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# The EU's interactions with formal intergovernmental organizations: a big data analysis of news media

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**ABSTRACT**

Interactions between the EU and IGOs - such as joint statements, verbal public disagreements, formal cooperation agreements, and IGO dispute resolution involving the EU - have increased in the past decades. We address the question *What determines the EU's interactions with formal IGOs?* by carrying out a big data-based sentiment analysis of all news published online between 1999 and 2017. Using over 30,000 events machine-coded by the Global Data Event Language and Tone (GDELT) database, we construct an annual measure for the dyadic relations between the EU and 36 formal IGOs. We find that when the EU has observer or member status in an IGO, this significantly and positively affects the quantity of interactions, while increasing the level of conflict in these interactions. Policy overlap between the EU and the IGO also increases the level of conflict in their interactions. Surprisingly, IGO authority is not relevant for these interactions.

**KEYWORDS**

International organizations; interorganizational relations; natural language processing; conflict; cooperation

## Introduction

Interactions between intergovernmental organizations (IGOs) in general have increased during the past decades (Biermann and Koops 2017c). Specifically, in the European Union's (EU)s case, as its involvement in global governance has grown (Westerwinter, this SI), researchers have shown how the EU has influenced IGOs and vice-versa (Costa and Jørgensen 2012; Erik Jørgensen 2009). As with other IGO-IGO relations, the increasing interactions between the EU and IGOs range from joint statements to trade agreements and dispute resolutions, among many others. These interactions have important implications for policy, given that EU and IGOs influence each other's policymaking (Costa and Jørgensen 2012; Jørgensen, Oberthür, and Shahin 2011).

Scholars have proposed several conceptual frameworks and engaged in empirical explorations to understand the depth and frequency (Westerwinter, this SI) of EU-IGO interactions. Yet the increased interaction between the EU and other institutions in global governance requires further research, and in particular, innovation in research designs to accompany the growing literature and theoretical premises set forth by researchers of inter-organizational relations (IOR). Despite previous research efforts, the field can benefit

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from complementary large-n studies capable of further testing a growing body of case-based findings (Biermann and Koops 2017a). Large-n research not only avoids the selection bias of smaller-n studies, it can also provide more generalizable findings and broader insights on the patterns and determinants of interactions between IGOs.

Our research studies the quantity of and level of cooperation (or conflict) in EU-IGO interactions. More specifically, we focus on the most formal variant of IGOs, which are treaty-based and have permanent secretariats: these are often labeled formal intergovernmental organizations or FIGOs (Vabulas and Snidal 2013). Other articles in this SI focus on alternative types of global governance institutions, see for example Roger (this SI) on informal IGOs, Westerwinter (this SI) on transnational public-private governance initiatives; and Jordana et al (this SI) on transgovernmental regulatory networks. Based on the reviewed literature, we explore three possible factors affecting EU-IGO interactions: an IGO's authority, the policy overlap between an IGO and the EU, and whether the EU is a formal member of the IGO. Our research design complements the dyadic case studies and small-n approaches that originally built the study of inter-organizational relations using a novel big data-based approach. In particular, our research question is: what determines the EU's interactions with formal IGOs?

To answer our research question, we carry out a big data-based Natural Processing Language (NLP) sentiment analysis of all the news published online between 1999 and 2017 – the time period covered by the news sentiment database used. Our analysis builds on more than 30,000 individual EU-IGO events, collapsed into over 400 EU-IGO-year pairs. Building on the Global Data Event Language and Tone (GDELT) database, we construct two annual measures for the dyadic relations between the EU and 36 individual IGOs, which were selected based on the match between two existing datasets. The two measures are: an annual quantity measure (which captures the quantity of interactions) and an annual Goldstein cooperation/conflict measure. We include as independent variables, among others, variables from Hooghe et al. (2017)'s international organization authority dataset. Based on this, we build our delegation, pooling, and policy 'overlap' variables. We also coded EU membership status in each IGO. The combination of these data allows us to build a dataset of the EU's relations with 36 IGOs across 18 years.

Contributing to the ongoing debate on the relevance of formal EU membership of IGOs (Gehring, Oberthür, and Mühleck 2013; Jørgensen, Oberthür, and Shahin 2011; Jørgensen and Wessel 2011; Kaddous 2015), we find that when the EU has observer or member status in an IGO, this significantly and positively affects the quantity of interactions, while negatively affecting how cooperative these interactions are. Policy overlap between the EU and the IGO also (albeit less strongly) increases the level of conflict between both parties – pointing to the possibility of vertical regulatory conflict (Becker 2021). Additionally, (pooling) authority has a negative effect on the quantity of interactions, and (delegation) authority has a barely positive effect on the level of cooperation in the interactions – both effects contradicting our expectations (Schmidtke 2019)

The article proceeds as follows: section one discusses previous research on EU-IGO interactions and their determinants, drawing from inter-organizational relations and EU studies literatures, among others. Section two describes the new longitudinal dataset created for this research and reviews the data, variables and methods. The results of the analysis are laid out in section three, which discusses the determinants of the quantity and cooperation level of the EU's interactions with IGOs, respectively. Section four

provides a discussion of the results and relates them to the literature. Lastly, the conclusion lays out our contributions, limitations of this study, and avenues for future research.

## The EU and its interactions with igos

Although relations between international organizations are hardly a new empirical phenomenon, academic research into these relations did not begin to develop in earnest until recently. Inter-organizational relations formed a fruitful field for management and organizational theory scholars from the 1950s and 60s approximately; however, international relations scholars did not engage systematically with relations between international organizations until the early 2000s (Biermann 2008). With the exception of work by Jönsson (2009) in the 1980s, it was not until the 2000s that empirical and policy studies into inter-organizational relations began to develop, and not until the 2010s that this field of study began to become somewhat more structured, systematized and more theoretically grounded (Biermann and Koops 2017b; Cropper et al. 2008).

Over the past two decades, international relations scholarship has analyzed IOR from a series of vantage points, including system-level factors explaining the increase in cooperation between international organizations (IOs), unit-level factors influencing the potential for and realization of cooperation or rivalry between pairs of IOs, and multilevel perspectives (Biermann and Koops 2017c).

On the system-level, scholars have identified four factors that are necessary for institutional overlap to exist, and therefore for cooperation between them to become an option: the proliferation of IGOs, the expansion of IGOs' functional scope, the growing tendency towards issue linkage, and the increasing number of challenges IGOs are expected to face (issue density) (Biermann and Koops 2017c). However, these preconditions do not automatically lead to the realization of relations between the IGOs in question. To explain this, the unit-level takes on particular relevance. At this level, rationalists have engaged especially with resource dependence theories to explain the initiation of either cooperation or conflict between IGOs, arguing that inter-organizational relations tend to start because one or both of the organizations require resources – whether material or non-material – to attain their goals (Biermann 2008; Biermann and Harsch 2017). Scholarship drawing on constructivist frameworks, in contrast, have focused on factors such as organizational culture, attributions of legitimacy, and trust when examining inter-organizational relations (Biermann and Koops 2017c). Both constructivist and rationalist accounts, finally, have also started to take a multilevel perspective (Biermann 2015; Clark 2021; Schuette 2022), opening the 'black box' of the IGO to attain a more nuanced understanding of the relationships and the question of agency in inter-organizational relations.

