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Vox populi, vox dei: A concept and measure for grassroots socio-political risk using Google Trends



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ABSTRACT

In this paper, we propose a concept of grassroots socio-political risk (SPR) and provide a measure for it that is based on individual-level Google Trends data that captures issue salience. Our concept provides a bottom-up complement to established measures that focus more on political and institutional players and the institutional constraints they face. Our grassroots SPR index attempts to capture public pressure to initiate institutional change in a country. In contrast to existing measures, our Google Trends-based measure captures issue salience directly among individuals rather than media or analyst reports. As such, it is uniquely representative of socio-political sentiment, timely, and widely available. Our concept and measure offer international business (IB) researchers novel opportunities. In addition to developing the index, we scrutinize its validity and provide an illustrative empirical application in the IB context by showing that differences between internal and external assessments of grassroots SPR are contingent on psychic distance.

1. Introduction

Despite increasing globalization, country-level socio-political risk (SPR) remains one of the most important and distinguishing issues in international business (IB) and international management (IM). In the US, the Economic Policy Uncertainty (EPU) index has seen steady increases since 1960 due to growing government regulation, frequent partisan rifts, and populist rhetoric (Baker et al., 2014; Baker et al., 2016). Crises, sanctions, trade wars, and, recently, military conflict have had similar effects on the global stage. According to the US National Intelligence Council's, 2021 report on *Global Trends 2040*, socio-political tensions will further increase in the coming years. Following this persistent relevance of SPR, academic interest in the impact of SPR on multinational enterprises (MNEs) has intensified in the past decades. Scholars have studied various facets of SPR such as corruption (Karhunen and Ledyayeva, 2012; Sartor and Beamish, 2018), legal uncertainty (White III et al., 2015), socio-political violence (Oh and Oetzel, 2017), military conflict (Arikan et al., 2020; Li and Vashchilko, 2010), or property rights violations (Jiang et al., 2011).

However, much of the institutional literature and the literature in IB that measures SPR focuses on political actors as sources of risk due to weak constraints on their political power. These measures observe countries' long-term institutional structures and capture the risk of adverse institutional changes based on the constraints that prevent policymakers from top-down sovereign intervention against, foremost, foreign investors (e.g., expropriation). In today's global policy environment (White III et al., 2021), such top-down structural SPR is vitally important for companies, but it does not necessarily reflect a more fundamental, bottom-up source of institutional change

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([Henisz and Zelner, 2010](#)). Specifically, we argue that through collective action, private citizens can increasingly force institutions to change in a bottom-up manner.

While traditional policy-centered, top-down SPR remains relevant, recent events have highlighted how dynamic grassroots socio-political changes can quickly undermine the formal institutions represented in these measures. Recent waves of populism ([Devinney and Hartwell, 2020](#); [Hartwell and Devinney, 2021](#); [Rodrik, 2018](#)), public protests and uprisings ([Darendeli and Hill, 2016](#); [Sottilotta, 2015](#)), as well as the dissolution of supranational institutions and multilateralism (e.g., Trumpism, Brexit), are symptoms of the dwindling absolute nature of top-down institutional logics and the increasing empowerment of popular movements of individuals in changing institutions (grassroots SPR). We argue that accurate theorizing and measuring of SPR in the 21st century requires top-down structural and, simultaneously, acknowledgment of bottom-up grassroots SPR ([Eesley et al., 2016](#); [Minefee and Bucheli, 2021](#)). In a similar vein, [Rice and Zegart \(2018\)](#) argue that SPR no longer emanates from despots, authoritarians, or elected governments but “from other actors: people making videos on their cell phones, city officials issuing ordinances, terrorists detonating truck bombs, and many more.” Accordingly, 21st-century SPR stems not solely from politicians’ decisions but from a grassroots issue salience within the populace. The observation also highlights the importance of digital communication and social media in the organization of popular movements. Therein, it positions digital information sources such as Google Trends as valuable data sources for studying this 21st-century type of SPR. In this paper, we propose such a grassroots concept of SPR and offer a suitable measure that is distinguishable from more traditional, structural sources of SPR using individual-level Google search queries.

Scholars from various disciplines have used Google Trends to measure socio-economic trends and sentiment. More importantly, all major business data providers, such as Bloomberg or Refinitiv, have embraced individual-level data as a means of SPR risk measurement. In line with these studies and business practice ([Beracha and Wintoki, 2013](#); [Cziraki et al., 2021](#); [Joseph et al., 2011](#)), we argue that search volume on Google reflects information-seeking behavior and, therefore, indicates public attention and issue salience ([Costola et al., 2021](#)). We use our publicly available globaltrends package for R ([Puhr, 2021](#)) as a toolbox to access Google Trends data and compile our grassroots SPR index.

Our paper contributes to SPR literature and institutional scholarship. First, we expand the theoretical perspective on SPR ([Henisz, 2000](#); [Tarabishi et al., 2005](#)), providing a complementary concept (and measure) that is tailored to capture antecedents of bottom-up institutional change initiated not by policymakers but by the populace. Adding such a perspective of bottom-up SPR allows for more nuanced theorizing and explains radical institutional changes that create uncertainty for firms. Hence, our study also responds to recent calls for a more dynamic and interrelated perspective on institutions ([Dau et al., 2022](#); [Yiu et al., 2021](#)). We focus on grassroots pressure from novel political actors ([Boddewyn, 2016](#); [Teegen et al., 2004](#)) as an antecedent of change in socio-political institutions. Consequently, we add to a better understanding of how institutional evolution creates SPR because of incongruence and interaction between different types of institutions ([Andrews et al., 2020](#); [Dau et al., 2022](#); [Gaur et al., 2022](#); [Röell et al., 2022](#)).

In addition to these theoretical contributions, our measure offers a variety of empirical and practical benefits. The proposed SPR index is related to existing sentiment-based grassroots measures of issue salience and public opinion ([Gruszcynski and Wagner, 2017](#); [Mellon, 2013](#)) but is the first measure of its kind that is based not on analyst or media interpretation ([Caldara and Iacoviello, 2021](#); [Hassan et al., 2019](#); [Marshall and Cole, 2008](#); [PRS Group](#); [Sun et al., 2021](#)) but on truly individual-level data. Data from Google Trends can be freely accessed, underlies no availability issues, and offers insights down to the subnational level. Since our SPR index aggregates search volume for different keywords, scholars can expand and adapt the index’s categories to their needs and research questions. These qualities offer unprecedented sensitivity to dynamic events and developments that can only be measured ex-post. This opens an entirely new dimension of empirical inquiry.

However, reliance on Google Trends as a data source also brings about some conceptual limitations. First, our measure captures SPR regarding the antecedents of institutional change. Therefore, it is problematic to apply it deterministically to explain ex-post outcomes. Second, our measure operationalizes issue salience based on search volume. This gives equal weight to each user’s search query (one query, one vote) and may not adequately reflect existing power balances in institutional structures. However, this egalitarian view is also a strong suit and distinguishes our concept and measure from existing approaches. In addition, the search volume lacks context and sentiment. Thus, while search volume allows us to capture issue salience, it offers no insights into the reasons for the salience of an issue. Finally, categorizing keywords into different dimensions is—like other multidimensional measures—inevitably subjective and never mutually exclusive. Therefore, our index intends to serve as a starting point that we invite other researchers to build and improve on.

From an empirical standpoint, our extensive empirical validation has revealed three caveats that researchers using the proposed SPR index should be aware of. First, Google Trends algorithms that classify search queries into topics may be more efficient for common languages. Second, differences in the degree to which countries restrict free internet access can affect the SPR index’s accuracy in countries with rigid online censorship (e.g., China, Russia, and Egypt). Third, because of increasing internet and Google usage, especially in developing countries, over the observation period, more recent SPR values may be more reliable than historical values. While we encourage scholars to consider these caveats to applying the proposed SPR index, our measure and the accompanying globaltrends package for R offer a state-of-the-art analytical tool to study grassroots SPR as a probabilistic predictor of institutional change.

2. Definitions and measures of SPR

We develop our measure of SPR based on the multitude of measures for country risk and SPR. For a detailed overview, we compare existing measures of SPR and their theoretical and empirical foundations in Tables A1–A3 of Online Appendix A.

2.1. Structural measures

The dominant class of SPR measures is structural measures (for a detailed overview, see Table A1). Structural measures are the conceptually most developed and most fundamental measures of SPR. Such measures include the political constraints index (POLCON) by [Henisz \(2000\)](#); the checks and balances indicators included in the Database of Political Institutions (DPI) by [Scartascini et al. \(2018\)](#); and the Polity IV measures by [Marshall et al. \(2002\)](#). These measures do not rely on the external assessment of experts or markets but capture SPR by codifying institutional safeguards that prevent policymakers from opportunistic behavior.

