Government policy documents across 185 countries largely cite Global North sources

Sebastian Ramirez-Ruiz [1,2*]

Roman Senninger [3]

This article has been published in *Nature Human Behaviour*.

Citation: Ramirez-Ruiz, S., Senninger, R. Government policy documents across 185 countries largely cite Global North sources. *Nat Hum Behav* (2026). https://doi.org/10.1038/s41562-026-02464-x

View-only journal version (open): https://rdcu.be/fhngy

Abstract. Evidence is widely acknowledged as essential for crafting effective public policies. Despite its critical role, we know surprisingly little about the specific sources that inform decisions around the world. This paper explores the sources of evidence in the policymaking arena by analyzing evidence cited in over 1.2 million policy documents from 185 countries. Our analyses capture references to 3.5 million scholarly works and 740,000 policy sources, including contributions from government agencies, academic researchers, international organizations, and think tanks. We map global patterns in citation practices, highlighting regional and policy domain variation, focusing on the documented, accessible, and digitally visible evidence available to policymakers. Our findings reveal a pronounced concentration of attention: the vast majority of foreign evidence cited—both academic and policy—is produced in the Global North, even in documents authored by governments in the Global South. These patterns persist across policy areas, though with notable variation in the types of sources commonly used. Overall, the findings reveal a highly concentrated evidence landscape, where a small number of countries disproportionately serve as global reference points, underscoring persistent asymmetries in visibility, access, and influence within the international policy knowledge ecosystem.

Keywords. Evidence-informed policymaking; Expert-based information; Information diffusion; Science-policy nexus; Global policy analysis; Knowledge brokers

[*1] European University Institute (EUI), [2] Hertie School, [3] Aarhus University. Address: Via dei Roccettini 9, 50014 Fiesole, Italy. Email: sebastian.ramirezruiz@eui.eu, Web: seramirezruiz.github.io.

Over the past decades, the principle of evidence-informed policymaking has become popular across policy circles. Guided by the notion that policymaking should be informed by solid evidence (broadly defined as a knowledge claim that is backed up by a recognized scientific method), many governments have increasingly adopted mechanisms to better integrate research, policy analysis, and evaluation into decision-making processes [1–4]. Despite widespread acknowledgment of evidence as a foundation of policymaking, surprisingly little is known about the types and origins of the evidence that makes it into the policy arena [5]. Although government agencies, research institutions, international organizations, and think tanks around the globe all engage in the creation of new knowledge, the extent to which different actors contribute to policymaking remains largely unexplored. Still, understanding the sources informing policymaking is crucial, as information plays a central role in many influential theories of the policy process [6–9].

While the principle of evidence-informed policymaking is widely embraced, its implementation is not value-neutral. Access to, transfer of, and processing of information are not merely technical matters in policymaking—they are deeply tied to power dynamics [7, 10, 11]. Ultimately, information can determine which problems are prioritized, how policy options are framed, and whose perspectives are represented [12–14]. Expert information, in particular, can be used to mobilize interests, reinforce or challenge dominant views, and serve as a strategic resource for coalition-building and contestation in policymaking [8, 15]. This underscores the importance of understanding whose knowledge is seen as legitimate and how certain types of expert information gain reach in policy discussions.

Consequently, a key issue in understanding evidence use on a global scale is that not all sources are equally accessible or hold the same influence. Perspectives from world polity, world society, and world systems theories [16–18] suggest that global norms and knowledge often diffuse through institutionalized centers of authority rather than emerging evenly across contexts. In practice this might mean that certain actors—such as prominent governments, research institutions, or international organizations—might play a more salient role in informing policymaking than others. If these dynamics hold, asymmetries could arise in whose expertise feeds into policy, potentially reinforcing existing geopolitical hierarchies [19–22].

The global landscape of knowledge production and circulation is already shaped by differences in influence and recognition. Research suggests that academic evidence generated in and about the Global North is often treated as universally applicable, whereas knowledge from the Global South is perceived as context-specific and 'localized' [23]. These

asymmetries are present in scientific practice, where leading nations in global science receive a disproportionate share of citations, even when producing research of comparable quality [24, 25]. This raises the question of whether similar disparities also shape the use of evidence in policymaking.

One of the most tangible ways to assess the relationship between evidence and policymaking is through the analysis of policy documents. These texts, ranging from white papers to regulatory impact assessments, are widespread artifacts of modern policy and knowledge dissemination practice across the world. More than just passive repositories of information, policy documents can act as signaling devices, reflecting underlying institutional preferences and evolving norms around what counts as legitimate evidence [26]. While there has been valuable research examining the use of evidence and references in policy documents, much of this work remains fragmented. Studies employing policy documents often focus narrowly on the role of scientific research, are confined to specific policy domains like climate change, or predominantly analyze cases from the U.S. [e.g., 27–30]. A broader, cross-national perspective on how different sources of evidence feature in policy documents is still lacking.

In this study, we aim to bridge this gap by analyzing the diverse range of evidence sources cited in policy documents authored by governments around the world. We ask: Whose knowledge—policy-based and scholarly—do governments cite in their policy documents, and what do these patterns suggest about global dynamics of reach, visibility, and influence in evidence-informed policymaking? As policy documents increasingly serve as instruments for communicating decisions, justifying actions, and engaging with transnational audiences, the references they include offer a window into which forms of knowledge are recognized, legitimized, and shared across borders.

To investigate these questions, we draw on the Overton database—the largest online repository of publicly available policy texts—to examine patterns of citation across countries and policy domains. While our data collection strategy does not capture the full universe of knowledge used in policymaking, it reflects a particularly consequential subset: the *documented*, *accessible*, and *digitally visible* evidence that circulates in the global policy arena. These documents are not only traceable and public-facing; they are also available to policy audiences beyond national borders, making them more likely to be discovered, consumed, and referenced by others. As such, the materials we study form part of the transnational infrastructure through which governments communicate, justify decisions, project legitimacy, and engage in global benchmarking. In this context, analyzing this corpus offers a

window into how policy-relevant knowledge becomes visible, shared, and influential across the global policymaking landscape.

We engage in a systematic exercise of quantitative description, mapping citation patterns within this corpus of policy texts to understand whose knowledge becomes visible and authoritative in the documented landscape of global policymaking. Specifically, we examine whether policy documents tend to cite domestic versus foreign sources, identify which countries and scientific fields are most frequently referenced, and assess how these citation dynamics vary across geopolitical regions, economic stratification, institutional affiliations, and policy issue areas.

Our analyses reveal three key findings about the geography of evidence use. First, there are pronounced differences in the citation of foreign versus domestic policy sources: governments in the Global South more frequently cite foreign materials, while higher-income countries tend to draw more heavily on domestic sources. Second, Global North countries dominate the production of both policy and academic research that is referenced in documents worldwide–with the United States playing an especially outsized role in shaping the global knowledge agenda. Third, although citation behavior varies across policy domains—with some relying more on academic knowledge or international references—the broader trend holds: evidence originating from economically powerful nations is consistently more prominent. These findings underscore persistent imbalances in knowledge circulation that feed into contemporary policymaking.

Empirical setting and contributions

To characterize the references used in policy documents, we integrate two large-scale data sources into a relational database, capturing information about publicly available government-authored documents and the materials they cite. To understand how governments draw on different forms of expertise, we distinguish between two major categories: *policy-based* sources, which include materials produced by policy actors such as governments, intergovernmental organizations (IGOs), and think tanks; and *scholarly* sources, which refer to scientific research outputs, including journal articles, working papers, and preprints authored by academic researchers.

Our dataset includes more than 1.2 million policy documents, citing 3.5 million scholarly works and 740,000 policy-based sources. Figure 1 presents an overview of our data collection structure, which forms the basis for our analyses. We extract the policy documents for our study from Overton, which compiles publicly accessible materials from over 1,700

policy sources using web-crawling techniques, gathering documents that are either written by policymakers or intended primarily for them [31]. The database is largely language-agnostic, indexing and analyzing documents in multiple languages, making it a valuable resource for global policy analysis. Overton has become a key tool for studying how evidence informs policymaking, with prior research using it to track the integration of academic knowledge into policy discussions [27–29, 32]. Among available sources, Overton offers the most comprehensive coverage of policy documents, along with high accuracy in reference extraction [31, 33].

Our study focuses on official government policy documents published between 2000 and 2024 that contain at least one reference to a scholarly or policy-based source. For each citation, we extract metadata on the referenced material, including its type and country of origin. While Overton provides structured information about both the citing policy documents and their policy-based references, its metadata on academic citations is more limited. To address this, we incorporate data from OpenAlex—an open, structured index of scholarly publications [34]. OpenAlex offers extensive metadata on academic works, including author affiliations, journal venues, topical classifications, and institutional locations. It has become a key infrastructure for metascientific research [35, 36]. By linking OpenAlex records to the academic citations found in Overton, we gain deeper insight into the geography and institutional sources of scholarly knowledge cited in policy. This enables us to enrich these references with deeper context—capturing not only what is cited, but also *who* produced it, *where* it was produced, and *in which domains* of scientific inquiry. Together, these two data sources allow us to capture a richer, granular view of evidence circulation in policy.

An important qualification is that both Overton and OpenAlex, while the most comprehensive resources of their kind, have inherent limitations. Overton does not index the full universe of government-authored policy documents; however, it represents the most extensive systematically retrievable corpus currently available. Other services, such as Altmetric, capture partially overlapping sets of documents, though with narrower coverage overall (see *SI Appendix, A.6*). Likewise, OpenAlex provides rich open metadata on scholarly work, but some records can lack detailed author information, which can limit completeness. These constraints reflect the structural realities of working with large-scale, digitally visible corpora, and we highlight them to contextualize the scope of our findings.

Our final database offers near-global geographical coverage spanning 185 countries. Importantly, the distribution of the core policy documents is not uniform. A substantially

larger share of policy documents originates from Europe and the Americas, reflecting not only differences in publishing practices and institutional capacity, but also the nature of our empirical window: the *documented*, *accessible*, and *digitally visible* corpus of policy evidence. The availability of documents is highly correlated with the World Bank's Worldwide Governance Indicators (WGI) on regulatory quality, government effectiveness, and control of corruption (see *SI Appendix*, Fig 2). These patterns highlight the infrastructural and institutional factors around which knowledge becomes part of the visible layer of policy-relevant evidence.

The imbalance in data availability has important implications: the observed patterns likely reflect both the structural visibility of certain governments' documents *and* genuine institutional and personal referencing preferences shaped by conventions, perceived legitimacy, and applicability of knowledge. We therefore invite readers to engage with this analysis as a study of the *accessible policy commons*—a corpus that, while partial and structured by institutional inequalities, nonetheless provides a rare lens into how evidence circulates across borders at a global scale.

To structure our empirical analysis, we extract directed citation pairs between each policy document and the sources it cites. For policy-based references, we identify the authoring institution (e.g., government agency, think tank, or intergovernmental organization) and determine whether the source is domestic or foreign relative to the citing government. For academic references, we use OpenAlex metadata to associate each citation with the scientific discipline and national affiliation of the institutions of its authors.

To enable regional comparisons, we classify countries using the United Nations Regional Groups, which organize member states into five geopolitical clusters. We focus in particular on the Western European and Others Group (WEOG), which—together with observer states like the United States—closely aligns with conventional definitions of the Global North [23, 37]. We also draw on the UN M49 classification system, which distinguishes between 'developed' and 'developing' regions. These complementary schemes help us contextualize regional imbalances in both the production and citation of policy-relevant knowledge.

Our study contributes to research on the relationship between expert knowledge and policymaking in three key ways. First, we undertake a large-scale data collection effort centered on one of the most tangible and authoritative outputs of the policy process: official government documents. Unlike prior research, which has largely centered on the U.S. policy context, our dataset captures policy documents from a global perspective, enabling regional and cross-country comparisons. Second, we bring together two major categories

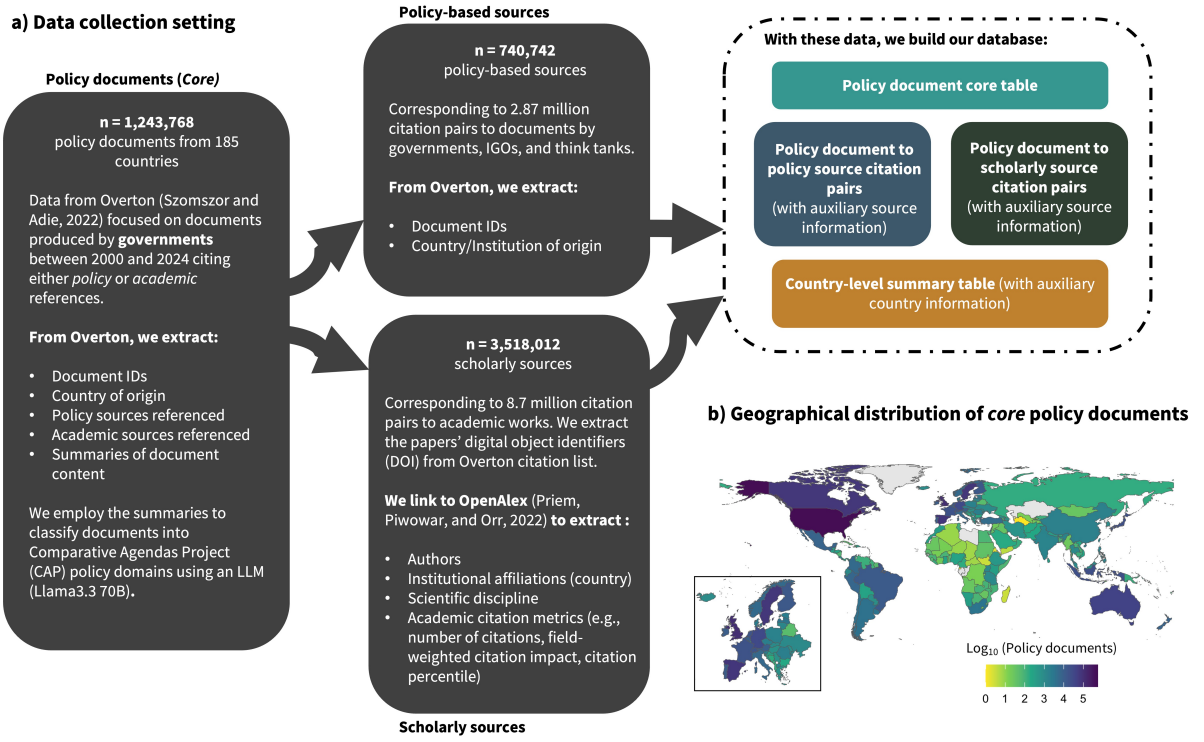

Figure 1: Study data collection and structure. Panel a illustrates the data sources, structure, and measures in our database. Panel b provides a summary of the geographical distribution of the *core* government policy documents.

of expert knowledge—policy-based sources and scientific research—bridging the gap between studies that have traditionally focused on one or the other. Third, we analyze evidence use across a wide range of policy domains, allowing us to examine how evidence use varies according to different fields with distinct expertise demands and 'localized' knowledge needs. By doing so, we aim to provide a more comprehensive view of the expert knowledge landscape that informs government policymaking.

Results

Equipped with this data infrastructure, we conduct a systematic, large-scale analysis of citation dynamics within this global corpus of policy documents. Our empirical analyses are guided by three sequential questions: a) To what extent do governments cite domestic versus foreign sources of evidence? b) Which countries' policy and scientific outputs are most frequently cited and therefore most visible? c) How do citation patterns vary across policy domains with differing knowledge demands? Together, these questions provide insight into whose knowledge is most prominently represented in global evidence-informed policymaking.

As introduced earlier, we distinguish between two broad categories of references: *policy-based* sources—documents from governments, intergovernmental organizations (IGOs), and think tanks—and *scholarly* sources, such as peer-reviewed journal articles and other scientific outputs. This classification allows us to examine how different forms of knowledge are incorporated into government documents.

Policy-based citations in our dataset total approximately 2.8 million references to 740,742 unique documents. Most of these (80%) are authored by government agencies, followed by 11% from IGOs and 9% from think tanks or other organizations. On the scholarly side, government-authored documents cite academic publications over 8.7 million times, spanning roughly 3.5 million unique papers.

Looking across documents, we find that 52% cite only policy-based sources, 24% cite only scholarly sources, and the remaining 24% draw on both. This distribution suggests that while some documents blend diverse forms of expertise, the majority of documents in this corpus draw primarily from within the policy ecosystem.

General patterns of domestic and foreign citations in policy-based and scholarly references We first examine the types of evidence cited in policy documents to understand the reliance on domestic versus foreign sources of evidence. Because our data link citing and cited entities, we can trace the geographic flow of references—offering a view into how governments engage with knowledge produced within their own borders versus abroad.