Although the field of IOR has begun to become more systematized, much work remains. In particular, there is a need for research going beyond dyadic studies and therefore avoiding potential selection bias (REF SI intro, Biermann 2008; Biermann and Koops 2017a). Additionally, further analysis is needed to identify and isolate key factors that explain the creation, design choices, and maintenance of relations between IGOs (Biermann and Koops 2017c, 22; Dijkstra 2017).

## The EU's increasing interactions with IGOs

EU-IGO interactions have consistently increased in recent decades, particularly after the end of the Cold War (Costa and Jørgensen 2012; Erik Jørgensen 2009). Systematically understanding the quantity and cooperation level of these interactions (REF SI INTRO) is of importance to both global governance and EU studies scholars. For the EU, effective multilateralism is a key foreign policy objective (Kissack 2010), and as such the EU has invested significantly in international organizations (Erik Jørgensen 2009, 188). When it comes to the EU's influence on IGOs, scholars have found contradictory patterns of engagement that show both successes and failures (Jørgensen, Oberthür, and Shahin 2011). Overarchingly, however, the evidence shows a dominant trend where the EU 'is getting increasingly engaged and influential in the world of international organizations' (Erik Jørgensen 2009).

Vice-versa, researchers have also studied how IGOs influence the EU. IGOs may change the EU's domestic interests, by generating opportunities and constraints on domestic actors, and potentially reshaping distribution of power and decision-making patterns (Costa and Jørgensen 2012). In addition to modifying incentives, IGOs may change the legitimacy and appropriateness of different norms (Barnett and Finnemore 2004; Costa and Jørgensen 2012; Scharpf 1997). Moreover, the EU's characteristics, on the one hand, make it particularly amenable to external influence, given its technocratic nature and the absence of strong political parties (Costa and Jørgensen 2012; Kohler-Koch 2002; Wallace 1997, 19). On the other hand, the EU's fragmentation implies multiple veto points that may block influence by IGOs (Costa and Jørgensen 2012; Zito 2001).

## Quantity of interactions and level of cooperation and conflict

EU-IGO relations can vary greatly, both in quantity – defined as the number of interactions between both institutions over a period of time – and in how cooperative or conflictual these interactions are. In his operationalization of relations between organizations, Dijkstra (2017, 102) defines intensity as the 'the scope of interaction between IGOs times the frequency of interaction'. While the former part of this definition pertains to how much the IGOs can overlap in their activities on paper (based on their functional and geographical overlap), the latter part studies how frequently these interactions take place in practice. It is this latter element we capture through our 'quantity' measure. Interactions can range from formal meetings and letters to phone conversations, joint declarations, joint projects and missions, signed agreements (e.g. free trade talks between the EU and the Association of Southeast Asian Nations (ASEAN)) and conflict over a decision over a particular norm or regulation (e.g. World Trade Organization (WTO) rulings [decision] on EU tariffs [norm]), among many others.

An additional important dimension of international relations is whether interactions among entities are cooperative or conflictive (Goldstein 1992; Moses et al. 1967). Interactions between the EU and IGOs can range between displaying strong cooperation and intense conflict. To provide just one example, Becker (2021) explores vertical regulatory conflict between the EU and IGOs, which may arise when an internal EU policy, intentionally or unintentionally, provokes European market actors to stop abiding by the rules and obligations of an IGO, thereby undermining the effectiveness of the institution

in question. In these cases, given the EU's market size and regulatory power (Damro 2012; Young 2014), the IGO may end up aligning with (or internalizing) the EU's policies, for example, in the case of Internet Corporation for Assigned Names and Numbers (ICANN) and EU data protection (Becker 2021).

## Factors affecting EU-IGO interactions

In an effort to contribute to the systematic study of factors explaining the creation and maintenance of relations between IGOs (REF SI intro, Dijkstra 2017), we focus on three factors and their effects on EU-IGO interactions. The first two factors lie at the dyad level. First, we analyze policy overlap between the EU and IGOs, which has recurrently been identified in prior research as a precondition to IOR; however it remains understudied whether policy overlap is likely to lead to more conflictual or more cooperative relations (Biermann and Harsch 2017; Biermann and Koops 2017c). Second, we analyze whether the EU is a member (observer or full) of the IGOs, following prior research suggesting that IGOs weigh autonomy and asymmetry concerns when considering potential inter-organizational relations (Biermann 2008). Obviously, this second factor is very specific to the EU, which may have observer or member status in other IGOs. The third factor we investigate is the effect of the authority of the IGO in the EU-IGO pair, a unit-level factor which may affect the balance of autonomy and asymmetry, and hence also relate to questions of resource dependence and power.

### EU-IGO policy overlap

Scholars of inter-organizational relations point to the scope of interaction as a significant factor when analyzing the relations between two IGOs (Dijkstra 2017, 102). By scope, we refer to the policies that an IGO covers – in some cases, IGOs cover a wide range of issue areas (the EU is a clear example); whereas other IGOs have a more narrow emphasis, focusing for example on trade (World Trade Organization) or health (World Health Organization) (Dijkstra 2017, 103).

What is of interest for this article is the 'overlap' between the policies of the IGO and EU. Importantly, having policy overlap does not necessarily mean that this potential will be realized (Dijkstra 2017, 103), but it is a precondition for meaningful interactions (Biermann and Harsch 2017, 17). The scope of overlap is what creates the potential for interactions between the EU and the IGO – whether of high or low quantity and of a cooperative or conflictive nature.

In the case of the EU, in particular, whether or not the EU has legal competence over a particular policy has an important effect on its inter-organizational relations (Jørgensen, Oberthür, and Shahin 2011, REF SI INTRO). In order to understand EU performance, and more precisely, EU relevance in international institutions, it is fundamental to analyze the framework that substantiates the action of the EU. If the EU possesses either explicit or implicit legal competence in an issue area, the European Commission's role increases, meaning that EU member states have to coordinate their position. Conversely, if the EU is lacking competence over a particular policy area, as is the case for finance or security policy, the EU's role is diminished (Jørgensen, Oberthür, and Shahin 2011, 611). For the EU to overlap with an IGO in scope, the EU must regulate in a matter (even if the matter relates to domestic affairs) that is '*under consideration*

*internationally*' (Jørgensen, Oberthür, and Shahin 2011, 613), as in, being dealt with by an IGO. In these cases, the EU can potentially interact with the IGO where this matter is being addressed.