They capture the top-down ad-hoc discretion of policymakers to interpret or change regulations unilaterally, altering the terms of contractual agreements or hindering their enforcement ([Dorobantu et al., 2020](#); [Henisz, 2000](#)). The underlying assumption is that institutional constraints are stable over time and, since they restrict political intervention, are useful predictors of political intervention and political risk.

Contributions of these measures to IB and Strategy research have been seminal but face two challenges described by [Rice and Zegart \(2018\)](#). First, structural measures of SPR are biased towards policymakers' discretion. Therefore, these measures are only predictive if policymakers remain within their institutional constraints. Populist movements and their political leaders in the US, Europe, and emerging markets have been accused of undermining or violating existing institutions ([Devinney and Hartwell, 2020](#); [Hartwell and Devinney, 2021](#); [Rodrik, 2018](#)). If government officials can circumvent institutions with a popular grassroots mandate, the power of existing institutional safeguards as predictors of institutional change is partially compromised.

Second, since structural measures of SPR build on existing formal constraints to predict political intervention, they implicitly assume that today's institutions remain unchanged in the future. Hence, structural measures lose predictive power when the institutional environment changes rapidly. However, such episodes of profound institutional change bring about the most fundamental and severe SPR. Therefore, we argue that structural top-down measures must be complemented by a measure of grassroots SPR that captures bottom-up change and institutional disruption.

2.2. Analyst-based grassroots SPR concepts

Some providers of country-risk measures include grassroots aspects of SPR as sub-dimensions in their aggregated country-risk measures (for a detailed overview, see Table A2). The International Country Risk Guide (ICRG), curated by the [PRS Group](#), provides a measure of political risk (in addition to economic and financial) that captures 12 sub-dimensions. Among these, some focus on the top-down, structural dimension of SPR (e.g., law and order), whereas ethnic tensions are akin to bottom-up grassroots SPR. Similarly, the State Fragility Index by [Marshall and Cole \(2008\)](#) includes structural measures of government effectiveness and bottom-up grassroots measures like societal legitimacy.

These approaches are based on analysts' consensus. This involves surveys of employees, analysts, political commentators, or consultants with expertise in a specific country and its risk characteristics to compile risk evaluations ([Madura and Fox, 2011](#)). Literature in IB has highlighted the distinction between actual and perceived political risk and has shown that risk perceptions are important in shaping firms' decisions ([Cavusgil et al., 2020](#); [Giambona et al., 2017](#); [Kelly and Philippatos, 1982](#)¹). In predictive applications, expert forecasting has shown a high tendency to predict the status quo and a very low ability to predict surprising radical change ([Bofinger and Schmidt, 2003](#)). Consequently, analyst-provided measures of bottom-up suffer from substantial bias.

2.3. Market-based grassroots SPR concepts

Other SPR measurement and forecasting approaches are based on market mechanisms. In finance practice and research, country credit ratings and bond spreads are often used as measures of SPR. Such measures take a restricted financial investor perspective to capture specific aspects of SPR (e.g., credit risk, sovereign default). For IB purposes and to explain MNEs' strategic decisions, such crude proxies are insufficient in detail and validity.²

2.4. Sentiment-based grassroots SPR concepts

More recently, academic scholars and private data providers have attempted to create measures of grassroots SPR that do not rely on analyst judgment or functioning markets. These attempts are based on natural language processing of media and press materials (for a detailed overview, see Table A2). The Fragile States Index, for example, uses an artificial intelligence algorithm to extract issue salience in different countries and incorporates this data (in addition to traditional analyst assessments) in government stability

¹ For reviews of conceptualization of risks in IB, see [Cavusgil et al. \(2020\)](#) and [Eduardsen and Marinova \(2020\)](#).

² Within the universe of market-based measures of SPR, there are also some highly sophisticated attempts. [Bekaert et al. \(2014\)](#), for example, decompose the yield spread between a country's US Dollar debt and an equivalent US Treasury bond into global economic conditions, country-specific economic factors, liquidity of the country's bond, and SPR. While econometrically rigorous and sophisticated, due to the complexity and data requirements involved, applications of Bekaert's index in IB have been scarce.

measures.

Similarly, Baker et al. (2016) use textual analysis of media to derive a monthly index for EPU (Fig. 1). The Geopolitical Risk Index uses word counts in US media to derive a predictive measure of violent conflict (Caldara and Iacoviello, 2021).³ The Global Database of Events, Language, and Tone (GDELT) collects and automatically codes news reports from across the world and offers opportunities for analysis of SPR. Though GDELT does not provide country-level risk measures, this data can create country and country-pair measures of political tensions (Sun et al., 2021).

These initiatives offer bottom-up grassroots measures of risks that are based on issue salience; however, none of the measures (a) focuses on SPR and (b) uses truly individual-level, grassroots data. Focusing entirely on media coverage, they are selective in their information sources and subjective in their interpretation. In some countries, the media is not free to report critical developments. Even in developed countries with freedom of the press, mainstream media sentiment does not necessarily reflect societal consensus. We argue that a true measure of grassroots SPR requires individual-level data on issue salience to predict societal change. This measure would complement the structural measures of SPR.

3. A measure of grassroots SPR using Google Trends data

3.1. Theoretical foundations

In this section, we provide the theoretical case for a measure of grassroots SPR (illustrated in Fig. 2). We base our theory and, subsequently, our proposed measure on the seminal Knightian distinction between risk and uncertainty (Knight, 1921: 19–20): “Uncertainty must be taken in a sense radically distinct from the familiar notion of Risk, from which it has never been properly separated. [...] It will appear that a measurable uncertainty, or ‘risk’ proper, as we shall use the term, is so far different from an unmeasurable one that it is not in effect an uncertainty at all.”

This definition implies three important properties and requirements for a measure of SPR.⁴ First, the risk is related to measurable but uncertain outcomes. According to this objectivist view, a measure of SPR must provide a probabilistic and ex-ante assessment of future states of the world (e.g., changes in institutions) (Holton, 2004). Second, risk is unrelated to the ex-post realization of such events or changes and their impacts. Once an event occurs (or not), there is no more uncertainty attached to it ex-post, and risk is zero (or 1)—still, the materialized impact of the occurrence or non-occurrence of the event on individuals and firms may be substantial. Third, risk is related to the uncertainty of a certain parameter in the environment and is conceptually different from firm-level exposure (formally expressed as the multiplicative term of probabilistic risk and expected loss/gain for the focal actor). To qualify for risk, in a Knightian sense, risk can have a negative, positive, or no relevant impact on a focal actor (firm).

The second theoretical element of our conceptualization of SPR introduces firm-level exposure by connecting the probability of institutional change (risk) to firm-level outcomes (Kobrin, 1979; Moran, 1973; Vernon, 1971). If a socio-political or other risk has no firm-level consequences, it bears no relevance for IB. Institutional theory is the dominant theoretical perspective studying the interaction between individuals, firms, and nations. Institutional theory argues that socio-economic activity is governed by formal and informal institutions (laws, norms, beliefs). The neoinstitutional view focuses on how “organizational agency is constrained by institutional legacy” (Aguilera and Grøgaard, 2019: 27; Zietsma et al., 2017). Institutions accordingly structure the socio-political environment for individuals, organizations, and companies, as well as politicians and branches of government (North, 1990). Efficient institutions stabilize, whereas institutional change entails uncertainty in the socio-political environment (lower tier of the institutional spiral illustrated in Fig. 2). Moreover, institutional change may result in incongruences and negative interactions between different institutions, adding to uncertainty (Andrews et al., 2020; Dau et al., 2022; Gaur et al., 2022; Röell et al., 2022).

This structuralist, or neoinstitutionalist view, assumes that institutions are stable and does not focus on how institutions are created or changed. To understand the creation and change of institutions, it is vital to distinguish institutions (laws, norms, beliefs) from institutional players (individuals, organizations, branches of government) (North, 1990). Institutional players create institutions and receive their legitimacy from these players as prominently theorized in institutional work and institutional logic (Aguilera and Grøgaard, 2019; Berger and Luckmann, 1967; Dobbin, 2010; Kraatz, 2011). Thus, institutional players are subordinates and creators of institutions as institutions develop in an iterative legitimization process (Powell and Colyvas, 2008). We argue that the structural, institutional measures of SPR emphasize political players and their discretion.

Based on the seminal work of Berger and Luckmann (1967), the institutional works perspective focuses on institutional change initiated by individuals within societies (Lawrence et al., 2013; Thornton and Ocasio, 2008; Zilber, 2013). At the center of attention are “the practices of individual and collective actors aimed at creating, maintaining, and disrupting institutions” (Aguilera and Grøgaard, 2019: 26). These disruptive grassroots pressures emanating from the level of individuals within society, we argue, are insufficiently recognized in SPR theory. Further, measures akin to this grassroots SPR use potentially biased data sources such as media reports or analyst opinions.