For policy-based sources, we compare the origin of the cited document to the country authoring the citing document. For scholarly references, we identify institutional affiliations for 98% of citations (8,603,678) corresponding to 85% of the unique cited works (3,012,209 in total) and classify papers as either: *Domestic* (all authors affiliated with institutions in the citing country), *mixed make-up* (at least one domestic affiliation), or *exclusively foreign* (no domestic affiliations).

A clear pattern emerges when it comes to policy-based sources. Governments in the Global North predominantly cite domestic sources, whereas those in the Global South more frequently reference foreign sources (see left panel of Figure 2). For example, only 13.2% of policy references in documents from African countries originate from national sources, compared to 73% in countries belonging to the U.N. Western European and Others Group (excluding the U.S.). This asymmetry underscores disparities in the transnational flow of policy-relevant information and the reliance on foreign expertise (see *SI Appendix* A.2 for a selection of example documents showcasing this pattern).

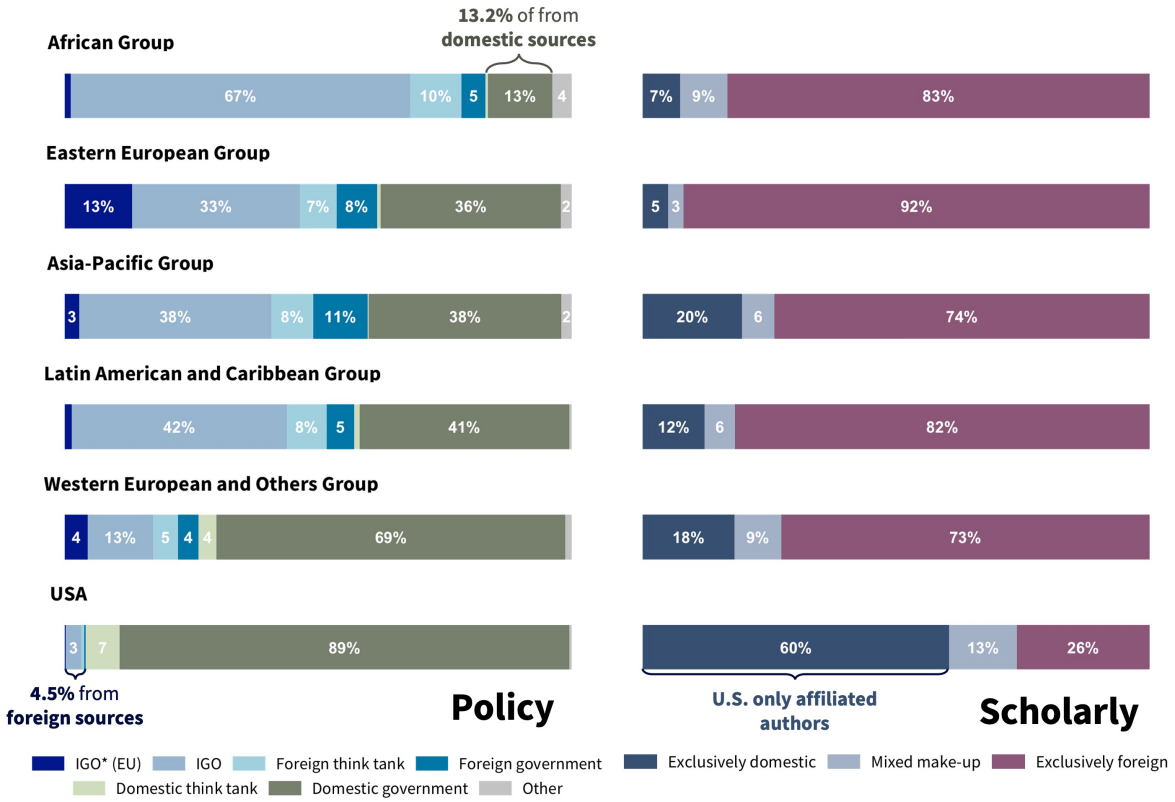

Figure 2: Composition of policy and scholarly source references by policy documents across UN regional groups. The left panel shows the breakdown of policy-based citations by source type for each UN regional group and the USA. The right panel shows the composition of scholarly citations, classifying cited papers as exclusively domestic, mixed make-up, or exclusively foreign based on author institutional affiliations.

On the scholarly end, the contrasts between the Global North and South are less pronounced. That said, the proportion of science produced with at least one author associated with an institution within the country authoring the government document is larger in Western European and Others and Asia-Pacific groups compared to the other regions. In most geographies, the modal cited scholarly work is authored abroad—either solely by foreign-based scholars or by teams spanning domestic and foreign institutions. This contrasts sharply with the United States, where 60% of cited papers are authored by researchers based at U.S. institutions.

While our analysis of domestic versus foreign references reveals notable differences in evidence use, it also prompts a broader question about visibility: which countries' outputs—both policy-based and scholarly—feature more prominently beyond their borders? While a significant portion of foreign citations is directed toward documents from international organizations, many also cite policy materials produced by other national governments. In the academic realm, the majority of citations are dominated by researchers affiliated with institutions abroad. To explore these patterns of transnational influence, we now turn to an

analysis of which countries' policy documents and scientific publications are more salient in the global policymaking arena, focusing on the references that "make it" across borders.

Global leaders in policy-based evidence reach and scientific visibility To quantify the international reach of government-produced evidence, we derive two complementary metrics from the government-to-government citation matrix. The first is a standard *H*-index, which captures the depth of reach by identifying how many policy documents from a country receive at least *n* foreign citations each. The second is a modified "country *H*-index", which instead captures the breadth of reach by identifying how many distinct foreign governments cite at least *n* policy documents from that country. Together, these metrics provide a window into both the frequency and the international spread of citations by foreign countries, highlighting whose policy outputs circulate most widely within the corpus.

Our analysis reveals notable regional differences in the citation of policy documents. Higher *H*-indices indicate countries whose policy documents are frequently referenced by other governments worldwide. The United States, with 44, has the highest *H*-index, reflecting widespread reach and international recognition of its policy documents. The United Kingdom follows with an *H*-index of 32, while Germany, Australia, Canada, and several other European countries also exhibit strong citation patterns (see Figure 3a & c and SI Table 2).

On the other hand, a substantial proportion of countries—particularly those in the Asia-Pacific and African regions—are rarely cited in international policy documents. In fact, 30 countries (roughly 16% of the total) were never referenced in any policy documents from other nations during the study period. Most of these countries are classified as Least Developed Countries (LDCs) and Landlocked Developing Countries (LLDCs), highlighting unequal participation in global policy discourse.

We adopt the above metrics not in their traditional bibliometric sense—where the *H*-index is used to characterize an individual researcher's scientific output—but rather as a descriptive summary of prominence in a government-to-government citation matrix. In this context, the mathematical properties of the *H*-index offer an intuitive way to jointly capture the breadth and depth of a country's international reach, though we acknowledge that this repurposing comes with limitations. We therefore complement these measures with alternative approaches reported in the *SI Appendix*, A.3. This general pattern holds across these alternatives, including the centrality measures of the directed citation network between countries, as well as the inverse document frequency weighted country references.

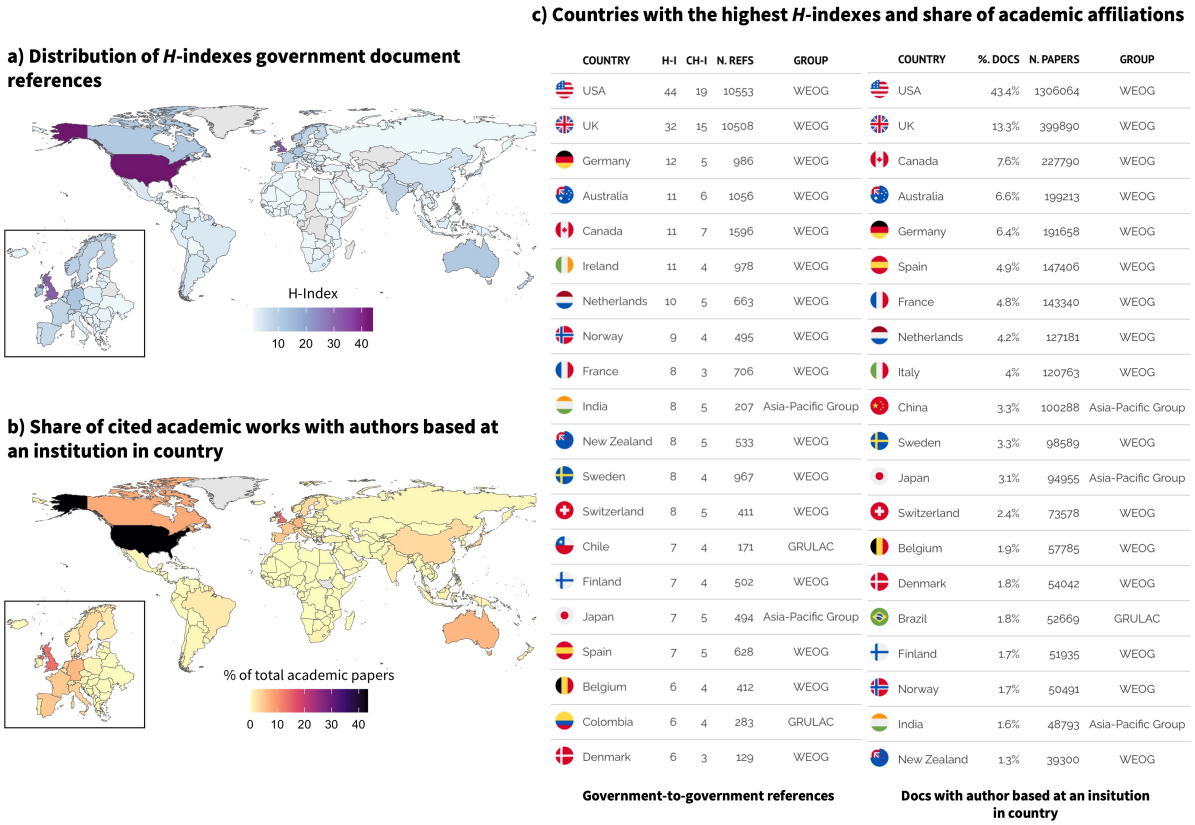

Figure 3: Overview of the distribution of reference metrics of government documents and academic works across countries. Panels a and b map the distribution of *H*-indexes and share of works with authors based at institutions in each country. Panel c presents the top-20 countries with the highest *H*-indexes and share of papers with authors linked to in-country institutions. Panel d illustrates the share of citations to foreign government and academic papers from UN M49 'developed' economies (dots represent individual countries in the regional group). *H*-I, *H*-index; CH-I, country-centered *H*-index (number of distinct foreign governments citing at least *n* documents from that country); n refs, total number of foreign government citations to documents from the target country in the government-to-government citation matrix; Docs, share of scholarly works referenced across the corpus that include at least one author affiliated with an institution in that country; n papers, total number of academic papers with at least one author from that country cited in the policy documents.

Countries in the Global North consistently rank higher on betweenness, eigenvector, and PageRank centrality, illustrating their importance in global policy conversations.

In addition to these global metrics, we further examine regional variation in citation patterns using two complementary approaches. First, we run a series of logistic mixed-effects models to assess the probability that a reference targets sources from developed economies, neighboring countries, or within the same regional group. These models reveal differences across UN regional groupings, particularly in the extent to which countries in the Global South cite local or regional sources. Second, a correspondence analysis of intergovernmental citations illustrates how governments cluster based on shared citation behaviors. This exploratory technique highlights distinct citation logics across regions. For instance, the WEOG group of countries display relatively cohesive patterns, while other groups show more diffuse or externally oriented citation tendencies. Together, these analyses provide a more granular view of how geopolitical and regional dynamics might be at play in shaping patterns of knowledge exchange across policy systems (see *SI Appendix*, A.5).

As with policy citations, scholarly references are heavily skewed toward institutions located in the Global North. To attribute scholarly outputs to countries, we adopt an affiliation-based approach. Papers with authors from multiple countries are counted toward each country represented ("mixed make-up"). For instance, a paper co-authored by researchers at U.S. and Colombian institutions contributes to both the U.S. and Colombia in our calculations of the number and share of papers. While this provides a straightforward measure of global visibility, it means that country-level totals can overlap across collaborations. The United States, United Kingdom, Canada, Australia, and Germany are not only among the top sources of government-authored policy documents but also lead in cited academic research. Figure 3c illustrates this overlap. Notably, 17 of the top 20 countries for cross-border government citations also rank in the top 20 for scholarly citations by institutional affiliation. For instance, over 10,500 policy documents by other governments in the corpus cite U.S. government publications, and 43% of all scholarly works referenced across the corpus include at least one author based at a U.S. institution.

An important qualification to these findings is that the academic research featured in policy documents generally aligns with the most prominently cited work within the scholarly community. We take this as a sign that the academic research employed is also regarded highly within the academic environment. We analyze the field-weighted citation impact (FWCI)—a measure of how many citations a paper receives relative to the average for publications of the same year, type, and discipline—and the citation percentile (by year and

subfield) of the referenced scholarly sources. Our analysis shows that the median scholarly work cited in policy documents receives 13 times more citations than comparable academic publications. These works also fall within the 92nd citation percentile of their field and year, suggesting that policy documents consistently draw on some of the most prominent scholarly research.

Evidence use might vary across policy domains, but not its origins. Policy domains may differ widely in the types of expertise they require and the degree to which knowledge must be localized or specialized. Scholars have proposed that distinct "cultures of evidence" may exist across different policy sectors [38]. These cultures are thought to arise from factors such as the nature of decisions being made, policymakers' backgrounds and training, organizational norms, and the academic disciplines that inform each sector. However, when it comes to studies like ours—examining citations within policy documents—empirical research has so far focused almost exclusively on the climate change sector [30]. Our large-scale data enables a much broader and more detailed examination of evidence use across a diverse range of policy domains.

To explore these patterns, we classify each policy document using the Comparative Agendas Project (CAP) framework [39], which provides a standardized set of policy areas. We frame this as an automated text-annotation task, using a large language model (LLM) to assign each document's summary—provided by Overton—to the most likely CAP category. This method enables us to efficiently classify millions of documents at scale. The corpus contains varying numbers of documents across policy domains, and their distribution is relatively stable across world regions (see Table 6). Among these, documents in the Environment and Health domains are the most common, together accounting for roughly 38% of the corpus.

We find suggestive evidence that policy domains might indeed differ in their "cultures of evidence", particularly in the degree to which they cite *policy-based* versus *scholarly* sources. To assess this, we categorize documents according to the type of evidence they cite: exclusively policy-based, exclusively scholarly, or a mix of both. Some domains—such as Housing and Government Operations—rely almost entirely on policy-based sources. Others—such as Macroeconomics, Agriculture, Public Lands, Health, and Environment—more frequently incorporate scholarly references, indicating a stronger orientation toward academic expertise (see *SI Appendix, Figure 8*).

We extend this analysis by examining the distribution of both foreign policy-based and scholarly references across domains. Figure 4 presents the results of four mixed-effects logistic regression models. The left-hand panels report estimates of the probability that a policy document within the respective policy domain references (a) a foreign policy-based source—defined as evidence from foreign governments, intergovernmental organizations (IGOs), or foreign think tanks—and (b) a scholarly source of any kind. These models are estimated over the full corpus of documents. The right-hand panels restrict the sample to documents that cite foreign government and scholarly sources, respectively, and model the probability that such citations originate from actors or authors based in UN M49 'developed' countries. Specifically, Panel (a) models whether a cited foreign government document comes from a 'developed' nation, and Panel (b) models whether cited academic papers have exclusively 'developed' country–based authors, including those with co-authors from multiple such countries.

These models reveal domain-specific patterns. Engagement with foreign policy-based sources is highest in areas intrinsically tied to international coordination, such as International Affairs ($z = 23.4$, $p < .001$, pred = 0.494, 95%CI $[0.452, 0.536]$) and Foreign Trade ($z = 18.9$, $p < .001$, pred = 0.374, 95%CI $[0.335, 0.412]$) . In contrast, domains centered on domestic governance—like Cultural Affairs ($z = 12.1$, $p < .001$, pred = 0.119, 95%CI $[0.101, 0.139]$) and Government Operations ($z = 11.4$, $p < .001$, pred = 0.085, 95%CI $[0.070, 0.100]$) —cite more domestic sources. When it comes to scholarly references, we observe elevated engagement in technically intensive domains, including Public Lands ($z = 50.55$, $p < .001$, pred = 0.688, 95%CI $[0.661, 0.714]$), Macroeconomics ($z = 41.77$, $p < .001$, pred = 0.611, 95%CI $[0.582, 0.640]$), Health ($z = 40.13$, $p < .001$, pred = 0.591, 95%CI $[0.562, 0.620]$), Environment ($z = 39.24$, $p < .001$, pred = 0.581, 95%CI $[0.552, 0.610]$), Agriculture ($z = 37.51$, $p < .001$, pred = 0.565, 95%CI $[0.536, 0.595]$), and Technology ($z = 34.97$, $p < .001$, pred = 0.534, 95%CI $[0.504, 0.564]$). In these fields, more than half of the policy documents reference academic research, underscoring the importance of specialized expertise.