How does policy overlap affect the quantity and cooperation level of EU-IGO interactions? When both the EU and IGO have significant regulatory power or a strong mandate in an overlapping area, vertical regulatory conflict may ensue (Becker 2021). Moreover, and more generally, resource dependency and organizational ecology theories hold that as policy scopes overlap, rivalry and particularly competition for scarce resources may ensue between the organizations in a particular space (Biermann and Koops 2017c; Gehring and Faude 2013). Overall, we generally expect that as policy overlap grows, EU-IGO interaction will increase and potentially become more conflictive.

### *Membership*

How does the EU's formal participation in IGOs affect the quantity and level of cooperation of its interactions with an IGO? Much research has been dedicated to the issue of the legal status of the EU in IGOs, and perhaps even more so to its capacity to act within IGOs. We focus, in this section, on the *de jure* participation (membership, either full or as an observer) of the EU in IGOs.

Firstly, it is important to note that many IGOs do not offer the possibility of full membership for the EU, given that they were initially designed for nation-state members (Govaere, Capiau, and Vermeersch 2004). In order for the EU to become a member of an IGO, therefore, two conditions must be fulfilled. On the one hand, the IGO's membership conditions in its statute would need to be modified to allow the EU to join, or another type of membership (such as enhanced/extensive observer) would need to be used to achieve an equivalent effect.[1] On the other hand, the EU would need sufficient competences in the policy field of the IGO to be able to join the IGO, potentially alongside its member states (Kaddous 2015, 13).

Scholars differ in their views on the significance of the EU's *de jure* membership in IGOs for the Union's engagement with those IGOs. Jørgensen, Oberthür, and Shahin (2011), on the one hand, find that structural factors such as the possibility of the EU's membership in IGOs – along with other conditions (the EU's treaties, domestic EU politics, and the linkages between internal and external policies) – play a role in the EU's performance in international institutions. Gehring and Faude (2013, 850), on the other hand, hold that sociological, capacity-based factors are more significant than legal ones in explaining the 'recognition of the EU as a relevant actor in an international institution'. Based on six case studies, they find that the formal status of the EU in an IGO is of inferior importance to the question of whether the EU has 'capability' in the field of the IGO. In a similar vein, Jørgensen and Wessel (2011) conclude that 'there is no direct correlation between … legal competences and the political performance of the EU', and Kaddous (2015) notes that the EU is capable of taking action in or towards an IGO even if it is not a member of the organization, for example by adopting policy positions.

We therefore expect that having membership status (full or observer) in an IGO will increase the interactions of the EU with an IGO, but existing evidence is inconclusive as to whether this will produce greater cooperation or conflict in the relationship.

### *IGO authority*

Researchers have found that the more authority the IGO enjoys, the greater the scrutiny it receives from other stakeholders, in particular elites (Schmidtke 2019). We build on this logic to expect that an IGO's level of authority will also affect the quantity and degree of cooperation in EU-IGO interactions. Authority is a 'social contract in which a governor provides a political order of value to a community in exchange for compliance by the governed with the rules necessary to produce that order' (Lake 2010, 587; Tallberg and Zürn 2019). According to Hooghe et al. (2017, 22), this social contract is captured in the formal rules of IGOs, particularly in the tasks delegated to international organizations and the decision-making capacity that member states pool in them.

A higher degree of authority leads to greater scrutiny of an IGO with respect to procedural and performance standards (Tallberg and Zürn 2019, 592). In other words, 'authority creates a demand for legitimacy' (Tallberg and Zürn 2019, 591), and indeed, Schmidtke's (2019) work demonstrates how international organizations with greater authority are subject to more intense processes of legitimation and delegitimation in the media. We expect that when IGOs have a significant degree of pooled and delegated authority, the IGO will have a larger number of interactions with the EU. However, it is unclear whether these interactions will be more or less conflictive on average.

## Methods

Our research design is based on large-n machine-coded event data. Event data studies, which began with hand-coded projects such as the Conflict and Peace Data Bank (COPDAB) (Azar 1980) and the World Event/Interaction Survey Codebook (WEIS) (McClelland 1976) in the late 70s, faced important criticism initially due to a fundamental theoretical cleavage between scholars aiming at rich, detailed, and predictive analyses of specific cases and those aiming at a grand unified theory through conceptual and large-n studies (Hudson and Vore 1995). Event data studies fell under the latter. A further critique had to do with quantification itself: important variables for the study of international relations include some that are difficult to operationalize, such as perception or emotion (Hudson and Vore 1995).

Several developments helped overcome, in part, some of the initial resistances to event studies. For one, theoretical universalism has been abandoned for more meso-level approaches focusing on specific topics rather than universal theories. Second, the speed provided by machine coding (Schrodt and Gerner 1994) has increased its attractiveness. Third, the power of natural language processing and its application to discursive analysis (Alker et al. 1991) has improved its capacity to capture hard-to-measure variables.

However, scholarly resistance re-emerged again some decades later, this time opposing automated-coding event datasets. According to Schrodt (2010), these criticisms had to do with unrealistic expectations about the accuracy of coding (human or machine) and a misunderstanding of how these models deal with noise. As King and Lowe (2003) showed, automated coding performs better than a subject-matter expert since the total amount of information in the system is vastly greater and the subject matter covered much broader than that which can be processed by an individual. It is thus impossible

for humans to code such vast volumes of information, but machine coding is comparable in accuracy to human coding (King and Lowe 2003; Schrodt 2010). Moreover, the sources of errors in automatically-coded event datasets are not restricted to coding errors. These other sources of errors are common to all types of coded events (including human-coded ones) and include: news ultimately being non-randomly selected by reporters and editors, inevitable specification error in the statistical models, and the intrinsic randomness of complex and chaotic political systems as well as the free will of individuals (Schrodt 2010).

In order to examine the quantity and cooperation level of EU-IGO interactions in this article, we created a new longitudinal dataset, spanning the years 1999–2017, based on machine-coded online news media using Natural Language Processing. The bottom limit of 1999 is set by GDELT, the news sentiment database used, while the upper 2017 limit is set by the most recent data on IGOs available from Hooghe et al. (2017). In order to gauge the effects of a set of determinants on these interactions, we gathered Hooghe et al.'s (2017) data on IGO authority, along with other hand-coded and constructed variables. In analyzing the data, we ran a linear and an ordinal regression to explore the determinants of the quantity of EU-IGO interactions and the level of cooperation or conflict of EU-IGO relations, respectively.