Based on these two theoretical components, we propose an SPR framework that recognizes structuralist and grassroots perspectives

³ The PRisk and PSentiment index (Hassan et al., 2019) is the only firm-specific measure of political risk. It is derived from textual analysis of firms' earnings and conference calls. It represents a firm's perception of political risk in a country rather than a measure of political risk in the respective country.

⁴ Also, this understanding implies that risk is objective and that probabilities are true representations of reality. This objectivist conceptualization has received some criticism.

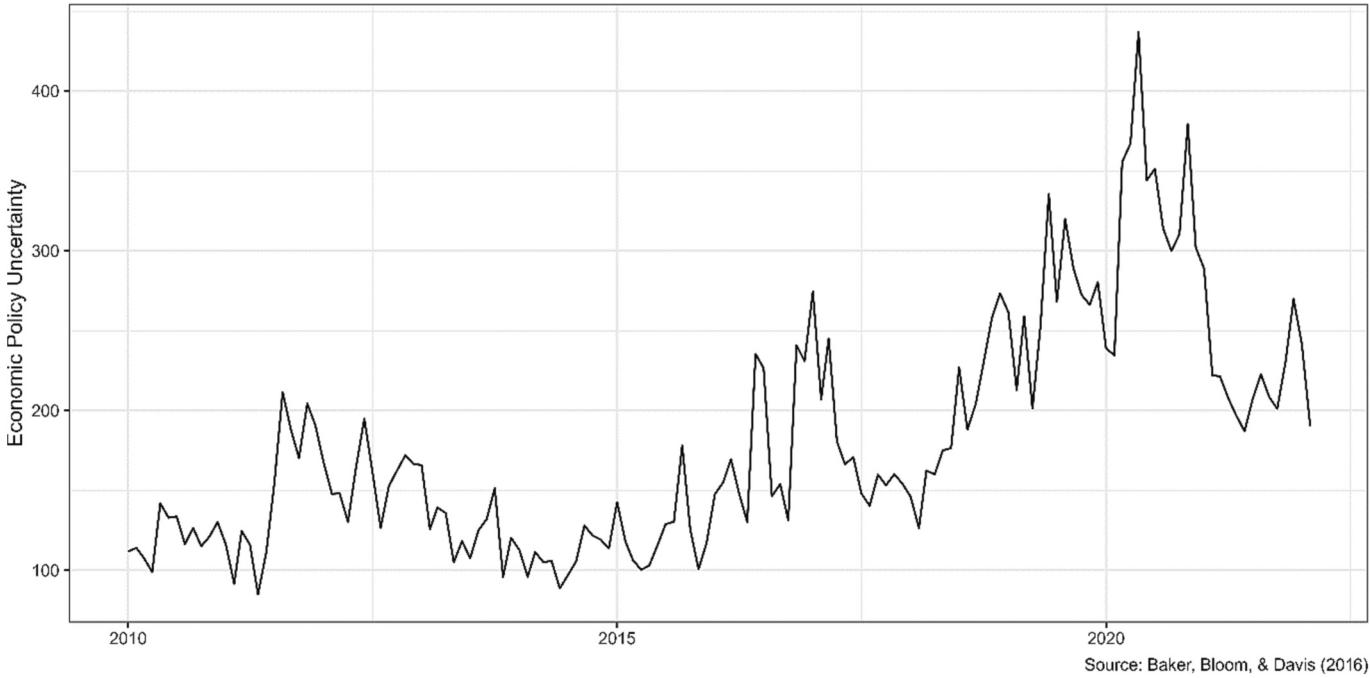
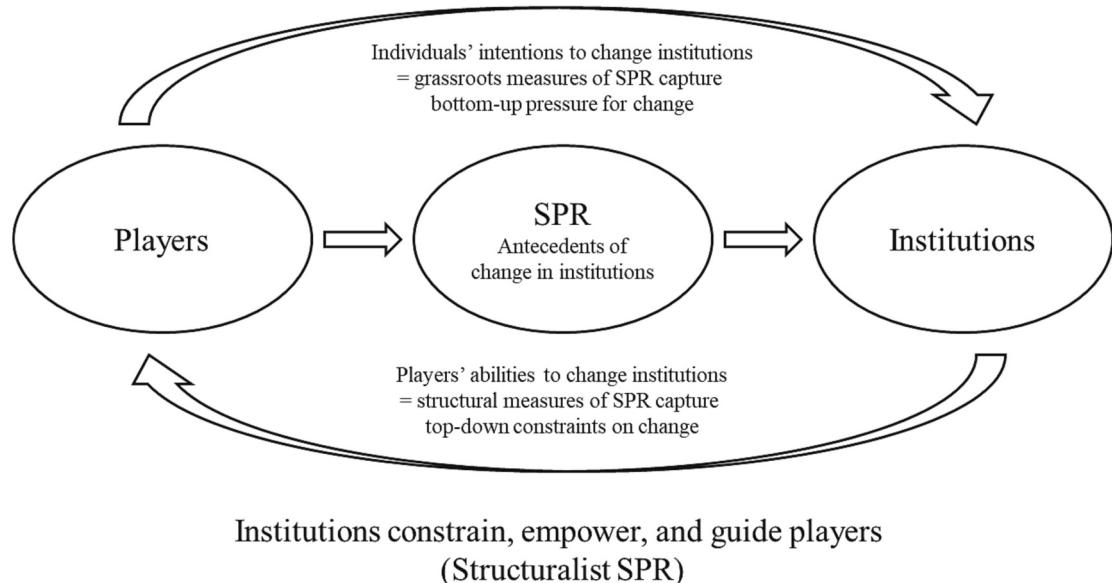


Fig. 1. Monthly global EPU index.

Individuals socially create, shape, and destroy institutions
(Grassroots SPR)



Institutions constrain, empower, and guide players
(Structuralist SPR)

Fig. 2. Theoretical foundations of a measure of grassroots SPR.

of institutional change. We label these two perspectives as top-down and bottom-up mechanisms. In the democratic ideal, the ballot box aligns the two mechanisms in the long run since the structural institutions in place are legitimized by grassroots popular vote. Yet in cases where the democratic process is imperfect, untimely, obstructed, or biased, or where large parts of the populace are disenfranchised, a purely top-down perspective on institutions does not capture the possibility of radical institutional change driven by a majority of individuals and, consequently, SPR (Hirsch, 1997). We refer to this special type of SPR akin to the concept of *vox populi* as grassroots SPR (upper tier of the institutional spiral illustrated in Fig. 2). We define grassroots SPR as the antecedents of institutional change in terms of changes in attitudes, issue salience, and behavior of a majority of the populace.

The acknowledgment of grassroots SPR has valuable theoretical implications. First, it allows for more nuanced theorizing of the institutional envelope of firms (Ahuja et al., 2018), as it acknowledges an additional source of SPR. For example, the power of individuals to change institutions (grassroots SPR) depends on how power is distributed between all institutional players. In autocratic regimes, the ability of individuals to pursue their salient issues and enforce institutional change is lower than in democratic countries.

Second, the process of grassroots institutional change will equally depend on the power distribution between political and grassroots players. Whereas institutional change from the grassroots majority in democratic countries manifests through the ballot box, bottom-up institutional change in autocratic countries is often associated with violent regime change. These two scenarios illustrate that distinguishing between top-down, structuralist SPR and bottom-up grassroots SPR can yield more nuanced theoretical predictions.

Table 1 highlights the theoretical distinction between traditional structural measures of SPR and our proposed grassroots measure. It also illustrates why our proposed grassroots measure complements structural measures and provides a theoretical contribution to IB research. Having established the theoretical need to measure grassroots SPR, we propose using Google Trends data as a truly individual-level and unbiased data source. We summarize the theoretical foundations of our SPR index later in Part 1 of Table 10, which also outlines the empirical strategy for index construction and validation.

3.2. Google Trends in academic research

Since 2010, Thompson Reuters Web of Science and PubMed have jointly recorded over 1000 papers that used Google Trends across various disciplines. Researchers in medical sciences use Google Trends to trace epidemics and assess public health and well-being (Brodeur et al., 2021; Nuti et al., 2014). In social sciences, researchers study public opinion on environmental issues and societal attitudes on gender, sexuality, and religiosity (Corbi and Picchetti, 2020). Meteorologists use Google Trends to study extreme weather phenomena (Kam et al., 2019). Finance scholars use Google Trends to analyze micro-economic aspects, such as stock prices and their volatilities (Huang et al., 2020; Petropoulos et al., 2021; Vlastakis and Markellos, 2012), trading behavior (Preis et al., 2013), or stock market investor attention (Cziraki et al., 2021). Economists have long cherished the richness and predictive qualities of Google Trends

Table 1
Theoretical comparison of SPR measures & concepts.

