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On the Determinants of Sanctions Effectiveness: An Empirical Analysis by Using Duration Models

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Abstract: Sanctions are a recurrent issue on the international scene that has gained relevance in recent decades. This article intends to approach this matter in an innovative way by analyzing the relative importance of sanctions' types and objectives, besides target countries' characteristics, on sanctions outcomes. Unlike most previous studies, we use more comprehensive data and a competing risk discrete-time hazard model to analyze the differences between sanctions termination by target compliance and sender capitulation. Our results show that the determinants for the two outcomes differ and that there are differences in the efficacy of sanctions according to their type and objective. We conclude that while higher levels of political volatility, democracy, and equality in target countries increase the probability of compliance, higher levels of democracy and globalization increase the probability of sender capitulation. Smart sanctions seem to be more effective at targeting compliance, as the likelihood of compliance is higher for financial and military sanctions than for trade. The likelihood of compliance also increases if the objective is to promote democracy and decreases if the objectives are policy, regime change, or terrorism. Instead, the probability of sender capitulation is higher for travel and trade sanctions and if the objective is to promote human rights.

Keywords: sanction objectives; sanction types; sender capitulation; target compliance; duration models

1. Introduction

With the advance of economic globalization, several instruments emerged that have been used by countries or institutions with the purpose of influencing the behavior of other countries, with sanctions being one of these mechanisms. These sanctions gradually increased in the post-Cold War period and have captured the interest of academics and politicians, generating multiple debates and placing them at the center of international politics. However, economic science has not consolidated a robust theoretical and methodological basis to study its impacts, despite the evidence of its effect on reducing economic growth, employment, and purchasing power in target countries.

Sanctions imposed by multilateral organizations, individual states, or coalitions of states (sanctioners) on other countries (sanctioned) are a mechanism for putting pressure on the policies of some countries in order to change them. According to Lopez and Cortright (1995), sanctions lie between the traditional diplomatic approach and the military route, so their imposition encounters less national and external resistance as they are seen as a substitute for military action. Sanctions can have different purposes, namely promoting human rights and democracy, combating terrorism and nuclear proliferation, destabilizing autocratic regimes, and accelerating the resolution of military conflicts. Sanctioning entities may limit trade or foreign aid to target countries, restrict travel, block assets, and deny access to financial institutions to specific individuals or groups.

The literature on sanctions has focused on different aspects, from their causes to their impacts and their effectiveness, i.e., the degree of success obtained. Indeed, assessing

whether sanctions incite changes in a country's conduct or whether they end up without obtaining any concessions is relevant for policy design. Alongside the extent and nature of changes in target states, some studies have analyzed the duration of sanctions, a relevant aspect for sender states (Bolks and Al-Sowayel 2000; Krustev and Morgan 2011; Attia et al. 2020), which have increasing costs with the duration of sanctions. Some authors have analyzed the factors that lead to the rescission of sanctions (Bolks and Al-Sowayel 2000; McGillivray and Stam 2004; Allen 2005), whether by successfully changing the behavior of the sanctioned state or by the capitulation of the sender state.

Despite the long use of sanctions, their real contribution to changing the policies of target countries has been highly contested (DuBard 2021). On this issue, the profuse literature on sanctions in economics and political science has generated a diversity of results that do not allow robust and unequivocal conclusions to be drawn about their effectiveness (Elliott and Hufbauer 1999; Beladi and Oladi 2015). Indeed, there have been several perceptions about the success of sanctions, as economics evaluates them based on their economic impacts, while political science evaluates them against the fulfillment of objectives.

Political science has been looking for arguments that rationalize the inconsistency: if sanctions have not been effective in achieving the stated objectives, why do they continue to be applied at an increasing rate? Several explanations have been advanced for such a pertinent question. In a seminal study, Barber (1979) identified three categories of sanctions objectives: the primary ones, focused on the behavior and policies of the targets; the secondary ones, related to the international status of sanctioners; and the tertiary ones, which concern the structure and functioning of the international system. Further to this argument, Kaempfer and Lowenberg (2007) argue that stated and real objectives are different, especially when one of the purposes is to support domestic interests, while Lindsay (1986) argues that sanctions aim at symbolic objectives.

In this context, to understand the factors that influence the duration and effectiveness of sanctions, it is necessary to consider the political and economic structures of both target and sender states. Furthermore, it is of crucial importance to understand the impact of the characteristics of the types of sanctions and their objectives. Despite the profuse literature on international sanctions, there is little research on the influence of target country characteristics, sanction types, and objectives on the duration of sanctions and the way they end. When the influence of the attributes of the target country on the outcome of sanctions is explicitly considered, as well as the type of sanctions and their objectives, we broaden the debate on their effectiveness.

In this perspective, to expand knowledge of the process and results of economic sanctions, we believe it is relevant to articulate the perspectives of economics and political science. In our study, we try to follow this approach and seek to build on previous research in a number of different ways. First, we explicitly include in the analysis variables related to the economy and political system of the sanctioned countries, as well as the different types of sanctions and their objectives. Second, we use version 2 of the Global Sanctions Data Base (GSDB), which covers a wider number of sanctions and a more recent period when compared to previous studies on sanctions duration. Finally, we employ a competing risk discrete-time hazard model to analyze the determinants of sanctions' duration, which is not a common methodology used in previous studies. This approach allows us to compare the likelihoods of sanctions ending through target compliance or sender capitulation and to consider sanctions that have not yet terminated. Furthermore, we can model the impact of explanatory variables on the sanctions' outcomes over time. We thus use a more comprehensive approach to sanctions, not only through the use of (potentially) explanatory variables of different nature but also through several facets related to sanctions, namely, their duration, results, and types/objectives.