As detailed further below, our dependent variables are based on the open-access database Global Data on Events, Location and Tone (GDELT). GDELT is a large database that registers and codifies world events based on news sources. It is a big data platform on worldwide news, collected and maintained by Google. GDELT draws on more than 150,000 news sources, in more than 100 languages, which are machine-translated into English (Guo and Vargo 2017; Leetaru, Perkins, and Rewerts 2014), and from which events are then machine-coded to identify their tone, location, theme, and actors, among others.

## *Sample*

In constructing our sample, we combined two different databases and kept those IGOs present in both – we discuss this possible bias in our conclusion section. Our starting point were the 77 IGOs covered by Hooghe et al. (2017), which provided the IGO authority data for the analysis. We then searched the big data GDELT database to determine whether these IGOs were included in the GDELT entities/actors library.

GDELT codes actors using actor and entity dictionaries. The reliance on these dictionaries, however, which focus heavily on states – due to the focus of the original creators of the database (Schrodt 2012) – makes actor coding one of the most limited aspects of the GDELT Events database: many private sector, intergovernmental or non-government type actors simply are not included in the entity or actor dictionaries. This process therefore left us with the 39 IGOs shown in Table 1.

## *Dependent variable: EU-IGO interactions*

We follow Davis, Fuchs, and Johnson (2019, 415) in operationalizing the quantity and cooperativeness of the EU-IGO interactions. The cooperation/conflict and quantity data were obtained from the GDELT Events database using Google Big Query. The query selected news events where an IGO and the EU were both identified as actors and

**Table 1.** IGOs included in the analysis.

| Sample of IGOs | |
|---|---|
| (1) Arab League | (21)International Labor Organization |
| (2) African Union | (22) International Maritime Organization |
| (3) Andean Community | (23) International Monetary Fund |
| (4) Arab Maghreb Union | (24) International Telecommunications Union |
| (5) Association of Southeast Asian Nations | (25) Nordic Council |
| (6) Caribbean Community | (26) North Atlantic Treaty Organization |
| (7) Common Market for Eastern and Southern Africa | (27) Organization for Economic Cooperation and Development |
| (8) Commonwealth of Independent States | (28) Organization for Security and Cooperation in Europe |
| (9) Commonwealth of Nations | (29) Organization of American States |
| (10) Council of Europe | (30) Organization of Arab Petroleum Exporting Countries |
| (11) East African Community | (31) Organization of Eastern Caribbean States |
| (12) East African Community | (32) Organization of Petroleum Exporting Countries |
| (13) Economic Community of Central African States | (33) Shanghai Cooperation Organization |
| (14) Economic Community of West African States | (34) Southern African Development Community |
| (15) Gulf Cooperation Council | (35) United Nations |
| (16) Intergovernmental Authority on Development | (36) Universal Postal Union |
| (17) International Atomic Energy Agency | (37) World Health Organization |
| (18) International Civil Aviation Organization | (38) World Tourism Organization |
| (19) International Criminal Court | (39) World Trade Organization |
| (20) International Criminal Police Organization | |

returned annual values for each EU-IGO pair on the number of events, number of articles mentioning the events, average tone, and the average Goldstein scale value (i.e. conflict/cooperation scale). Our data collection method does not allow us to identify intra-institutional dynamics in the captured events. However, given the term search described in the Appendix, we operate in this article under the assumption that the EU and IGO in the identified events are the institutions as a whole (with their actions likely often operationalized through their secretariats or main decision-making bodies) rather than its members. We discuss the limitations of this approach later on in the article.

When searching for articles mentioning both the EU and one of the sample's IGOs, articles related to 36 IGOs were identified (as mentioned, the GDELT Events Database's entity/actor libraries include 39 of the 77 IGOs in the Hooghe et al. (2017) dataset, but events where the IGOs and the EU coincided were found for only 36). In total, 34,564 EU-IGO events were returned, in 461 EU-IGO-year combinations, between January 1999 and December 2017. The Appendix includes more information on our search and extraction procedure.

Our quantity dependent variable is the count of events per year per EU-IGO pair. We then logged this variable to correct for its skewness. Our cooperation/conflict dependent variable is the average Goldstein score of the events per year per EU-IGO pair. This score was later transformed to an ordinal variable, since we used an ordinal regression to explore the determinants of the level of cooperation and conflict of the EU-IGO interactions. The final EU-IGO-year combinations used were categorized as follows: negative (89), neutral (63), and positive (309).

## *Independent variables*

To complete the dataset, we combined the quantity and cooperation/conflict data from GDELT with authority and policy scope data from Hooghe et al. (2017), and two variables we collected ourselves: a variable for the EU's membership status in each IGO and the number of members per IGO.

### IGO authority

We use Hooghe et al.'s (2017) measure of authority. This measure has two main dimensions: delegation and pooling. Delegation refers to what decisions the IGO can make autonomously from its members, while pooling reflects how the decisions are made, that is, whether member states have veto power. We use the aggregate annual values of delegation and pooling in our analysis below. For the linear regression on the logged count of annual events, we logged both these aggregate annual values as well.

### Scope: EU-IGO policy overlap

The policy overlap variable builds on the Hooghe et al. (2017) dataset on the core and flank policies covered by each IGO and the EU. Moreover, this score is divided by the policy count of the corresponding IGO, in order to yield the weighted normalized policy score. For the linear regression on the logged count of annual events, we logged this variable as well.

### Membership

We initially coded the membership status of the EU in each IGO along the following three categories: membership, other representation, or no representation. 'Membership' entails holding official member status at the IGO (this is only the case for one of the IGOs in the sample: the EU is a full and official member at the WTO). In the 'other representation' category, the EU is not a full member, but it has formal representation at the IGO – that is, a form of participation right, such as admission to meetings.[2] 'No representation' means having no formal representation with the IGO.

The data was hand-coded based on the following sources, in order of consultation: review of relevant academic literature, IGO official website, EU official websites, United Nations (UN) treaty series. If, after having reviewed all of these source types, no evidence was found of the EU being a member of or having some form of formal representation at an IGO, the EU was considered to have no representation at the IGO. For the purposes of the analysis, membership status was collapsed into a binary indicator: 'Other' (comprising both full membership as well as 'other representation') or 'No representation'.

### Control variable: number of members

The data on the number of members in an IGO was gathered from the official websites of the IGOs and corresponds to the reality of July 2021. For the linear regression on the logged count of annual events, we logged this variable as well.

Table 2 includes descriptive information of all variables used.

