLISH | 0.100975 | | |
| EU_PARTICIPATION | 0.7493768*** | 0.6847599*** | 0.2074381*** |
| US_PARTICIPATION | 0.661376*** | 0.5679135*** | 0.1720412*** |
| GATT_WTO_COMPLAINANT | 0.6582899** | 0.6572437** | 0.1991024** |
| GATT_WTO_RESPONDENT | 0.396937 | | |
| TARIFF_1_OT_NON_TARIFF | 0.306284* | 0.2878889* | 0.0872118* |
| Type_goods | 3.806586 | | |
| Type_services | 4.260496 | | |
| Type_intel_property | 4.964844 | 1.218118*** | 0.3690111*** |
| C | -5.820061 | -1.064378*** | |
| Prob > χ^2 | 0.000000 | 0.000000 | - |
| R ² | 0.2171 | 0.2048 | - |
| Observations | 486 | 488 | 488 |

Note(s): Asterisks indicate the *p*-value: ****p* < 0.01, ***p* < 0.05 and **p* < 0.1
Source(s): Own elaboration

Table 3.
The econometric modelling results

the other models under consideration. The descriptive statistics support the results of our Model 2 (Table 4). Furthermore, in this model, there are no censored observations

The descriptive statistics show that most trade disputes are non-tariff. As tariff measures are more transparent, the complainant can prove their position to the respondent before the consultation stage commences. As a rule, the contradictions in tariff measures are resolved bilaterally and do not reach the consultation stage. Descriptive statistics on the number of third parties show a spread in their number, which partially confirms (Johns and Pelc, 2016).

For the econometric model with significant variables, a binary probit regression was used. The correlations between variables in the model with significance variables are low. We can estimate the prediction strength of the improved regression (Table 5). For this purpose, we use the ROC curve (Figure 1). The receiver operating characteristic (ROC)-curve and hit-miss table are standard instruments to estimate the predictive power of a model.

In our model, macroeconomic factors are not significant, so we exclude them. The significance of trade and macroindicators has been proved (Bown, 2004c). Our result correlates with the emphasis on the institutional characteristics of trade disputes. The complainant's participation in the GATT system demonstrates their previous experience in

| Variable | Obs | Mean | SD | Min | Max |
|-------------------------|-----|-----------|-----------|-----|-----|
| NUMBER_OF_THIRD_PARTIES | 488 | 4.436475 | 6.018116 | 0 | 37 |
| Type_intel_property | 488 | 0.0696721 | 0.2548549 | 0 | 1 |
| TARIFF_1_OT_NON_TARIFF | 488 | 0.2438525 | 0.4298454 | 0 | 1 |
| US_PARTICIPATION | 488 | 0.2520492 | 0.4346349 | 0 | 1 |
| EU_PARTICIPATION | 488 | 0.307377 | 0.4618805 | 0 | 1 |
| GATT_WTO_COMPLAINANT | 488 | 0.9262295 | 0.2616653 | 0 | 1 |

Source(s): Own elaboration

Table 4.
Descriptive statistics for significant variables

| Variable name | Coefficient | DS560 | DS561 | DS562 | DS563 | DS564 | DS565 | DS566 | DS567 |
|------------------------------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| NUMBER_OF_THIRD_PARTIES | 0.0803761 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| EU_PARTICIPATION | 0.6847599 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| US_PARTICIPATION | 0.5679135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GATT_WTO_COMPLAINANT | 0.6572437 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| TARIFF_1_OR_NON_TARIFF | 0.2878889 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| Type_intel_property | 1.218118 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| C | -1.064378 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| x*b | | -0.119245 | -0.119245 | -1.064378 | -1.064378 | 0.7598822 | -0.776489 | -0.119245 | 0.8109837 |
| $\Phi(xb)$ | | 0.4525405 | 0.4525405 | 0.1435787 | 0.1435787 | 0.7763375 | 0.2187301 | 0.4525405 | 0.79131248 |
| Possibility to win for complainant | | 45.25% | 45.25% | 14.36% | 14.36% | 77.63% | 21.87% | 45.25% | 79.13% |
| Source(s): Own elaboration | | | | | | | | | |