That being said, the article proceeds by reviewing the literature, which is followed by the presentation of the materials and methods hereby used. After that, the results are presented and discussed. The last section concludes as usual.

2. Literature Review

International sanctions and the debate over their effectiveness and the extent of the costs they entail are at the heart of international politics. International sanctions have been around for a long time, with their most expressive use in the post-Cold War period. For a long time, sanctions only implied restrictions on foreign trade, which are known as conventional sanctions. More recently, targeted sanctions have been used, named 'smart' sanctions, which include financial and travel restrictions and arms embargoes, seeking to more effectively reach social strata linked to the economic and political elite of the target state and, at the same time, to protect more vulnerable social groups (Hufbauer and Jung 2020). Such an evolution is legitimized by the impacts of sanctions on the most disadvantaged population of the target country (Hoskins 1997; Alnasrawi 2001; Petrescu 2016). Hence, smart sanctions have been gaining more expression (Weiss 1999; O'Sullivan 2003; Kaempfer and Lowenberg 2007; Drezner 2011).

In fact, financial and travel restrictions, by their nature, seem to reduce collateral damage, affecting mainly the elites of the target state. As these have greater influence on the governments of the countries, they can cause changes in their behavior, leading them to comply with what is required by the sanctioning entity. They will be 'fairer' than trade sanctions, which cause losses for producers and consumers in the target country, via 'spillover' effects (Ahn and Ludema 2020), but will have a slight effect on financial and political elites (Lektzian and Souva 2003).

The seminal approach to smart sanctions occurred within the scope of political science, and only more recently has economic science studied this type of sanction (Beladi and Oladi 2015; Ahn and Ludema 2020). In fact, according to Felbermayr et al. (2021), the combination of political and economic visions will be more adequate to understand its effects and success. In this line, Beladi and Oladi (2015) use a game theory model for an oligarchic economy and consider that a reduced group of agents with economic power can influence the government, generating situations of exchange of favors, often linked to corrupt activities.

The result of the imposition of smart sanctions has allowed some conclusions to be drawn. Their effectiveness seems to increase with the level of per capita income in the target country. Furthermore, there is an argument in favor of smart sanctions when there is a strong oligarchic economy (Beladi and Oladi 2015). The literature also recognizes that sanctions are more effective the greater the cost inflicted on sensitive economic sectors of the target country (Bapat et al. 2013). In this respect, Ahn and Ludema (2020) admit that smart sanctions are less effective when the government of the target country strategically protects those economic sectors.

Most conventional sanctions include restrictions on international trade, so external dependence has been considered an influential factor in the results of sanctions. The theoretical expectation is that the greater the trade dependence of the target countries, the greater the incentive for them to give in to the pressure exerted by sanctions on their economies. However, most studies do not recognize that the degree of economic dependence of targets has a significant effect on the decision to resist sanctions or to capitulate (Bapat et al. 2013; Jeong and Peksen 2019). The ability of target countries to survive economic pressure depends on their ability to create new commercial and financial relationships with third countries (Peksen and Peterson 2016) and also to resort to the black market and other illicit channels to access external goods and services or to sell their own goods (Early and Peksen 2019).

Sanctions also have effects on the sender country, and the negative impacts can lead to their failure (Besedeš et al. 2021). This is due to the target country's inter-firm relations with non-sanctioned countries, which may also have economic relations with the sender state. Therefore, through the triangulation of business networking, sanctioned and sanctioning countries continue to interact through companies from a third country (Crozet et al. 2021). The well-known "black knight" effect occurs when relevant companies in the sender state put pressure on their governments not to impose (or withdraw) sanctions.

The authors studied Germany's financial sanctions between 1999 and 2014, considering the economic relevance of the target country. From the analysis, they conclude that, with exceptions such as Russia, financial restrictions were imposed on countries with little relevance for the German economy, allowing firms to redirect their activities to non-sanctioned states. Thus, a possible explanation for the performance indicators of firms in the sender country not having the expected negative effect has to do with the diversion of activities to third countries.

The existence of third countries with which the sender or target country has some kind of relationship (friendship or enmity) is relevant to the success of sanctions (Kwon et al. 2022). The network of stakeholders involved in the sanctioning process was studied by Joshi and Mahmud (2020) when addressing the impacts on the sender entity that may jeopardize the issuance or continuity of sanctions. In fact, sanctions have redistributive effects in sender countries and in target countries and may operate as 'bust' effects since sectors affected by the recessive effect of sanctions may oppose their imposition (Besedeš et al. 2021).

With regard to the sender entity, the literature has stressed the influence of its characteristics on sanctions effectiveness. For example, in the case of the EU, it will be difficult for any member state not to comply with sanctions, as the legal framework that supports them is approved in the Council by a qualified majority and is binding on all members. The cultural and historical attributes of the entities involved in the sanctioning process, something neglected in the literature, must also be considered (Kaempfer and Lowenberg 2007).

