The Emerging Regime Complex for Artificial Intelligence

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Abstract: The promises and pitfalls of artificial intelligence (AI) have led to an intense race to regulate the technology. However, no central international regulatory institution has yet emerged. Instead, the regulatory landscape is characterized by a variety of nascent and partially overlapping governance arrangements, resembling an emerging regime complex. What are the key characteristics of this regime complex, and what logics can account for its origin and shape? This article offers the first systematic analysis of the AI regime complex. Its contribution is twofold. First, theoretically, we develop three explanatory logics—power-oriented, functionalist, and path-dependent—to evaluate the evolution and shape of the AI regime complex along two key structural dimensions: hierarchy and differentiation. Second, empirically, we track and explain the development of the AI regime complex 2014–2024 based on a novel and comprehensive dataset on 119 international institutions involved in AI governance. Our findings show that the AI regime complex is marked by a lack of hierarchy, dense geographic concentration of governance efforts in Europe, and generally low functional differentiation, reflecting the combined influence of state power, functional demands, and institutional path dependencies. These patterns point to risks of fragmentation in global AI governance, as overlapping institutions and regional concentration may impede coherent rule-making and constrain the regime complex's capacity to adapt to emerging challenges.

The rapid development of artificial intelligence (AI) raises urgent governance challenges across social domains (e.g., Horowitz, 2018; Tallberg et al., 2023). AI is poised to disrupt labor markets through automation (e.g. Acemoglu & Restrepo, 2018), transform warfare through autonomous drones (Trager & Luca, 2022), undermine democratic processes through deep-fakes (e.g., Kreps & Kriner, 2023), and challenge privacy rights through facial recognition (e.g., Leong, 2019). These developments have raised calls for regulation to protect jobs, safeguard democracy, provide ethical guidelines, and uphold personal integrity (e.g., Ehret, 2022).

These calls have been met by increasing regulatory activity at the international level. Prominent examples include the appointment of the United Nations (UN) High-Level Advisory Board on AI and the adoption of the European Union's (EU) AI Act as the first legally binding framework on AI. These initiatives follow in the footsteps of other agreements on voluntary principles for the development and use of AI, for instance, by the Organisation for Economic Co-operation and Development (OECD), and the UN Educational, Scientific and Cultural Organization (UNESCO). Concurrently, non-state actors have actively sought to shape emerging AI governance through cross-border, multistakeholder initiatives, such as the Partnership on AI (PAI).

So far, however, there is no central institution tasked with coordinating AI governance at the international level. The AI governance landscape remains at a fragmented state (Roberts et al., 2024). In large parts, it resembles an emerging regime complex, that is, "a set of international institutions that operate in a common issue area and the (formal and informal) mechanisms that coordinate them" (Henning, 2017, p.19), rather than a coherent regulatory regime (Alter & Raustiala, 2018). In this respect, AI seemingly follows the trajectory of other transnational policy challenges, such as climate change (Keohane & Victor, 2011), cyberspace (Hofmann & Pawlak, 2023; Nye, 2014), and international finance (Henning, 2023). Yet the exact nature of this nascent regime complex and the forces that shape it, remain largely unknown. What are the core characteristics of the emerging AI regime complex? What logics drive its development and orientation? How can insights from the AI regime complex inform our understanding of the evolution of regime complexes generally?

While scholars have begun to take an interest in international AI governance, research has been held back by an absence of systematic conceptualization efforts, as well as a lack of systematic data (Tallberg et al., 2023). Previous research has suggested that AI governance efforts

resemble a "regime in a fragmented landscape" (Schmitt, 2021, p.1), a "nascent regime complex" (Cihon et al., 2020, p. 547), and a "weak regime complex" (Roberts et al., 2024, p. 1278), but has not provided comprehensive descriptive analysis across time and space, or presented systematic explanations for the shape of the emerging AI regime complex. The few existing large-scale mappings focus on specific AI policies, such as ethics guidelines and principles (e.g., Jobin et al., 2019). Furthermore, while several studies have discussed how AI ought to be regulated globally and what "future-proof" AI governance would entail (e.g., Cihon et al., 2020; Maas, 2023; Krasodomski et al., 2024), they have lacked systematic data to evaluate whether emerging institutions align with their recommendations.

This article aims to address this gap by offering the first systematic analysis of the AI regime complex. Theoretically, we build on Henning & Pratt's (2023) framework for comparative regime complex analysis, which identifies two principal dimensions: *hierarchy* and *differentiation*. Hierarchy refers to the extent to which institutions recognize the authority of other institutions in a regime complex, while differentiation is the extent to which institutions within a regime complex vary in their functions (Henning & Pratt, 2023, pp. 7-8). We develop three explanatory accounts for why regime complexes may vary in hierarchy and differentiation, with specific application to the AI regime complex: a *power-oriented logic*, expecting institutional hierarchy and differentiation to be shaped by the degree of alignment in great power preferences; a *functionalist logic*, expecting them to be influenced by the nature of cooperation problems and externalities; and a *path-dependent logic*, expecting them to be impacted by institutional legacies.

Empirically, we evaluate the explanatory power of these logics based on a novel dataset. This dataset provides a comprehensive inventory of international institutions involved in AI governance, capturing a diverse range of institutional types – from formal international organizations, like the UN or the EU, to informal governance arrangements, like the G7 or the newly established AI summit series, and multistakeholder initiatives, like the Global Partnership on AI (GPAI). These granular data allow us to trace the emergence and evolution of the AI regime complex, 2014–2024, and to evaluate the explanatory contribution of the three logics to patterns of hierarchy and differentiation by way of utilizing congruence analysis (e.g. Blatter & Blume, 2008; George & Bennett, 2005).

Our analysis produces two key findings. First, our data indicate that the AI regime complex is low in hierarchy, as few institutions are subordinate to other institutions, low (but somewhat increasing) in functional differentiation, as regional institutions dominate in the AI regime complex and policies are primarily concerned with AI from a human-rights perspective, and high in geographic differentiation, as AI institutions are concentrated in Europe. Second, we find that the structural features and development of the AI regime complex reflect complementarities between our three explanatory approaches. In line with our expectations on state power, we find that misalignment in great powers' regulatory preferences contribute to low hierarchy, as witnessed in the absence of a focal organization and a multitude of competing institutions, leading to low functional differentiation. Our findings also lend some support to the functional logic, as most observed AI policy is non-binding, consistent with states' desire for flexibility in a rapidly evolving and uncertain technological context. This desire for flexibility contributes to the low level of hierarchy in the AI regime complex. Finally, we find some support for the path-dependent logic, most clearly reflected in the EU's role as an early key player in international AI regulation, offering insights as to why functional differentiation is low, while geographic differentiation is high.

Our findings have several broader implications, further elaborated in the conclusion. First, we contribute to efforts focused on investigating the formation and evolution of regime complexes (e.g., Heldt et al., 2025; Langlet & Vadrot, 2024; Morin & Orsini, 2013), by underscoring the utility of hierarchy and differentiation as two core dimensions that enable the analysis of regime complex trajectories. Second, we contribute to new research on adaptive and maladaptive regime complex evolution (for an overview, see Heldt et al., 2025), by showing how low hierarchy and differentiation in the AI domain present significant risks of maladaptive outcomes. Third, this article makes a significant contribution to a burgeoning literature on the international governance of AI (for an overview, see Tallberg et al., 2023), by offering a systematic longitudinal analysis of how AI governance has evolved internationally. Our study shows how AI governance scholarship is ready to move beyond normative discussions and initial mappings to address questions pertaining to the sources, nature, and consequences of AI governance institutions.

The remainder of this article is organized into four sections. In the following section, we present our theoretical argument. In the second section, we introduce a new dataset on international AI

governance institutions. In the third section, we present our results. We conclude by summarizing our findings and outlining the broader implications of this article.

Theorizing the AI Regime Complex

Today, novel policy issues that emerge at the global level often transpire within densely institutionalized governance arrangements and through regime complexes. Yet the processes that lead to the formation of regime complexes remain understudied. In the following section, we first introduce two dimensions for characterizing regime complexes, before we turn to our main theoretical argument, highlighting three distinct logics for explaining the development of the AI regime complex.