Among documents that include scholarly references, nearly 90% of citations fall within three broad disciplinary families: the medical, natural, and social sciences. While the total volume of citations from each of these families is relatively balanced, a domain-level breakdown reveals a consistent pattern: social science research is the most frequently cited in 16 of 21 policy domains (see *SI Appendix, Figure 7*). These findings highlight not only the diversity of evidence practices across policy areas but also the central role of academic

expertise—especially from the social sciences—in informing policy across a wide array of sectors.

Despite this domain-level variation in the type and source of evidence used, the right-hand panels of Figure 4 reveal a striking consistency: when policy documents cite foreign government sources or academic research, they overwhelmingly draw from knowledge produced in high-income countries. This pattern holds across nearly all policy domains. It suggests that while evidence needs may vary, the global geography of knowledge production—and the epistemic dependence on scholarship and policy knowledge from the Global North—remains a defining feature of contemporary evidence use in policymaking.

Discussion

This study offers a comprehensive quantitative account of evidence cited in government policy documents across 185 countries. By analyzing the world's largest corpus of *documented*, *accessible*, and *digitally visible* policy evidence, we gain insight into the information infrastructure that shapes policymaking across borders. Three broad empirical patterns stand out. First, we observe stark geographical differences in the sourcing of expert information. Indexed documents from governments in the Global North primarily cite domestic sources, whereas those in the Global South more often draw on foreign knowledge. Second, references to policy-based and academic research are heavily skewed toward work produced in the U.S., U.K., Canada, and other high-income countries. Even when diverse scientific disciplines contribute to policy discourse, the institutional and geographic origins of that knowledge remain tightly concentrated. Finally, we observe that while evidence needs vary by policy domain, the geographic origin of sources remains consistent: most knowledge, regardless of thematic focus, originates in the Global North.

Importantly, we do not aim to measure the direct impact of evidence on policymaking, nor to characterize all knowledge and expertise employed in policymaking. Our analysis focuses exclusively on the formal references included in policy documents, rather than their full text. This means we cannot account for how evidence is discussed, the length or formatting of documents, or other contextual features that may influence referencing practices. While these factors may shape the likelihood and visibility of citations, we view our focus on formal references as analytically valuable: we focus on one dimension of the publicly visible layer of knowledge that circulates within policy documents which we argue holds important signals for understanding the flow of knowledge in the policy process. The

citation patterns we uncover likely represent a dual reality: they reflect prevailing norms about what constitutes legitimate evidence in global policy discourse, and they illustrate the supply of expert knowledge that is available to policy professionals.

A related point to emphasize is that the data generation process is embedded in the very dynamics we seek to understand. Our dataset—and by extension, our findings—are embedded within the same infrastructure of visibility and access we aim to study. A large share of the documents in our corpus originates from Europe and the Americas. This is partly due to Overton's document indexing protocol, but more fundamentally, it reflects global differences in the capacity to produce, preserve, and disseminate policy materials.

Countries with well-resourced bureaucracies, open government policies, and digital infrastructure are more likely to publish documents that get captured by global repositories. At the same time, these countries may also influence which foreign documents are included in the corpus, since the likelihood of encountering a document through Overton increases if it is cited by already-indexed documents. As a result, the Global South documents included in the corpus are likely a selective subset—those oriented toward international visibility, donor audiences, or other salient international processes—potentially underrepresenting domestically focused or South–South oriented policy outputs. While this introduces important caveats for interpreting our findings, it also reflects the broader reality that uneven production of and access to policy information shapes the global marketplace of evidence available to policymakers.

Rather than merely a methodological limitation, this constitutes an empirical finding in its own right which likely reflects both demand- and supply-side dynamics in how policy evidence circulates globally. On the demand side, world system theory highlights how powerful countries shape the norms that become institutionalized in the international arena, emphasizing conflict, power, and national interests. From this perspective, the world polity reflects and reproduces existing structures of domination, with international organizations advancing the interests of powerful states and promoting Western policy models as global standards of legitimate governance [19–21, 40]. In short, norms travel globally and set expectations for what counts as legitimate policy knowledge, leading to high isomorphism. This perspective is complemented by Weiss' typology of evidence use, which emphasizes how policymakers may adopt, instrumentalize, or symbolically reference evidence based on institutional norms and pressures rather than relevance [41]. As a result, policymakers in the Global South may be more receptive to evidence that aligns with—or at least resembles, in form or content—the expectations set by more dominant actors.

On the supply side, the availability of digitally visible policy evidence is itself unevenly distributed across the globe. Countries with more institutional capacity for public documentation are disproportionately represented in global policy repositories, which in turn reinforces their epistemic prominence. This imbalance is amplified by disparities in technical infrastructure, including the ability to maintain digital portals and open-access systems. The infrastructure of evidence—who can publish, preserve, and make policy documents discoverable—can shape the profile of global knowledge hierarchies. A similar logic applies to the supply of academic work: global disparities in research productivity mean that scholars in the U.S., Western European states, and China produce a disproportionate share of academic output. These differences shape the availability of scholarly evidence to be cited in policy documents and help explain why domestic citations might be more accessible in some contexts, with many Global South countries being underrepresented in the pool of easily accessible scholarly producers. Together, these factors create asymmetries in both policy and academic knowledge that contribute to the patterns of cross-national citation we observe.

The supply and demand pressures compound and can help explain why, even though research shows that policy professionals tend to value evidence [42, 43]—particularly when it is locally grounded [44]—not all policy actors are able to act on these preferences. Policymakers in low- and middle-income contexts often face structural barriers such as limited research capacity and budgetary constraints. As a result, even where there is a desire for locally embedded evidence, decision-makers may be functionally reliant on internationally visible sources—most of which originate in high-income countries.

In fact, we find that countries most frequently cited as sources—such as the United States and the UK—are also among the world's largest investors in research and development relative to their gross domestic product. These countries house robust academic ecosystems and dense bureaucratic apparatuses that generate a steady stream of policy-based evidence. However, the resilience of these knowledge systems should not be taken for granted. They remain politically contingent, subject to shifting funding priorities and ideological pressures. Recent developments indicate that political actors are increasingly willing to challenge the independence of scientific and policy institutions [45, 46]. In the United States, for example, recent administrative actions have included downsizing parts of the federal policy workforce, reducing support for major research initiatives, and deprioritizing international collaboration—trends that may reduce the country's future visibility in global evidence flows. As a result, even countries that currently dominate the produc-

tion and dissemination of policy-relevant knowledge may risk losing their status as global reference points, underscoring the fragility of epistemic centralization.

The implications of the asymmetries uncovered in our study are not merely symbolic. Policy professionals grapple with complex challenges that can make organizations prone to getting stuck on local peaks—defaulting to a narrow set of familiar solutions rather than exploring a broader range of possibilities [47]. When policymakers repeatedly draw on a narrow set of well-established sources, they may reinforce existing models and overlook alternatives that are more contextually appropriate or better suited to emerging problems. In contrast, incorporating a broader range of knowledge can expand the space of viable solutions. From a systems perspective, some heterogeneity in evidence use can help prevent informational lock-in and foster the exploration of new policy pathways [48].

Breaking the patterns identified in this study requires interventions that reduce epistemic dependency and foster evidence pluralism. This could involve strengthening South–South research collaboration, which can create alternative channels of expertise and reduce overreliance on knowledge from dominant economies. It also means investing in the documentation and institutional capacities of low- and middle-income countries so that locally generated evidence becomes digitally visible and enters global repositories. At the same time, international organizations can help by championing inclusive evidence production practices, e.g., broadening citation practices, diversifying expert networks, and providing resources for underrepresented regions [49]. Together, such measures would not only widen the range of voices in global policymaking but also strengthen the resilience and legitimacy of knowledge systems.

Materials and methods

Data collection

The data on policy documents were sourced from Overton, the largest database of policy documents, which indexes over 44,000 sources from governments, intergovernmental organizations, and think tanks [31]. We used the Overton API to extract data for all available documents authored by government sources published within the 25-year range from 2000 to 2024. This window is particularly suited for our analysis because the accessibility of data has expanded markedly in recent years through digital infrastructures. At the same time, governments have faced interconnected challenges such as climate change, migration, economic shocks, and a global pandemic, that make the use of internal and external ev-

idence especially relevant. While extending the study further back would be desirable, it is complicated by the more limited availability and discoverability of policy documents, as well as uneven internet access and digital capacity among potential policy document producers. The chosen period, therefore, provides a suitable foundation for analyzing global patterns of evidence citation. The data collection was conducted between January 17 to 23, 2025. Because data collection occurred in January 2025, records for the publication year 2024 might be incomplete.

In total, we compiled 1,243,768 policy documents from 185 countries. To enrich this collection, we also extracted data on all entities cited by these documents, with a particular focus on policy documents and academic works. This resulted in 740,742 unique policy documents—including sources outside government—and 3,518,012 academic works, along with their respective DOIs.

To contextualize the academic research referenced in the policy documents, we extracted auxiliary information from OpenAlex, an open index of academic work [34]. This auxiliary data includes metadata about each academic work, such as authorship, citation metrics, and publication details. We connected records across Overton and OpenAlex by matching DOIs via the OpenAlex `\works` endpoint. While this approach offers high precision in linking sources, it necessarily limits matches to works with valid DOI records. As a result, a small share of academic citations without DOI metadata could not be matched. In our case, we obtained coverage for 98.5% of references (corresponding to 85% of unique works).

Measurement

Policy domains. We categorize policy documents into specific policy domains. We approached this task as an automated text-annotation problem using a large language model (LLM). Specifically, we classified the policy domains of individual policy documents based on the framework established by the Comparative Agendas Project (CAP) [39]. Our classification process involved assigning each policy document summary provided by Overton to one of the predefined CAP categories.

Following the recommendations by Barrie *et al.* [50], we favored a locally versioned open source language model, over similarly performing commercial alternatives (e.g., OpenAI's GPT). Our classification was performed using Meta's Llama3.3-70B model, which was prompted with a standardized annotation instruction. Each policy document was classified in its own session to prevent prior classifications from influencing subsequent inferences.

To ensure the validity and reliability of our automated classification, we benchmarked the Llama3.3-70B categorization against a human annotator on a random draw of 1,000 policy documents. The LLM derived categorization coincided with the annotator's in 78.9% of the instances. This level of agreement is comparable to the reported intercoder reliability of the CAP in the Croatian, UK, and German legislative contexts [39]. *SI Appendix, Table 7* shows the most frequent misclassifications (those accounting for more than 1% of total errors) resulting from the validation exercise. Notably, the zero-shot performance of the Llama3.3-70B model exceeded that of the CAP Babel Machine, an encoder model employing XLM-RoBERTa trained for CAP classification [51], which was used as an additional benchmark (see SI Appendix A.4 for a detailed description of the protocol).

Auxiliary variables

To assess the international reach of policy documents, we calculate a series of metrics from the government-to-government citation matrix. We utilize a simple *H*-index focused on total citations per document, such that: $h = \max\{h' \mid \text{at least } h' \text{ papers have } \geq h' \text{ citations}\}$. Under the same logic, we extract a country-centered *H*-index, which instead of counting total citations per document, focuses on how many different countries have cited a given country's documents. Finally, we extract the betweenness, eigenvector, and PageRank centrality measures from the citation network. For our supplementary analysis of citations to bordering countries, we extracted contiguity relationships between states from the CoW Direct Contiguity (v3.2) dataset [52].

Acknowledgments

The authors thank Asya Magazinnik, Will Lowe, Jesper A. J. Hansen, Simon Munzert, Francesca Minetto, Sascha Göbel, Muzhou Zhang, David Weisstanner, Kevin Munger, Fabrizio Gilardi, Stefan Müller, as well as audiences at the Hertie School Data Science Lab Research Group, University of Lucerne, and EPSA, for their valuable feedback. R.S. acknowledges support by the Carlsberg Foundation, grant CF22-0805. S.R.R. acknowledges support by the Hertie School in the form of a doctoral stipend. A version of this manuscript was previously published as part of S.R.R.'s doctoral dissertation [53].

Data availability

Data for this study are available at seramirezruiz/policydocs

Code availability

A reproducibility package for this study is available at seramirezruiz/policydocs. The analyses were performed using R version 4.4.2 [54]. See *Supplementary Appendix C* for a detailed software statement.

Author contributions

S.R.R. and R.S. contributed to the conceptualization, analysis, writing, and editing of the manuscript. S.R.R. led the manuscript preparation and was responsible for data collection. Both authors reviewed and approved the final version of the manuscript.

Competing interests

The authors declare no competing interests.

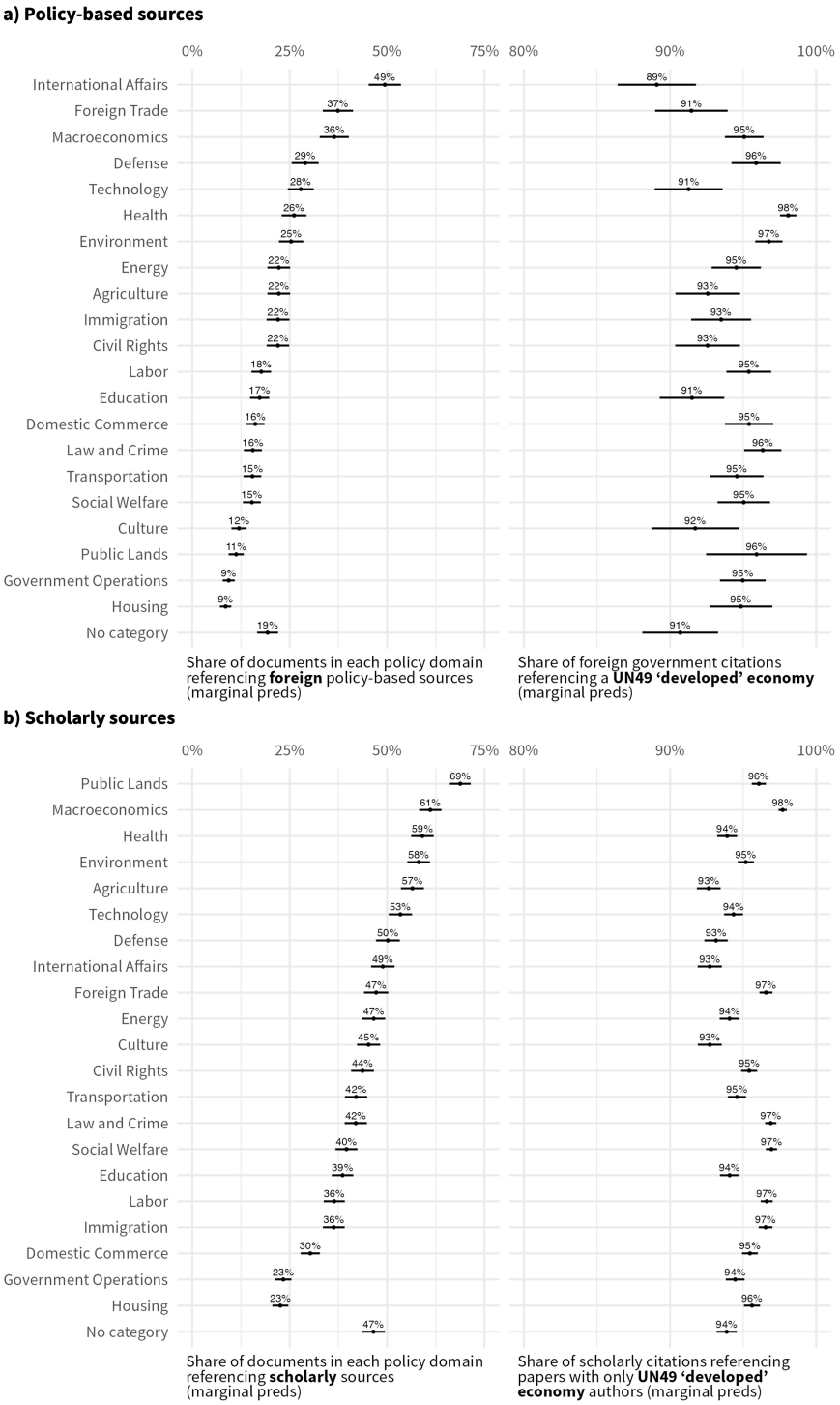

Figure 4: Overview of the distribution of references across policy domains. Results present the marginal predictions from four logistic mixed-effects models with country-of-document random effects. The left-hand panels report the predicted probability that a policy document within each policy domain references a) a foreign policy-based source (i.e., foreign governments, IGOs, or foreign think tanks) and b) a scholarly source of any kind; these models are estimated over the full corpus of documents. The right-hand panels restrict the sample to citation dyads directed to foreign government and scholarly sources, respectively, and model the probability that such citations originate from actors or authors based in UN M49 'developed' countries. Specifically, Panel a models whether a cited foreign government document comes from a 'developed' economy, and Panel b models whether cited academic papers have exclusively 'developed' economy-based authors, including those with co-authors from multiple such countries. Error bars represent 95% confidence intervals around mean marginal predicted probabilities. Sample sizes are as follows: Panel (a) left, n = 945,555; Panel (a) right, n = 78,698; Panel (b) left, n = 1,245,096; Panel (b) right, n = 7,306,427.