Sanctions can be imposed by a country or by a supranational entity; the effects of unilateral and multilateral sanctions are diverse. In general, the results indicate that multilateral sanctions are more effective as a result of international cooperation (Early and Spice 2015), since they impose a higher cost on the target by reducing its ability to find alternative markets that help to circumvent the effects of sanctions (Joshi and Mahmud 2020). The greater effectiveness of multilateral sanctions may also result from differences in decision-making processes in both situations, as shown by Weber and Schneider (2020) when comparing US and EU sanctions. Given the institutional characteristics of the EU, where there can be conflicts of interest among members over sanctions, approval will be more difficult than in the US. Possible conflicts of interest mean that sanctions in the EU are less likely and less severe as the economic ties of EU member states with the target country increase.

In addition to economic impacts, sanctions have political effects (Kaempfer and Lowenberg 2007; Krustev and Morgan 2011). For this approach, the nature and extent of sanctions are defined by pressure from interest groups in the political system of the sender state. The authors also argue that the political effects of sanctions on the target country are sometimes perverse, as they contribute to increasing popular support for the regime, which thus sees itself as more legitimized to oppose compliance with the sanction's requirements.

The relationship between the duration and effectiveness of sanctions has also been discussed in the literature. It has generally been concluded that the duration of sanctions is negatively related to their effectiveness (Hufbauer et al. 1990; Drury 1998; Kaempfer and Lowenberg 2007; Bolks and Al-Sowayel 2000). The explanation for this fact seems simple since the sanctions that prove to be the most effective are, by nature, those that most quickly generate the desired effects, inducing a faster termination.

The time that a sanction takes to produce effects seems to be linked with whether or not there was a threat to the target country in the period prior to its imposition. Weber and Schneider (2020) then argue that US-imposed de facto sanctions are a 'negative' selection of these cases (including unrealized threats) and therefore less successful than EU-imposed de facto sanctions. Studies with data on effective sanctions—based on databases—may have this selection bias (Kaempfer and Lowenberg 2007; Nooruddin 2002; Miller 2014).

The effectiveness of sanctions depends on what is meant by success, an issue on which there is no consensus. For example, of the 115 episodes of sanctions considered in Hufbauer et al. (1990), 40 (i.e., 34%) were classified as successful cases. Applying a more restricted notion of success to the same sample, Pape (1997) only validated five cases of

success.[1] Other authors adopt a broader notion of success, understanding that this occurs when the target country sufficiently changes its behavior (Baldwin 1985).[2]

There is an understanding that the bargaining process and the costs that countries bear influence the duration of sanctions. As for bargaining, the inherent coercion in the sanction tries to get the target state to adjust its behavior to that required by the sender. However, if this does not occur, the sender entity will recognize its ineffectiveness and/or the costs it bears, and the sanction will end. According to Krustev and Morgan (2011), the bargaining factors are relevant, but their impact decreases with the duration of the sanction. Rather, domestic realignments due to rising sanction costs become crucial as sanction duration rises. Thus, the authors maintain that, in general, most of the short episodes of sanctions can be explained by the bargaining mechanism, and the longer ones are justified by their redistributive nature.

The way in which the sanction ends (due to compliance with the requirements by the target or by the sender party's capitulation) is also a relevant topic, although it has received little attention in the empirical literature. Exceptions are Krustev and Morgan (2011), Attia et al. (2020), or Early (2011). The end of the penalty for compliance seems to be all the more likely the higher the costs for the target state, the lower its economic power, and the greater the volatility of its political regime. On the other hand, the end of the sanction by sender capitulation is more likely the higher the cost to the country, the more intense the economic and political links with the target, and the greater the political volatility in the sender entity.

In short, from what has been mentioned, the issues associated with sanctions are multiple and complex. For a tabular view of the literature, see Table S1 in the Supplementary Material. Not neglecting what the theory proposes, it is our objective to expand the degree of knowledge about the explanatory factors of the success (and failure) of sanctions using an econometric model, deliberately considering some factors that, until now, as far as we know, were not considered in the literature. See Table S2 in the Supplementary Material for a tabular view of the empirical references using duration models.

3. Methodology

In order to investigate the determinants of sanctions' outcomes, we use data for a wide number of different countries since the post-Cold War period up until recently. We consider information about the number and characteristics of the sanctions from the Global Sanctions Data Base (GSDB—https://www.globalsanctionsdatabase.com/, accessed on 1 November 2022); (Felbermayr et al. 2020). This dataset covers 1101 publicly traceable multilateral, plurilateral, and purely bilateral sanction cases over the 1950–2019 period. It contains data on the types of sanctions, their objectives, and the perceived degree of success of each identified sanction. Hence, the dataset allows us to consider a wider number of senders and a more recent period when compared to previous studies. In fact, unlike prior studies, which typically focus on US and EU sanctions, we include information on sanctions imposed by other states as well as by the United Nations and other organizations.

After eliminating missing values, our sample contains a total of 539 sanctions that started between 1994 and 2018. Of all sanctions, a total of 152 were imposed by the US alone (87 have been terminated), 53 by the EU (42 have been terminated), and 48 by the UN (30 have been terminated). The average duration of sanctions is 4.75 years, and as we can see in Figure 1, 70% of sanctions last less than 6 years.