SPR concepts & measures	Structuralist SPR (Institutional safeguards)	Grassroots SPR (Institutional pressures)
Individually focused		✓
Perspective dependent		✓
Acknowledging institutional change		✓
Short-term (intra year)	✓	✓
Policy focused	✓	
Assuming institutional stability	✓	
Long-term	✓	

data. It has been used to predict macroeconomic variables⁵ like private consumption (Vosen and Schmidt, 2011), trade (Ma and Fang, 2021), unemployment, inflation, and exchange rates. In political science, scholars use Google Trends, for example, for polling (Balz, 2011; Mavragani and Tsagarakis, 2016).

We aim to capture risk resulting from changes in issue salience. Google Trends has been used in other disciplines to capture uncertainty and issue salience. Economists have used Google Trends to measure different types of uncertainty (e.g., COVID or policy uncertainty) (Castelnuovo and Tran, 2017; D'Amuri and Marcucci, 2017; Dzieliński, 2012). Most relatedly in political science, scholars use Google Trends to measure issue salience (Dennison, 2019; Mellon, 2013) or voter interest (Street et al., 2015). Gruszczynski and Wagner (2017) use it to capture public opinion, and Koehler-Derrick (2013) uses Google search volume to study the radical institutional dynamics of the Arab Spring (Sottilotta, 2015). Similarly, Timoneda and Wibbels (2022) predict political protests using Google Trends.

In an early application, Dzieliński (2012) argues that in times of economic uncertainty, internet users increase their information-seeking and, as a result, search for the term “economy” more often on Google. This simple, single-keyword construct is robust and correlates strongly to a peer group of commonly used indicators. It is also significantly related to aggregate stock returns and volatility.

Castelnuovo and Tran (2017) start from the same assumption and create the Google Trends Uncertainty index (GTU) based on multiple keywords, defined from a textual analysis of the Federal Reserve Banks’ Monetary Policy Statements. The index is available only for Australia and the US, but empirical analysis confirms its quality as a predictor for unemployment.⁶ Using 84 keywords in the Turkish language, Bilgin et al. (2019) achieve similar results, showing that Google Trends’ predictive validity for economic uncertainty extends beyond the English-speaking world. In a similar application, Dorobantu and Müllner (2019) use global Google search activity for “crisis” and “recession” as a robustness measure of volatility in the MSCI Index 180 to capture financial market systemic risk during the financial crisis. Anastasiou and Drakos (2021) show that Greeks’ Google search volume for “Drachma” reliably predicted cash withdrawals during the Euro crisis. Bontempi et al. (2021) introduce the Economic Uncertainty Related Queries index (EURQ), which seeks to measure economic, political, and normative uncertainty through Google search volume for 183 queries in Italy and the US. Validity tests attest that their measure can capture uncertainty perceived by economic agents.

Deviating from topically selected keywords, Kupfer and Zorn (2020) propose a language-independent measurement of economic policy uncertainty in CEE countries. Authors use the automated Google Trends feature of topics and categories to create their policy uncertainty index. The Google algorithm assigns these categories (e.g., dissolution of parliament) and topics (e.g., elections and campaigns) based on the users’ post-query clicks and are consequently language-independent.

Past successes in predictive modeling attest to the empirical value of Google Trends in academic research. Regarding SPR, several features of Google Trends approaches make them ideally suited to fill the empirical gap outlined in the introduction. In the following section, we discuss these advantages and some disadvantages of Google Trends approaches to SPR measurement.⁷

3.3. Empirical advantages & disadvantages of Google Trends-based SPR measurement

We argue that data on Google search volume is uniquely suitable to generate insights into changing socio-political realities. Google Trends allows for a socially rooted measure of grassroots SPR. First, data on Google search volume is available daily in all countries and even on a subnational level (i.e., availability). Second, Google search volumes are unrivaled in their representativity. Google dominates everyday online information-seeking. Thanks to its near-global market dominance, Google Trends provides researchers with potential access to nearly 4.4 billion internet users (World Bank, 2019). As such, Google is a highly representative survey instrument. We argue that this advantage also holds against market-based measures, which can be considered representative of investors’ assessment of SPR but not of a holistic societal perspective. For example, sovereign loan spreads may accurately reflect investors’ SPR perception at a given time, but they are not necessarily representative of the socio-political climate in a country.

Third, data on Google search volume is made available almost in real-time, allowing researchers to track dynamic changes in socio-political sentiment (i.e., timeliness). The Arab Spring, for example, swept through several countries in a matter of weeks utilizing social media (Darendeli and Hill, 2016; Sottilotta, 2015). In such cases of dynamic socio-political change, social media, and online

⁵ See Choi and Varian (2012) for an overview and discussion of Google Trends’ predictive qualities.

⁶ Tran et al. (2019) extend the analysis to New Zealand, and Shields and Tran (2019) attempt to disaggregate to a US-state level.

⁷ A similar discussion in the context of political science can be found in Reilly et al. (2012).

information gathering serve as a mirror and a medium of change. This dual role makes Google search data uniquely useful for tracking socio-political change in real-time within a country. For IB scholars, this opens new avenues of empirical research focusing on changes in SPR within countries rather than sticky structural measures of SPR for between-country comparisons.

Fourth, data from Google Trends promises lower biases than other survey-based methods of SPR measurement. Google search volume is obtained not from surveys but from individual users' actual information-seeking. As a result, data on Google search volume has lower social desirability bias and is more reflective of true attitudes (Bontempi et al., 2021). Given the unrivaled global coverage and the fact that users cannot opt out from data collection, Google Trends data can be expected to have a much lower response bias than other instruments. Furthermore, Google can reliably track users' locations, which is impossible in market-based measures of SPR like sovereign loan spreads. This feature allows researchers to distinguish how domestic and foreign users perceive SPR in a given country. For IB research, a particularly interesting feature thus relates to differences in perception within and outside of a specific country as they relate to core IB constructs like liability of foreignness and psychic distance.

Fifth, and most importantly, Google accompanies a large variety of users through their digital activities (i.e., disaggregation). As such, Google collects data on various socio-economic activities and sentiments. These activities and sentiments can then be aggregated to capture latent constructs like SPR. At the same time, they can also be disaggregated into different dimensions of SPR (e.g., economic development, political crisis, crime, social unrest). This versatility is an advantage compared with market-based measures, which are also timely available, objective, and representative. Yet these measures aggregate the sentiment of all market participants in a single measure.

Despite these advantages, using data provided by Google Trends to measure grassroots SPR poses some challenges and limitations. First, data on search volume lacks the context of this search activity. Thus, researchers can gain insights into which keywords attract the attention of internet users but not into why these keywords attract such attention.

Second, since researchers do not know the context in which users search for keywords, search volume may be subject to keyword contamination. This occurs when keywords gain different meanings in a different context (e.g., voting for a "party" vs. attending a "party"). Search volume for a political party may be contaminated by search volume for a party event. Consequently, keyword contamination can create noise in search volume data, and researchers may overestimate the search volume for an issue. A similar challenge, keyword dilution, occurs when users consider multiple keywords for a single issue (e.g., vote and election). Thus, search volume is diluted between the two keywords. Such dilution may cause researchers to underestimate the search volume for an issue.

Third, the analysis of data from Google Trends in an international context necessitates the translation of keywords. Researchers must decide on selecting relevant languages for a country and translate keywords to these languages. Translation thus adds substantial complexity to the research design and potentially aggravates keyword contamination and dilution. However, using search topics predefined by Google rather than individual search terms provides a way to reduce language challenges and a credible robustness check.

Finally, accessing Google as a search engine is another challenge in using Google Trends in research. For Google Trends to provide reliable data, a country's population must use the internet and Google to seek information. Thus, low levels of internet usage (e.g., Burundi), domestic alternatives to Google (e.g., Yandex in Russia), or government interference (e.g., China) inhibit the reliability of data from Google Trends. In a study on the Russian invasion of Ukraine, Kupfer and Puhr (2022) found similar information-seeking patterns by Russian internet users for Google and Yandex. In measuring the degree of corporate internationalization, Puhr and Müllner (2021) observed that the predictive power of Google search volume remains robust irrespective of home-country characteristics or the firm's exposure to China. Therefore, we assume that as long as Google users do not systematically differ from the wider population, data from Google Trends can provide valuable insights, even when only a small share of the population uses Google for information gathering.

Table 2 contrasts the empirical advantages of using Google Trends to create a measure of grassroots SPR with the use of market-based and survey-based measures.

4. Empirical strategy for index construction

Our construct of grassroots SPR is based on the argument that widely shared sentiment in a country's populace can lead to bottom-up institutional change. In line with existing sentiment measures, we claim that issue salience (and changes in issue salience) can be used to capture the antecedents of such institutional change. We summarize the empirical steps of the construction of our grassroots SPR index later in Part 2 of Table 10.