**Table 2.** Descriptive analysis of variables.

| | AvgG | Num_Events | Delegation | Pooling | Policy_Total_Norm | Members_Number |
|---|---|---|---|---|---|---|
| Min. | −6.9500 | 1.00 | 0.0000 | 0.06187 | 2.857 | 4.00 |
| 1stQu. | 0.4802 | 3.00 | 0.19937 | 0.19937 | 3.167 | 13.00 |
| Median | 1.8833 | 11.00 | 0.2500 | 0.33042 | 5.500 | 35.00 |
| Mean | 1.9617 | 74.96 | 0.2632 | 0.33535 | 9.263 | 73.08 |
| 3rdQu. | 3.5515 | 42.00 | 0.3452 | 0.48281 | 13.000 | 164.00 |
| Max. | 10.0000 | 2479.00 | 0.6160 | 0.68833 | 37.000 | 194.00 |

## Results

### *Which IGOs does the EU interact (most) with?*

Cumulatively across all the years studied, the North Atlantic Treaty Organization (NATO) is by far the IGO with most 'events' together with the EU. As Figure 1 shows, the UN, the International Monetary Fund (IMF), ASEAN, and the African Union (AU) follow.

We run a linear regression to explore the determinants of the quantity of EU-IGO interactions. The results, shown in Table 3 below, reveal that when the EU is a full or observer member of an IGO, this significantly and positively affects the quantity of interactions. That is, when the EU is a formal member of an IGO, the number of interactions within this pair clearly increases – see, for example, the high number of interactions between the EU and the IMF or the UN, where the EU has observer status. Pooling, on the other hand, has a negative relationship with quantity of EU-IGO interactions: the greater/lower the pooling in the IGO, the lower/greater the number of interactions. The high number of interactions between the EU and NATO, an organization where pooling is low, showcases this relationship.

### *Are the EU's interactions with IGOs cooperative or conflictive?*

We run an ordinal regression to explore the determinants of the level of conflict or cooperation in interactions between the EU and the IGOs (based on the average Goldstein score per EU-IGO-year). Results are presented in Table 4.

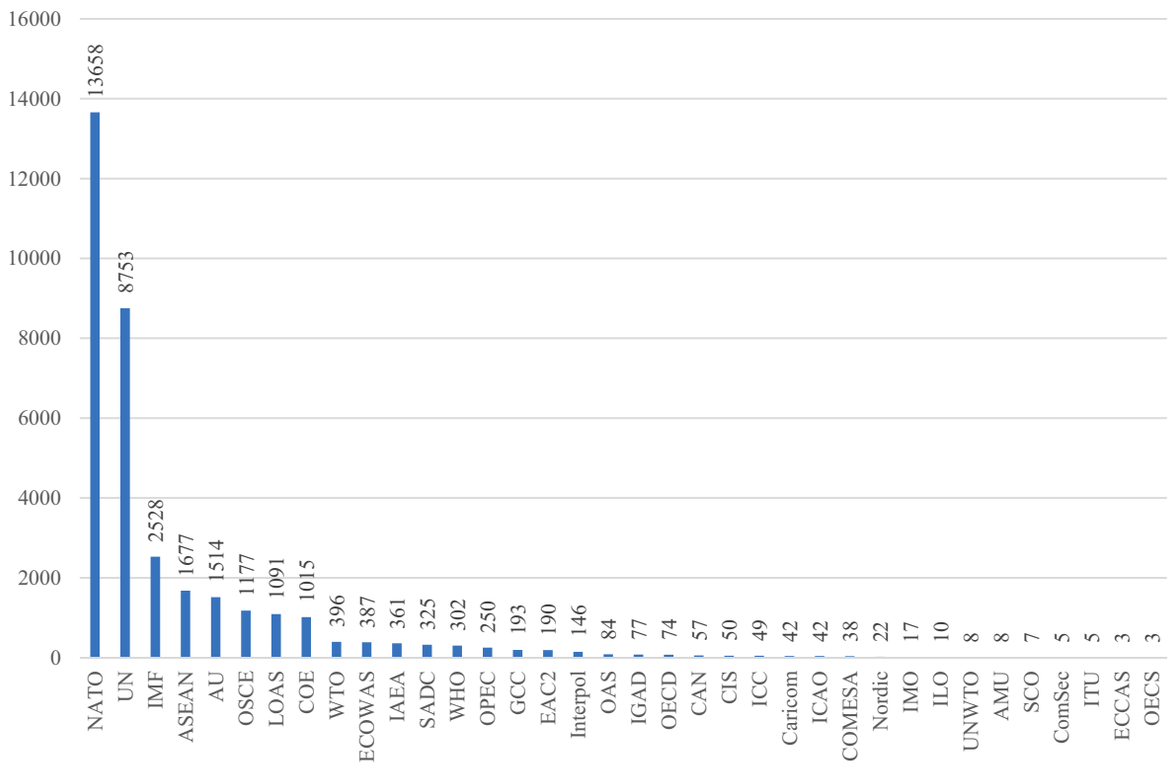


**Figure 1.** N° of events with the EU per IGO.

**Table 3.** Results for linear regression on quantity of EU-IGO interactions (log).

| Quantity | Estimate | Std. Error |
|---|---|---|
| (Intercept) | 1.152 | (0.517) |
| Log_Delegation | 0.972 | (0.866) |
| Log_Pooling | −0.523** | (0.166 |
| Log_Policy overlap (w2_norm) | 0.030 | (0.154) |
| Norm_Members | 0.296 | (0.404) |
| Status1 | 0.750** | (0.228) |

Observations: 461 | Note: *p < 0.1 **p < 0.05 ***p < 0.01

**Table 4.** Results for ordinal regression on level of cooperation/conflict of EU-IGO interactions.

| Goldstein score | Estimate | Std. Error |
|---|---|---|
| Delegation | 1.634* | (0.851) |
| Pooling | 0.144 | (0.762) |
| Status_other | −1.235*** | (0.306) |
| Policy overlap (w2_norm) | −0.021*** | (0.008) |
| Members_Number | 0.0001 | (0.002) |

Observations: 461 | Note: *p < 0.1 **p < 0.05 ***p < 0.01

We find that when the EU is a full member or observer in an IGO (Figure 2), this has a negative effect on the interactions, as shown in Figure 3. The generally cooperative interactions between the EU and Economic Community of Central African States (ECCAS) and the overall conflicting interactions with the WTO exemplify this finding. We also find that policy overlap has a weak negative relationship with the level of cooperation of the interactions (Figure 4): a higher degree of overlap in scope thus leads to a drop in the degree of cooperation in the interactions in the EU-IGO pair (exemplified by the high cooperation and low policy overlap between the EU and the International Telecommunication Union (ITU)). Delegation to the IGO has a barely significant and positive effect on the Goldstein score (see Figure 5), while pooling has no effect. Both goodness-of-fit tests – the Lipsitz likelihood-ratio and the Hosmer-Lemeshow (Fagerland & Hosmer, 2017) – validate our results.