Conceptualizing the AI Regime Complex: Hierarchy and Differentiation

While much scholarship on regime complexes thus far has explored individual policy domains (e.g. Abbott, 2012; Kijima and Lipscy, 2023; Raustiala and Victor, 2004), there is an emerging literature focused on examining how and why regime complexes vary across different policy domains and geographic regions. To identify the core characteristics of the AI regime complex, we build on Henning and Pratt (2023), who conceptualize regime complexes in terms of two key dimensions: hierarchy and differentiation.[1] These two concepts offer a valuable framework for descriptively categorizing regime complexes, but also a useful starting point for explanatory accounts by identifying variation in outcomes across regime complexes (Henning & Pratt, 2023). *Hierarchy* captures the extent to which institutions within a regime complex recognize the authority of other institutions to "craft definitive rules, organize common projects or otherwise set the terms of interinstitutional cooperation" (Henning & Pratt, 2023, p.7). Institutions within a regime complex typically establish "overlapping and (potentially) rival authority claims regarding international governance" (Alter & Raustiala, 2018, p.332). Hierarchy can be conceptualized on a continuum, ranging from a lack of hierarchy, where institutions hold equal claims to rule-making, to extensive hierarchical links, where institutions recognize a ranking of rule-making claims amongst each other (Henning and Pratt, 2023). When

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[1] Other regime complex research (e.g., Eilstrup-Sangiovanni & Westerwinter, 2022), suggests three dimensions: scale, density, and diversity. There is considerable overlap between what Eilstrup-Sangiovanni and Westerwinter label "diversity" and what Henning and Pratt call "differentiation," leading us to view these as the same. We consider scale a basic indicator of system complexity (Anderson, 1999) that tells us something about the number of relations between institutions but not about the nature of relations between institutions.

institutions have authority over other institutions and inter-institutional bodies, they are hierarchically superior. Authority relationships are shaped by institutions' degree of flexibility, since rule-making claims are less consequential in the presence of high flexibility (Koremenos et al. 2001). In general, however, if an institution is a subordinate body of another institution, the former is viewed as hierarchically linked to the latter. When a regime complex is characterized by a high degree of such links, it is more hierarchical.

Differentiation refers to variation between institutions in a regime complex (Henning & Pratt, 2023, p.8). We distinguish between two types of differentiation, namely, functional and geographic differentiation. Regime complexes are functionally differentiated if the institutions within the complex are dissimilar in terms of their type and policy domain. For example, a functionally differentiated regime complex consists of diverse members, including state and non-state actors across varying policy domains. Similarly, geographic differentiation captures the degree of differentiation in terms of the geographic scope of international institutions within a regime complex. Regime complexes are geographically differentiated, if the institutions within the complex have "specialized expertise" or are "spatially defined" (Henning & Pratt, 2023, p.13), that is, they are concentrated in certain geographic areas. Like hierarchy, functional and geographic differentiation can be assessed along a continuum. Functional differentiation is highest when different institutions perform highly variegated policy functions, and it is lowest when like institutions perform similar policy functions. Similarly, geographic differentiation is highest when the geographic scope of institutions is concentrated within a limited geographic area, while it is lowest when institutions are geographically dispersed and wide in their scope.

The concepts of hierarchy and differentiation are not only useful to map and explain the nature of regime complexes but can also be suggestive of governance outcomes. Hierarchy can mitigate rule conflict within a regime complex, as more authoritative institutions likely have the capacity to impose greater rule consistency (Henning & Pratt, 2023). Similarly, greater differentiation within a regime complex is associated with less functional and geographic overlaps between institutions, likely reducing the scope for forum shopping (Henning & Pratt, 2023).

Explaining the AI Regime Complex: State Power, Functional Demands, and Path Dependencies

What explains the development of the AI regime complex along the dimensions of hierarchy and differentiation? Building on established work in international relations (IR) theory, we develop theoretical accounts of three distinct logics that may help to explain the evolution of the AI regime complex. Specifically, we theorize (1) the role of *state power and preferences*; (2) the nature of the issue, exploring whether specific *functional demands* drive regime complex development; and (3) whether *path dependencies* from existing international governance structures affect the evolution of the AI regime complex.

The first logic centers on the *role of powerful states* and their divergent regulatory preferences. It builds on research suggesting that international regulatory outcomes reflect the distribution of interests among major powers, as defined by aggregate and issue-specific power (Drezner, 2007; Gruber, 2000; Krasner, 1991; Moravcsik, 2013). Aggregate power captures a state's overall power across several domains, such as military capability and economic size, while issue specific power captures a state's power within a certain issue area, such as technology or climate change. Less powerful states and non-state actors, for their part, must operate within the parameters set by the preferences of those with high aggregate and issue-specific power, leaving them with limited independent influence over regulatory outcomes.

When applied to regime complexes, a power logic highlights several factors that could help explain how they develop along the dimensions of hierarchy and differentiation. First, this logic would expect the hierarchical positioning of a focal organization, an institution that is extensively and hierarchically linked with other institutions within a regime complex, to depend on the alignment of interests among all powerful actors and their willingness to agree on shared rules and regulations within a given issue area (Keohane & Victor, 2011). Research in this tradition suggests that agreement between all major powers is a necessary condition for achieving progress toward global regulation (Drezner, 2007). Second, this logic would expect a lack of alignment of interests among great powers not only to impede the formation of a focal organization but also to promote the development of parallel institutions, therefore resulting in functionally similar institutions. Scholarship on forum-shopping shows that powerful states commonly shift discussions to the governance fora most closely aligned with their preferences, thus contributing to institutional diversification (Abbott, 2012; Alter & Meunier, 2009; Busch, 2007; Drezner, 2009; Dür et al., 2014; Helfer, 2004). Such venue shifts are also common when

emerging powers challenge established actors, opting for novel institutions more closely aligned with their increased capabilities and interests (Morse & Keohane, 2014). Third, and related to the former expectation, if great powers have competing interests and are therefore unable to align their interests to create a focal organization, we expect great powers to promote the development of parallel institutions and advance their interests in the governance fora most closely aligned with their preferences (Abbott, 2012; Alter & Meunier, 2009; Busch, 2007; Drezner, 2009; Dür et al., 2014; Helfer, 2004). For instance, they may turn to regional organizations, which are most proximate to their spheres of influence, subsequently driving heightened geographic differentiation within the regime complex.

If this logic is at play in international AI governance, we would expect three patterns to materialize. First, we would only expect convergence on a focal institution of international AI governance if all major powers have shared interests in establishing such an institution. If they lack sufficiently overlapping preferences to agree on a focal institution, but nevertheless support some degree of international AI governance, we expect them to pursue their regulatory preferences through competing institutions, leading to a more fragmented governance landscape. As a result, we would expect the AI regime complex to be low in hierarchy, given the absence of a focal institution. Second, when powerful actors advance their interests through the institutions that they favor in the AI sector, this is likely to drive the number of overlaps among functionally similar institutions upwards. As a result of the absence of a focal organization and weak authority relations, we would expect institutions to perform similar functional roles, leading to low levels of functional differentiation. Third, and related, if powerful actors contribute to competitive institutional proliferation, we expect them to turn to institutions within their geographic sphere of influence. As a result, we expect the geographic scope of these institutions to be limited, indicative of a high degree of geographic differentiation.

The second logic suggests that *functional demands* determine the prospects for international cooperation. It builds on research submitting that international institutions and their design reflect the functional demands of the issues that are regulated, commonly termed the "problem-design link" (Abbott & Snidal, 1998; Keohane, 1984; Koremenos, 2016; Koremenos et al., 2001; Martin, 1992; Voeten, 2019). According to this logic, international institutions help states to overcome barriers to cooperation, such as information asymmetries, commitment problems, and transaction costs (Hawkins et al., 2006; Koremenos et al., 2001; Koremenos, 2016).

When applied to regime complexes, the functional logic generates several insights that could help explain patterns of hierarchy and differentiation. First, this logic would expect the extent of hierarchy within a regime complex to depend on the nature of the governance problem. Generally, regime complexes are well suited for governance issues which are too complex for one institution to handle and require the involvement of all relevant stakeholders to ensure effective governance outcomes (Reinsberg & Westerwinter, 2021). Furthermore, if uncertainty surrounding a policy issue is high, actors can be expected to respond by designing institutions that offer them greater flexibility (Koremenos, 2005, 2016), a feature typically associated with international regime complexes (Reinsberg & Westerwinter, 2021). Second, the functional logic expects regime complexes to develop in ways reflective of functional dynamics and efficiency considerations, for instance, in terms of divisions of labor between institutions (Heldt et al., 2025; Heldt & Schmidtke, 2019; Zürn & Faude, 2013). This would suggest clear functional mandates for the institutions in the issue domain in question, therefore leading to high functional differentiation. Third, and related, if externalities are expected to be global, then governance arrangements should predominantly emerge at the global level as states seek to design institutions that can solve the governance problem at hand (Koremenos, 2016). Accordingly, geographic differentiation should be low, reflecting the dominance of global institutions.