References

1. Kenny, C., Rose, D. C., Hobbs, A., Tyler, C. & Blackstock, J. *The role of research in the UK Parliament* (Parliamentary Office of Science and Technology, 2017).
2. Commission, E. *Mission letter to Commissioner Moedas* 2014.
3. United States Congress. *Foundations for Evidence-Based Policymaking Act* 2019.
4. African Union. *Accurate and Disaggregated Data Critical for Evidence-Based Policies: Launch of Africa Migration Data Network* Press Release No: /2021, Venue: Addis Ababa, Ethiopia. 2021.
5. National Research Council. *Using Science as Evidence in Public Policy* (National Academies Press, Washington, D.C., 2012).
6. Campbell, J. L. Ideas, Politics, and Public Policy. *Annual Review of Sociology* **28,** 21–38 (2002).
7. Jones, B. D. & Baumgartner, F. R. *The Politics of Attention: How Government Prioritizes Problems* (Chicago: University of Chicago Press, 2005).
8. Campbell, J. L. & Pedersen, O. K. *The National Origins of Policy Ideas: Knowledge Regimes in the United States, France, Germany, and Denmark* (Princeton University Press, Princeton, NJ, 2014).
9. Baumgartner, F. R. & Jones, B. D. *The Politics of Information: Problem Definition and the Course of Public Policy in America* (University of Chicago Press, Chicago, 2015).
10. Schattschneider, E. E. *The Semi-Sovereign People: A Realist's View of Democracy in America* (Holt, Rinehart and Winston, New York, 1960).
11. Bachrach, P. & Baratz, M. S. Two Faces of Power. *American Political Science Review* **56,** 947–952 (1962).
12. Simon, H. A. Decision-Making and Administrative Organization. *Public Administration Review* **4,** 16 (1944).
13. Lindblom, C. E. The Science of "Muddling Through". *Public Administration Review* **19,** 79–88 (1959).
14. Kingdon, J. W. *Agendas, alternatives, and public policies* (Harper Collins, S.l., 1984).
15. Weible, C. M. Expert-Based Information and Policy Subsystems: A Review and Synthesis. *Policy Studies Journal* **36,** 615–635 (2008).
16. Meyer, J. W., Boli, J., Thomas, G. M. & Ramirez, F. O. World Society and the Nation-State. *American Journal of Sociology* **103,** 144–181 (1997).
17. Boli, J. & Thomas, G. M. World Culture in the World Polity: A Century of International Non-Governmental Organization. *American Sociological Review* **62,** 171–190 (1997).
18. Kentikelenis, A. E. & Seabrooke, L. The Politics of World Polity: Script-writing in International Organizations. *American Sociological Review* **82,** 1065–1092 (2017).
19. Henisz, W. J., Zelner, B. A. & Guillén, M. F. The Worldwide Diffusion of Market-Oriented Infrastructure Reform, 1977–1999. *American Sociological Review* **70,** 871–897 (2005).
20. Shanks, C., Jacobson, H. K. & Kaplan, J. H. Inertia and Change in the Constellation of International Governmental Organizations, 1981–1992. *International Organization* **50,** 593–627 (1996).
21. Hughes, M. M., Peterson, L., Harrison, J. A. & Paxton, P. Power and Relation in the World Polity: The INGO Network Country Score, 1978–1998. *Social Forces* **87,** 1711–1742 (2009).
22. Kuhlmann, J., González de Reufels, D., Schlichte, K. & Nullmeier, F. How social policy travels: A refined model of diffusion. *Global Social Policy* **20,** 80–96 (2020).
23. Castro Torres, A. F. & Alburez-Gutierrez, D. North and South: Naming practices and the hidden dimension of global disparities in knowledge production. *Proceedings of the National Academy of Sciences* **119,** e2119373119 (2022).
24. Gomez, C. J., Herman, A. C. & Parigi, P. Leading countries in global science increasingly receive more citations than other countries doing similar research. *Nature Human Behaviour* **6,** 919–929 (2022).
25. Nielsen, M. W. & Andersen, J. P. Global citation inequality is on the rise. *Proceedings of the National Academy of Sciences* **118,** e2012208118 (2021).

26. Freeman, R. & Maybin, J. Documents, practices and policy (2011).
27. Isett, K. R., Hicks, D. & Kingsley, G. Blending the two communities: concurrent evidence use in state-level policy processes. *Public Management Review* **28,** 602–619 (2026).
28. Furnas, A. C., LaPira, T. M. & Wang, D. Partisan disparities in the use of science in policy. *Science* **388,** 362–367 (2025).
29. Ma, J. & Cheng, Y. D. Why do some academic articles receive more citations from policy communities? *Public Administration Review* (2025).
30. Bornmann, L., Haunschild, R. & Marx, W. Policy documents as sources for measuring societal impact: how often is climate change research mentioned in policy-related documents? *Scientometrics* **109,** 1477–1495 (2016).
31. Szomszor, M. & Adie, E. Overton: A bibliometric database of policy document citations. *Quantitative Science Studies* **3,** 624–650 (2022).
32. Yin, Y., Gao, J., Jones, B. F. & Wang, D. Coevolution of policy and science during the pandemic. *Science* **371,** 128–130 (2021).
33. Jonkers, K., Costa, D. F. J., Biagi, F. & Scharfbillig, M. *Quantitative "science for policy" evaluation: are Science for Policy Organisations operating in Pasteur's Science for Policy Quadrant?* 2024.
34. Priem, J., Piwowar, H. & Orr, R. *OpenAlex: A fully-open index of scholarly works, authors, venues, institutions, and concepts* 2022.
35. Yu, Y. & Romero, D. M. Does the use of unusual combinations of datasets contribute to greater scientific impact? *Proceedings of the National Academy of Sciences* **121,** e2402802121 (2024).
36. Harris, M. J., Murtfeldt, R., Wang, S., Mordecai, E. A. & West, J. D. Perceived experts are prevalent and influential within an antivaccine community on Twitter. *PNAS Nexus* **3,** pgae007 (2024).
37. Zhou, Y., Li, X., Chen, W., Meng, L., Wu, Q., Gong, P. & Seto, K. C. Satellite mapping of urban built-up heights reveals extreme infrastructure gaps and inequalities in the Global South. *Proceedings of the National Academy of Sciences* **119,** e2214813119 (2022).
38. Lorenc, T., Tyner, E. F., Petticrew, M., Duffy, S., Martineau, F. P., Phillips, G. & Lock, K. Cultures of evidence across policy sectors: systematic review of qualitative evidence. *European Journal of Public Health* **24,** 1041–1047 (2014).
39. *Comparative Policy Agendas: Theory, Tools, Data* (eds Baumgartner, F. R., Breunig, C. & Grossman, E.) (Oxford University Press, 2019).
40. Boswell, T. & Chase-Dunn, C. K. *The spiral of capitalism and socialism: Toward global democracy* (Lynne Rienner Publishers, 2000).
41. Weiss, C. H. The Many Meanings of Research Utilization. *Public Administration Review* **39,** 426–431 (1979).
42. Hjort, J., Moreira, D., Rao, G. & Santini, J. F. How Research Affects Policy: Experimental Evidence from 2,150 Brazilian Municipalities. *American Economic Review* **111,** 1442–1480 (2021).
43. Senninger, R. & Seeberg, H. B. Which Information Do Politicians Pay Attention To? Evidence from a Field Experiment and Interviews. *British Journal of Political Science* **54,** 1115–1132 (2024).
44. Vivalt, E., Coville, A. & Kc, S. Local knowledge, formal evidence, and policy decisions. *Journal of Development Economics* **174,** 103425 (2025).
45. Vandekerckhove, J., Kellen, D., Trueblood, J. S. & Shiffrin, R. M. *The structures that fund, publish, and evaluate science shape its progress PNAS Updates*, Proceedings of the National Academy of Sciences. 2025.
46. Garisto, D., Kozlov, M. & Tollefson, J. Trump team orders huge government lay-offs: how science could fare. *Nature* (2025).
47. Rivkin, J. W. Imitation of Complex Strategies. *Management Science* **46,** 824–844 (2000).
48. Gomez, C. J. & Lazer, D. M. J. Clustering knowledge and dispersing abilities enhances collective problem solving in a network. *Nature Communications* **10,** 5146 (2019).
49. Lenz, T. & Schmidtke, H. Agents, Audiences, and Peers: Why International Organizations Diversify their Discursive Legitimation. *International Affairs* **99,** 921–940 (2023).

50. Barrie, C., Palmer, A. & Spirling, A. *Replication for Language Models: Problems, Principles, and Best Practice for Political Science* 2025.

51. Sebők, M., Máté, Á., Ring, O., Kovács, V. & Lehoczki, R. Leveraging Open Large Language Models for Multilingual Policy Topic Classification: The Babel Machine Approach. *Social Science Computer Review,* 08944393241259434 (2024).

52. Stinnett, D. M., Tir, J., Diehl, P. F., Schafer, P. & Gochman, C. The Correlates of War (Cow) Project Direct Contiguity Data, Version 3.0. *Conflict Management and Peace Science* **19,** 59–67 (2002).

53. Ramirez-Ruiz, S. *The Evidence Interface: How policymakers encounter, engage with, and make sense of scientific knowledge* PhD thesis (Hertie School, 2025).

54. R Core Team. *R: A Language and Environment for Statistical Computing* R Foundation for Statistical Computing (Vienna, Austria, 2024).

Government policy documents across 185 countries largely cite Global North sources

Online Appendix

Contents

Appendix A Data and Statistical Analyses

A.1 Data

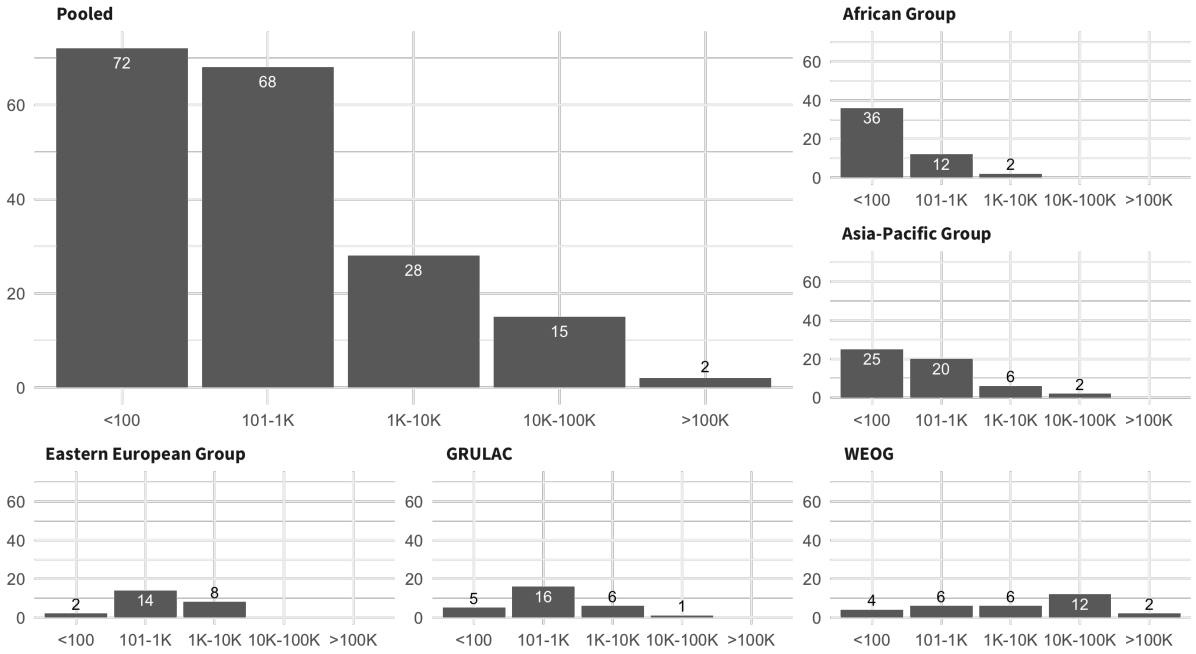

Figure 1: Overview of distribution of government authored policy documents. This figure shows the number of countries categorized by the total of policy documents collected, both in the full sample and grouped by UN Regional levels.

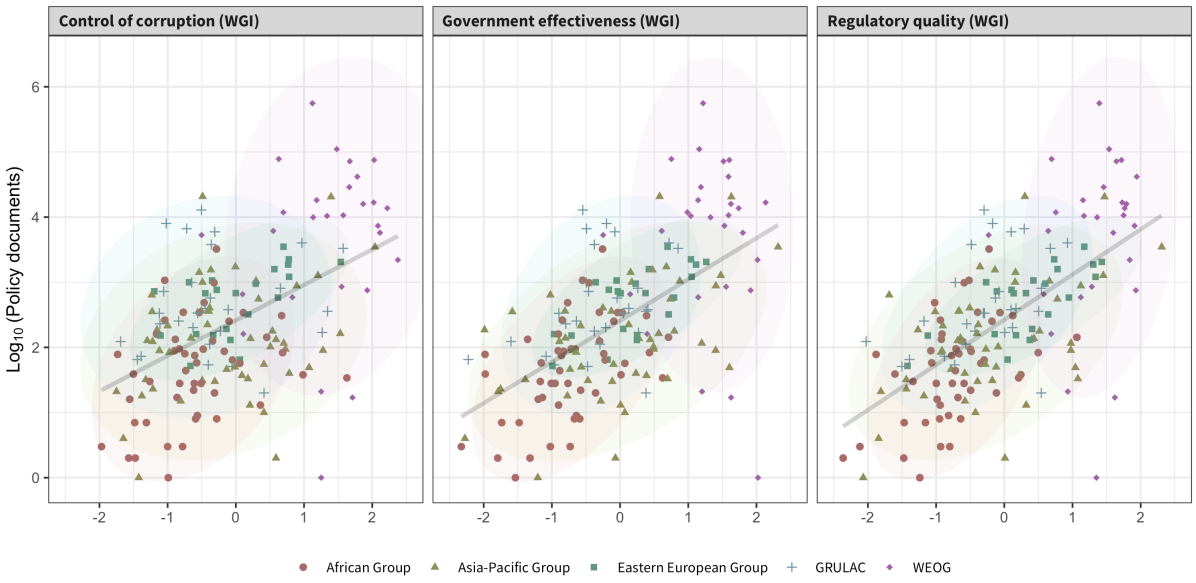

Figure 2: Relationship between Worldwide Governance Indicators (WGI) [1] and policy documents available across countries. Each dot represents individual countries, with ellipses at the UN Region-level.

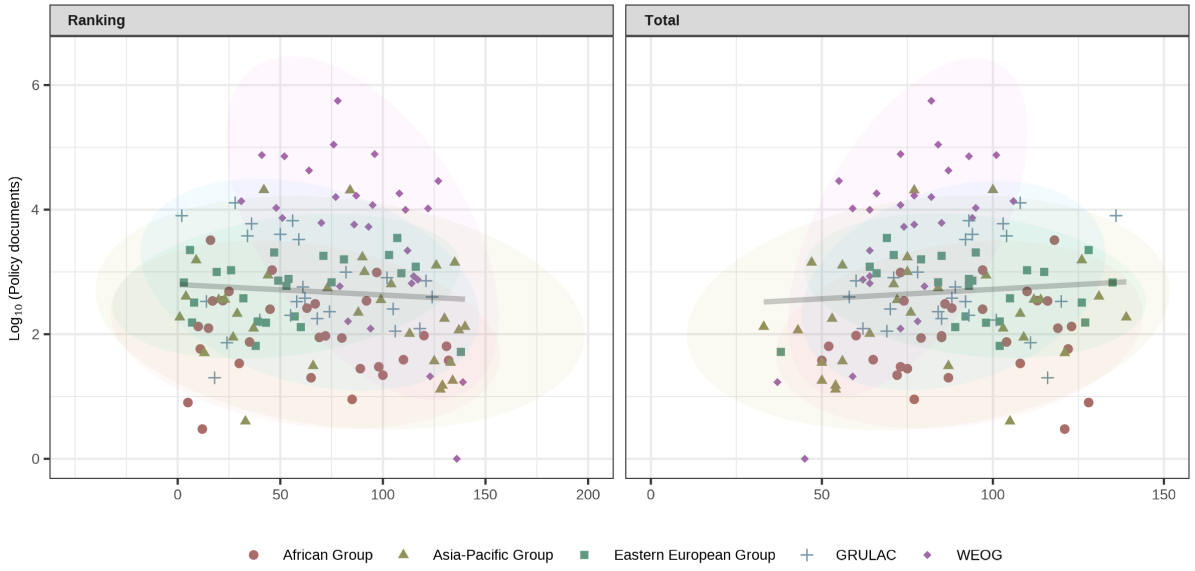

Figure 3: Relationship between Right to Information Indicators (RTI) [2] and policy documents available across countries. The figure shows countries' total score (0-150) (right panel) and their ranking (left panel), based on RTI indicators across seven categories. Each dot represents individual countries ($N = 137$), with ellipses at the UN Region-level.