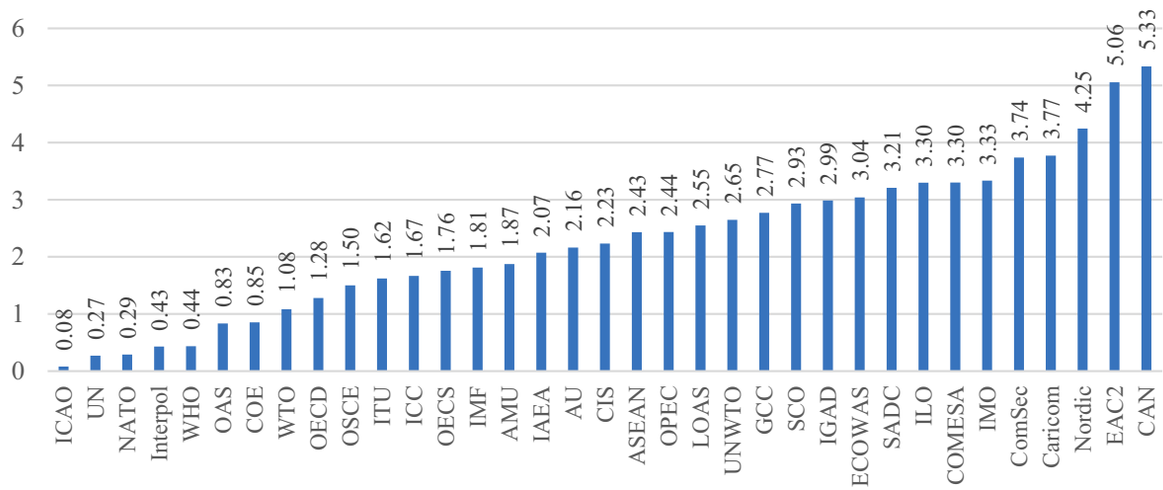


**Figure 2.** Average Goldstein Score per IGO.

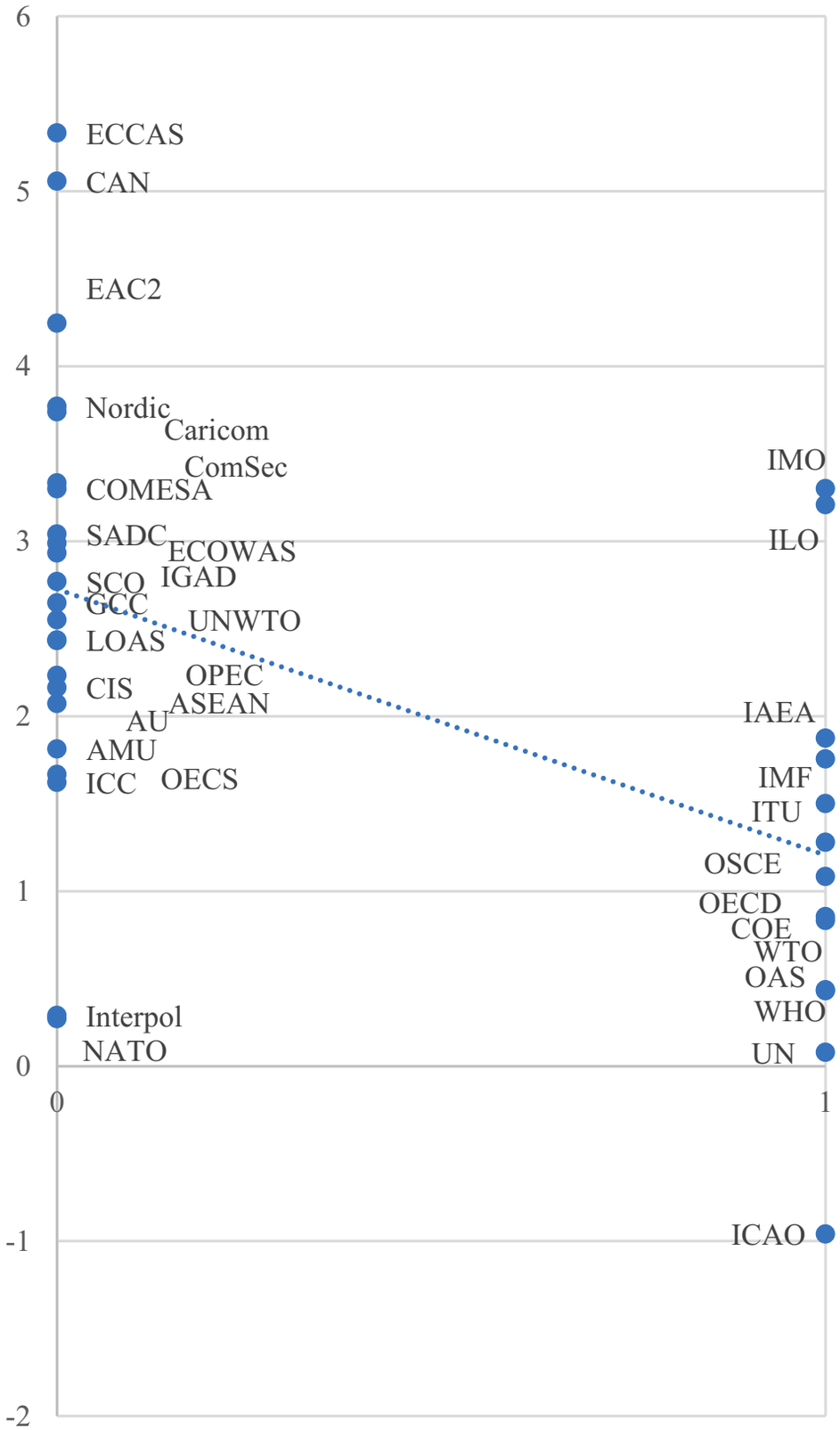


**Figure 3.** Level of cooperation/conflict of interactions (Goldstein scores) vs Membership status. Vertical axis indicates Goldstein score