Contrasting with most previous studies about sanctions termination (exceptions are Early 2011; Krustev and Morgan 2011; Attia et al. 2020), we differentiate between the ways they end: by target compliance or by sender capitulation. We use the information from the "success" variable on the Global Sanctions Data Base and consider that sanctions end by target compliance if either they are total or partially successful or if they finish as a result of a negotiation settlement. Sanctions end in sender capitulation when they are coded as failures. In total, 362 sanctions have been terminated up to 2018, mostly by target compliance (76%).
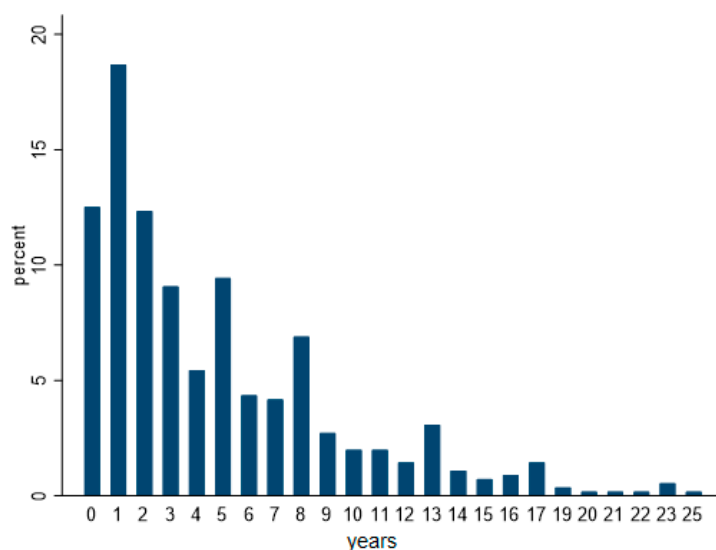
Figure 1. Duration of sanctions (%).

Following Attia et al. (2020), in order to compare the likelihoods of sanctions ending with target compliance or sender capitulation, we use a duration model in our methodological approach, in particular a competing-risk model. This approach has some advantages over other methods. Firstly, it allows us to include sanctions that are still in progress and those that have terminated, besides giving us the possibility of considering the different ways sanctions terminate. Secondly, we may explicitly consider explanatory variables that change over the period that the sanction lasts, like countries' economic situation or political stability.

As in the dataset, the duration of sanctions is measured in years, so we consider a competing risk discrete-time hazard model (grouped interval data). Several specifications can be used to model the hazard function for each state. In this paper, we consider a discrete-time logistic model.[3] Under the assumption that the hazards and risks are independent, we use a multinomial logit to estimate the model. By rearranging the data in a proper way (in a sequential form, considering each survival or exit in each year as an observation), we estimate the parameters of the model by using Stata version 16.

Hence, in our competing risks model, we have a categorical dependent variable that takes for each year the value zero for sanctions still in progress, one for sanctions that end with target compliance, and two when the end is sender capitulation.

The hazard rate for state *j* is given by:

$$h_j(t_i|x(t_i)) = \exp(-\gamma_j(t_i) - x_j'(t_i)\beta_j)[1 + \sum_{j=1}^{2}(\exp(-\gamma_j(t_i) - x_j'(t_i)\beta_j))]^{-1} \qquad (1)$$

j = 1 if the sanction ends due to target compliance; *j* = 2 if the sanction ends due to sender capitulation; ongoing sanctions serve as the baseline category. $\gamma(t_i)$ corresponds to the baseline hazard and $x(t_i)$ to the vector of explanatory variables that may vary over time.

The baseline hazard, $\gamma(t_i)$, can be specified following a parametric approach by assuming a specific form for the hazard function. This is a restrictive approach, and hence we choose a semi-parametric approach, where no assumption about the shape of the baseline hazard is considered. We employ a piecewise constant hazard specification[4] as it is more flexible and allows duration dependence to be different among states. In order to account for possible heteroskedasticity across sanctions, we use cluster-robust standard errors.

As many different factors influence the sanctions' outcome, we include explanatory variables ($x(t_i)$) of different nature, capturing countries' characteristics, as well as several facets related to sanctions like their type and objectives.

Previous research has suggested that the economic situation and political stability of the target states may influence the probability of compliance with sanctions. Therefore, we include the logged annual gross domestic product per capita in US dollars (Varieties of Democracy; Coppedge et al. 2018) as well as an indicator of the equality distribution of resources—the Egalitarian component index (Varieties of Democracy; Coppedge et al. 2018) of the target countries. Furthermore, to capture political stability and levels of democracy, we use the "Polity Combined Score" and the number of 'coups de état', provided by Varieties of Democracy.

We also include the "KOF Globalization Index", which is a composite indicator based on 43 variables that capture different aspects of globalization, namely economic, social, and political, covering almost all states in the world from 1970 to 2019. It has been the most widely used globalization index in the literature (Potrafke 2015) since its creation in 2006 (Dreher 2006). In the study, we used data from the latest version of the KOF Globalization Index (Gygli et al. 2019) and tested the 'de jure' and 'de facto' dimensions separately. Thus, while 'de facto' globalization measures real flows and activities, 'de jure' globalization measures the policies, resources, and institutions that promote effective flows and activities. This distinction follows the seminal works of Feld and Voigt (2003) and Voigt et al. (2015), who showed how the results of the two versions can be very different. To the best of our knowledge, the impact of globalization was never considered in previous studies in this context.