Table 1: Overview of core document data table.

Country	Group	# Docs	Country	Group	# Docs	Country	Group	# Docs
USA	WEOG	558925	Georgia	EEG	582	Malawi	AF-G	75
UK	WEOG	110409	Trinidad and Tobago	GRULAC	573	Nicaragua	GRULAC	73
Spain	WEOG	77886	Cyprus	APG	552	Armenia	EEG	65
Sweden	WEOG	75114	Ethiopia	AF-G	486	Haiti	GRULAC	65
Canada	WEOG	71818	Sri Lanka	APG	404	Benin	AF-G	64
Australia	WEOG	41726	Dominican Republic	GRULAC	396	Sierra Leone	AF-G	58
Germany	WEOG	28848	Jamaica	GRULAC	379	Senegal	AF-G	57
Indonesia	APG	20715	Kosovo	EEG*	377	Kiribati	APG	55
Japan	APG	20460	Nepal	APG	360	Suriname	GRULAC	54
France	WEOG	18194	Barbados	GRULAC	358	Belarus	EEG	52
Switzerland	WEOG	16763	Maldives	APG	358	Cuba	GRULAC	51
Netherlands	WEOG	15921	Lebanon	APG	353	Vanuatu	APG	50
Finland	WEOG	13690	Kenya	AF-G	346	UAE	APG	49
Brazil	GRULAC	12860	Morocco	AF-G	343	Solomon Islands	APG	46
Portugal	WEOG	11828	Namibia	AF-G	342	Eswatini	AF-G	44
Ireland	WEOG	10653	El Salvador	GRULAC	336	Micronesia	APG	40
Belgium	WEOG	10409	Guatemala	GRULAC	334	Sudan	AF-G	39
Austria	WEOG	9932	Croatia	EEG	321	Cape Verde	AF-G	38
Mexico	GRULAC	7987	Rwanda	AF-G	307	Jordan	APG	37
New Zealand	WEOG	7352	Nigeria	AF-G	262	Timor Leste	APG	35
Peru	GRULAC	6644	Bolivia	GRULAC	254	Seychelles	AF-G	34
Italy	WEOG	6134	Ghana	AF-G	252	Bahrain	APG	33
Colombia	GRULAC	5940	Honduras	GRULAC	230	Iraq	APG	32
Norway	WEOG	5754	Vietnam	APG	223	Mongolia	APG	31
Turkey	WEOG	5295	Pakistan	APG	214	Tonga	APG	30
Chile	GRULAC	4015	Panama	GRULAC	201	Zimbabwe	AF-G	30
Argentina	GRULAC	3788	Bulgaria	EEG	192	Angola	AF-G	28
Latvia	EEG	3508	Afghanistan	APG	186	Lesotho	AF-G	28
Singapore	APG	3478	Belize	GRULAC	178	Mauritania	AF-G	28
Uruguay	GRULAC	3310	Saudi Arabia	APG	178	Myanmar	APG	23
South Africa	AF-G	3235	Bahamas	GRULAC	169	Togo	AF-G	22
Slovenia	EEG	2248	Bhutan	APG	163	San Marino	WEOG	21
Denmark	WEOG	2202	Malta	WEOG	161	Syria	APG	21
Estonia	EEG	2053	Bos and Herz	EEG	160	Ivory Coast	AF-G	20
Czech Republic	EEG	1868	Cameroon	AF-G	160	Saint Kitts and Nevis	GRULAC	20
Romania	EEG	1814	Albania	EEG	154	Tajikistan	APG	18
China	APG	1726	Russia	EEG	152	Liechtenstein	WEOG	17
Poland	EEG	1590	Mauritius	AF-G	143	Mali	AF-G	17
India	APG	1546	Papua New Guinea	APG	139	Burundi	AF-G	16
Philippines	APG	1416	Oman	APG	137	Palestine	APG	16
Taiwan	APG*	1273	Liberia	AF-G	133	DR Congo	AF-G	15
Lithuania	EEG	1212	Palau	APG	132	Uzbekistan	APG	15
Uganda	AF-G	1071	Montenegro	EEG	130	Kuwait	APG	13
North Macedonia	EEG	1064	Cambodia	APG	127	Sao Tome and Principe	AF-G	13
Malaysia	APG	1044	Tunisia	AF-G	125	Marshall Islands	APG	10
Thailand	APG	1000	Andorra	WEOG	123	Niger	AF-G	9
Ukraine	EEG	1000	Kyrgyzstan	APG	123	Algeria	AF-G	8
Ecuador	GRULAC	993	Venezuela	GRULAC	123	Gambia	AF-G	8
Tanzania	AF-G	981	Qatar	APG	116	CAR	AF-G	7
Slovakia	EEG	951	Guyana	GRULAC	112	Chad	AF-G	7
South Korea	APG	881	Fiji	APG	102	Yemen	APG	4
Iceland	WEOG	853	Mozambique	AF-G	95	Djibouti	AF-G	3
Costa Rica	GRULAC	808	Samoa	APG	94	Madagascar	AF-G	3
Moldova	EEG	765	Zambia	AF-G	94	South Sudan	AF-G	3
Luxembourg	WEOG	751	Brunei	APG	90	Equatorial Guinea	AF-G	2
Azerbaijan	EEG	725	Bangladesh	APG	89	Eritrea	AF-G	2
Paraguay	GRULAC	720	Guinea	AF-G	89	Nauru	APG	2
Hungary	EEG	681	Burkina Faso	AF-G	87	Comoros	AF-G	1
Serbia	EEG	677	Laos	APG	84	Monaco	WEOG	1
Greece	WEOG	655	Botswana	AF-G	83	Turkmenistan	APG	1
Iran	APG	637	Egypt	AF-G	80	Vatican City	WEOG	1
Israel	WEOG	588	Somalia	AF-G	78			

A.2 Examples of aggregate patterns

In the following, we provide four illustrations of government policy documents from the Global South that help ground the aggregate patterns. These examples all cite predominantly policy documents and show what it looks like in practice when Global South governments draw mostly on foreign sources.

Our first example is a 2021 report by the Brazilian Ministry of Health on *Quality in Care and Patient Safety*. Brazil is a particularly relevant case as one of the largest Global South countries, with a well-developed public health system and strong regional influence. The report contains 42 policy citations, yet the overwhelming majority reference international sources. These include 20 citations to WHO publications, 7 to OECD reports, and several to U.K. institutions such as the Health Foundation, alongside a citation to the U.S. Centers for Disease Control and Prevention. By contrast, only a handful (6) reference domestic Brazilian sources, notably ANVISA (Brazil's national health surveillance agency) and the Government of Brazil. In addition, the government policy document cites 225 scholarly sources.

A second example is the Indian Ministry of Science and Technology's 2021 publication on *Intellectual Property*. India is a major Global South country with a large and rapidly expanding innovation sector. The report contains 20 policy citations, of which the great majority reference international organizations. Sixteen of these are to the World Intellectual Property Organization, while one cites the World Economic Forum. By contrast, only three references are to domestic Indian government sources.

An additional case is the Indonesian Ministry of Education and Culture's 2022 publication on *Reopen, Recover and Resilience in Education*. Indonesia is the world's fourth most populous country and the largest education system in Southeast Asia. The report contains 53 policy citations, most of which reference international organizations. These include 9 documents from the World Bank, 6 from the World Health Organization, 5 from UNICEF, 4 from the OECD, and contributions from regional development banks such as the Asian Development Bank and the Inter-American Development Bank. It also cites ASEAN (Association of Southeast Asian Nations), reflecting regional cooperation. Prominent Global North think tanks are also present, including 4 to the Brookings Institution. By contrast, only one reference each is made to the EU, the UK, and Australia, while domestic Indonesian policy sources are absent.

Our final example is the Ugandan Ministry of Health's 2019 *Human Development Report*. Uganda is an important Global South country with pressing development challenges and a young, rapidly growing population. The document contains 218 policy citations, of which the majority reference international organizations and Global North policy actors. These include 38 documents from the World Bank, 29 from the International Monetary Fund, 10 each from the United Nations Development Programme and the OECD, and 9 from the International Labour Organization. Country-level policy sources from the Global North are visible, with 14 from the United Kingdom, 3 from Canada, and several scattered references from European countries. By contrast, domestic Ugandan policy sources are virtually absent, and only a handful of references come from other Global South governments, such as Bolivia and South Africa. In addition, the report makes use of scholarly work published in leading U.S. journals such as the *Proceedings of the National Academy of Sciences*, *Science*, and the *American Economic Review*. The above examples illustrate in concrete terms how highly policy-citing Global South documents often employ predominantly IGO and foreign (government) sources, thereby grounding the aggregate pattern we observe.

A.3 Government-to-government reference reach

Table 2: H-index and Country-centered H-index of government policy documents by country.

Country	H-i	CH-i	# Refs	Country	H-i	CH-i	# Refs	Country	H-i	CH-i	# Refs	Country	H-i	CH-i	# Refs
USA	44	19	10553	Rwanda	3	2	15	Trinidad and Tobago	2	1	17	Kosovo	1	1	10
UK	32	15	10508	Singapore	3	2	182	Turkey	2	1	29	Lebanon	1	1	3
Germany	12	5	986	South Africa	3	2	47	Uganda	2	1	20	Lesotho	1	1	1
Australia	11	6	1056	Afghanistan	2	2	12	United Arab Emirates	2	2	3	Mali	1	1	3
Canada	11	7	1596	Bahamas	2	1	15	Albania	1	1	1	Marshall Islands	1	1	2
Ireland	11	4	978	Bhutan	2	2	5	Algeria	1	1	3	Mauritania	1	1	1
Netherlands	10	5	663	Costa Rica	2	2	28	Andorra	1	1	2	Mauritius	1	1	6
Norway	9	4	495	Croatia	2	2	12	Angola	1	1	1	Moldova	1	1	3
France	8	3	706	Ecuador	2	2	20	Armenia	1	1	5	Mongolia	1	1	2
India	8	5	207	El Salvador	2	1	12	Azerbaijan	1	1	3	Montenegro	1	1	4
New Zealand	8	5	533	Ghana	2	2	22	Bahrain	1	1	2	Mozambique	1	1	4
Sweden	8	4	967	Greece	2	1	5	Bangladesh	1	1	5	Myanmar	1	1	2
Switzerland	8	5	411	Guatemala	2	2	14	Barbados	1	1	14	Niger	1	1	1
Chile	7	4	171	Haiti	2	1	5	Belize	1	1	5	Oman	1	1	1
Finland	7	4	502	Iceland	2	2	18	Benin	1	1	2	Palau	1	1	12
Japan	7	5	494	Kenya	2	1	19	Bolivia	1	1	12	Qatar	1	1	6
Spain	7	5	628	Latvia	2	1	27	Bosnia and Herzegovina	1	1	3	Russia	1	1	1
Belgium	6	4	412	Liberia	2	2	8	Botswana	1	1	4	Saint Kitts and Nevis	1	1	3
Colombia	6	4	283	Luxembourg	2	2	14	Brunei	1	1	2	Samoa	1	1	6
Denmark	6	3	129	Malawi	2	1	6	Burkina Faso	1	1	1	San Marino	1	1	1
Austria	5	3	176	Malaysia	2	1	9	Burundi	1	1	2	Sao Tome and Principe	1	1	1
China	5	3	65	Maldives	2	1	4	Cambodia	1	1	2	Saudi Arabia	1	1	4
Uruguay	5	2	79	Malta	2	2	16	Cameroon	1	1	8	Sierra Leone	1	1	7
Argentina	4	2	71	Morocco	2	1	15	Cape Verde	1	1	2	South Sudan	1	1	2
Brazil	4	4	122	Namibia	2	1	4	Cuba	1	1	1	Sri Lanka	1	1	11
Czech Republic	4	2	35	Nepal	2	1	19	Cyprus	1	1	6	Sudan	1	1	3
Estonia	4	3	65	Nicaragua	2	1	7	Dominican Republic	1	1	10	Taiwan	1	1	20
Italy	4	2	157	Nigeria	2	2	25	Egypt	1	1	5	Togo	1	1	1
Mexico	4	3	130	North Macedonia	2	1	8	Eritrea	1	1	1	Tunisia	1	1	4
Paraguay	4	1	12	Panama	2	1	9	Eswatini	1	1	3	Ukraine	1	1	4
Portugal	4	3	81	Papua New Guinea	2	2	18	Ethiopia	1	1	3	Vanuatu	1	1	4
Bulgaria	3	1	8	Romania	2	1	13	Fiji	1	1	6	Venezuela	1	1	2
Hungary	3	2	10	Senegal	2	2	10	Georgia	1	1	8	Vietnam	1	1	2
Indonesia	3	1	16	Serbia	2	2	8	Guinea	1	1	1	Zambia	1	1	5
Jamaica	3	2	33	Slovakia	2	1	22	Guyana	1	1	6				
Lithuania	3	3	38	Slovenia	2	2	22	Honduras	1	1	1				
Pakistan	3	2	18	South Korea	2	1	6	Iran	1	1	2				
Peru	3	3	74	Tanzania	2	2	57	Ivory Coast	1	1	6				
Philippines	3	1	32	Thailand	2	1	19	Jordan	1	1	3				
Poland	3	2	16	Timor Leste	2	1	9	Kiribati	1	1	3				

Table 3: Inverse document frequency weighted governent-to-government citations.

H-i rank	Country	IFW refs	H-i rank	Country	IFW refs	H-i rank	Country	IFW refs	H-i rank	Country	IFW refs
2	UK	35312	37	Pakistan	161	61	Malaysia	63	111	Ethiopia	25
1	USA	12714	57	Latvia	156	67	Nicaragua	61	90	Azerbaijan	24
6	Ireland	5278	71	Papua New Guinea	152	118	Ivory Coast	60	97	Bosnia and Herzegovina	23
5	Canada	5057	66	Nepal	151	60	Malawi	59	122	Lebanon	21
4	Australia	4067	56	Kenya	150	69	North Macedonia	56	128	Moldova	21
3	Germany	3665	75	Slovakia	140	112	Fiji	56	144	South Sudan	21
12	Sweden	3640	83	Uganda	139	113	Georgia	54	101	Burundi	20
11	New Zealand	3211	49	Ecuador	137	74	Serbia	53	125	Marshall Islands	20
7	Netherlands	3025	41	Rwanda	136	136	Qatar	53	152	Venezuela	19
8	Norway	2981	63	Malta	136	115	Guyana	51	87	Andorra	18
9	France	2758	76	Slovenia	135	139	Samoa	51	91	Bahrain	18
15	Finland	2724	82	Turkey	135	32	Bulgaria	49	95	Benin	17
18	Belgium	2182	45	Bahamas	118	77	South Korea	46	104	Cape Verde	17
13	Switzerland	1974	55	Iceland	115	94	Belize	45	129	Mongolia	17
17	Spain	1625	81	Trinidad and Tobago	115	127	Mauritius	45	132	Myanmar	17
19	Colombia	1482	79	Thailand	109	89	Armenia	44	99	Brunei	16
16	Japan	1375	135	Palau	107	54	Haiti	43	102	Cambodia	16
10	India	1201	93	Barbados	106	154	Zambia	43	117	Iran	15
42	Singapore	970	40	Poland	102	46	Bhutan	41	153	Vietnam	15
14	Chile	939	147	Taiwan	101	106	Cyprus	40	109	Eritrea	13
21	Austria	834	64	Morocco	99	92	Bangladesh	39	123	Lesotho	11
20	Denmark	739	73	Senegal	99	108	Egypt	38	88	Angola	10
28	Italy	705	59	Luxembourg	94	151	Vanuatu	38	114	Guinea	10
29	Mexico	643	96	Bolivia	94	98	Botswana	36	133	Niger	10
25	Brazil	489	53	Guatemala	92	131	Mozambique	35	140	San Marino	10
27	Estonia	436	44	Afghanistan	91	138	Saint Kitts and Nevis	35	141	Sao Tome and Principe	10
23	Uruguay	402	48	Croatia	90	142	Saudi Arabia	35	100	Burkina Faso	9
24	Argentina	401	50	El Salvador	87	65	Namibia	34	105	Cuba	9
31	Portugal	373	34	Indonesia	81	52	Greece	33	126	Mauritania	9
38	Peru	347	30	Paraguay	78	62	Maldives	32	148	Togo	9
22	China	321	145	Sri Lanka	78	130	Montenegro	32	85	Albania	8
78	Tanzania	320	80	Timor Leste	75	146	Sudan	30	134	Oman	8
35	Jamaica	256	107	Dominican Republic	73	149	Tunisia	30	116	Honduras	7
43	South Africa	241	143	Sierra Leone	72	84	United Arab Emirates	28	137	Russia	7
36	Lithuania	236	121	Kosovo	71	110	Eswatini	28			
68	Nigeria	217	70	Panama	67	124	Mali	28			
47	Costa Rica	216	72	Romania	67	86	Algeria	27			
26	Czech Republic	188	103	Cameroon	66	119	Jordan	27			
51	Ghana	182	33	Hungary	65	150	Ukraine	27			
39	Philippines	169	58	Liberia	65	120	Kiribati	26			

Note: We generate the weights based on the total number of available documents from each country in the larger Overton pool, not just the subset of 1.2 million documents that engage in referencing. The weight is calculated by $\log\left(\frac{1}{\text{Document Frequency of Country X}}+1\right)$

Table 4: Descriptives and centrality measures from government-to-government citation network.