If this logic is at play in international AI governance, we would expect several patterns to materialize. First, the specific design of AI policies should reflect the nature of the underlying cooperation problem(s) raised by the advance of AI technologies. Given the high uncertainty around AI (e.g. Nordström, 2022), we would expect actors to turn primarily to flexible governance arrangements and prefer non-binding policies. Consequently, we expect this to lead to low levels of hierarchy in the AI regime complex. Second, we would expect the regime complex to involve a clear division of labor between extant and emerging institutions to avoid duplication. When new initiatives emerge, they would fill governance gaps rather than provide competition in the governance space of already existing institutions. Taken to its extreme, this logic would expect only one principal institution in each issue area of the AI regime complex, and thus a high degree of functional differentiation. Third, the level and scope of governance should reflect the nature of externalities from AI technology. Accordingly, national-level and even regional-level regulation would be seen as sub-optimal, since the development and

deployment of AI involve considerable cross-border externalities (e.g. Tallberg et al., 2023). In line with this, we would expect geographic differentiation to be low.

A third logic posits that international cooperation is shaped by *path dependencies*. It builds on research suggesting that development of international institutions reflects complex temporal dynamics, including patterns of path dependency arising from lock-in effects, positive feedback effects, increasing returns, and self-reinforcement (e.g., Fioretos, 2011, 2017; Pierson, 2004; Voeten, 2019). There is ample evidence underscoring that institutional structures which prevail after a certain moment in time affect the subsequent institutional development (Fioretos, 2011). Furthermore, similar to the functional logic, path dependency also suggests that when states create new institutions, they typically consider extant institutions (Abbott et al., 2016; Copelovitch & Putnam, 2014; Kalyanpur & Newman, 2017).

When applied to regime complexes, existing scholarship suggests that path dependencies may influence both hierarchy and differentiation in the following ways. First, this logic would expect hierarchy within regime complexes to mirror the authority relations inherent in pre-existing institutions of a regime complex. In particular, first-mover institutions in a given issue domain tend to reinforce existing hierarchies by leveraging informational and other advantages, which later institutions must accommodate (Eilstrup-Sangiovanni & Westerwinter, 2022). Furthermore, when states design new institutions, their choices are often informed by the design of existing institutions (Reinsberg & Westerwinter, 2023). Second, path dependency suggests that institutional development is often suboptimal and inefficient, as institutional thresholds hinder actors from adapting institutions to provide the most efficient solutions for the governance problem at hand (Fioretos, 2011). Moreover, path-dependent behavior makes actors seek out institutions most in line with their interests, while resisting change due to the high cost associated with institutional shifts (Keohane & Victor, 2011). Accordingly, if the functional mandates are poorly aligned with governance problems, this should result in low functional differentiation. Third, and building on our first expectation, the path dependent logic would expect first movers and early (regulatory) decisions to shape the trajectory of a regime complex's subsequent development (Fioretos, 2011). When new cooperation problems arise, states would typically consider existing organizations in the relevant policy area and be inclined to rely on those with an established role in a given issue area (Reinsberg & Westerwinter, 2021), thus not only reinforcing patterns of institutional hierarchy, but also driving geographic differentiation.

If this logic is at play in international AI governance, we would expect a number of patterns to materialize. First, the AI regime complex should reflect earlier choices and the legacies of existing institutions. Given that AI is a novel technology, this would lead us to expect that the development of AI regulation is closely tied to the regulation and governance of other modern technologies. States would promote AI regulation within institutions already vested with regulatory power in the tech domain, such as technical organizations, thus inheriting pre-existing authority structures. This could, for example, include institutions with epistemic authority in the internet governance policy domain, which is closely connected to the AI policy domain. As a result, if first-mover institutions play a dominant role in the AI regime complex, we would expect this to manifest in a high degree of hierarchy. Second, we would expect it to be challenging for institutions to quickly adapt to the demands of effective AI governance, resulting in institutions with existing functional mandates that are not best suited to address issues raised by AI. Accordingly, we expect functional differentiation in the AI regime complex to be low. Third, early regulatory decisions should grant first movers an influential role in the AI domain and reinforce existing geographic patterns of differentiation. Applied to the context of AI, we would expect the EU to hold a distinct role in the AI regime complex, due to its leading position as a digital regulator (e.g. Bradford, 2020), therefore contributing to a high level of geographic differentiation.

Taken together, the power-based, functionalist, and path-dependent logic generate both similar and different expectations for hierarchy and differentiation in the AI regime complex. Table 1 provides an overview of each logic and the respective expectations for outcomes on the two structural dimensions.

Theoretical perspective	Expectation for hierarchy	Expectation for differentiation
State power and preferences	Divergent interests are expected to prevent the establishment of a focal institution, leading to low hierarchy	Competing institutions are expected to exhibit institutional overlaps, leading to low functional differentiation Competing institutions are expected to be limited in geographic scope, leading to high geographic differentiation
Functional demands	High uncertainty within the AI policy domain is expected to drive preferences for flexible, non-binding arrangements, undermining authority claims amongst institutions and leading to low hierarchy	One principal institution is expected in each AI domain, leading to high functional differentiation Transnational externalities of AI are expected to require global rules, leading to low geographic differentiation
Path dependencies	Institutions are expected to reflect inherited authority structures and regulatory roles, leading to high hierarchy	Institutions are expected to develop inefficiently due to high costs for adaptation, leading to low functional differentiation First-mover institutions are expected to hold advantageous positions, leading to high geographic differentiation if these institutions are limited in geographic scope

Table 1. Theoretical Logics and Expected Outcomes for Hierarchy and Differentiation in the AI Regime Complex.

Data

Our study draws on a novel dataset covering 119 institutions involved in international AI governance from 2014 to 2024, providing detailed information on their policies addressing AI development, deployment, and use.[2]

The dataset is centered on institutions involved in transnational AI governance. In defining these institutions, we adopt a broad conceptualization, viewing institutions as "sets of rules meant to govern (…) behavior" (Martin & Simmons, 2013; North, 1990), which allows us to capture a diverse array of entities, ranging from formal international organizations (e.g., the UN or the EU) to informal governance arrangements (e.g., the G7 or the AI safety summits), multistakeholder initiatives (e.g., the Global partnership on AI), and NGOs (e.g., the World Economic Forum). We applied two key inclusion criteria. First, institutions were included only if they had adopted at least one policy (including laws, regulations, guiding principles, or reports) that explicitly and substantively addressed AI governance. This criterion excluded institutions that only tangentially referenced AI, as well as institutions whose policies predated the emergence of AI technologies by targeting earlier ICT developments.[3]

Second, given our interest in mapping the international regime complex within a global issue domain, we limit our analysis to international-level institutions concerning AI (cf. Keohane & Victor, 2011). We are interested in existing and novel transnational institutions that engage with AI policies, given a recent surge of regulatory initiatives at regional and global levels (Tallberg et al., 2023). This criterion excluded purely national-level institutions, even when they addressed AI governance, as well as self-regulation arrangements by private companies or academic institutions without cross-border relevance.[4]

We identified institutions based on a combination of primary and secondary sources, including the OECD AI Policy Observatory,[5] the Digital Policies Framework data by the Council of

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[2] For an overview of all institutions and respective institutional bodies covered in our dataset, see table A.1. in the Appendix. Note that the total count covers both core institutions and institutional bodies, if applicable. For certain AI governance efforts, particularly multistakeholder fora, no established name was available; in such cases, we record the coordinating institution's name instead.

[3] For a similar coding procedure, see the AGORA dataset, in particular, the discussion of the nominal scope of the dataset: Emerging Technology Observatory (2024)

[4] To illustrate our inclusion criteria for non-state actors: Our data excludes self-regulatory efforts by individual private corporations, but does include collaborative, private-sector initiatives with a transnational scope, such as the Frontier Model Forum.

[5] OECD (n.d.)

Europe,[6] and a mapping of AI governance initiatives provided by Global Partners Digital.[7] [8] These data sources cover institutions from all regions of the world. To identify gaps and discrepancies, we cross-checked our data against academic and civil society sources, such as AGORA[9] or AlgorithmWatch.[10] While we cannot exclude that there might be institutions that are not captured in our dataset, we judge this dataset to represent a comprehensive inventory of international institutions involved in AI governance, according to our inclusion criteria, as of December 2024.