Using the information provided by the Global Sanctions Database, a full set of dummies to identify the type of sanctions and their objectives is incorporated, which typically was not fully considered by previous literature. This approach allows us to understand the effectiveness of sanctions according to their objectives and according to their type, in particular to compare the efficiency of trade sanctions with other types of sanctions.

Following previous studies (e.g., Attia et al. 2020), in order to understand the effectiveness of sanctions imposed by different countries, we consider dummies to account for the possible unique impacts of sanctions imposed by the US, the EU, and the UN, as well as one dummy to account for a coalition of countries.

Finally, we consider dummies to control for possible differences among the periods when each sanction has started. We consider three phases into this period to contemplate how the dynamic of sanctions can be associated to relevant issues of international politics and economic orders. We distinguish the so-called post-cold war period (1994–2000), the period after the terrorist attacks of 9/11 and before the economic crisis (2001–2008), and finally the period after 2008. The base category is the period up to the year 2000. In fact, general economic, social, and political conditions around the world changed along the time which may influence the success of sanctions.[5]

4. Results

Table 1 displays the estimates for the hazard function. The estimates of the baseline hazard suggest a negative dependence for both target compliance and sender capitulation, although they are not significantly different for many time periods. Hence, as expected, the probability of sanctions termination seems to decrease over time.

Concerning the effects of the explanatory variables, we first observe that there is a lower likelihood of sanctions termination by target compliance if they are imposed by the USA. Thus far, the probability of sender capitulation is lower for UN sanctions, followed again by the US, in comparison to sanctions imposed by other individual countries.

Referring to the objectives and types of sanctions, we identify differences between target compliance and sender capitulation. The results show significant differences in the effectiveness of sanctions according to their objectives in the case of target compliance. The likelihood of target compliance is significantly lower if the objectives are focused only

on policy, regime change, and terrorism, and higher if they are focused on democracy. Conversely, there seems to be only one objective that significantly differs from the others in the case of the sender's capitulation. In fact, the probability of the sender capitulating is significantly higher if the objective is to promote human rights.

Table 1. Determinants of the sanction termination-competing-risk model.

	Target Compliance	**Sender Capitulation**
Sanctioning states		
EU	−0.275 (0.213)	−0.786 (0.487)
USA	−0.716 (0.209) ***	−1.054 (0.350) ***
UN	−0.368 (0.243)	−1.913 (0.766) **
Coalition	−0.365 (0.270)	0.438 (0.321)
(Base category: other unilateral sanctions)		
Sanctions' objectives		
Policy regime	−0.929 (0.395) **	−0.298 (0.538)
War	0.476 (0.203) **	0.605 (0.391)
Human rights	0.183 (0.255)	0.762 (0.368) **
Democracy	0.928 (0.239) ***	0.094 (0.535)
Terrorism	−0.969 (0.539) *	0.596 (0.681)
Other objectives	−0.094 (0.291)	0.535 (0.420)
(Base category: multiple objectives)		
Type of sanctions		
Trade	0.462 (0.230) **	1.217 (0.401) ***
Arms	0.056 (0.310)	0.875 (0.472) *
Military	0.871 (0.376) **	1.115 (0.574) **
Financial	0.830 (0.208) ***	0.538 (0.414)
Travel	0.500 (0.552)	1.645 (0.659) ***
Other	1.109 (0.242) ***	0.894 (0.548)
(Base category: multiple sanctions)		
Target-related factors		
Log (GDP per capita)	−0.148 (0.118)	−0.547 (0.261) **
Equal distribution of resources index	1.542 (0.416) ***	0.137 (0.671)
Democracy levels (polity index)	0.026 (0.014) *	−0.044 (0.024) *
Number of coups d'état	0.360 (0.127) ***	−0.532 (0.358)
Globalization Index, de facto	−0.014 (0.009)	0.003 (0.019)
Globalization Index, de jure	0.007 (0.010)	0.048 (0.020) **
Period when sanctions started		
2001–2008	−0.596 (0.190) ***	−1.176 (0.328) ***
2009–2018	−0.416 (0.208) **	−1.521 (0.341) ***
(Base category: 1994–2000)		
Duration dependency		
1–2 years	0.176 (0.234)	1.705 (0.518) ***
3–4 years	−0.272 (0.258)	1.187 (0.555) **
5–6 years	−0.551 (0.297) *	0.526 (0.642)
7–8 years	−0.507 (0.312)	0.005 (0.775)
(Base category: >8 years)		
Constant	−2.041(0.452) ***	−5.770 (0.955) ***
N	2459	

Notes: coefficients are displayed first, followed by robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

As for the impact of the type of sanction, target compliance is higher if sanctioners impose individual sanctions rather than multiple types of sanctions. "Other types" of sanctions seem to be more effective. This category includes aspects like diplomatic sanctions, which, according to the data, are mainly associated with the objectives of democracy or

human rights. Financial and military sanctions also significantly increase the likelihood of target compliance, followed by trade sanctions. Isolated travel sanctions do not seem to be significantly important for target compliance. Therefore, we may conclude that some smart sanctions seem to be more effective than trade sanctions for target compliance. On the other hand, sender capitulation is higher for travel and trade sanctions. Financial sanctions by themselves do not seem to influence the likelihood of sender capitulation.