The first step in the empirical construction of the grassroots SPR index is identifying issues that can signal certain types of grassroots institutional pressures. To provide a basis for index construction, we review (a) existing multidimensional conceptualizations of SPR (Brown et al., 2015; Miller, 1992), (b) traditional SPR measures (ICRG, WGI), and (c) similar text-based indices (Baker et al., 2016; Bontempi et al., 2021; Donadelli and Gerotto, 2019). This allows us to capture the full complexity of SPR and enhance the accuracy of measurement (Dang et al., 2020; Sottilotta, 2015).

From the reviewed studies, we collect 82 partly overlapping issues. To reduce complexity, we attempt to group these issues into four categories of SPR (Table 3).⁸ We base our SPR categories on the frameworks used by Miller (1992) and in the ICRG. Each category

⁸ By nature of the complexity of SPR, the allocation of issues to these categories is subjective and can never be mutually exclusive. This is a shortcoming that all multidimensional measures of risk share. Accordingly, we caution against considering individual categories or sub-categories of SPR in isolation.

Table 2

Empirical properties of potential approaches to a measure of grassroots SPR.

	Empirical properties		
	Google-based	Survey-based	Market-based
Availability	High	Low	High
Representativity	High	Low	Medium
Timeliness	High	Low	High
Reliability	Medium	Low	Medium
Disaggregation	High	Low	Low

covers a specific set of issues that increase the probability that a majority of the populace calls for institutional change. The economy category of our index covers issues relating to the state and development of a country's economy and economic policy. In the government category, we subsume issues concerning branches of government, political accountability, and transfer of executive power. The security category captures issues relating to internal and external conflict. The society category covers issues concerning social security and environmental sustainability.

The index categories each consist of sub-categories we identified in the extant literature. These sub-categories provide our basis for keyword selection and, on the other hand, relate the scope of our four categories to the relevant literature. Next, we review the studies identified above as the basis for our index construction to collect search terms associated with these issues. This leaves us with a reference library of 339 search terms. In a final step, we attempt to improve the validity and interdisciplinary of our search-term selection by iterating the selection process and categorization with two senior political scientists at a top-10 US university. In Online Appendix B, we show a detailed outline of dimensions, issues, the SPR library, a full list of the 110 search terms, and all relevant references.

In the second step, we prepare the search terms identified in our review for usage on Google Trends. As outlined above, using Google Trends poses some challenges for researchers, notably keyword contamination, keyword dilution, and translation issues. We follow [Kupfer and Zorn \(2020\)](#) to overcome these potential issues and analyze search volume for search topics rather than search terms.⁹ Unlike single search terms, search topics allow us to access search volume for specific themes (e.g., fruit)—irrespective of the actual terms (e.g., apple, banana) or language applied in the search query. Thus, we construct a language-independent measure of grassroots SPR that does not suffer from keyword contamination or dilution. While this approach allows a language-independent measurement, Google algorithms may be more efficient in categorizing topics for some languages than others.¹⁰

In the third step, we use our globaltrends R package to download data on search volume from Google Trends. The package normalizes the results of different search topics in different countries using a benchmark of reference topics. Ideally, the search volume for these reference topics is stable over time and common enough to be comparable across countries.¹¹ As a benchmark, we select the reference topics "Gmail," "Google Maps," "Google Translate," "Wikipedia," and "YouTube." Since these topics refer to popular internet services, their meaning is unaffected by cultural differences or country context. Using multiple reference topics, we reduce the likelihood of bias related to a single topic. On the one hand, this normalization relative to the reference topics allows comparison of search volume across countries and search-topic combinations. On the other hand, normalization implies that time series must be interpreted as search volume relative to the benchmark in this specific country. In other words, the volume obtained for a specific topic (e.g., protest) is relative to the benchmark (i.e., how often the term is googled relative to the reference topics).¹² We provide further details on index construction and this normalization step in Online Appendix B.

We obtain country-level data on the monthly search volume for each topic in the SPR library. For inclusion in our analysis, a country must have contributed at least 0.01 % to global GDP in 2019. This leaves us with a sample of 149 countries on all continents (see Online Appendix B). Together, these countries represent about 7.49 billion people, equivalent to 97.5 % of the world's population and 98.3 % of global GDP. On average, 61.4 % of these countries' population had internet access. Thus, our data covers over 4.14 billion potential Google users (data for 2019, retrieved from the World Bank, WDI database).

The fourth and final stage in constructing the grassroots SPR index is the stepwise aggregation of data from Google Trends to a comprehensive index (formal details can be found in Online Appendix B). We compute grassroots SPR scores for each category as the mean of the normalized search volume for all search topics included in the respective category. As an alternative aggregation approach, we also compute the first principal component of each category, thereby focusing on the search volume's common component that explains the most variance in the data. In addition, we compute the category means only of those search topics with the greatest loadings (loading ≥ 0.001) for the category's most important principal components (explained variance ≥ 0.05). Using this approach, we focus on the search topics that contribute most to explaining the data's variance. These alternative measurements allow us to control for the impact of outlier search topics on category grassroots SPR scores. We compare and discuss results for these

⁹ See [Kupfer and Zorn \(2020\)](#) for a detailed comparison of search volume for single search terms and the corresponding search topics.

¹⁰ We address such potential language biases in our validation.

¹¹ This is particularly challenging for least-developed countries, in which internet usage is low and subject to structural changes over the observation period (see [Discussion](#) section).

¹² Since we consider search volume for a topic relative to general volume on Google, under the condition that interest of Google users does not differ from the general population's interest, Google's market share in a country is irrelevant for our approach.

Table 3

Categories and sub-categories of the grassroots SPR index.

Category	Sub-category	Sources
Economy Issues that relate to the state and development of a country's economy and economic policy and that increase the probability that a majority of the populace calls for institutional change.	General	<ul style="list-style-type: none"> • Macroeconomic indicators^c • Economic risk – GDP growth^e • Fiscal policy and government spending; Sovereign debt; Taxes^a • Fiscal policy; Foreign sovereign debt^b • Macroeconomic indicators - financial/fiscal^c • Economic risk – deficit; Financial risk – debt^e • Fiscal reforms^f
	Fiscal policy	<ul style="list-style-type: none"> • Macroeconomic indicators – broad/labor^c • Socio-economic conditions – unemployment^e • Currency crisis; Monetary policy^{a,b} • Currency over/undervaluation; Macroeconomic indicators - financial/monetary^c • Economic risk – inflation; Financial risk - exchange rate^e • Foreign exchange rates; Inflation; Interest rates; Monetary reforms^f
	Labor policy	<ul style="list-style-type: none"> • Financial regulation; Regulation^a • Regulation^b • Price controls; Trade restrictions^f • Trade policy^{a,b} • Market access^c
	Monetary policy	<ul style="list-style-type: none"> • Government and politics in general • Voice and accountability^{c,g} • Democratic accountability; Military in politics^e
	Regulation	<ul style="list-style-type: none"> • Control of corruption^{c,g} • Bureaucratic quality; Corruption^e
	Trade policy	<ul style="list-style-type: none"> • Rule of law^{c,g} • Investment profile^e • Nationalization^f • Political stability^{f,g} • Election^e • Government stability^e • Coup d'état; Democratic changes in government; Other political turmoil^f
Government Issues that relate to branches of government, political accountability, and the transfer of executive power and that increase the probability that a majority of the populace calls for institutional change.	General	<ul style="list-style-type: none"> • Security and conflict in general • National security – external^a • National security and war – external^b • External conflict^e • War^f
	Accountability	<ul style="list-style-type: none"> • National security – internal^a • National security and war – internal^b • Absence of terrorism^{f,g} • Terrorism^d • Internal conflict^e • Demonstrations; Revolution; Riots; Small-scale terrorist movements; Social unrest^f
	Corruption	<ul style="list-style-type: none"> • Absence of violence^{f,g} • Law and order^e
	Rule of law	<ul style="list-style-type: none"> • Ethnic tensions; Religious tensions^e • Environmental sustainability^c
	Stability	<ul style="list-style-type: none"> • Pollution^d • Health care^{a,b} • Health^c • Entitlement programs^{a,b} • Middle class propensity^c • Socio-economic conditions^e
Security Issues that relate to internal and external conflict and that increase the probability that a majority of the populace calls for institutional change.	General	<ul style="list-style-type: none"> • Law and order^e
	External conflict	<ul style="list-style-type: none"> • Internal conflict^e
	Internal conflict	<ul style="list-style-type: none"> • Demonstrations; Revolution; Riots; Small-scale terrorist movements; Social unrest^f
	Law and order	<ul style="list-style-type: none"> • Environmental sustainability^c
Society Issues that relate to social security and environmental sustainability and that increase the probability that a majority of the populace calls for institutional change.	Tensions	<ul style="list-style-type: none"> • Pollution^d
	Environment	<ul style="list-style-type: none"> • Health care^{a,b}
	Health care	<ul style="list-style-type: none"> • Health^c
	Social security	<ul style="list-style-type: none"> • Entitlement programs^{a,b} • Middle class propensity^c • Socio-economic conditions^e

^a Baker et al. (2016).^b Bontempi et al. (2021).^c Brown et al. (2015).^d Donadelli and Gerotto (2019).^e PRS Group.^f Miller (1992).^g Kaufmann and Kraay.

alternative aggregation approaches as robustness checks in the paper's Results section. After creating indices for the different categories or dimensions of grassroots SPR, we compute a total score for the grassroots SPR index as the mean of every country's four category grassroots SPR scores. To generate a global aggregate of our country-based grassroots SPR index, we compute a global grassroots SPR index as the GDP-weighted average of all country scores for the grassroots SPR index (Davis, 2016). As an alternative aggregation method for the global grassroots SPR index, we weigh the country scores by their share of global internet users to account for potential bias from differences in internet usage.