Country	In-D	Out-D	BC	EVC	PR	Country	In-D	Out-D	BC	EVC	PR
United States	11172	97438	15324.176	0.554	0.083	Bhutan	39	14	0.012	0.001	0.001
Spain	19697	1079	975.219	1	0.08	Papua New Guinea	30	27	0.033	0.002	0.001
United Kingdom	13739	41842	4228.52	0.651	0.044	Namibia	34	6	0.002	0.002	0.001
Germany	8280	6445	1288.349	0.409	0.04	Zambia	32	5	0	0.002	0.001
Sweden	11952	2604	215.375	0.582	0.037	Vanuatu	5	4	0	0	0.001
Mexico	2245	408	42.912	0.123	0.037	Malawi	34	9	0.001	0.002	0.001
Canada	18766	4691	218.27	0.981	0.03	Saudi Arabia	103	9	0.001	0.006	0.001
Australia	9855	2782	302.329	0.515	0.027	Luxembourg	133	20	0.001	0.006	0.001
Switzerland	4886	1754	798.109	0.245	0.023	Senegal	47	56	0.689	0.002	0.001
France	5865	9817	1833.856	0.312	0.022	Egypt	144	51	0.437	0.007	0.001
Finland	5486	1010	18.072	0.286	0.022	Ghana	58	29	0.051	0.003	0.001
Italy	4611	546	272.132	0.228	0.021	Kuwait	9	4	0	0	0.001
Japan	5738	830	426.715	0.296	0.021	St. Kitts & Nevis	18	3	0.005	0.001	0.001
Argentina	1557	201	13.163	0.071	0.021	Guyana	18	7	0.001	0.001	0.001
Netherlands	6661	2050	133.782	0.33	0.02	South Korea	204	19	0.003	0.011	0.001
Peru	2468	121	4.8	0.121	0.02	Lesotho	14	1	0	0.001	0.001
Norway	4162	1395	238.988	0.212	0.019	Sudan	17	6	0	0.001	0.001
Portugal	2908	174	46.744	0.147	0.019	Bahamas	49	17	0.008	0.002	0.001
Uruguay	1196	145	2.19	0.06	0.018	Nigeria	99	36	0.065	0.005	0.001
Chile	2300	390	186.619	0.123	0.017	Armenia	69	6	0	0.004	0.001
Ireland	5337	2813	172.09	0.297	0.015	San Marino	14	1	0	0.001	0.001
Belgium	4129	6268	364.291	0.21	0.014	Kiribati	20	3	0.005	0.001	0.001
Austria	2442	880	88.087	0.104	0.014	Morocco	49	26	65.045	0.003	0.001
Colombia	2828	453	30.037	0.147	0.014	Bosnia & Herz	84	5	0.406	0.004	0.001
Turkey	2162	58	20.62	0.106	0.012	Qatar	210	37	0	0.012	0.001
Brazil	2141	237	13.175	0.105	0.011	UAE	71	6	2.087	0.003	0.001
New Zealand	2833	977	9.602	0.153	0.008	Albania	101	2	0.005	0.005	0.001
Latvia	1264	35	1.09	0.061	0.008	Lebanon	118	8	0	0.007	0.001
Romania	1385	17	2.014	0.066	0.008	Sierra Leone	36	8	0.001	0.002	0.001
Moldova	811	3	2.809	0.038	0.008	Liberia	27	10	0	0.001	0.001
Costa Rica	209	43	0.281	0.011	0.007	Tuvalu	0	3	0	0	0.001
Slovenia	887	29	2.393	0.042	0.006	Tunisia	46	4	0	0.002	0.001
China	943	249	40.713	0.047	0.006	Benin	19	2	0	0.001	0.001
Indonesia	797	37	44.307	0.038	0.006	Togo	4	1	0	0	0.001
Denmark	888	589	2.074	0.045	0.005	North Macedonia	441	11	0.001	0.023	0.001
Lithuania	356	89	19.471	0.016	0.005	Bulgaria	51	32	0.001	0.003	0.001
Uganda	1219	39	0.162	0.061	0.005	Cameroon	71	8	0.078	0.004	0.001
Estonia	756	182	4.478	0.037	0.005	Burundi	10	2	0	0	0.001
Greece	829	23	56.527	0.045	0.005	Georgia	313	11	0.251	0.015	0.001
Dominican Republic	281	13	1.6	0.013	0.005	Ethiopia	158	3	0	0.008	0.001
Paraguay	222	62	0.032	0.01	0.004	Eritrea	0	2	0	0	0.001
South Africa	1751	218	1.671	0.094	0.004	Vietnam	14	4	0	0.001	0.001
Ecuador	138	28	0.075	0.007	0.004	Côte d'Ivoire	4	7	0	0	0.001
Bolivia	110	15	0.011	0.004	0.004	Jordan	8	3	0	0	0.001
Singapore	1118	442	2.133	0.058	0.004	Somalia	21	3	0	0.001	0.001
Hungary	303	26	1.457	0.013	0.004	Algeria	1	4	0	0	0.001
Trinidad & Tobago	281	19	0.176	0.013	0.004	Myanmar (Burma)	10	2	0	0	0.001
Barbados	160	15	195.134	0.007	0.004	Mozambique	31	4	0	0.001	0.001
Israel	475	46	0.815	0.025	0.003	Azerbaijan	20	3	0	0.001	0.001
Sri Lanka	800	14	0.319	0.04	0.003	Maldives	67	9	0	0.003	0.001
Philippines	548	56	11.517	0.027	0.003	Brunei	50	2	0.001	0.002	0.001
Czechia	501	90	1.559	0.025	0.003	Palau	19	13	0	0.001	0.001
Croatia	138	20	117.59	0.007	0.003	Iran	69	8	0	0.004	0.001
Tanzania	325	97	1.055	0.015	0.003	Cambodia	62	2	0.001	0.003	0.001
Kyrgyzstan	50	0	0	0.003	0.003	South Sudan	0	3	0	0	0.001
Rwanda	165	26	0.409	0.008	0.002	Eswatini	71	5	0	0.004	0.001
Venezuela	81	148	0.742	0.004	0.002	Bahrain	4	3	0.001	0	0.001
India	407	789	3.734	0.02	0.002	Cape Verde	2	2	0	0	0.001
Russia	162	121	0.358	0.008	0.002	Marshall Islands	0	2	0	0	0.001
Panama	34	12	0.064	0.001	0.002	Niger	2	1	0	0	0.001
Thailand	291	95	1.45	0.016	0.002	Mongolia	7	9	0	0	0.001
Bangladesh	39	9	0.227	0.002	0.002	Oman	16	2	0	0.001	0.001
Timor-Leste	19	13	0.003	0.001	0.002	Angola	12	1	0	0	0.001
Nepal	204	22	0.192	0.01	0.002	Palestinian Territ	4	2	0	0	0.001
Poland	202	88	0.015	0.009	0.002	Libya	0	1	0	0	0.001
Malta	58	26	0.054	0.003	0.002	Mali	12	3	0	0.001	0.001
Montenegro	41	5	0.123	0.002	0.002	São Tomé & Príncipe	1	1	0	0	0.001
Slovakia	671	53	0.471	0.035	0.002	Guinea	47	1	0	0.002	0.001
Jamaica	189	48	1.389	0.01	0.002	Mauritania	2	2	0	0	0.001
Pakistan	134	47	0.218	0.007	0.002	Burkina Faso	4	1	0	0	0.001
Belize	126	5	36.901	0.006	0.002	Belarus	17	0	0	0.001	0.001
Guatemala	173	23	0.016	0.009	0.002	Chad	1	0	0	0	0.001
Serbia	213	14	0.087	0.011	0.002	DR Congo	7	0	0	0	0.001
Botswana	55	5	172.001	0.002	0.002	Gambia	2	0	0	0	0.001
Malaysia	848	12	0.013	0.046	0.002	Iraq	49	0	0	0.002	0.001
Iceland	331	39	0.067	0.017	0.002	Kosovo	108	0	0	0.006	0.001
Nicaragua	8	11	0.013	0	0.002	Laos	12	0	0	0	0.001
Mauritius	118	6	0.098	0.006	0.002	Liechtenstein	7	0	0	0	0.001
El Salvador	78	18	0.203	0.004	0.002	Madagascar	2	0	0	0	0.001
Cyprus	144	11	0.004	0.006	0.002	Micronesia	17	0	0	0.001	0.001
Taiwan	429	20	0.026	0.022	0.002	Monaco	1	0	0	0	0.001
Ukraine	99	8	0.01	0.005	0.002	Seychelles	6	0	0	0	0.001
Cuba	98	1	0	0.005	0.002	Solomon Islands	12	0	0	0.001	0.001
Andorra	36	2	0	0.002	0.002	Suriname	13	0	0	0.001	0.001
Honduras	29	1	0	0.001	0.002	Syria	7	0	0	0	0.001
Haiti	16	8	0.003	0.001	0.001	Tajikistan	2	0	0	0	0.001
Kenya	107	123	0.212	0.005	0.001	Tonga	11	0	0	0.001	0.001
Fiji	12	23	0.007	0.001	0.001	Turkmenistan	3	0	0	0	0.001
Afghanistan	45	122	0.009	0.002	0.001	Zimbabwe	11	0	0	0.001	0.001
Samoa	12	7	0	0	0.001						

Note: The table is arranged in descending PageRank centrality order. (*In-D: In-degree*; *Out-D: Out-degree*; *BC: Betweeness*; *EVC: Eigenvector*; *PR: PageRank*)

A.4 Classification of policy domains

To categorize policy documents thematically, we employed an automated annotation workflow using a large language model (LLM). We based our classification scheme on the Comparative Agendas Project (CAP) framework [3], assigning each document to one of the CAP's predefined policy domains. The classification relied on the summary metadata provided by Overton.

Following recent recommendations emphasizing transparency and reproducibility in computational research [4], we utilized Meta's open-source Llama3.3-70B model, hosted locally. This choice ensured greater control and auditability, while maintaining performance on par with commercial LLM offerings.

We used a consistent, structured prompt format to guide the model's outputs. Each input comprised two parts:

- System instruction: A fixed prompt that described the classification task and listed all 21 CAP categories along with brief definitions to reduce ambiguity.
- User content: The summary of the policy document to be classified.

Each summary was evaluated independently in a clean model session to eliminate carryover effects. The model was directed to respond with only the name of the most appropriate policy category, omitting any additional commentary.

An example of the instruction prompt used in all sessions is provided below:

> **System prompt:** Your task is to categorize a government document summary from {`Country name`} into one of the following policy topics. Return only the name of the single most-likely category. The categories are:
>
> - `Macroeconomics`: Domestic economic policy.
> - `Civil Rights`: Civil and minority rights.
> - `Health`: Healthcare policy and funding.
> - `Agriculture`: Farming and agricultural policy.
> - `Labor`: Employment, labor rights, and pensions.
> - `Education`: Education policy and funding.
> - `Environment`: Environmental regulations and policy.
> - `Energy`: Energy policy and regulation.
> - `Immigration`: Immigration, refugees, and citizenship.
> - `Transportation`: Transportation policy and infrastructure.
> - `Law and Crime`: Law enforcement, crime, and justice.
> - `Social Welfare`: Social assistance and welfare programs.
> - `Housing`: Housing and urban affairs.
> - `Domestic Commerce`: Business and trade within the country.
> - `Defense`: National defense and military policy.
> - `Technology`: Science, technology, and communication policy.
> - `Foreign Trade`: Trade agreements and international commerce.
> - `International Affairs`: Diplomacy, foreign aid, and global relations.
> - `Government Operations`: Public administration and agencies.
> - `Public Lands`: Land management, water policy, and territorial issues.
> - `Culture`: Arts, culture, and heritage policy.
>
> Return your answer in the following JSON format:
>
> {'policy_domain': 'Policy domain category from the options above'}
>
> Input: {`Summary of policy document`}

Each document underwent this classification protocol individually to maintain consistency and reproducibility across the dataset.

A.4.1 Validation protocol

To validate the accuracy and reliability of our automated policy domain classification, we implemented a protocol involving both human annotation and a comparative assessment with an established external model. For this purpose, a random sample of 1,000 policy document summaries was drawn from our dataset.

Each of these 1,000 documents was manually annotated by a human expert. The annotator was instructed to identify the "most likely" policy domain based on the identical CAP framework and definitions used by the LLM, ensuring a consistent application of classification logic. This manual annotation served as our gold standard for evaluation.

Concurrently, these same 1,000 policy documents were also classified using a pretrained model `poltextlab/xlm-roberta-large-english-cap-v3` from the CAP Babel Machine [5]. This allowed for a direct, quantitative comparison of our Llama3.3-70B model's performance against an established encoder-based model specifically trained for CAP classification.

We then assessed the agreement between our Llama3.3-70B model's classifications and the human annotator's judgments. The LLM's derived categorizations coincided with the human annotator's in 78.9% of the instances. To provide a robust measure of inter-rater reliability, Cohen's Kappa was calculated, yielding (κ=0.768; z-value: 81.6; p-value: < 0.001). This result indicates substantial agreement between our automated classification and human judgment.

For direct comparison, we also calculated the agreement between the human annotator and the CAP Babel Machine model. Their classifications agreed in 68.8% of the cases. The corresponding Cohen's Kappa was (κ=0.660; z-value: 73.4; p-value: < 0.001).

These validation results underscore the strong performance of the Llama3.3-70B model and, notably, its superior accuracy when compared to the established CAP Babel Machine, further supporting its suitability for this large-scale classification task.

Table 5: Comparative Agendas Project (CAP) policy domains and descriptions

Policy Domain	Description
1. Macroeconomics	Issues related to general domestic macroeconomic policy.
2. Civil Rights	Issues related generally to civil rights and minority rights.
3. Health	Issues related generally to health care, including appropriations for general health care government agencies.
4. Agriculture	Issues related to general agriculture policy, including appropriations for general agriculture government agencies.
5. Labor	Issues generally related to labor, employment, and pensions, including appropriations for government agencies regulating labor policy.
6. Education	Issues related to general education policy, including appropriations for government agencies regulating education policy.
7. Environment	Issues related to general environmental policy, including appropriations for government agencies regulating environmental policy.
8. Energy	Issues generally related to energy policy, including appropriations for government agencies regulating energy policy.
9. Immigration	Issues related to immigration, refugees, and citizenship.
10. Transportation	Issues related generally to transportation, including appropriations for government agencies regulating transportation policy.
12. Law and Crime	Issues related to general law, crime, and family issues.
13. Social Welfare	Issues generally related to social welfare policy.
14. Housing	Issues related generally to housing and urban affairs.
15. Domestic Commerce	Issues generally related to domestic commerce, including appropriations for government agencies regulating domestic commerce.
16. Defense	Issues related generally to defense policy, and appropriations for agencies that oversee general defense policy.
17. Technology	Issues related to general space, science, technology, and communications.
18. Foreign Trade	Issues generally related to foreign trade and appropriations for government agencies generally regulating foreign trade.
19. International Affairs	Issues related to general international affairs and foreign aid, including appropriations for general government foreign affairs agencies.
20. Government Operations	Issues related to general government operations, including appropriations for multiple government agencies.
21. Public Lands	Issues related to general public lands, water management, and territorial issues.
23. Culture	Issues related to general cultural policy issues.