We also observed several target-related factors that influence the way sanctions end. An increase in GDP per capita significantly decreases the likelihood of sanctions termination by sender capitulation but does not seem to be important for target compliance. Higher equality in the distribution of resources also seems to positively influence the probability of targets' compliance but not the probability of the sender's capitulation.

As expected, the target's political volatility (measured by the number of 'coups d'état') increases the likelihood of sanctions termination by target compliance. On the contrary, the political volatility of the target does not significantly alter the probability of the sender's capitulation. We also find that higher levels of democracy in target countries increase the probability of those countries' compliance but decrease the probability of the sender's capitulation.

The degree of globalization in the target country only seems to be significant for the sender's capitulation. Indeed, the Globalization Index 'de jure' displays a positive and significant impact on the likelihood of termination. This is according to what should be expected, as a higher value in this indicator means a higher effort from the country to create the conditions to be integrated into international society.

Finally, we conclude that the probability of termination for both sides is significantly different according to the period when sanctions have started. The probability of termination was higher for sanctions starting in the period between 1994 and 2000. Target compliance was also higher in the period 2009–2018 in relation to 2001–2008, while the opposite occurs in the case of sender capitulation.

5. Discussion

We proceed by discussing the results of the model. First, our results highlight the importance of considering in the analysis the way in which sanctions end. In our analysis, we have disaggregated sanctions termination by target compliance and by sender capitulation, and our findings confirm previous conclusions from the recent work of Attia et al. (2020), showing that the determinants of both outcomes are significantly different.

Focusing on the variables that proved to be significant, we first comment on the dummy variables related to the period when sanctions started. These indicate that, in the periods 2001–2008 and 2009–2018, when compared to the base period (1994–2000), the probabilities of target compliance and sender capitulation decreased. Target compliance was also higher in the period 2009–2018 in relation to 2001–2008, while the opposite occurs in the case of sender capitulation. This means a reduction in the effectiveness of sanctions in relation to the period 1994–2000, where historically there was an increase in the use of financial sanctions and particularly arms sanctions. Along the way, there was an expansion (and diversification) of sanctions, reflecting the growing divergence between sanctioned and sanctioning countries.

In fact, with the fall of the Berlin Wall, the bipolar global order that had emerged in the post-World War II era and that had been established over decades had come to an end. In the 1990s, there was hope for a new multipolar global order where democratic regimes would expand their influence and the liberalization of economic relations between states would deepen. Conflicts between powers seemed, then, to be something of the past, and the renewed multilateral organizations seemed capable of managing conflicts and structuring new forms of cooperation (Barnett 1997). In this phase, globalization and economic interdependence became generalized on a global scale.

However, at the political level, the extension of democratic regimes did not evolve as expected, and many autocratic regimes remained. Alongside this reality, China's accession

to the WTO in 2001 accelerated the US/China rivalry (Van Bergeijk 2021). The greater conflict in the international system created a new geopolitical and geoeconomic context that, along with the global financial crisis of 2007 and the recent pandemic crisis, deepened the trend of economic deglobalization (Papava 2022) and turned sanctions into a more relevant political instrument (Halcoussis et al. 2021).

Given that the specific characteristics of the target country influence the success of the sanctions, we have studied the effects of several features on the acceptance, or lack thereof, by the targets of the sanctioners' requests. Knowing whether the pressure of sanctions effectively forces targets into compliance depends largely on their degree of economic vulnerability and the nature of the respective political regime (Attia et al. 2020). It is recognized that economically weak targets are less able to bear the costs inherent in sanctions (Hufbauer et al. 2007), especially as economic crises can reduce the legitimacy of targeted governments and create internal divisions (Teorell 2010). Furthermore, the characteristics of the target countries' political regimes and their dynamics appear to influence their propensity for compliance (Grauvogel and Von Soest 2014). In fact, the empirical literature indicates that democratic regimes are more vulnerable to destabilization than autocratic regimes (Allen 2005; Lektzian and Souva 2007; Grauvogel et al. 2017; Peksen 2019), since democracies, in general, are more likely to give in to the pressure of sanctions than do autocratic countries because governments are more susceptible to the costs felt by the population. Political volatility over the period of sanctions is also relevant to the outcome of sanctions, whereby a change in political leadership in the target country can lead to its compliance (McGillivray and Stam 2004).

Our results are mostly in line with those of the aforementioned studies, allowing us to highlight a number of aspects, namely: an increase in the probability of target compliance is related to greater political instability (measured by the number of 'coups d'état'), a more equal distribution of resources in the country, and, furthermore, its level of democracy. The fact that the existence of democratic regimes in the target countries seems to reduce the duration of sanctions through target compliance impressively recognizes the capacity of democratic regimes to act as an antidote to the persistence of sanctions. Second, as the more egalitarian distribution of resources occurs in democratic regimes, the results obtained attest that sanctions will produce more generalized impacts on the majority of the population, encouraging governments to comply with them. Thus far, according to our results, the target's per capita income does not seem to be important for target compliance.

We also conclude that target country characteristics affect different targets' compliance and senders' capitulation, as an increase in GDP per capita significantly decreases the likelihood of sanctions termination by sender capitulation, and higher levels of democracy in target countries decrease that probability.