We collected information on a range of variables at both the institution and policy level.[11] At the institution level, the variable *institution type* distinguishes between, e.g., regional and global IGOs, NGOs, and multistakeholder initiatives. The variable *membership* identifies the states, private-sector participants, and civil-society organizations that comprise these institutions. We also recorded information on *links* between institutions. We capture the nature of links between institutions by recording whether institutions have shared authority relations with one another and are either hierarchically or non-hierarchically linked. To that end, we introduce the binary variable *subentity*, allowing us to gauge whether an institution is a body within an institution or not. At the policy level, we record features of institutional output. For each policy we recorded the *name* and *publication year*, as well as *scope* and *policy domain*, where we distinguish between horizontal frameworks that address multiple domains and vertical policies targeting specific areas, such as trade, human rights, or security. We identified policy domain categories based on conventions in policy agenda research (e.g., Lundgren et al., 2024) and in AI governance research (e.g., Li, n.d.). Finally, we assessed the *bindingness* of policies (e.g., Tallberg et al., 2016), classifying them as either voluntary guidelines or legally binding instruments, and associating more binding arrangements with lower flexibility and potentially greater authority and hierarchy.[12]

Our data show that the number of international AI institutions has increased dramatically over the time period 2014 to 2024 (Figure 1). The data reveal an S-shaped growth pattern, with few

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[6] Council of Europe (2022)
[7] Global Partners Digital (2024)
[8] For a full list of all data sources, see table A.2. in the Appendix
[9] Emerging Technology Observatory (2024)
[10] AlgorithmWatch (n.d.)
[11] See tables A.3. and A.4. in the Appendix for a full list of variables, as well as table A.5. for an example of institutions covered by our coding procedure.
[12] For a similar classification, see e.g. (Li, n.d.)

institutions before 2016, followed by five to six years of rapid expansion, transitioning into somewhat more moderate growth in the last two years of the period. While the remarkable increase of new institutions in the AI governance space has slowed somewhat recently, there are still not any clear signs of saturation.
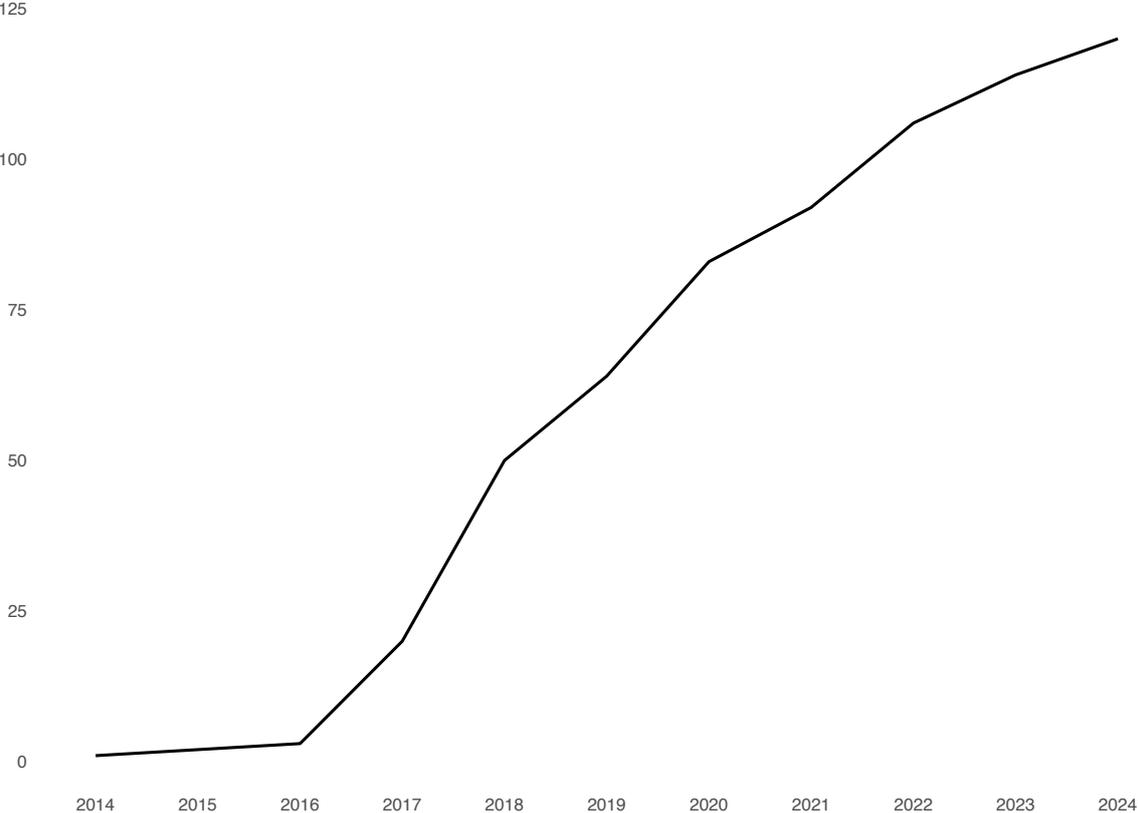

Figure 1. Cumulative count of international AI institutions, 2014-2024. Data: Authors' own.

Characterizing and Explaining the AI Regime Complex

How does the AI regime complex score on the dimensions of hierarchy and differentiation, and what roles do state power, functional demands, and path dependencies have in explaining these patterns? Our findings show that the AI regime complex currently exhibits low degrees of hierarchy and functional differentiation, as well as a high degree of geographic differentiation. Moreover, our analysis suggests that all three logics contribute to explaining its development along the two dimensions, albeit to varying degrees.

Hierarchy and Differentiation in the AI Regime Complex

We begin by outlining our descriptive findings on hierarchy. Figure 2 visualizes authority relations within the AI regime complex through a network map of all institutions. Each grey node represents a single institution, while solid lines represent formal and hierarchical relations between institutions. The network reveals that a considerable number of institutions in the AI governance landscape are not hierarchically linked. We do, however, observe a few clusters of institutions with hierarchical links and clear authority relations, including two prominent regional IGOs, the EU and the Council of Europe. For the most part, the hierarchical links our data show are within large international institutions, that is, between institutional bodies. For instance, the High-Level Expert Group on Artificial Intelligence (AI HLEG) is linked to the EU, and the Venice Commission, which is an advisory body on constitutional matters, is linked to the CoE. At the global level, we note that two global IGOs, the UN and the OECD, are at the center of two governance clusters, each having several subordinate institutions. The only non-state-based institution with hierarchical links is the World Economic Forum (WEF). The WEF has subordinate bodies, such as the AI Governance Alliance, an initiative that is part of the WEF's Centre for the Fourth Industrial Revolution and tasked to "establish global standards for AI governance," firmly embedded within the principal organization (World Economic Forum, 2025). In all, our data on authority relations in the AI regime complex reveal a low degree of hierarchy: there is no apparent centralization around a focal organization and most AI governance institutions have no hierarchical links at all.
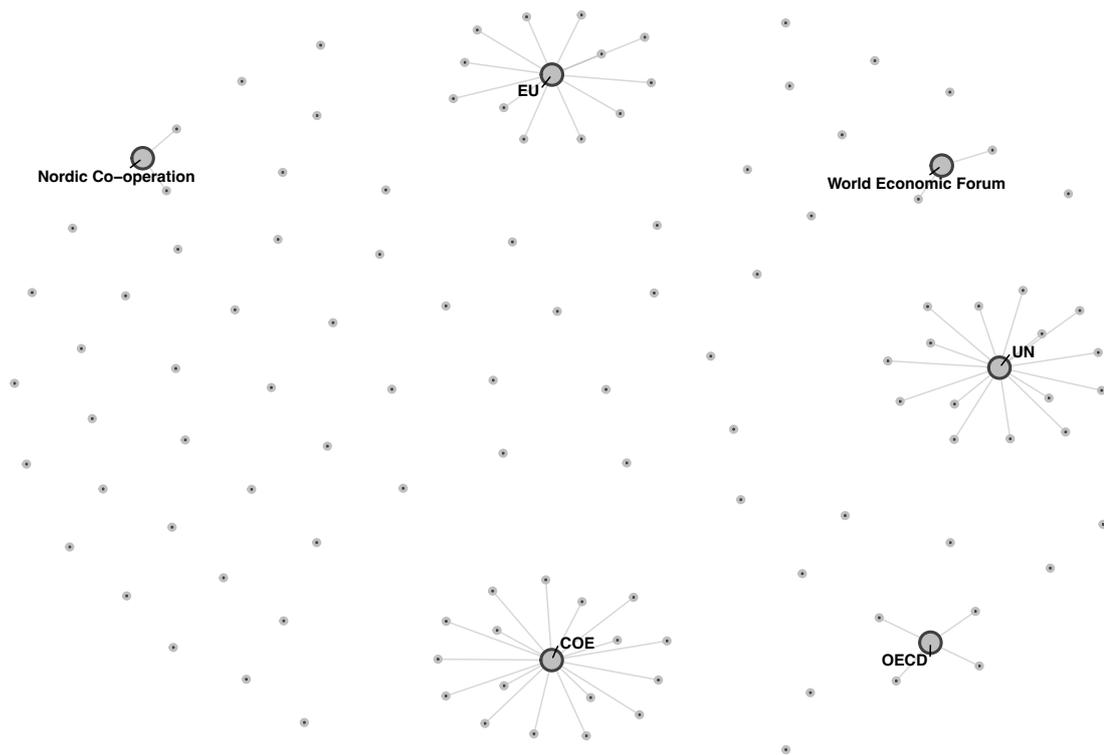
Figure 2. Network map of international AI governance institutions in 2024. Nodes represent individual institutions and edges formal, hierarchical relationships. Data: Authors' own.