Table 6: Distribution of policy domains classes by region.

Policy domain	**Pooled**	AG	EEG	APG	GRULAC	WEOG	USA
Health	20.68% (257481)	37.51% (3,553)	24.57% (5,404)	23.97% (14,142)	11.78% (6,007)	22.85% (124,465)	18.59% (103,910)
Environment	17.47% (217550)	13.30% (1,260)	14.05% (3,089)	15.71% (9,266)	10.07% (5,133)	17.05% (92,841)	18.95% (105,961)
Government Operations	8.05% (100288)	5.98% (566)	6.58% (1,448)	2.48% (1,464)	16.73% (8,527)	4.95% (26,938)	10.97% (61,345)
Education	7.20% (89594)	7.52% (712)	13.85% (3,045)	10.76% (6,349)	10.60% (5,403)	6.99% (38,089)	6.44% (35,996)
Transportation	5.11% (63670)	1.40% (133)	1.36% (299)	2.00% (1,181)	1.22% (622)	7.16% (38,967)	4.02% (22,468)
Law and Crime	4.59% (57193)	1.82% (172)	3.16% (694)	1.95% (1,152)	3.28% (1,671)	3.36% (18,282)	6.30% (35,222)
Macroeconomics	4.51% (56107)	9.69% (918)	6.52% (1,433)	5.29% (3,123)	14.64% (7,466)	5.23% (28,480)	2.63% (14,687)
Labor	3.85% (47932)	1.34% (127)	2.51% (551)	2.55% (1,507)	3.53% (1,801)	3.67% (19,965)	4.29% (23,981)
Agriculture	3.35% (41682)	5.50% (521)	3.05% (671)	9.51% (5,609)	3.84% (1,960)	4.49% (24,452)	1.51% (8,469)
Housing	3.00% (37395)	1.31% (124)	1.08% (238)	0.78% (463)	0.74% (375)	2.12% (11,551)	4.41% (24,644)
Energy	2.98% (37083)	1.60% (152)	1.47% (323)	2.93% (1,729)	4.84% (2,465)	2.68% (14,587)	3.19% (17,827)
Domestic Commerce	2.93% (36516)	2.08% (197)	1.44% (316)	3.91% (2,307)	2.25% (1,146)	2.22% (12,084)	3.66% (20,466)
Social Welfare	2.81% (34957)	1.60% (152)	2.46% (542)	1.55% (912)	2.34% (1,191)	2.97% (16,171)	2.86% (15,989)
Civil Rights	2.10% (26182)	2.01% (190)	2.56% (562)	1.45% (855)	3.41% (1,739)	2.64% (14,374)	1.51% (8,462)
Technology	2.09% (26041)	2.31% (219)	4.01% (881)	5.93% (3,499)	2.44% (1,246)	2.09% (11,369)	1.58% (8,827)
No category	2.01% (25043)	0.87% (82)	1.15% (252)	1.88% (1,108)	1.12% (571)	2.25% (12,243)	1.93% (10,787)
Public Lands	1.78% (22141)	0.48% (45)	0.21% (47)	0.18% (109)	0.33% (170)	0.50% (2,745)	3.40% (19,025)
Culture	1.58% (19680)	1.11% (105)	1.52% (335)	3.10% (1,826)	2.56% (1,306)	1.89% (10,305)	1.04% (5,803)
International Affairs	1.43% (17795)	1.40% (133)	3.29% (723)	1.83% (1,079)	2.23% (1,135)	1.98% (10,787)	0.70% (3,938)
Immigration	0.94% (11765)	0.23% (22)	0.88% (193)	0.44% (260)	0.54% (275)	1.35% (7,362)	0.65% (3,653)
Defense	0.93% (11612)	0.10% (9)	3.62% (797)	0.45% (265)	0.21% (105)	0.78% (4,229)	1.11% (6,207)
Foreign Trade	0.59% (7385)	0.83% (79)	0.68% (149)	1.33% (783)	1.31% (668)	0.79% (4,321)	0.25% (1,385)

Table 7: Top validation errors in LLM policy classification.

LLM domain	Human domain	N	Prop	LLM domain	Human domain	N	Prop
Environment	Public Lands	20	9.5	Government Operations	Education	3	1.4
Health	Social Welfare	9	4.3	Government Operations	Environment	3	1.4
Domestic Commerce	Macroeconomics	8	3.8	Government Operations	International Affairs	3	1.4
Environment	Energy	6	2.8	Government Operations	No category	3	1.4
Environment	Transportation	4	1.9	Government Operations	Technology	3	1.4
Government Operations	Housing	4	1.9	Law and Crime	Government Operations	3	1.4
Government Operations	Public Lands	4	1.9	Macroeconomics	Foreign Trade	3	1.4
Labor	Social Welfare	4	1.9	Transportation	Government Operations	3	1.4
Environment	Agriculture	3	1.4	Transportation	Technology	3	1.4

A.5 Variation across regions

Having established broad patterns about the distribution of policy-based and academic references in the main body, we provide a more disaggregated examination into how these dynamics vary across regions. Specifically, we use references in policy documents to analyze differences in citation practices between UN regional groups. These groupings reflect geopolitical affiliations and geographic proximity. To complement this perspective, we also distinguish between references that originate from 'developed' economies—typically high-income countries with robust research infrastructures—and those from other regions. This dual approach allows us to disentangle factors like spatial proximity and economic stratification relation to patterns of knowledge use.

On the policy side, we present results from models assessing the probability that a reference targets a foreign government, and whether such references are directed toward neighboring countries, countries within the same regional group, or 'developed' economies. On the academic side, we evaluate regional differences in the likelihood that a scholarly citation refers to a paper authored exclusively by researchers from 'developed' economy institutions, and whether at least one author is affiliated with an institution in the citing country.

Our findings reveal notable regional heterogeneity in policy citations and more modest variation in scholarly citations. For instance, while references to foreign government documents are roughly equally likely across most regions, African policy documents are significantly less likely—by about half—to cite foreign governments. Further, when it comes to citing neighboring countries, we observe no significant differences between Eastern European, Western European and Others, and Latin American and Caribbean countries. In contrast, Asia-Pacific and African countries are significantly less likely to cite their immediate neighbors. The starkest differences emerge in citations to governments within the same regional group: the likelihood of such references is 3.5 times greater in the Western European and Others group compared to Latin American and Caribbean countries. This is in contrast to the scholarly-end, where the most notable gap is a higher likelihood—approximately 11% greater—of citing research produced exclusively by 'developed' economy institutions in documents from the Western European and Others group.

Figure 4 provides an overview of these results. The estimates represent relative risks, capturing the ratio of the probability of observing a reference with a given characteristic in a UN regional group compared to the probability of observing it in documents authored by Latin American and Caribbean countries. While the geographic distribution of references highlights asymmetries in whose knowledge reaches the policy sphere, another key dimension of variation can emerge when examining differences across policy domains.

In addition to these regional comparisons, we conducted an auxiliary analysis to address whether the predominance of Global North citations might simply reflect the larger pool of documents from these countries indexed in Overton. Specifically, we estimated a logistic mixed-effects model predicting whether a foreign government citation referred to a 'developed' economy, controlling for the total number of documents available from the cited country. The results (Figure 5) indicate that the pattern holds even when adjusting for differences in document availability: policy documents from Global South countries still disproportionately cite developed-country governments. This finding suggests that the observed asymmetries cannot be explained solely by supply-side imbalances in the corpus but also reflect deeper structural referencing dynamics.

Figure 4: Marginal effects on observing a reference with a specified feature across groups. Results from six logistic mixed-effects models with document government author random effects. The estimates in the figure are relative risks representing the ratio of probability of observing a reference with the characteristic in a UN region group to the probability of observing it in documents authored by Latin American and Caribbean countries. Error bars represent 95% confidence intervals around the average marginal risk ratios. Sample sizes are as follows (from top to bottom): n = 2,875,242; n = 78,698; n = 78,698; n = 78,698; n = 78,698; n = 7,306,427; n = 7,306,427.

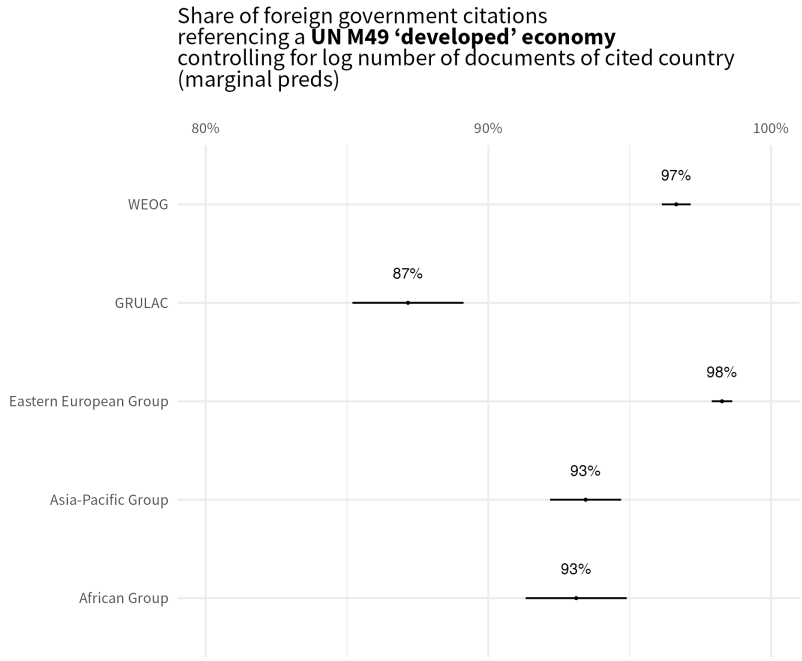

Figure 5: Adjusted share of citations to developed economies (controlling for document availability). Results show predicted probabilities from a logistic mixed-effects model of whether a foreign government citation references a UN M49 'developed' economy. Predictions control for the log number of documents available from the cited country, with citing-country random effects. Error bars represent 95% confidence intervals around mean marginal predicted probabilities. $n = 78{,}694$

A.5.1 Correspondence analysis

To further explore the structure of global evidence exchange, we conducted a correspondence analysis (CA) of intergovernmental citation patterns. We constructed a citation matrix that records how often a government in country A cited a document authored by a government in region B, producing a contingency table that summarizes citation flows among the 174 government citing countries and the 5 regions.

Correspondence analysis projects both citing and cited countries into a shared low-dimensional space, such that proximity reflects similarity in citation behavior. Countries that cite similar sources appear near each other in the space, while countries that are cited by similar sets of actors also cluster.

To visualize these relationships, we present a biplot, which jointly displays both the citing countries and the cited regions in the same coordinate space. In this plot, the spatial proximity between elements indicates similarity in citation patterns—that is, citing countries positioned close to each other tend to cite similar regions, and cited regions located near one another tend to be referenced by a similar set of countries. The biplot allows us to identify clusters of countries with aligned citation behaviors and to examine which regions attract broader versus more localized attention.

The results suggest the presence of regional citation clusters, with countries in Latin America and the Caribbean displaying particularly distinct citation patterns. Countries located near the center of the plot exhibit citation behaviors that are closer to the overall average, while those on the periphery demonstrate more differentiated or localized citation tendencies.

While exploratory in nature, this analysis offers additional evidence of variation in intergovernmental knowledge flows, and complements the main findings on global asymmetries in evidence use. The CA plots provide a visual summary of both citation practices and citation visibility, helping to contextualize broader patterns in the international exchange of policy evidence.

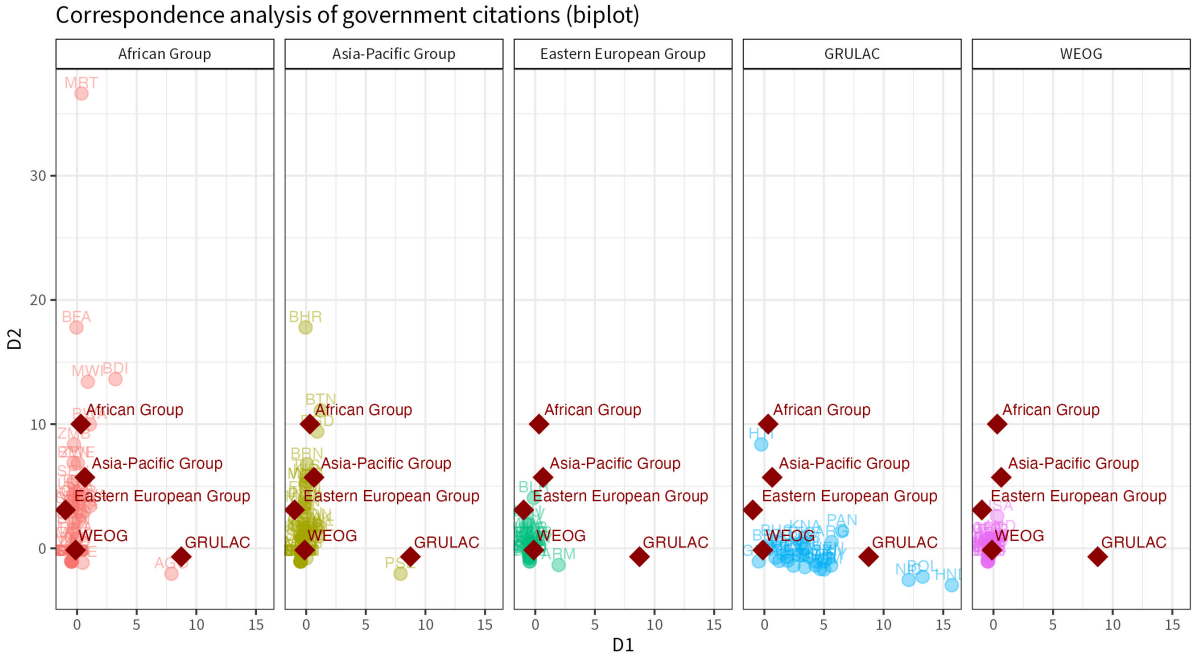

Figure 6: CA biplot.

A.6 Exploratory tests with Altmetric.com

To assess the robustness of our reliance on Overton data, we conducted exploratory tests using Altmetric.com via the Altmetric Details Page API. While both infrastructures contain policy-relevant information, they are designed for different purposes. Overton is policy-output centric, indexing policy documents directly and extracting metadata from them, whereas Altmetric.com is scholarly-output centric, creating entries for academic works after mentions are recorded in its tracked channels (including social media, Wikipedia, news media sources, and policy outputs). This design difference implies that coverage in Altmetric.com data is conditional rather than comprehensive, prospectively allowing us to access only the *scholarly-end* of the corpus. Furthermore, given their focus (i.e., academic output), metadata about policy documents themselves is relatively limited compared to Overton.

We drew a random sample of 35,987 DOIs logged in our Overton corpus, representing roughly 1% of cited papers, and queried the `\fetch` endpoint of the Dimensions API to examine the sources contributing to their Altmetric attention scores. Approximately 44% of these DOIs (15,739) had no entry in Altmetric.com. Among those that did, only 52% (10,678 of 20,248) contained policy mentions, meaning that only around one-third of the academic studies in this random sample could be matched. The limited match rate highlights the partial overlap between the two sources and indicates that Overton's approach, centering on policy documents and extracting metadata from them, captures a broader range of citation activity than is visible through Altmetric.

We also considered whether this approach might reveal additional references from Global South countries or studies with non–Global North authors that could potentially alter the conclusions from our current analyses. We find that given the platform's indexing, this is highly unlikely. Policy document referencing captured by Altmetric.com are similarly skewed toward a small set of Global North countries: the top ten countries, including the United States, United Kingdom, and eight EU states, account for 86% of logged references to these studies. Moreover, most matched DOIs (7,996, or 75% of DOIs with Altmetric entries) are exclusively authored by scholars affiliated with WEOG countries, further suggesting that inclusion of Altmetric.com data would not substantially change the overall patterns observed in our analyses.

These observations suggest that, while deduplication between the two systems could theoretically be attempted, the asymmetry in coverage and limited metadata would pose substantial challenges. More importantly, integrating Altmetric.com would be unlikely to meaningfully change the empirical patterns identified in our main analysis. We therefore rely on the Overton–OpenAlex framework as the most consistent and transparent foundation for our cross-country and cross-domain study, while explicitly noting the limitations of this choice, including the conditional coverage of scholarly references in our Overton and OpenAlex linkage, potential underrepresentation of policy documents from certain regions, and the reliance on digital and publicly accessible sources, which may not fully capture all evidence used in policymaking. These limitations should be considered when interpreting our findings, although this data source nonetheless provides a robust basis for analyzing cross-national and cross-domain patterns of citations of indexed government documents.