The complete R code to compute the grassroots SPR index and detailed data for the index can be downloaded from the authors' website (https://github.com/ha-pu/globaltrends_spr) and in Online Appendix B of this paper.

5. Empirical strategy for index validation

In the next section, we summarize the results from the index and demonstrate its consistency and validity. To this end, we proceed in five steps—we outline our strategy and summarize our empirical results in Part 3 of Table 10. First, we discuss descriptive statistics and general patterns observed in the index. We consider the development of the index over time and outline major within-country changes observed in the index. Second, we consider various measures for the index's robustness in terms of within-measure consistency. In this respect, we test the correlation of grassroots SPR in the index's four categories and between different methods of aggregation. In addition, we investigate the correlation between absolute levels of the grassroots SPR index and its variance. Third, we analyze the index's external validity. In this step, we consider the index's validity vis-à-vis developments in macroeconomic indicators and, on the other hand, regarding alternative indices of SPR. For these tests, we regress the grassroots SPR index on macroeconomic indicators and alternative SPR indices, thereby analyzing how the grassroots SPR index reacts to changes in these indicators and whether these relations validate the properties of our index. Fourth, we complement these tests with a set of checks that test the robustness of our results to alternative index specifications. We test for robustness to changes in reference terms for normalization and alternative methods for index aggregation. Moreover, we adapt our index to account for differences in a country's level of internet availability. We conclude with a brief discussion of four country-level case studies that demonstrate the explanatory power of the grassroots SPR index and offer a micro-level validation of our index.

6. Results of the grassroots SPR index

6.1. Descriptive results

We first discuss the variation of the global grassroots SPR index over time (Table 10, Part 3.1).¹³ In Fig. 3, we provide time-series plots for the total global grassroots SPR index and its four categories. The red line shows the GDP-weighted global grassroots SPR index; the blue line signifies the index aggregation based on each country's share of global internet users. Across all five panels, the time series for both aggregation methods follow the same pattern ($r = 0.952$).

In the total grassroots SPR plot (Panel A), we see an increase in grassroots SPR from high levels from 2010 to 2012. While we observe declining levels of grassroots SPR from 2012 onwards, this trend has reversed since 2015. The period since 2015 is characterized by two grassroots SPR shocks: November 2016 and November 2020. As shown in Fig. 3, these shocks are mostly attributable to a dramatic increase in grassroots SPR attributed to the government category. The grassroots SPR decomposition in Panels B through E provides a similar perspective. Risk levels across all four categories tend to fall between 2012 and 2015 and rise afterward. We also see that the high grassroots SPR in 2012 is the outcome of high risk in all categories. However, the grassroots SPR spikes in November 2016 and November 2020 can be mostly attributed to an increase in the Government category. Since these grassroots SPR shocks correspond to the US election cycle covered in our sample, we argue that US presidential elections triggered these rises. This effect of electoral uncertainty on SPR has been documented in related research (Julio and Yook, 2012, 2016). An increase in grassroots SPR in June 2020 characterizes the Security category. This increase in SPR might relate to the Black Lives Matter (BLM) protests that followed the murder of George Floyd in late May 2020. Although the demonstrations began in the US, BLM and anti-racism demonstrations soon occurred in several countries (Allam et al., 2021; Shahin et al., 2021).

In this analysis, we applied two different methods of data aggregation: based on a country's share of global GDP (red line) and based on its share of global internet users (blue line). A comparison of the two lines, therefore, provides valuable insights into the locations that triggered changes in grassroots SPR. In the pre-2015 period, grassroots SPR was mainly driven by risk in countries that comprised a greater share of global internet users than global GDP (blue line above red line). This difference diminished over time and began to reverse in 2020. Data for the US underlines this observation. While grassroots SPR in the US was below the global average from 2010 to 2013, US grassroots SPR has consistently been above the global average afterward. We interpret this observation as a shift in the "locations" of grassroots SPR, a finding we consider in further detail below (Fig. 4).

Next, to break down the aggregated grassroots SPR index shown in Fig. 3, we discuss how country scores for the grassroots SPR index changed for individual countries. In Fig. 4, we show scores for the grassroots SPR index in 2010 (Panel A), 2020 (Panel C), and the scale of changes over these ten years (Panel B). For better interpretation, we express these changes in percentages of the grassroots SPR index score in 2010. In countries highlighted in red, grassroots SPR worsened over time; in "green" countries, grassroots SPR

¹³ See Online Appendix C for annual descriptive statistics for the grassroots SPR index.

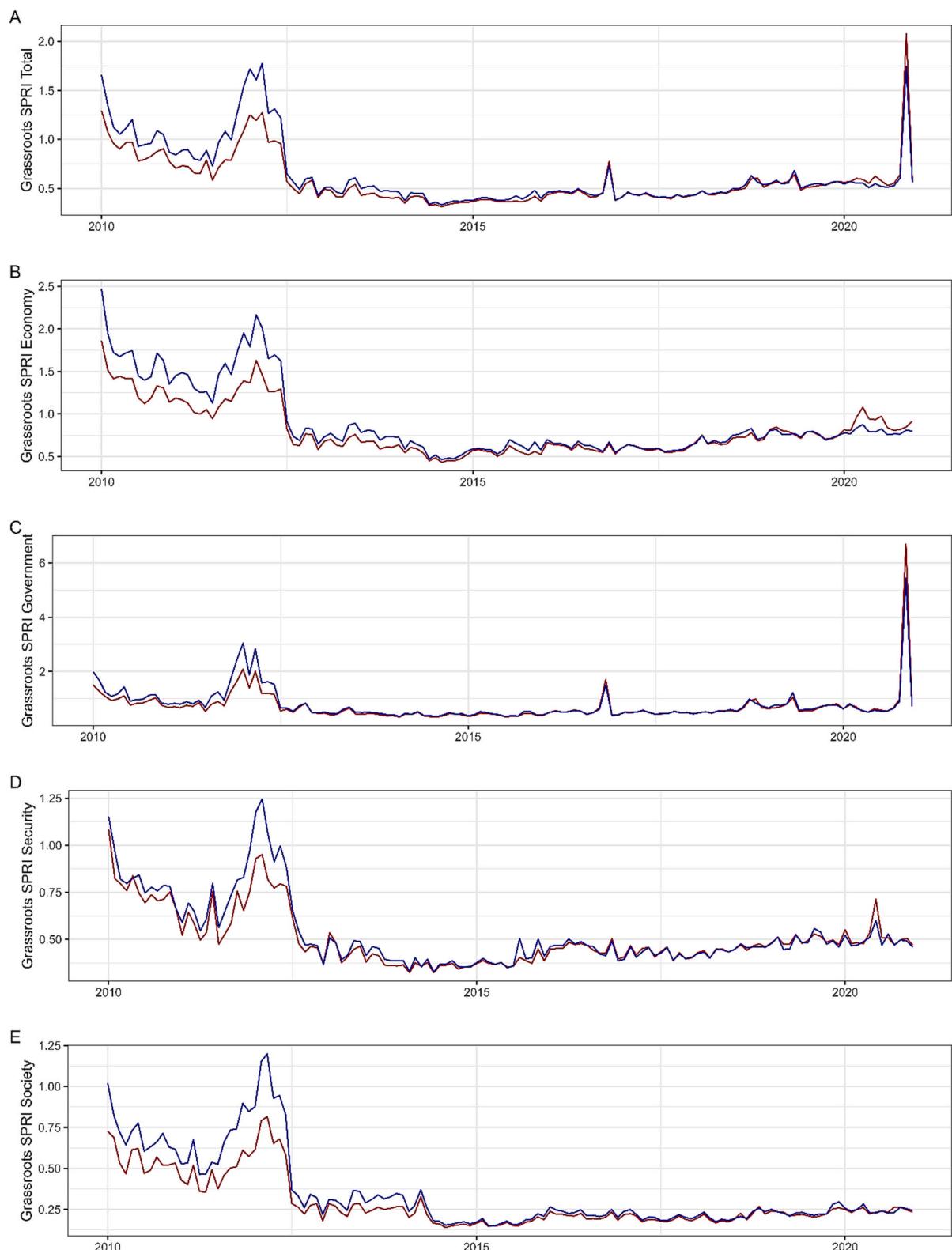


Fig. 3. Global grassroots SPR index.