The possibility
to win a WTO
dispute

Table 5.
The possibility of
winning for
complainants in trade
disputes

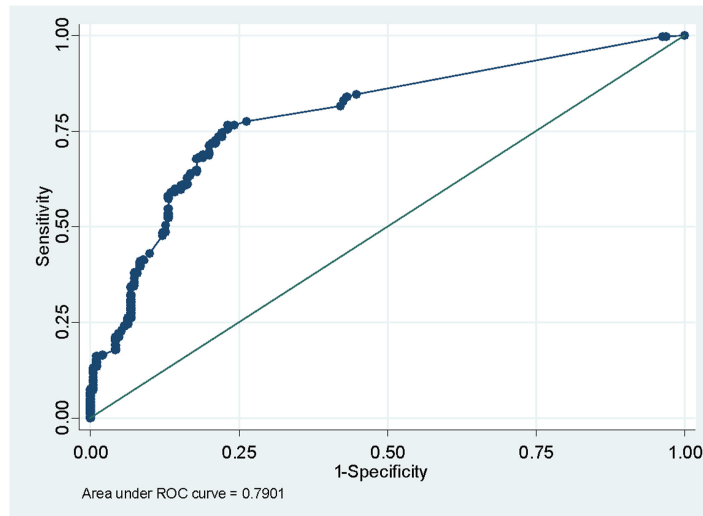


Figure 1.
The graph under
ROC curve

Source(s): Own elaboration

resolving trade disputes, translating into a higher chance of winning. Previous research has demonstrated that experience can affect the outcome of a trade dispute (Li, 2012).

To investigate the “lost-in-translation” effect, we considered whether the national language of the respondent is English; the complainant has an advantage and a higher chance of winning since it is much easier to analyse the paperwork in English. The complainant has a chance to estimate whether they have enough experts to carry out a trade dispute before its commencement if the respondent provides documents in a language other than English. However, the variable defining the “lost-in-translation” effects is not significant in terms of the result, but it could influence the duration of the trade dispute.

We have also demonstrated that the result is influenced by its type and by significant actors such as the EU and the US. The characteristics of the dispute affect the duration of negotiations and the probability of winning.

ROC curve is used to calculate the quality of binary modelling. We are mostly interested in the meaning of the area under the ROC curve (AUC). For our model, the AUC is equal to 0.7901 [2]. This means that the predictive strength of our model is significant. To analyse the predictive strength of our model, it is also possible to create a prediction matrix. The data were classified as significant if $\Pr(D) \geq 0.5$. The matrix demonstrates that the percentage of correctly predicted trade dispute results is 76.64% (Model 2). Having calculated the classification table for the model with the full number of variables, the matrix demonstrated that it correctly predicted 75.72% (model 1). This value is lower than for a model with significant variables. Henceforth, Model 2 was chosen for further analysis. Average marginal effects that estimate the coefficients for the significant variables are used to analyse the influence of the factors. Our variables have a positive effect on the complainant’s probability of winning. The main factors affecting the probability of losing or winning the trade dispute for the respondent are shown in Figure 2. The respondent can use these indicators at the consultation stage, calculating the probability of the complainant’s chances of winning.

Every additional participant as a third party (NUMBER_OF_THIRD_PARTIES) increases the possibility of winning for a complainant. The coefficient is 0.0243488. This means that an