Next, we present our descriptive findings on differentiation. Recall that we distinguish between two types: functional and geographic differentiation. We begin by outlining our findings on functional differentiation, which we approximate in various ways by using data on the type of institutions and policy domains within the broader AI governance landscape. Figure 3 visualizes type diversity, measured as the proportion of institutions by type, over time (see Figure A.3. in the Appendix for the count of institutions by type). Our data show that most institutions are state-based institutions, with regional IGOs as the most common type of institution. We note that the prominence of regional organizations is especially driven by two European institutions, the EU and the CoE. We do, however, also find a significant presence of non-state-based institutions, mainly consisting of NGOs and actors from the private sector. Multistakeholder initiatives represent another notable institutional type, which typically bring together both state and non-state actors and are often newly created institutions. Furthermore, our findings underscore notable time patterns: Although functional differentiation remains at a low level, as

indicated by the relatively stable proportions since 2019, both global IGOs and multistakeholder fora have slowly increased in proportion.
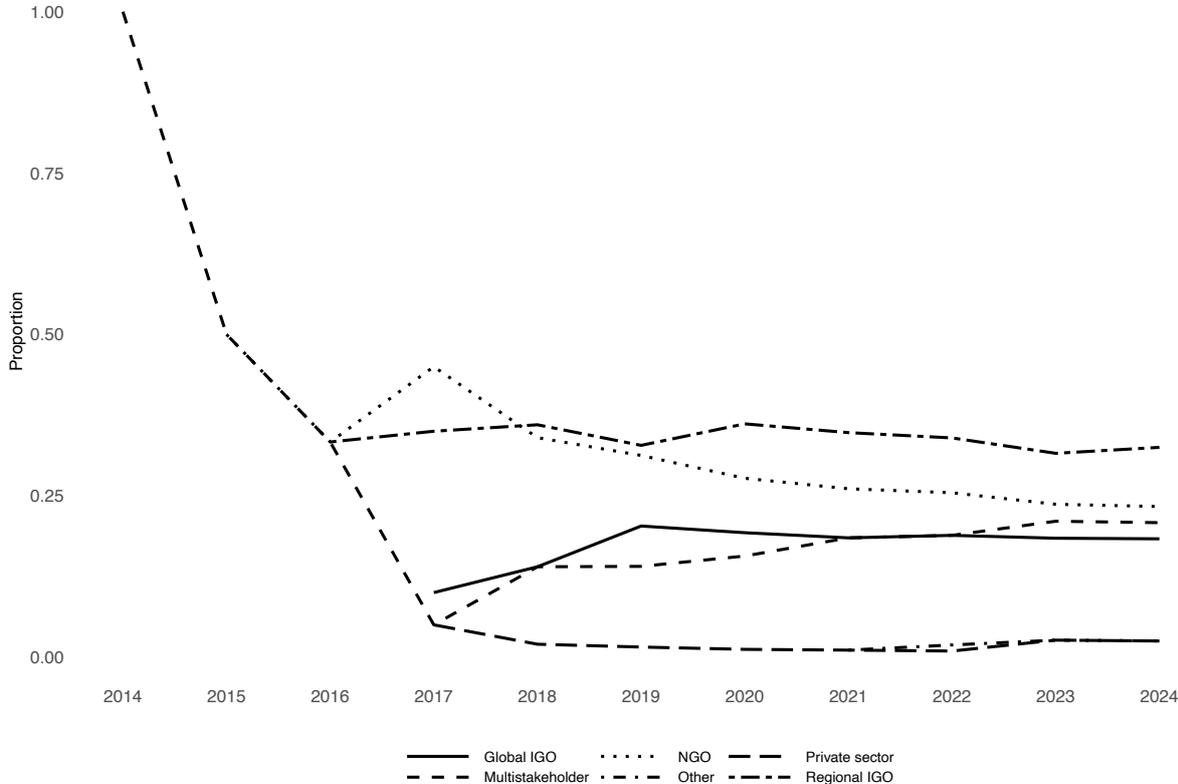

Figure 3. Proportion of international AI governance institutions by year, 2014-2024. Data: Authors' own.

Figure 4 visualizes policy domain diversity, measured as the count of policies by policy domain (see Figure A.1. in the Appendix for the count of policies by policy scope, differentiating between horizontal and vertical policies). Our data indicate that the most frequent policy domain is human rights, likely in response to oft-cited concerns regarding AI's potential consequences for privacy, biases, discrimination, and inequality (Wong, 2023). Policies in this domain vastly exceed the number of policies in other domains. Other domains include governance, which captures issues such as AI-enabled decision-making in public services, and law and crime, which captures policies related to AI and its use for law enforcement. We note that only a small proportion of adopted AI policies address security and defense issues, corroborating findings in prior research (Li, n.d.). This pattern indicates that policy domain differentiation remains at a low level overall, even if our data indicate a growing diversity of policy domains over time, therefore underscoring our findings on growing functional differentiation (see Figure A.3. in the Appendix). Our data also indicate distinct patterns of

functional differentiation for prominent types of institutions, whereby global IGOs stand out due to their focus on policies within the human rights domain (see Figure A.4. in the Appendix).
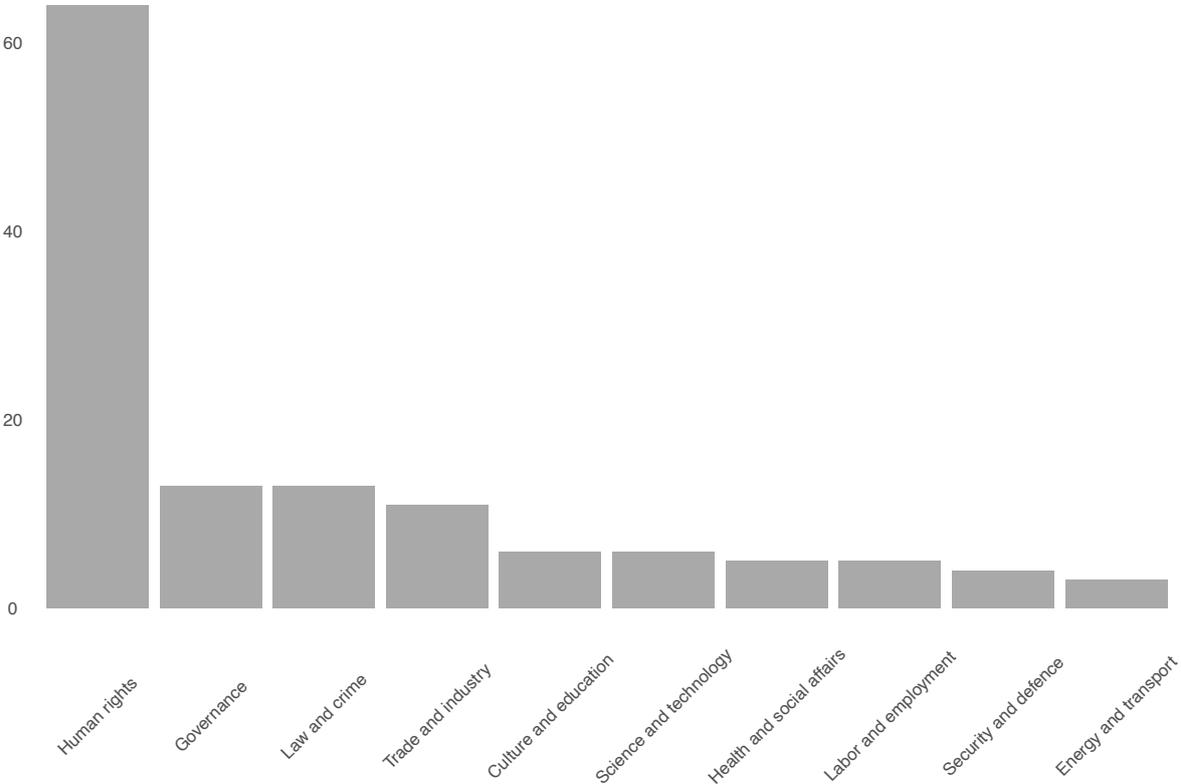

Figure 4. Count of policies, by policy domain. Data: Authors' own.