Note: Global grassroots SPR index, computed as the GDP-weighted average (red line) and average weighted by the share of global internet users (blue line) of 149 country grassroots SPR scores. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

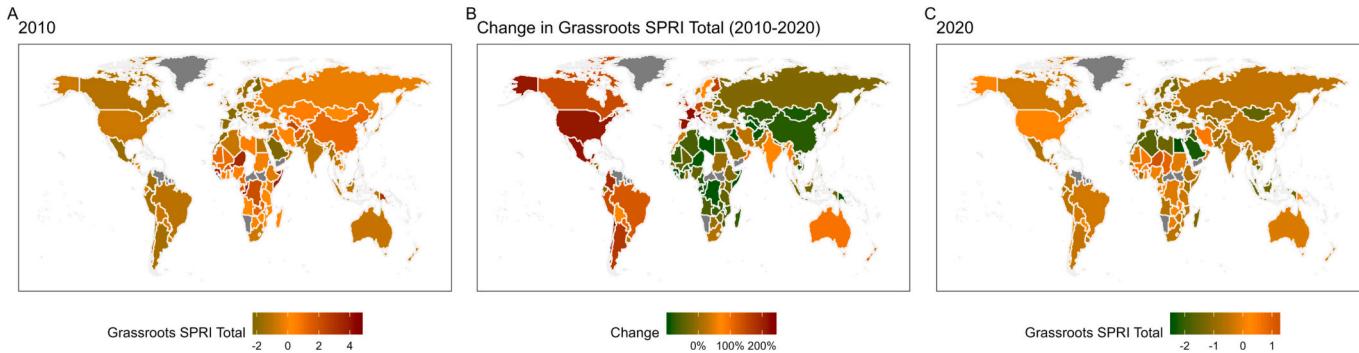


Fig. 4. Grassroots SPR index for 2010 and 2020.

Note: Total grassroots SPR index for 2010 (Panel A), 2020 (Panel C), and change from 2010 to 2020 (Panel B). Grassroots SPR index computed as the mean of grassroots SPR scores for each of the four SPR categories (Economy, Government, Security, Society). For better interpretation, we show changes in Panel B as a percentage relative to the grassroots SPR score in 2010. See Tables C5 and C6 for further details.

declined. At first glance, the map shows a transformation from “bright orange” to “yellowish-green” for many countries. In most countries in Africa and Asia, grassroots SPR decreased between 2010 and 2020. In the Americas and Europe, on the other hand, we observe an increase in grassroots SPR. As a result of this shift, the differences between emerging markets and high-income countries decrease. Most notably, whereas China was characterized by greater grassroots SPR than the USA in 2010, the US grassroots SPR overtook China's in 2017. Moreover, a detailed analysis shows that the drivers of grassroots SPR changed substantially between 2010 and 2020. While the Economy and Security categories mainly drove grassroots SPR scores in 2010, the Government category was the most important driver in 2020. In Online Appendix C, we provide additional data on country grassroots SPR scores for the 30 largest economies.

6.2. Tests for internal consistency

We empirically test the internal consistency and robustness of the proposed grassroots SPR index (Table 10, Part 3.2). To assess the internal consistency of our grassroots SPR index and its components, we consider the correlation between the grassroots SPR index's categories, the correlation between mean and variance of the grassroots SPR index, and the correlation between alternative methods of index aggregation. We provide detailed information on these analyses in Online Appendix C. The descriptive statistics in Table C1 show that the median grassroots SPR index remained relatively constant between 2010 and 2021. However, we also observe a decrease in maximum scores and within-country variance over the observation period. This decrease in within-country variance may point to an increase in reliability that could result from growing internet and Google usage, especially in least-developed countries. As more users rely on the internet to collect information, online search data becomes more representative of society's information demands, and results are less distorted by outlier search activity.

We find positive pairwise correlations between the scores for all four categories of the grassroots SPR index ($r \sim 0.6\text{--}0.8$). These findings are as expected and underscore the internal consistency of the proposed grassroots SPR index and the arguments in the literature that SPR is a multidimensional construct. At the same time, the correlation in the category scores is well below 1.0. This shows that the four categories, although referring to the same overall construct—grassroots SPR—capture different dimensions of this construct.

We construct the grassroots SPR index as a time series; therefore, dynamics and developments in the data provide valuable information beyond absolute grassroots SPR index scores. To analyze the relation between the absolute level of grassroots SPR and its volatility, we consider the correlation between yearly mean scores and yearly variance of the grassroots SPR index. As expected, we observe a positive correlation between mean scores and variance ($r = 0.771$). Also, this finding is consistent for all four categories of the index. We interpret these findings as an indication that countries with higher levels of grassroots SPR tend to experience greater volatility—that is, lower predictability—in their grassroots SPR.

The grassroots SPR index aggregates normalized search volume for individual search terms. Therefore, outlier values for individual search terms could have an outsized effect on the aggregated index. We apply two alternative aggregation approaches and the unweighted mean of normalized search volume to control for this potential effect. First, we use the first principal component of each SPR category. Second, we use principal-component analysis to select those search terms that explain most variance and take the mean only of these terms. We consider the correlation between the grassroots SPR index with mean aggregation and these alternative aggregation approaches to compare results. We observe that mean aggregation is highly correlated with PCA-based aggregation ($r = 0.754$) and combined PCA/mean aggregation ($r = 0.888$). These findings show that distortion from outliers in the SPR index is limited. We consider this to support the internal consistency of our index.

Table 4
Regression analysis for grassroots SPR index and macroeconomic developments.

	Grassroots SPRI (total)	
	(1)	(2)
GDP/capita	-0.033 p = 0.490	
HDI		-0.187 p = 0.000
Constant	0.004 p = 0.958	0.003 p = 0.951
Observations	1428	1428
Countries	143	143
Years	2010–2018	2010–2018
R ²	0.003	0.034
Adjusted R ²	0.003	0.033

Note: standardized regression coefficients; panel models used for estimation; models include country and year random effects; random effects model selected based on Hausman test.

6.3. Tests for external validity: correlation with macroeconomic developments

We seek to test the validity of our grassroots SPR index by considering the statistical association between the grassroots SPR index and a set of external macroeconomic indicators (Table 10, Part 3.3). While we do not propose a causal relation, this analysis provides further insights into the external validity of the grassroots SPR index. For a high-level comparison, we use data on GDP/capita and the Human Development Index (HDI) provided by the World Bank. While GDP/capita indicates a country's economic development, the HDI includes additional information, such as life expectancy and duration of education. We regress the total SPR index on GDP/capita and HDI, respectively (Table 4). In line with our assumption, results from Models 1 and 2 show a negative relation between high-level indicators for macroeconomic development and the grassroots SPR index. Yet only in the case of HDI do we observe a statistically significant relation ($p = 0.000$). We consider this to support that grassroots SPR, although positively related, is not equal to macroeconomic development.

While GDP/capita and HDI are high-level measures for macroeconomic development, we use the Fragile States Index (FSI) for a more fine-grained and multidimensional perspective on macroeconomic development. The FSI consists of 12 indicators belonging to five groups. We match these groups to the grassroots SPR index's categories. Then, we regress the respective category grassroots SPR scores on the corresponding FSI indicators (Tables D1 and D2). Except for the FSI's social indicators, we find positive relations with the respective category grassroots SPR scores. Across all indicators, results in terms of coefficient sizes (0.10–0.15) remain constant. We consider these findings, a positive association between a state's fragility and grassroots SPR, to be support for the grassroots SPR index's validity. Yet the observed adjusted R^2 indicates that the proposed grassroots SPR index captures a construct beyond a country's macroeconomic fragility or development (see Online Appendix D for detailed results).

6.4. Tests for external validity: alternative risk indices

We compare the grassroots SPR index with alternative risk indices and measures for environmental uncertainty (Table 10, Part 3.4). Since these alternative measures focus on specific aspects of environmental uncertainty, we compare them with the category grassroots SPR scores rather than aggregated grassroots SPR index scores.

The first comparison is between the grassroots SPR and POLCON indices (Henisz, 2000). Our grassroots SPR index is developed to complement structural measures of political constraints. Thus, we expect (a) imperfect correlation since it captures a different conceptual construct and (b) higher year-by-year volatility since it is a more timely and dynamic measure of grassroots societal sentiment. The comparison (Table 5) shows a negative relation between the grassroots SPR and POLCON indices. As expected, this indicates that greater political constraints limit grassroots SPR. However, we find that this relation differs between the SPR categories. The low values for adjusted R^2 indicate that both indices capture related but different types of risk. In addition, we compare the volatility of yearly changes in the grassroots SPR and POLCON indices. To this end, we compute the coefficient of variation for yearly changes in both indices. In line with the conceptual differences between the two indices, we observe greater variation in the grassroots SPR index (0.522) than in the POLCON index (0.303). Results from a t-test support this observation ($p = 0.000$). This attests to our argument that the grassroots SPR index provides a more timely and dynamic complement to the structural institutional constraints measured by POLCON.