Appendix B Supporting Figures and Tables

B.1 Auxiliary information

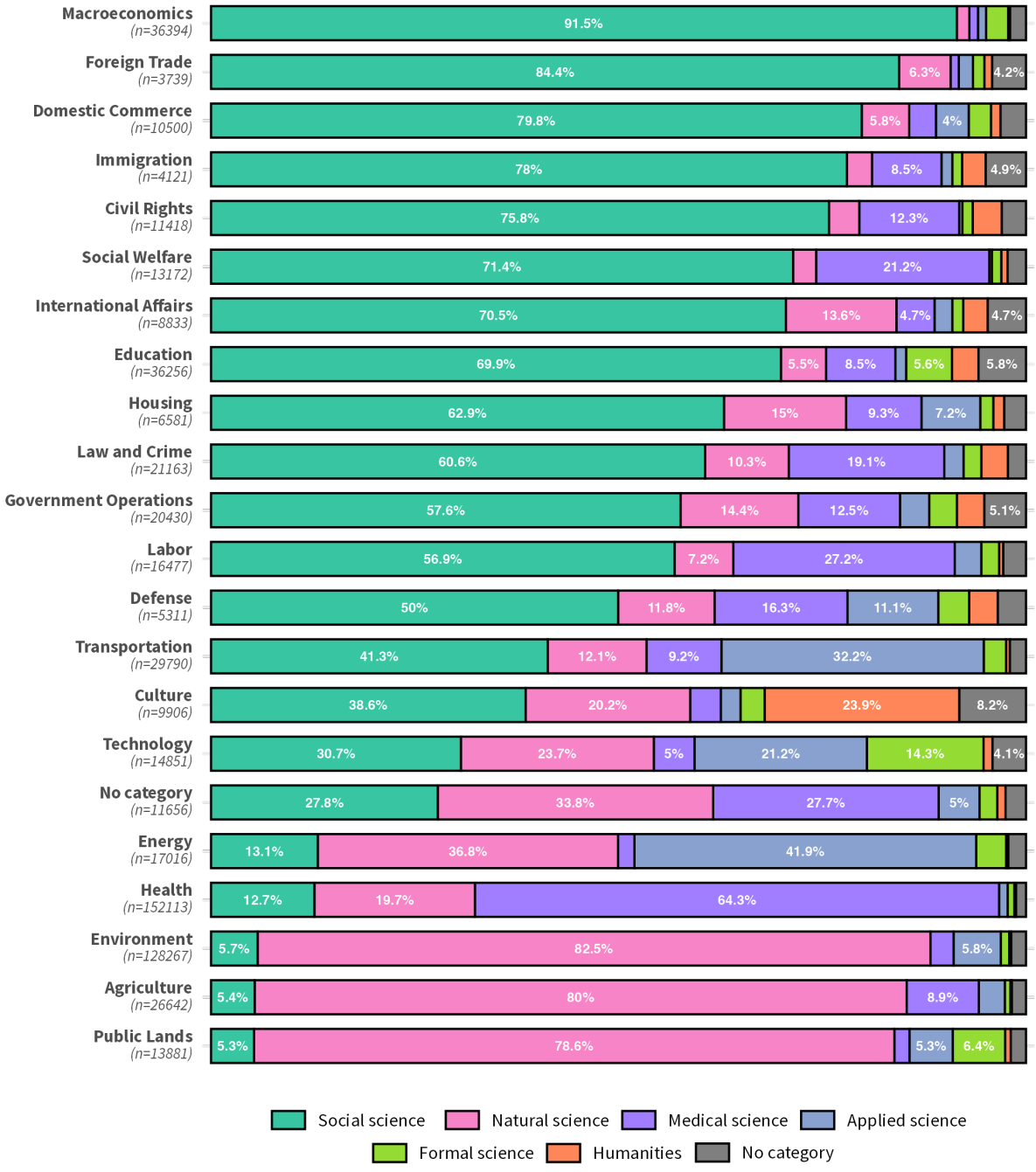

Figure 7: Share of references to scientific fields across policy domains. Each bar represents the distribution of cited scientific fields within a given policy domain, sorted by the share of social science references.

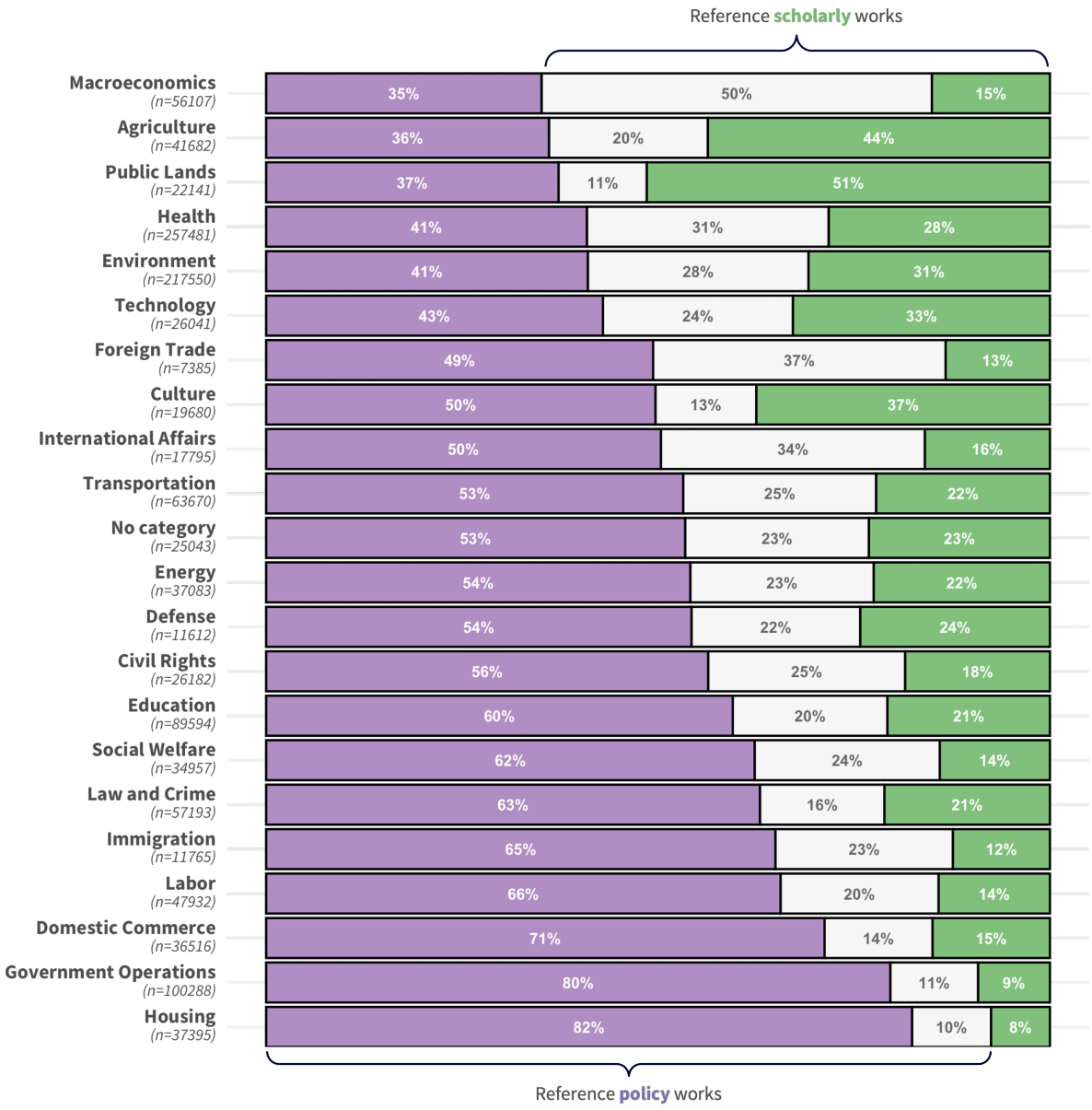

Figure 8: Share of policy documents citing policy, scholarly, or mixed sources across policy domains. Each bar represents the distribution of documents within a given policy domain according to whether they exclusively reference policy works (purple) and scholarly works (green), or both (white), sorted by the share of scholarly work-referencing documents.

Table 8: Top 30 academic journals by policy document citations

Academic journal	Refs	% of docs
The Lancet	71437	0.9%
JAMA	61125	0.8%
New England Journal of Medicine	60913	0.8%
PLOS ONE	56756	0.7%
Environmental Science & Technology	52641	0.7%
BMJ	48513	0.6%
Science	46337	0.6%
American Economic Review	42465	0.5%
Environmental Health Perspectives	37291	0.5%
Nature	35007	0.4%
Science of The Total Environment	33564	0.4%
PEDIATRICS	32256	0.4%
Canadian Journal of Fisheries and Aquatic Sciences	31818	0.4%
The Quarterly Journal of Economics	29941	0.4%
Proceedings of the National Academy of Sciences	29754	0.4%
The Journal of Wildlife Management	29541	0.4%
Accident Analysis & Prevention	28108	0.4%
SSRN Electronic Journal	27798	0.3%
Journal of Political Economy	27745	0.3%
American Journal of Public Health	27413	0.3%
Journal of Monetary Economics	26785	0.3%
Econometrica	24865	0.3%
Open-File Report	23567	0.3%
Cochrane Database of Systematic Reviews	23058	0.3%
Marine Ecology Progress Series	22940	0.3%
Clinical Infectious Diseases	22819	0.3%
Biological Conservation	22479	0.3%
Chemosphere	21652	0.3%
Journal of Geophysical Research	21291	0.3%
The Journal of Finance	21032	0.3%

Table 9: Language distribution across collected country policy documents.

Language	N	Prop	Language	N	Prop	Language	N	Prop	Language	N	Prop	Language	N	Prop
eng	862297	69.3	chi	2898	0.2	mac	950	0.1	hin	295	<0.1%	arm	38	<0.1%
spa	96891	7.8	lav	2883	0.2	tha	836	0.1	wel	291	<0.1%	tam	33	<0.1%
swe	55487	4.5	rum	2120	0.2	ara	756	0.1	gle	238	<0.1%	tib	29	<0.1%
fre	45914	3.7	dan	1958	0.2	vie	717	0.1	urd	210	<0.1%	guj	25	<0.1%
ger	40072	3.2	slv	1943	0.2	aze	713	0.1	bul	176	<0.1%	mlt	22	<0.1%
por	21984	1.8	pol	1818	0.1	ice	634	0.1	ben	151	<0.1%	tel	10	<0.1%
dut	17216	1.4	est	1815	0.1	ukr	630	0.1	amh	136	<0.1%	mal	8	<0.1%
jpn	16802	1.3	kor	1715	0.1	scr	606	<0.1%	swa	123	<0.1%	sin	5	<0.1%
ind	14463	1.2	cze	1539	0.1	heb	583	<0.1%	yid	108	<0.1%	<na>	3	<0.1%
cat	10140	0.8	rus	1444	0.1	per	549	<0.1%	pan	106	<0.1%	syr	2	<0.1%
fin	9658	0.8	may	1378	0.1	hun	538	<0.1%	khm	92	<0.1%	div	1	<0.1%
ita	6524	0.5	lit	1063	0.1	geo	447	<0.1%	bur	59	<0.1%			
tur	4304	0.3	slo	1021	0.1	scc	447	<0.1%	lao	55	<0.1%			
nor	3299	0.3	glg	965	0.1	alb	432	<0.1%	iku	41	<0.1%			
baq	3077	0.2	gre	964	0.1	fil	307	<0.1%	afr	38	<0.1%			

Appendix C Software statement

The computer code and processed data for this study is available at seramirezruiz/policy-docs. We used R version 4.4.2 [6] and the following R packages:

`ca` v. 0.71.1 [7]
`countrycode` v. 1.6.0 [8]
`data.table` v. 1.16.4 [9]
`dplyr` v. 1.1.4 [10]
`ggh4x` v. 0.3.0 [11]
`ggplot2` v. 3.5.1.9000 [12]
`glmmTMB` v. 1.1.10 [13]
`gt` v. 0.11.1 [14]
`httr` v. 1.4.7 [15]
`igraph` v. 2.1.4 [16]
`janitor` v. 2.2.0 [17]
`jsonlite` v. 1.9.1 [18]
`marginaleffects` v. 0.24.0 [19]
`ollamar` v. 1.2.2 [20]
`openalexR` v. 1.4.0 [21]
`purrr` v. 1.0.4 [22]
`rnaturalearth` v. 1.0.1 [23]
`rnaturalearthdata` v. 1.0.0 [24]
`tidyr` v. 1.3.1 [25]
`xtable` v. 1.8.4 [26]

References

1. *Worldwide Governance Indicators, 2024 Update,* World Bank, Accessed on 2025-02-18.
2. For Law, C. & Democracy. *The RTI Rating: Global Right to Information Rating* https://www.rti-rating.org. 2025.
3. *Comparative Policy Agendas: Theory, Tools, Data* (eds Baumgartner, F. R., Breunig, C. & Grossman, E.) (Oxford University Press, 2019).
4. Barrie, C., Palmer, A. & Spirling, A. *Replication for Language Models: Problems, Principles, and Best Practice for Political Science* 2025.
5. Sebők, M., Máté, Á., Ring, O., Kovács, V. & Lehoczki, R. Leveraging Open Large Language Models for Multilingual Policy Topic Classification: The Babel Machine Approach. *Social Science Computer Review,* 08944393241259434 (2024).
6. R Core Team. *R: A Language and Environment for Statistical Computing* R Foundation for Statistical Computing (Vienna, Austria, 2024).
7. Nenadic, O. & Greenacre, M. Correspondence Analysis in R, with two- and three-dimensional graphics: The ca package. *Journal of Statistical Software* **20,** 1–13 (2007).
8. Arel-Bundock, V., Enevoldsen, N. & Yetman, C. countrycode: An R package to convert country names and country codes. *Journal of Open Source Software* **3,** 848 (2018).
9. Barrett, T., Dowle, M., Srinivasan, A., Gorecki, J., Chirico, M., Hocking, T. & Schwendinger, B. *data.table: Extension of 'data.frame'* (2024).
10. Wickham, H., François, R., Henry, L., Müller, K. & Vaughan, D. *dplyr: A Grammar of Data Manipulation* (2023).
11. van den Brand, T. *ggh4x: Hacks for 'ggplot2'* (2024).
12. Wickham, H. *ggplot2: Elegant Graphics for Data Analysis* (Springer-Verlag New York, 2016).
13. Brooks, M. E., Kristensen, K., van Benthem, K. J., Magnusson, A., Berg, C. W., Nielsen, A., Skaug, H. J., Maechler, M. & Bolker, B. M. glmmTMB Balances Speed and Flexibility Among Packages for Zero-inflated Generalized Linear Mixed Modeling. *The R Journal* **9,** 378–400 (2017).
14. Iannone, R., Cheng, J., Schloerke, B., Hughes, E., Lauer, A., Seo, J., Brevoort, K. & Roy, O. *gt: Easily Create Presentation-Ready Display Tables* (2024).
15. Wickham, H. *httr: Tools for Working with URLs and HTTP* (2023).
16. Csárdi, G., Nepusz, T., Traag, V., Horvát, S., Zanini, F., Noom, D. & Müller, K. *igraph: Network Analysis and Visualization in R* (2025).
17. Firke, S. *janitor: Simple Tools for Examining and Cleaning Dirty Data* (2023).
18. Ooms, J. The jsonlite Package: A Practical and Consistent Mapping Between JSON Data and R Objects. *arXiv:1403.2805 [stat.CO]* (2014).
19. Arel-Bundock, V., Greifer, N. & Heiss, A. How to Interpret Statistical Models Using marginaleffects for R and Python. *Journal of Statistical Software* **111,** 1–32 (2024).
20. Lin, H. & Safi, T. ollamar: An R package for running large language models. *PsyArXiv* (2024).
21. Massimo, A., Le Trang, Corrado, C., Alessandra, B. & June, C. openalexR: An R-Tool for Collecting Bibliometric Data from OpenAlex. *The R Journal* **15,** 167–180 (4 2024).
22. Wickham, H. & Henry, L. *purrr: Functional Programming Tools* (2025).
23. Massicotte, P. & South, A. *rnaturalearth: World Map Data from Natural Earth* (2023).
24. South, A., Michael, S. & Massicotte, P. *rnaturalearthdata: World Vector Map Data from Natural Earth Used in 'rnaturalearth'* (2024).
25. Wickham, H., Vaughan, D. & Girlich, M. *tidyr: Tidy Messy Data* (2024).
26. Dahl, D. B., Scott, D., Roosen, C., Magnusson, A. & Swinton, J. *xtable: Export Tables to LaTeX or HTML* (2019).