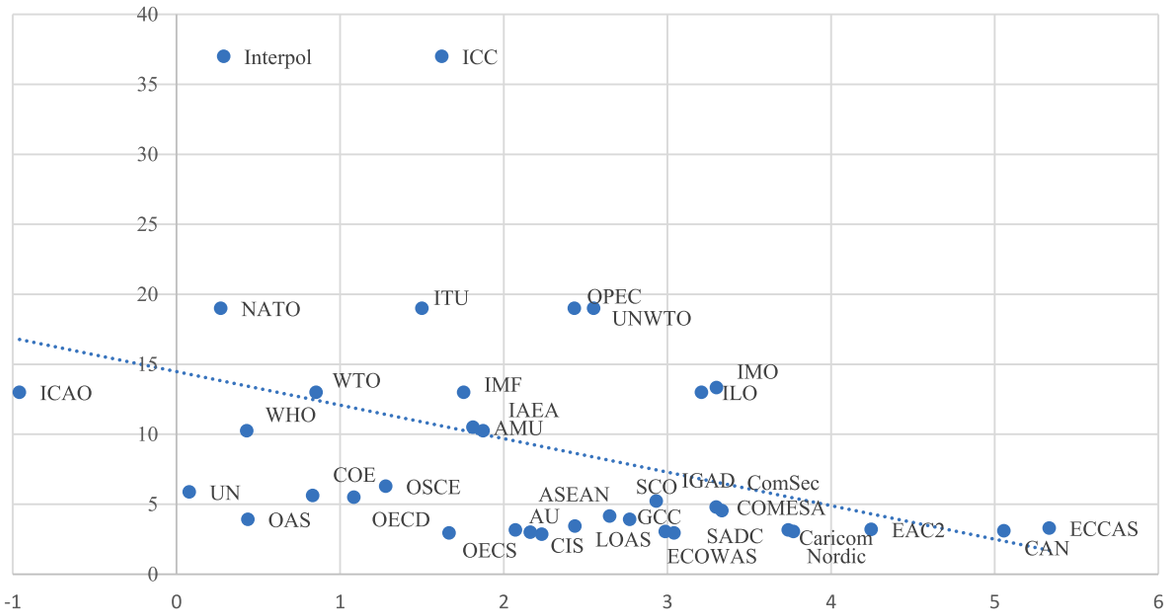


**Figure 4.** Level of cooperation/conflict of interactions (Goldstein scores) vs policy overlap. Vertical axis indicates policy overlap score. Horizontal axis indicates Goldstein score.

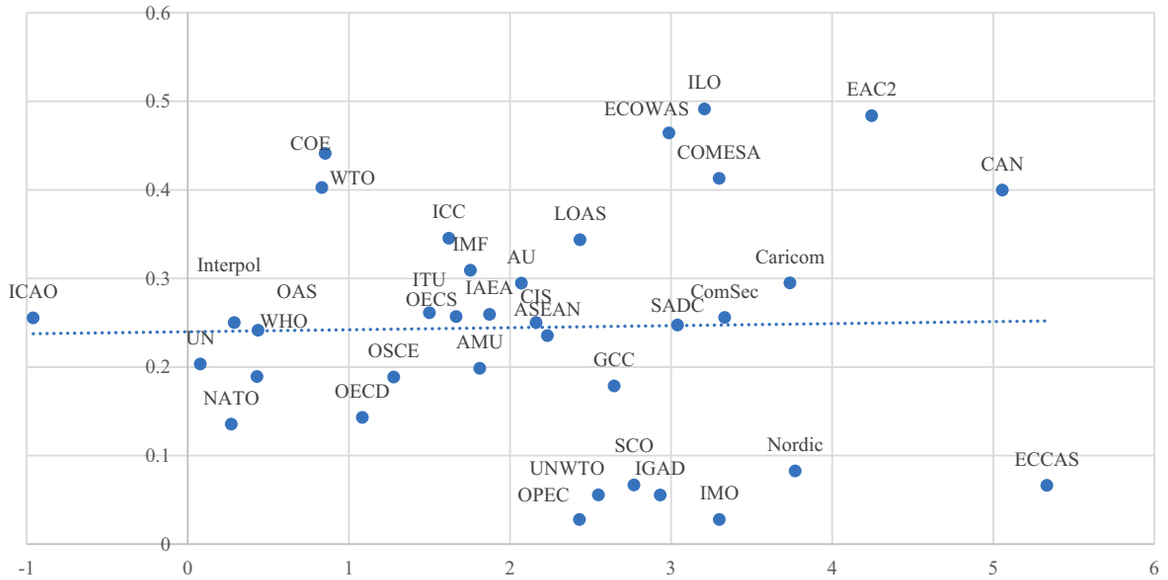


**Figure 5.** Level of cooperation/conflict of interactions (Goldstein scores) vs Delegation. Vertical axis indicates delegation score. Horizontal axis indicates Goldstein score.

Lastly, we also tentatively explore whether our two separate dependent variables correlate. That is, whether the level of cooperation/conflict varies as the quantity of interactions between EU-IGOs increases. We find a negative correlation between the Goldstein score and the number of events between the EU and IGOs (−.302, $p < 0.001$): in other words, the more interactions, the more conflictual these are. Figure 5 illustrates the relationship between dependent variables.

## Discussion

We set out to explore determinants of interactions among international organizations. In particular, we look at how the EU interacts with formal IGOs, complementing other articles in this SI which look at other types of international institutions (REF SI INTRO). We focus on the interactions between EU and IGOs using a novel large-scale news media methodology and data.

While IOR scholarship examines several variables and dimensions (Biermann and Koops 2017c), in this study we focused on whether IGO authority, EU membership status in the IGO, and the degree of policy overlap between the EU and an IGO affect the quantity of interactions and the level of cooperation or conflict in those interactions. We do so by building on existing literature and datasets on IGOs (in particular Hooghe et al. (2017)) to develop machine-coded dependent variables based on over 30,000 events.

We find that the greater the pooling in an IGO, the fewer interactions between that IGO and the EU. IGOs exemplifying this are the International Atomic Energy Agency (IAEA) (high pooling, low quantity) and NATO (low pooling, high quantity). This contradicts scholars who have argued that the greater authority of an IGO, the greater demand it will face for accountability, triggering more legitimation and de-legitimation events and therefore higher interaction (Schmidtke 2019; Tallberg and Zürn 2019). The main driver of the quantity of EU-IGO interactions, however, is the EU's membership status in the IGO: if the EU is an observer or a full member of the IGO, the number of interactions in this pair increases significantly.[3]

Regarding conflict/cooperation, we also find that the greatest determinant of the EU-IGO cooperation level is whether the EU has observer status in (or is a member of) the IGO or not. Interestingly, having membership status – full or other – has a negative effect on cooperation; in other words, it increases the level of conflictual interactions. This is illustrated by the on-average cooperative interactions the EU has with the Economic Community of West African States (ECOWAS) and the more conflictual interactions with the WTO – as exemplified by the illustrations provided in Table 5, below. Our findings therefore contradict the prevailing view in the literature that downplays the relevance of formal membership as compared to other factors, such as the *de facto* capacity to act (Gehring, Oberthür, and Mühleck 2013; Jørgensen, Oberthür, and Shahin 2011; Jørgensen and Wessel 2011; Kaddous 2015). Formal membership status does play a role: in particular, the EU being an observer or a full member of an IGO leads to more interactions and a higher degree of conflict in the interactions. This finding may also imply that the EU is a member of the organizations that matter most to it: the level of conflict (or perhaps bargaining and negotiation) is higher in the organizations the EU is an observer or a full member of.