Finally, we turn to our findings on geographic differentiation in the AI regime complex to determine whether institutions are global or regional in scope—and, if regional, whether they are concentrated in specific geographic areas. Figure 3 already underscored the prominence of regional organizations as the most common institutional type in the AI regime complex. To approximate geographic differentiation, we assess whether global or regional organizations are the dominant institutional outlet for a given country around the world. To that end, we count state memberships in global and regional IGOs involved in AI governance. Figure 5 shows a distinct pattern of variation. The concentration of regional organizations tasked with AI governance in Europe suggests that memberships in regional IGOs exceed those in global IGOs for most European countries, in particular members of the EU.
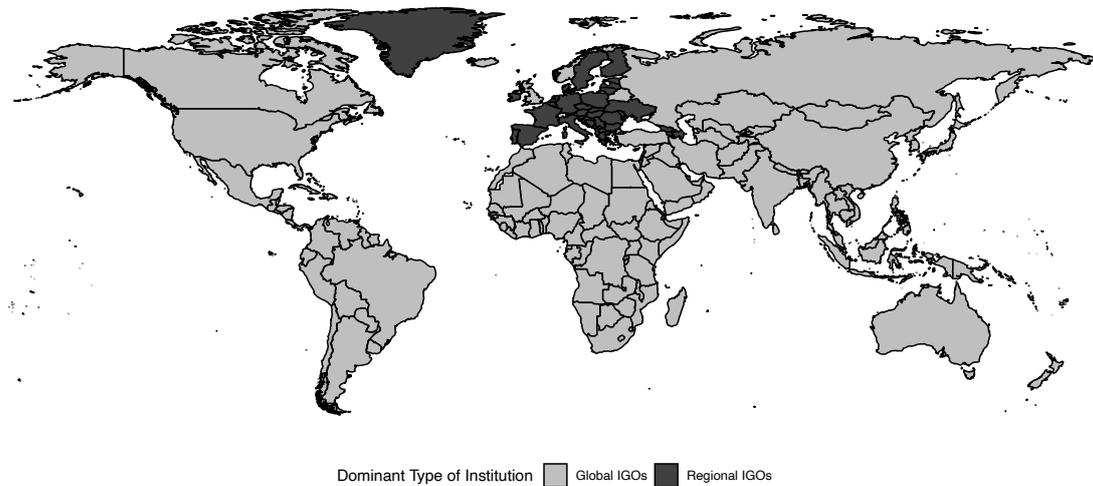
Figure 5. Dominant type of institutional membership (global or regional IGOs), by country. Data: Authors' own.

Taken together, our data indicate several noteworthy patterns of functional and geographic differentiation in the AI regime complex. Currently, functional differentiation is relatively low, since most policies emanate from regional IGOs and since existing policies mainly address human rights issues. Interestingly, we find some indication that our data point to growing differentiation (Figure 3 and Figure A.3.). In terms of geographic differentiation, however, our data clearly underline that the AI regime complex is concentrated in Europe, signaling a high degree of geographic differentiation.

State Power, Functional Demands, and Path Dependencies in the AI Regime Complex

We now turn to the three theoretical logics posited to shape the development of the AI regime complex and influence its form in terms of hierarchy and differentiation. The first logic centered around the role of *powerful states* in shaping international regulatory outcomes. More precisely, we expected this dynamic to materialize in three ways.

First, convergence on one focal institution for international AI governance would be unlikely in the absence of overlapping preferences among major powers. In the AI domain, we identify the U.S., China, and the EU as the three major powers with the highest levels of aggregate and

issue-specific power. With regard to aggregate power, all three actors possess significant economic capabilities; in addition, the U.S. and China command the world's most powerful militaries. With regard to issue-specific power, the U.S. and China stand out as the two leading countries in AI development (Tortoise Media, 2023). Furthermore, the U.S., China, and the EU host more than half of the world's data centers, a critical component to run advanced AI systems (Hawkins et al., 2025). In addition to that, the EU also possesses issue-specific power as a result of its well-developed regulatory authority, especially in the tech domain (Bach & Newman, 2007). These three major powers approach the international regulation of AI based on competing preferences, centered around three alternative models of AI governance: the American market-driven model, the Chinese state-driven model, and the European rights-driven model (Bradford, 2023).

The regulatory model championed by the U.S. places importance on the protection of free speech and a free internet, while simultaneously providing incentives to innovate (Bradford, 2023). The principal objective of the U.S. has been to protect the innovation potential of its domestic AI industry, which occupies a leading position worldwide. This position leads the U.S. to pursue a comparatively lenient regulatory approach domestically, mainly relying on self-regulation by the AI industry, while at the same time eschewing international initiatives that could hamper the scope for innovation, especially if binding in nature.

The regulatory model favored by China emphasizes the role of AI as an economic growth factor and as a tool to ensure social stability (Bradford, 2023). Like the American model, the Chinese model is focused on the development of the AI sector, but contrary to the American market-based approach, China aims to ensure that the government and not the tech companies are ultimately steering the digital economy (Bradford, 2023). Furthermore, China aims to develop from a norm taker to a norm maker by expanding its influence in existing digital governance institutions and creating new international institutions (Ding, 2021; Cheng & Zeng, 2022). At the same time, China is careful to avoid international constraints that could limit its ability to use AI for purposes of economic development and social control.

The EU's regulatory model focuses on individual and collective rights, the protection of democratic values, and ensuring fair and human-centric digital technologies (Bradford, 2023). In recent years, the EU has adopted several stringent regulations in the digital sphere, such as the digital markets act (DMA), the digital services act (DSA), and, most importantly, the AI

Act – the first comprehensive, legally binding, and horizontal AI regulation in the world. In the field of AI regulation, the EU typically prefers binding rules, since such rules can mitigate potential risks of AI, protect the individual rights of citizens, and safeguard the rule of law. In addition, initiatives to govern AI internationally can allow the EU to harness its regulatory power and help the European AI industry by creating a level playing field vis-à-vis U.S. and Chinese competitors.
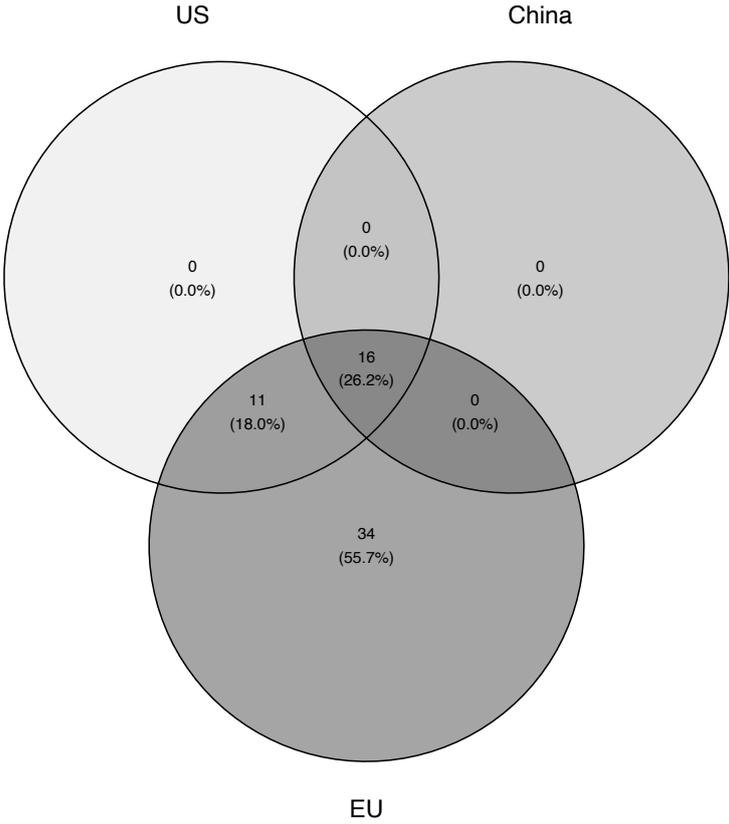

Figure 6. Membership of AI great powers in international AI institutions. Data: Authors' own.