The results associated with economic conditions are not fully in accordance with previous findings from Attia et al. (2020), which conclude that GDP per capita influences the probability of target compliance but not sender capitulation. This difference in results might be related to the fact that Attia et al. (2020) focus only on US and EU sanctions, whereas in our case we include many other individual countries, coalitions of countries, and other multilateral organizations like the UN. Furthermore, we consider in our model a different set of explanatory variables as well as a different period of analysis.

Finally, a higher level of 'de jure' globalization[6] increases the probability of sender capitulation, but it is not significant for target compliance. As the variable measures the countries involvement in the world order through their policies, resources, and institutions, our result is relevant, especially since it has never been tested. Globalized countries reinforce their credibility and international acceptance, which encourages senders to give up on sanctions. In addition, a globalized country with diversified partnerships has more conditions for bearing the costs of sanctions. A more internationally integrated country may be in better conditions to circumvent the impact of sanctions, namely through the "black nights" effect, which is recognized by the sanctioners.

The impact of the several types of sanctions on their duration has not received enough attention from researchers (Jeong 2019). Sanctions are rarely applied in isolation, as they sometimes complement other measures, making it difficult to assess the real effectiveness of the various types of sanctions (Smeets 2018). Nevertheless, our study contributes to a better understanding of this issue.

From our analysis, we first conclude that target compliance is higher if sanctioners impose individual sanctions rather than multiple types of sanctions. We also highlight the following: military, financial, and those classified as "other types" (where diplomatic sanctions predominate) increase the probability of target compliance more than trade sanctions. This confirms the expectation that smart sanctions are, in fact, more likely to succeed, which is an important outcome as this type of sanction has been gaining importance when compared to traditional sanctions based on trade. On the contrary, the probabilities of sender capitulation in travel and trade sanctions are higher than those of a military nature and an arms embargo. The "other type" category of sanctions seems to be more effective than trade sanctions.

The literature has addressed the relative effectiveness of the various objectives pursued by sanctions. However, in studies on the success of sanctions, there is an unavoidable issue related to possible endogeneity since the senders control the type of sanctions they apply and the objectives they aim to achieve. As these choices are interconnected, it becomes difficult to disentangle the real effects given the treatment of the underlying issues. Biersteker and Van Bergeijk (2015) confirm the greater effectiveness of sanctions with precise objectives and also those that are complemented with other political instruments (generally based on traditional diplomacy). Recently, Morgan et al. (2023), considering sanctions that took place in the period 1950–2022, refer to sanctions aimed at the institution of democratic regimes, respect for human rights, and even sanctions inserted in the "Others" category as being more successful.[7] Conversely, those that were less effective were the sanctions that were openly aimed at changing the political regime, territorial disputes, and the fight against terrorism.

Our results related to the impact of objectives pursued confirm that sanctions aimed at establishing democracy and ending a war have a greater probability of target compliance, while sanctions focused only on changing the political regime or combating terrorism were less effective. With regard to the sender's capitulation, only sanctions aimed at restoring human rights seem to contribute to increasing this probability. Hence, these results are generally in line with previous empirical literature, also suggesting that ambiguous and/or multiple goals are in general less likely to succeed.

The comparison of the effectiveness of sanctions imposed by individual countries, coalitions of countries, or institutions has also been a topic of research. According to Drezner (1999), multilateral institutions often reveal the ability to transform weak cooperation agreements into solid coalitions, recognizing the added value provided by information mechanisms and permanent cooperation. Furthermore, Bapat and Morgan (2009), via an empirical approach, argue that multilateral sanctions seem to have a greater probability of success than unilateral ones. Besedeš et al. (2017) conclude that EU sanctions have been less effective than those imposed by the UN but are more likely to succeed when compared to US sanctions, which is also in agreement with Weber and Schneider (2020).

Our results are not fully in agreement with previous studies. Thus far, it should be noted that not only did we distinguish the ways sanctions end but also, we considered unilateral and multilateral sanctions (UN, EU, and coalitions), a fact that rarely happens in this type of research. We conclude that sanctions imposed by the US have a lower probability of success due to target compliance than those imposed by multilateral (or supranational) entities like the UN, but also than those imposed by other single states. With regard to the eventual capitulation of the sender, we found that the probability of this occurring was lower when sanctions were applied by the UN, followed by the US.

6. Conclusions

Databases are a fundamental tool for studying the various aspects inherent in international sanctions, so their growth between 2009 and 2020 (from two to five databases) expands the resources for analyzing sanctions. Naturally, this greater diversity increased the range of variables and deepened the information on the various categories of sanctions, making it possible to study the conditions that influence their duration and effectiveness. Due to the greater variety and accuracy of information, research gradually began to integrate new topics of analysis.

Part of the literature on sanctions has focused on their duration without considering how they end. It is from this perspective that we seek to provide new insights into the determinants of the different ways sanctions terminate, such as target compliance and sender capitulation, an aspect that has not received much attention from researchers. The attributes of the sanctioned states are different from each other and have a dynamic nature, being able to change over time and influence the outcome of the sanctions. Therefore, the inclusion in the analysis of the attributes of the target state as determinants of the sanctions' success allows a deeper and more comprehensive understanding of the sanctioning process.