We furthermore find that the quantity of interactions correlates with the cooperation-conflict level of these interactions: the more interactions between EU-IGO, the more conflictual these are. Again, this may signal that the when the EU engages more with an IGO, it has more interests in the policies that are covered there, and hence engages in more intense discussions towards particular policy outcomes. Alternatively or additionally, it may point to questions of resource dependence: once cooperation is established between the EU and IGO, the struggle over resources (material or non-material) may intensify (Biermann and Harsch 2017).

**Table 5.** Illustrative evidence from news feeding the machine-coded events.

| Level of cooperation /conflict of EU-IGO interaction (Goldstein score of event) | Independent variable (value) | IGO | Date | News article feeding event |
|---|---|---|---|---|
| Low (−2) | EU membership status ('other'/1) | WTO | 29.3.2016 | WTO Panel Dings EU Tariffs On Argentina's Biodiesel https://www.law360.com/articles/777362/wto-panel-dings-eu-tariffs-on-argentina-s-biodiesel |
| High (4) | EU membership status ('no'/0) | Ecowas | 26.02.2014 | Ecowas Trade, Finance Ministers Reach Consensus on Partnership Agreement With EU https://allafrica.com/stories/201402260087.html |
| Low (1) | High EU-IGO policy overlap (10,25) | WHO | 13.09.2013 | Europe has a bad track record on tobacco says WHO http://www.euronews.com/2013/09/13/europe-has-a-bad-track-record-on-tobacco-says-who/ |
| High (7) | Low EU-IGO policy overlap (2,85) | ASEAN | 10.03.2017 | EU, ASEAN ready to restart free trade talks https://www.dw.com/en/eu-asean-ready-to-restart-free-trade-talks/a-37882922 |
| Low (−2) | Low IGO delegation (0,027) | IMO | 6.3.2017 | Shipping emissions: EU vs IMO? https://www.ship-technology.com/features/featureshipping-emissions-eu-vs-imo-5753670/ |
| High (4) | High IGO delegation (0,51) | EAC | 14.10.204 | EAC signs trade deal with EU https://nation.africa/kenya/business/996-2486458-it4qx6/index.html |

Low = Conflict; High = Cooperation

Policy overlap is also significantly related to the cooperation level of EU-IGO interactions. While it is far lower than the effect of membership status, we find a negative relation: that is, higher policy overlap leads to more conflictual interactions, lending support to the argument that overlapping competences can lead to competition, for example over scarce resources, and vertical regulatory conflicts (Becker 2021). Interactions between the EU and ASEAN, which are cooperative despite having a low policy overlap, showcases this effect. The opposite is true for EU-WHO interactions: see Table 5. Our findings thus match our general expectations regarding the effects of policy overlap and add further evidence to the ongoing debate on the effects of policy overlap on interactions (Biermann and Harsch 2017; Biermann and Koops 2017c; Gehring and Faude 2013).

Interestingly, IGO authority, specifically delegation, has a weakly significant but relevant effect on the cooperation level of EU-IGO interactions (while pooling is not significant). However, contrary to expectations regarding legitimation conflicts (Schmidtke 2019; Tallberg and Zürn 2019), the effect is positive: the greater the power delegated in the IGO, the more cooperative its interactions with the EU. Exemplifying this relation is the EU-NATO dyad, where NATO has low authority and rather conflictive interactions with the EU, as per the debate on building EU defense capabilities outside of NATO. On the opposite end, the East African Community exemplifies a high delegation IGO with positive interactions with the EU, where events are about economic cooperation such as negotiating and signing a trade deal (see Table 5).


**Figure 6.** Level of cooperation/conflict of interactions (Goldstein scores) vs Quantity of interactions (log). Vertical axis indicates Goldstein score.. Horizontal axis indicates log of nº of interactions.

## Conclusion

This article contributes to the growing literature on the EU and its interactions with IGOs, and on inter-organizational relations among IGOs more generally. It does so with a novel methodology and dataset, which builds on over 30,000 events involving the EU and a selection of IGOs over almost two decades. It thus complements extant research, which has primarily used case studies and small-n analysis to produce knowledge. The article supports some of the literature's earlier findings, refutes others, and nuances yet others. Moreover, it also sets a further step towards the use of novel large-n datasets and Natural Language Processing techniques in the field of European and international organization studies.

The article has several limitations. For one, on the methodological side, the sample of the 39 IGOs studied is constrained by the available data product of combining two different datasets. Moreover, NLP machine-coding is still a rapidly evolving field, where coding can be further improved. Our methods and data also lead us to consider, throughout the research, the EU as a unitary actor, meaning we do not consider the challenges of coordination between the EU and its member states in the Union's engagement with IGOs in this analysis. The focus on the EU as the actor also limits our ability to capture events where the EU is not a member of an IGO, but an EU state that is a member of the IGO pushes forward the EU's agenda in the organization. Finally, in working with only *de jure* measurements of the EU's membership status in IGOs and the theoretical policy overlap between the EU and an IGO, the present research is unable to capture more sociological factors in the relationship, such as the *de facto* capabilities of the EU in a particular issue area.

In any case, we hope this article opens new avenues for future research on the important topic of EU-IGO interactions. First, given that the methodology employed here offers the potential to test hypotheses with a relatively large universe, it creates fertile ground for nested analysis (Lieberman 2005), guiding case study selection for in-depth qualitative case studies to further test the causal processes behind the hypotheses. Second, and taking a multilevel approach, it may be fruitful to expand this research to understand whether EU member state-level actions and dynamics play an

intermediate role in the EU-IGO relations – that is, whether questions of vertical coherence influence the quantity of and level of cooperation/conflict in the interactions under study.(Figure 6) Third, this research has remained agnostic as to whether EU-IGO interactions might vary depending on the particular policy field (for example, the 'high politics' of security versus less sensitive issue areas) being addressed. Fourth, further research is required to fully unpack the detailed mechanism behind the relationship between EU membership and the increase in the quantity of and conflict in its interactions with IGOs. Fifth, and more broadly, further research employing this methodology could explore in more depth the relation between policy overlap and cooperation/conflict in IOR, asking under what conditions policy overlap leads to higher conflict or higher cooperation.

## Notes

1. Tokhi (this issue) explores this question in more depth to understand the conditions under which a FIGO grants access to the EU, focusing particularly on the effect of the level of authority of the FIGO making this decision.
2. The 'other representation' category covers formal representation including participation rights only – that is, having a delegation or mission at an IGO is not considered formal representation in our coding.
3. However, this finding may also indicate that membership or observer status of the EU in IGOs reflects geographical overlap in policies, which we do not measure.

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