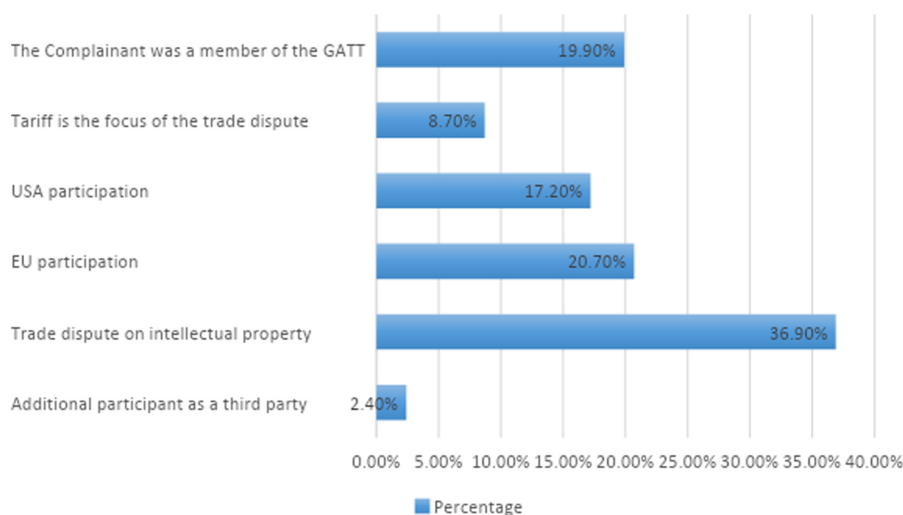


Figure 2. Factors affecting the complainant's probability of winning

Source(s): Own elaboration

increase by one-third party member leads to a 2.4% increase in the complainant's probability of winning, and a respondent should monitor the potential participation of third parties. It is more difficult to make a bilateral agreement, which would suit all countries. If a respondent expects high third-party interest, it should fulfil all the requirements of the complainant. A complainant can ask the other WTO members about their interest in participating in the trade dispute. If other member states want to participate, the complainant should initiate the trade dispute. This result corresponds to [Johns and Pelc \(2014\)](#) and confirms their concept formulated ([Johns and Pelc, 2016](#)). Particularly, the more participants in the trade dispute, the longer the official process.

The trade dispute on intellectual property (Type_intel_property) increases the complainant's probability of winning by 36.9%. Intellectual property issues are important for a complainant from a financial point of view. Intellectual property regulation is one of the fastest-developing regulatory areas. Many countries have accumulated considerable experience in the protection of intellectual property rights. Therefore, disputes related to intellectual property demonstrate more probability of the complainant's victory.

EU participation as a third party (EU_PARTICIPATION) also increases the possibility of winning for a complainant by 20.7%. Our hypothesis about the biased effects of large countries' participation in a trade dispute is supported.

US participation as a third party (US_PARTICIPATION) increases the complainant's probability of winning by 17.2%. A respondent can also analyse the possibility of the US participation to make a strategic decision about continuing with a trade dispute.

Trade disputes are associated with tariff restrictions (TARIFF_1_OR_NON_TARIFF). Disputed tariff restrictions increase the complainant's probability of winning by 8.7%. If the trade dispute problem is linked with a duty or tariff, this trade dispute is more likely to be lost by a respondent. This result is mostly correlated with the ease of examining tariff measures in WTO rules. It is harder to define and calculate the non-tariff restrictions and their influence. This result was also supported by [Kuenzel \(2017\)](#).

A complainant, *who participated in GATT*, had obtained experience in a previous trade dispute system and, therefore, held a better chance of winning. Being a member of GATT

(GATT_WTO_COMPLAINANT) increases the complainant's probability of winning by 19.9%.

Our suggested approach can be applied to the calculation of the probability of winning in trade disputes that are not yet finished. We took several trade disputes at the consultation stage and collected the statistics suggested by our model. We have chosen the following disputes (WTO, 2020a):

- (1) DS560 "Mexico – Additional Duties on Certain Products from the United States";
- (2) DS561 "Turkey – Additional Duties on Certain Products from the United States";
- (3) DS562 "United States – Safeguard Measure on Imports of Crystalline Silicon Photovoltaic Products";
- (4) DS563 "United States – Certain Measures Related to Renewable Energy";
- (5) DS564 "United States – Certain Measures on Steel and Aluminium Products";
- (6) DS565 "United States – Tariff Measures on Certain Goods from China II";
- (7) DS566 "Russian Federation – Additional Duties on Certain Products from the United States";
- (8) DS567 "Saudi Arabia, Kingdom of – Measures concerning the Protection of Intellectual Property Rights".

These trade disputes are at the stage when a respondent must make a strategic decision on whether to fulfil all the requirements of a complainant or to continue a formal trade dispute. For calculation, we used the model with significant variables (Table 5). Results are presented in Table 5. The member country that is deciding whether to continue trade disputes or implement all claims needs only information available at the consultation stage.

Our model has demonstrated the real possibility of winning trade disputes. Our results show that only DS562 (14%), DS563 (14%), DS565 (22%) and DS560, DS561 and DS566 (45%) have a low probability of winning for a complainant. The respondent can decide that these disputes can be won. There is a chance that the respondent could lose the trade disputes DS564 (78%) and DS567 (79%). DS567 is related to intellectual property rights, which greatly increases the complainant's probability of winning. The respondents in DS564 and DS567 should not continue the trade dispute. They will possibly have to fulfil all the claims of the complainant at the consultation stage.