Our work follows this line by investigating the influence of the political structure and economic health of the target country on the success of sanctions, besides considering the objectives they pursue and their typologies. We included explanatory variables typically used in the literature, to which we added variables related to the target country that were absent from the studies so far, such as one that captures the degree of insertion of countries in the globalization process and another that measures the way in which resources are distributed in these countries, and both variables were significant. Thus, the inclusion of the dimensions of globalization and inequality, which are relevant societal challenges of our times, broadens the understanding of the microfoundations of the effectiveness of sanctions, articulating the perspectives of economics and political science.

The results obtained show that there are clear advantages to evaluating the factors that lead to target compliance and sender capitulation in an integrated structure, jointly assessing the two ways of terminating sanctions using static and dynamic factors. In fact, the conclusions we draw impressively confirm that the determinants of the two types of termination differ with regard to several elements of the studied trilogy: attributes of the target country, objectives, and types of sanctions.

With regard to target attributes, the best allocation of resources, the highest level of democracy, and high political volatility increase the likelihood of compliance. In turn, the increase in per capita GDP and the degree of democracy in the target country reduce the probability of sender capitulation. The only attribute that increases the likelihood of capitulation is the 'de jure' level of globalization.

Referring to the objectives of sanctions, the reactions of targets and senders are also different. Target states are more likely to accept compliance when the objectives of sanctions are to end military conflict or strengthen democracy; on the contrary, the likelihood of compliance is reduced when sanctions are aimed at changing the political regime or combating terrorism. From the sender's perspective, the only objective that is significantly different from the others in increasing the probability of capitulation is the respect of human rights.

Finally, regarding the effect of the type of sanction, acceptance by the target is more likely to occur when sanctioners impose sanctions of a diplomatic nature as well as financial and military sanctions. Conversely, the probability of sender capitulation is higher for sanctions that limit travel and trade restrictions.

Based on these results, we highlight two aspects that are transversal to the analysis and that should be studied in greater depth in the future. First, the existence of democratic regimes in the target countries and the orientation of sanctions towards objectives related to the reinforcement of these regimes increase the probability of compliance with the target, placing the role of democracy and domestic political institutions at the center of the debate. Second, as sanctions applied to countries with a 'de jure' higher level of globalization

are more likely to be terminated due to issuer withdrawal, we can infer that this happens because more globalized countries have a greater reputation in the international community, making them credible partners and committed to worldwide cooperation. These two features, democracy and globalization, constitute decisive complements for the institution of open and participatory political and economic regimes respectful of human rights and international norms, supporting a less conflicted society.

The conclusions of this study have several implications for policymakers, indicating that they should not neglect the duration of sanctions and the way in which they end. There seems to be a consensus that long-term sanctions inflict greater costs on issuers, causing dissatisfaction and limiting their usefulness as a foreign policy instrument. Thus, concrete knowledge of the characteristics of the target countries, the choice of precise and verifiable objectives, and the selection of types of sanctions suited to the objectives and attributes of the targets are key elements to shortening the life span of sanctions. This study is part of the new approaches to economic diplomacy and provides a more complete picture of the environment and process surrounding the imposition of sanctions. In fact, by integrating the political and economic dimensions into the analysis, the results provide analytical tools that will allow the choice of the most appropriate type of sanction for each case, as well as the choice of multilateral or plurilateral partnerships that can best guarantee the success of the sanctions.

We believe that this work can help researchers and politicians have a different approach to the process that involves the termination of sanctions and the political implications that result therefrom. There is one aspect that seems crucial to us, to which little emphasis has been given, and that has to do with the questions of knowing whether the end of sanctions stabilizes or destabilizes the target regime and whether it reinforces democracy or not. Naturally, in order to deal with these issues in a rigorous and reasoned way, it is necessary to consider the different ways in which sanctions end. Intuitively, we can assume that sanctions that end with the capitulation of the sender strengthen the current regime of the target, given that it will have successfully resisted external pressure. The opposite effect would occur in the case of the termination of sanctions due to yielding to pressure from the issuer. However, these intuitions require more detailed studies to prove them. The dynamics of these consequences associated with sanctions, which we recognize as one of the limitations of this study, present themselves as a promising path for future analysis.

Notes

¹ On the subject, see also Pape (1998).

² To this respect, it should be noted that the databases have inserted not innocuous methodological changes in the way of classifying the effectiveness of sanctions (Van Bergeijk and Siddiquee 2017).

³ See Box-Steffensmeier and Jones (2004) and Cameron and Trivedi (2005), for more details about these models.

⁴ We also estimated a parametric specification (cubic-polynomial). The coefficient estimates were quite similar which points to the robustness of our results. These estimates can be provided upon request.

⁵ Sample averages of all variables used in this work can be found in the supplementary material (Table S3).

⁶ The 'de jure' Globalization Index includes multiple aspects of an economic (level of tariffs, Trade and Investment Agreements, Current Account Openness, etc.) social (Press and Civil Freedom, Gender Parity, Expenditure in Education, etc.) and political natures (membership of International Organizations, number of Treaties, etc.).

⁷ According to the authors, the justification for its success has to do with the fact that this category includes sanctions that aim to achieve very specific and tangible objectives, such as putting an end to drug trafficking, freeing imprisoned citizens or even fighting against corruption.

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