Consistent with our first expectation, the different approaches of the U.S., China, and the EU have prevented convergence on one focal institution for international AI governance. Figures 2-4, as well as Figure 6, all point to a fragmented AI governance landscape with multiple international institutions. The AI regime complex is characterized by a lack of clear authority relations, with only a limited number of clusters of institutions with hierarchical links (Figure 2). No singular international institution stands out as fulfilling the role of a focal organization. Figure 6 shows a total of 16 institutions involving all three great powers, of which several overlaps can be attributed to UN institutions, including the Office of the United Nations High

Commissioner for Human Rights (OHCHR) or specialized agencies, such as the World Health Organization (WHO) and the World Intellectual Property Organization (WIPO). Yet there is no evidence for a hierarchically elevated position of the UN and its adjacent institutions vis-à-vis other international institutions. To the contrary, the U.S. has recently pressured the UN to temper its ambitions in creating new AI governance institutions, effectively undermining the UN's efforts to position itself more centrally in the international AI governance landscape (Murphy, 2024). While the EU has assumed a leading role in advocating for AI regulation and is a member of most international institutions pursuing AI policy, it has also focused a substantial number of its efforts through the EU legal framework, further indicated by the high number of exclusively European institutions, as visible in Figure 6 (34). Nevertheless, given its regional scope and in line with our findings on geographic differentiation, the EU cannot be regarded as a focal organization for international AI governance. Rare exceptions bringing together all three AI great powers, widely advertised for this reason, were the UK-initiated AI safety summit (Satariano & Specia, 2023).

Second, we expected that if major powers use AI governance fora selectively to advance their regulatory preferences, this should lead to the creation of parallel institutions. Consistent with this expectation, we find that major powers engage with institutions that most closely align with their preferences, thereby increasing institutional overlap within the AI regime complex and leading to a low degree of functional differentiation. Figures 3, 4, and 6 underscore this finding.

Third, and related, powerful actors were expected to create competitive institutions within their geographic sphere of influence. In line with our expectation, we find geographic differentiation in the AI regime complex to be high. Figure 5 visualizes the geographic concentration of the AI regime complex in Europe. Accordingly, we see a dominance of institutional membership in regional organizations for the case of Europe. Figure 6 illustrates this for the three AI great powers comparatively, underscoring the EU's extensive membership at both the global and regional levels of governance. Most governance efforts are indeed driven by EU institutions, but we also find additional evidence pointing to the role of other regional organizations, such as the Council of Europe. When turning to global or regional level AI institutions, the U.S. mainly tends to traditional Western global IGOs, such as the OECD, and engages in bilateral talks with the EU through initiatives such as the Trade and Technology Council (TTC). Furthermore, it has signed the CoE's framework convention on AI. More importantly, however, the U.S. has focused most of its attention on addressing AI at the national level, as underlined

by the Biden administration's voluntary commitments on AI regulation and the second Trump administration's multi-billion dollar investment project "Stargate" (Boak & Miller, 2025). China, for its part, has focused most of its international governance efforts on G20-driven institutions, hosting global conferences on the issue, and the UN, where China attempts to position itself as a "responsible major power" (Hulvey, 2025).

Our second logic suggested that *functional demands* should shape the structural features of governance arrangements. We expected this logic to materialize in three ways. First, we expected that the design of AI policies should reflect the nature of the policy problem. Given the high uncertainty around AI, we expected to see mostly flexible governance arrangements with non-binding policies, undermining authority claims amongst institutions and therefore leading to low levels of hierarchy. Consistent with this expectation, Figure 7 indicates that existing AI policies overwhelmingly consist of non-binding guidelines rather than binding laws, thus giving states greater flexibility in implementing AI policies. At the same time, the non-binding nature of most AI policies contributes may not be ideal for purposes of ensuring that states live up to their commitments and the authority claims of AI institutions over a given policy or issue domain. For instance, military AI presents a collaboration problem, requiring binding rules and monitoring mechanisms to ensure compliance. Yet existing governance mechanisms for LAWS, for example in the context of the Group of Governmental Experts (GGE) under the Convention of Certain Conventional Weapons (CCW), are limited to guiding principles, lacking enforceable regulations.
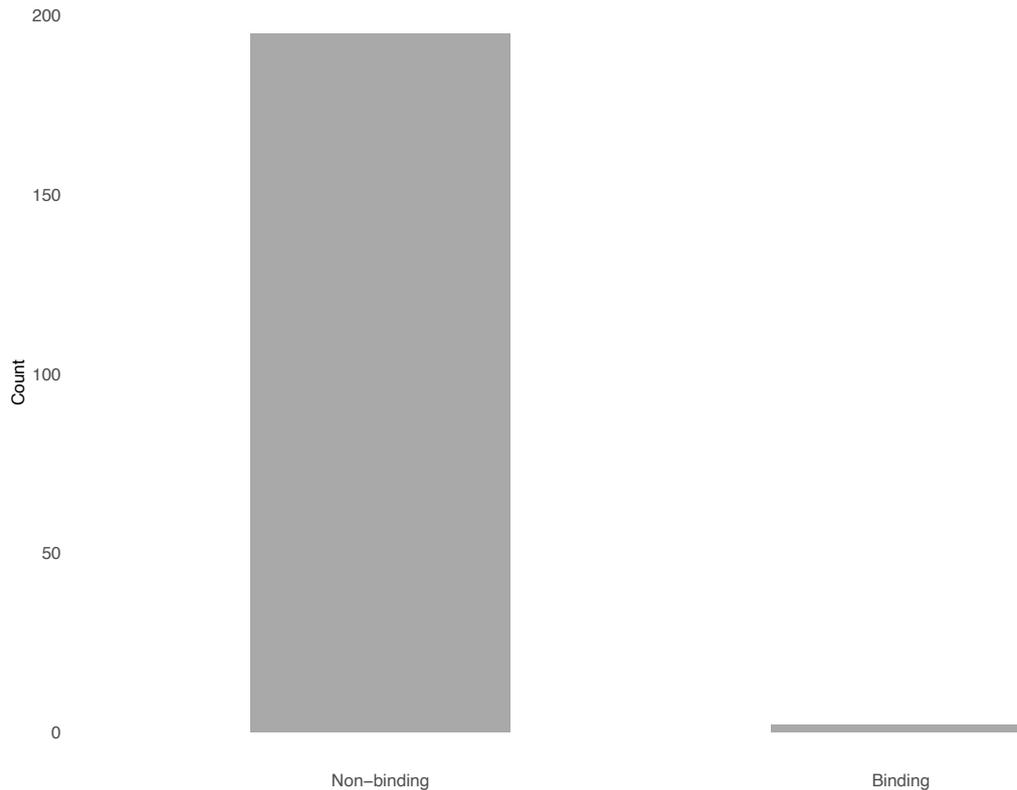
Figure 7. Distribution of bindingness of AI policies. Data: Authors' own.

Second, we expected the regime complex to exhibit clear division between extant institutions and new, emerging ones. Accordingly, new institutions should fill governance gaps and avoid rule duplication. Our data, however, do not indicate a clear functional division between extant and emerging institutions, implying limited efforts to avoid duplication. To the contrary, Figure 4, suggests considerable rule overlap, given the high number of AI policies in the human rights domain. As a result, we find no evidence of clear patterns of functional differentiation, as suggested by this logic.

Third, we expected that the level and scope of governance should reflect the nature of externalities raised by AI. In line with this, we anticipated that the global challenges posed by AI should be reflected in actors turning to the global level rather than the national level to establish adequate policy measures, leading to low levels of geographic differentiation. While our data, as evident in Figure 1, show the rapid growth of international AI institutions and policies, consistent with the notion that AI as a transnational governance challenge requires collaboration at regional and global levels, we do not find geographic differentiation to be low. Rather, our data underscore that the AI regime complex is geographically concentrated in

regional organizations, primarily in Europe, which is evident in the darkly shaded areas in Figure 5.