5. Discussion

The results demonstrate that respondents in a trade dispute can assess the probability of victory at the consultation stage and decide on meeting the complainant's requirements. The improved mechanism of punishment in the system of trade disputes may induce the respondent to meet all the WTO requirements. In this case, the practical implications of our results will significantly increase. Countries with a low probability of success can agree in advance to the complainant's claims. Thus, the costs of conducting a trade disputes will be reduced. Participants will focus on those trade disputes where they have a high probability of winning. The latter will also reduce the load on DSB.

From a theoretical point of view, the study confirms the influence of institutional factors on the probability of winning a trade dispute. Stakeholders should consider the previous experience of the complainant and the respondent in trade disputes. Our research proved Hypothesis 1, Hypothesis 2 and Hypothesis 3. The subject of the dispute significantly impacts

its result. The empirical results prove that the trade disputes on intellectual property and tariff restrictions increase the complainant's probability of winning.

Hypothesis 4 on "lost-in-translation" effects was not proved. The "lost-in-translation" effect might, however, affect the duration of a trade dispute. The existence of the "lost-in-translation" effect might be tested by demonstrating that the trade dispute outcome depends on the institutional characteristics of the complainant and respondent. Knowledge of foreign languages, legal and economic instruments can be decisive for a trade dispute outcome. An additional test of the hypothesis of the "lost-in-translation" effect should be the subject of another study.

Further research should be related to the expansion of the set of institutional variables. Countries can use the proposed approach when assessing the probability of winning a trade dispute, considering the internal information available to participants before formally registering a trade dispute. It is possible to use information about the profile of the experts involved in resolving a trade dispute. This information should be aimed at assessing the contribution of experts' human capital to the outcome of resolving a trade dispute and may include information about their level of education, experience in trade disputes, knowledge of foreign languages, etc. The presence of professional connections can also play a role in the process of resolving a trade dispute (Larrosa, 2019).

Another area of further research may be the assessment of the duration of the trade dispute. A trade dispute is the result of the failure of economic diplomacy between countries when national state bodies cannot agree at the bilateral level. For the complainant, the trade dispute is extremely unprofitable since the contested measure continues to operate before the final decision. As a result, it may lose its competitive advantage. The duration of trade disputes can be extremely long, for example, DSB3 took 26 years of consultations, and DSB226 took 20 years of consultations. As a result, the complainant should assess the predicted duration as well as the probability of winning before initiating a trade dispute. If the trade dispute is expected to continue for a long period, additional actions to resolve the situation at an early stage might be required. Thus, further research should be aimed at developing an approach to predict the duration, as well as the probability of winning it at various stages of a trade dispute.

6. Conclusions

In this research, we suggest that the respondent decides whether it is reasonable to continue the trade dispute process or fulfil all claims at the consultation stage to avoid the costs associated with further participation and the loss of international prestige. Deciding to participate in a trade dispute at the consultations stage allows for optimizing the resources of the stakeholders until the "active" phases of the trade dispute. A correct assessment of the probability of victory will allow the respondent to optimize their actions by focusing on the most promising trade disputes. Furthermore, it reduces the load of the DSB by focusing on disputes with more equal chances of the complainant and the respondent winning.

The results of this study will increase their relevance after the modernization of the system for resolving trade disputes. The mechanism for resolving trade disputes plays a key role in the effectiveness of the entire WTO system due to the presence of real economic levers ensuring that countries fulfil their obligations (Isachenko and Saveliev, 2019). The results of our study can optimize the number and duration of trade disputes, which is one of the causes of the current WTO crisis (Kalachyhin, 2021).

This approach aims to increase the efficiency of participation in the WTO trade dispute system. We hope our research will be useful for respondents and provide them with information about the chances of winning a WTO trade dispute at the consultation stage, potentially saving effort, time and money.

Notes

1. In practice, this leads to the introduction of specialized centres to deal with disputes. These centres are interested in collecting information on the trade dispute process and estimating the chances of success. Its main goal is to request the initiation of trade dispute proceedings in the WTO.
2. The higher the AUC, the better the prediction result. The robustness tests show the results of the improved model are robust.

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