Finally, our third logic posited that the development of the AI regime complex is shaped by temporal dynamics, particularly patterns of *path-dependency*. We anticipated that this logic would give rise to three observable patterns.

First, we expected the AI regime complex to be driven by existing institutions, in particular first-mover organizations with regulatory power and expertise in the tech domain, therefore reinforcing existing hierarchies. We do find some evidence that several institutions specializing in tech partake in the AI regime complex, among them the Institute of Electrical and Electronics Engineers (IEEE) and World Intellectual Property Organization (WIPO). Another example is the Freedom Online Coalition, a group of states collaborating on internet freedom at the highest levels of governance. Yet, contrary to our expectation, we do not find clear evidence that institutions specializing in tech hold a leading role. Instead, institutions with a general mandate (EU, UN) or institutions focused specifically on human rights, education, and research (CoE, OECD, UNESCO) occupy the most authoritative positions in this regime complex, as evident in Figure 2. There is little evidence that the AI regime complex has inherited the authority structure of earlier tech regulation and thus little to suggest that tech organizations occupy the most authoritative positions.

Second, we expected that institutional development in the AI regime complex should be suboptimal and inefficient, given that actors often resist institutional change. In line with this expectation, our findings indeed reveal low levels of functional differentiation. Figure 3 shows that functional differentiation in terms of the institutional types involved in AI governance has been remarkably stable over time. Figure 4 further illustrates that many AI-related institutions are primarily drafting policies within the human rights domain, which is unlikely to capture the complex and multifaceted nature of AI governance challenges.

Third, we anticipated that first movers would have an influential role in the AI domain, thereby reinforcing existing hierarchical structures, as well as contributing to geographic differentiation. Applied to the context of AI, we expected the EU to fulfill this role in the AI regime complex, given its legacy as an established digital regulator. In line with this expectation, our findings (Figure 5 and 6) indeed indicate that the EU (and other European

regional organizations, i.e. the CoE) play a leading role in contemporary AI governance. This is indicative of a path-dependent dynamic whereby the EU leverages its prior experience in establishing tech regulation more generally, to lead efforts on AI regulation as well. Yet despite this regional concentration of AI governance efforts in Europe, there are as of yet few indications that the EU as an early mover is able to exert influence on AI governance beyond its borders, consistent with the so-called "Brussels effect" (Bradford, 2020).

To sum up, the three logics can help us to understand several key characteristics of the AI regime complex. The power-oriented logic correctly matches our expectations on the dimensions of hierarchy and differentiation, underscoring the importance of powerful actors in shaping AI governance efforts. It helps to explain the absence of a focal organization and low hierarchy, given the divergent interests of the major AI powers. Major powers focus on the institutions most closely aligned with their preferences and geographic reach, driving institutional overlap, and producing limited functional but high geographic differentiation. The functional logic helps to explain how high uncertainty about the implications of AI has led states to prefer more flexible institutional arrangements, ultimately undermining authority between institutions. Yet contrary to our expectations, we do not observe high functional differentiation and low levels of geographic differentiation, as the functional logic would lead us to expect. Finally, the path-dependent logic helps to explain the low functional differentiation in the AI regime complex due to suboptimal and inefficient institutional development and how the EU's first-mover role in tech regulation has contributed to high geographic differentiation. At the same time, our findings do not support the expectation that the AI regime complex would inherit a leading role for specialized tech institutions, and thus authority relations, from earlier tech regulation.

Conclusion

AI is widely considered one of the most pressing governance challenges of our time. As a result, recent years have seen a surge in international efforts to regulate the development and deployment of AI. However, no central institution for AI governance has yet emerged. Instead, the regulatory landscape is characterized by a variety of nascent and partially overlapping governance arrangements, resembling an emerging regime complex.

This article provides the first systematic study of the AI regime complex. Based on comprehensive new data on international institutions and policies, we have mapped the key characteristics of this regime complex and sought to explain its origin and shape. Our core findings are two-fold. First, we find that the AI regime complex has a low degree of hierarchy, since only a few institutions have hierarchical authority relations with other institutions, and a low degree of functional differentiation, since most institutions are state-based and policies mainly address human rights issues. We note that functional differentiation is increasing, as more diverse sets of institutions are now starting to fulfill tasks in various functional domains. By contrast, geographic differentiation is high, as evident in the concentration of the regime complex in Europe.

Second, we find that the emergence and shape of the AI regime complex reflects complementarities between the power-oriented, functionalist, and path-dependent logics. In line with the power-oriented logic, we find that the diverging regulatory preferences of principal AI actors—the U.S., China, and the EU—have shaped the trajectory of the regime complex, leading them to channel their influence via competing institutions and reducing the prospects of convergence towards one focal organization. In line with the functionalist logic, we find that the link between the design of international institutions and experienced policy problems matters for the AI regime complex. Our findings reveal that most AI policies are non-binding, which may reflect a need to retain flexibility in adapting to the fast-paced development and deployment of AI technology. In line with the path-dependent logic, we find that the legacies of existing institutions shape the development of the AI regime complex. Notably, the EU holds a key role in advancing international AI regulation, consistent with its status as a first mover and global digital regulator (Bradford, 2020, 2023).

This article has three broader implications. First, it speaks to an extensive body of literature on international regime complexes. Our findings underline the utility of hierarchy and differentiation as two central dimensions for analysis of regime complex architectures and their development over time. Previous research has primarily focused on "mature" regime complexes and retroactively sought to understand the nature of complexity and the conditions of regime complex formation (e.g. Alter & Raustiala, 2018; Hofmann, 2009; Raustiala & Victor, 2004). By contrast, there is little prior systematic research on the formative phases of regime complexes (Langlet & Vadrot, 2024; Morin & Orsini, 2013). We have joined recent efforts to systematically assess the evolutionary dynamics of regime complexes (Heldt et al., 2025).

While other contributions to this special issue highlight the evolutionary dynamics between new and extant institutions in the multilateral development finance regime complex (Paper 4, n.d.), or exogenous and endogenous factors affecting the global disaster regime complex (Paper 2, n.d.), we have applied this framework to the formative stages of regime complex evolution in the AI domain.

Second, our analysis suggests patterns of hierarchy and differentiation within the AI regime complex that may affect substantive outcomes, by creating conditions conducive to rule conflict and forum shopping. Hierarchy and differentiation impact whether regime complexes develop in adaptive or maladaptive ways (Heldt et al., 2025). Greater hierarchy and higher levels of (functional) differentiation are typically associated with more adaptive regime complexes, as other contributions to this special forum underscore (Paper 2, n.d.; Paper 5, n.d.). By drawing on recent advancements in the literature on international regime complexes that allow us to assess their development in terms of adaptive versus maladaptive patterns, we offer measurable evidence on this question. In this vein, we can tentatively interpret the evolutionary patterns of the AI regime complex along these two dimensions. Efforts to establish a focal organization for international AI governance have largely been unsuccessful, raising early warnings of potential maladaptive developments within the regime complex if rule overlap between institutions becomes constraining for the functioning of the complex. Consistent with prior research, our findings underline the persistent fragmentation of international governance efforts and suggest that attempts to create a central institution remain unsuccessful (Cihon et al., 2020). Furthermore, while functional differentiation is currently low, we note that there is a trend towards increasing functional differentiation, as more specialized and diverse types of institutions address the multifaceted governance problems posed by AI. Finally, our findings on the EU's leading role in shaping transnational AI governance suggest a geographically uneven emphasis on the issue, which may potentially hinder the adaptive development of the regime complex in response to AI's transnational externalities.

Third, this article contributes to a burgeoning literature on the international governance of AI (for an overview, see Tallberg et al., 2023). Existing work in this field has considered the suitability of alternative governance frameworks (Büthe et al., 2022; Cihon et al., 2020; Maas, 2023; Schmitt, 2021; Stix, 2021), the international negotiations attempting to craft regulations for specific AI applications such as autonomous weapons (Bode, 2024; Horowitz, 2019; Rosendorf, 2021), and surveyed state and non-state preferences toward AI regulation (Canfil &

Kania, n.d.; Horowitz, 2016; Rosendorf et al., 2023; Tallberg et al., 2024; Zhang, 2023). Building on earlier scholarship that characterizes AI governance arrangements as a regime complex (Cihon et al., 2020; Roberts et al., 2024), we have provided a comprehensive longitudinal analysis of the AI regime complex. Moving beyond normatively oriented discussions and initial mappings of the AI domain, our data and theoretical framework offer researchers tools to investigate the sources, nature, and consequences of AI governance institutions.

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