For further analysis, we also consider whether our probabilistic grassroots SPR index indicates changes in political constraints. As outlined above, an important advantage of the proposed grassroots SPR index is its timeliness. Therefore, the grassroots SPR index may serve as a leading indicator of structural indicators of SPR. To this end, we apply a panel test for Granger causality (Dumitrescu and Hurlin, 2012) of the grassroots SPR index on POLCON (Table 6). We run separate tests by category and observe that developments in the grassroots SPR index are related to changes in the POLCON index in the following year.

As another measure of SPR, we consider the ICRG compiled by the PRS Group.¹⁴ Among the ICRG's three risk components, we consider only the political risk component. A higher score for a country on this dimension indicates lower political risk for the respective country. For our test, we regress a country's political risk score from the ICRG on the scores in the grassroots SPR index's four categories (Table 7). For each of the four categories, we observe, as expected, a negative relation between the ICRG and grassroots SPR indices. Again, we test the qualities of the grassroots SPR index as a leading indicator of changes in ICRG as a structural indicator of SPR. We use a panel test for Granger causality (Dumitrescu and Hurlin, 2012) to analyze whether the grassroots SPR index is a leading indicator for the ICRG index (Table 8). We find that developments in the grassroots SPR index are related to changes in the political risk component of the ICRG index in the following year.

Next, we use the EPU index (Baker et al., 2016) for comparison. The EPU index follows a big-data and text-based methodology like our grassroots SPR index and is a highly popular indicator for EPU. Yet, in contrast to the grassroots SPR index, the EPU index captures only risk related to economic policy and does not use individual-level data. The results in Table 9 confirm these conceptual differences. We observe a positive relation between the EPU index and the grassroots SPR index only in the Economy ($p = 0.098$) and Government ($p = 0.000$) categories. This shows that the four dimensions of the grassroots SPR index capture SPR beyond EPU. In addition to the EPU index, we compare the grassroots SPR index with the EURQ index by Bontempi et al. (2021). Both indices follow a big-data and text-based approach like the EPU and grassroots SPR indices. Like the EPU index, the EURQ index focuses on economic policy uncertainty. As for the EPU index, we observe strong positive relationships between these indices and the grassroots SPR index's economy

¹⁴ Documentation on the ICRG's methodology and data is available at <https://www.prsgroup.com/explore-our-products/international-country-risk-guide/>.

Table 5

Regression analysis for category grassroots SPR index and POLCON index.

Grassroots SPR category	Economy (3)	Government (4)	Security (5)	Society (6)
<i>POLCON index</i>	-0.114 p = 0.003	-0.103 p = 0.017	-0.142 p = 0.000	-0.100 p = 0.016
<i>Constant</i>	0.056 p = 0.354	0.038 p = 0.587	0.059 p = 0.302	-0.014 p = 0.821
Observations	1712	1712	1712	1711
Countries	144	144	144	144
Years	2010–2021	2010–2021	2010–2021	2010–2021
R ²	0.013	0.017	0.013	0.009
Adjusted R ²	0.013	0.017	0.012	0.008

Note: standardized regression coefficients; panel models used for estimation; models include country and year random effects; random effects model selected based on Hausman test.

Table 6

Test for Granger causality between category grassroots SPR index and POLCON index.

Grassroots SPR category	Wald stat.	p-value
Economy	6.866	0.000
Government	5.637	0.000
Security	6.095	0.000
Society	5.872	0.000

Note: panel test for Granger causality; 1-period lag included in the test.

Table 7

Regression analysis for category grassroots SPR index and ICRG index.

Grassroots SPR category	Economy (3)	Government (4)	Security (5)	Society (6)
<i>ICRG index</i>	-0.074 p = 0.000	-0.084 p = 0.000	-0.091 p = 0.000	-0.068 p = 0.079
<i>Constant</i>	-0.017 p = 0.531	-0.031 p = 0.217	-0.033 p = 0.332	-0.075 p = 0.099
Observations	1408	1408	1408	1407
Countries	128	128	128	128
Years	2010–2020	2010–2020	2010–2020	2010–2020
R ²	0.011	0.013	0.009	0.006
Adjusted R ²	0.010	0.012	0.008	0.005

Note: standardized regression coefficients; panel models used for estimation; models include country and year random effects; random effects model selected based on Hausman test.

Table 8

Test for Granger causality between category grassroots SPR index and ICRG index.

Grassroots SPR category	Wald stat.	p-value
Economy	5.608	0.000
Government	5.448	0.000
Security	6.659	0.000
Society	5.892	0.000

Note: panel test for Granger causality; 1-period lag included in the test.

category (see Online Appendix D for detailed results).

We consider these findings for comparison with the POLCON index, the ICRG index, and the EPU index to support the validity of our grassroots SPR index. At the same time, the comparison highlights important differences in the relation between the grassroots SPR index's categories. In sum, the results reported above strengthen the case for the validity of our grassroots SPR index.

6.5. Robustness checks

The results from the tests of external validity presented above could be affected by artifacts created in the computation of the grassroots SPR index. To analyze whether results from external validation are robust to alternative computational approaches, we run

Table 9

Regression analysis for category grassroots SPR and EPU index (monthly).

Grassroots SPR category	Economy	Government	Security	Society
	(7)	(8)	(9)	(10)
EPU index	0.002 p = 0.098	0.014 p = 0.000	0.001 p = 0.324	-0.001 p = 0.187
Constant	-0.042 p = 0.00001	-0.058 p = 0.000	-0.073 p = 0.000	-0.095 p = 0.000
Observations	3181	3181	3181	3181
Countries	22	22	22	22
Years	2010–2022	2010–2022	2010–2022	2010–2022
R ²	0.001	0.016	0.001	0.001
Adjusted R ²	0.001	0.016	0.0002	0.0004

Note: standardized regression coefficients; panel models used for estimation; models include country random effects; random effects model selected based on Hausman test.

three robustness checks that relate to the choice of reference terms for data normalization, within-category aggregation of data, and Google as a tool for information gathering (Table 10, Part 3.5).

As discussed above, the structure in which Google Trends provides search volume data necessitates using reference topics for data normalization. In our base analysis, we use the topics “Gmail,” “Google Maps,” “Google Translate,” “Wikipedia,” and “YouTube” for reference. While we are confident that these reference topics have a consistent meaning across countries and time, this choice may affect the outcomes of our analysis. To evaluate this effect, we use an alternative set of reference topics: “Film,” “Music,” “News,” “Sports,” and “Weather.” Although scores for the grassroots SPR index change with these alternative reference topics, our tests for external validity yield results comparable to those in the base analysis. Consequently, we consider our results robust to the choice of reference topics.

We construct the category scores of the grassroots SPR index by averaging search scores on Google Trends for all search topics included in the respective category. Therefore, outlier search scores for one topic within a category might impact the category’s score. Although we consider this a valuable signal for changes in issue salience, we also consider aggregation methods that are less affected by outliers. To this end, we apply an alternative approach to the aggregation outlined above and specify the grassroots SPR index category scores as the principal component of all search volume related to the respective category and repeat the tests for external validity. We observe only modest changes in the results of the validation tests. Thus, we consider our results to be robust to changes in the method applied for category aggregation.

An important precondition to applying search volume on Google as an indicator of issue salience in the populace is that individuals rely on the internet as a source of information. For countries where the internet is a less relevant source of information, the proposed index may underestimate issue salience among the populace. To correct for potential underestimation, we use World Bank data to divide grassroots SPR scores by the share of internet users in the respective country. Next, we use this corrected data to rerun the tests for external validity. Again, we observe results comparable to those for our base analysis. Hence, we conclude that our results are robust to differences in internet usage across countries.

6.6. Country-level case studies

As an additional step in validating our index, we discuss four country case studies to provide a micro-level validation of the grassroots SPR index (Table 10, Part 3.6). We analyze changes in the grassroots SPR index for each country and relate them to significant socio-political events that occurred during the respective period. In addition, we decompose the changes in the grassroots SPR index, brought about by these events, into the four categories of the grassroots SPR index. For better visualization, all data is log-transformed. Thus, for each situation discussed below, we highlight the category of issues that are the main drivers of why the populace becomes more likely to call for institutional change. The case studies highlight the versatility of our index, which is based on 110 issue-related keywords (compared to single metric structural measures) to explain inevitably unique episodes of SPR.

6.6.1. Case study 1: Brazil 2018

In 2018, two major socio-political events shook Brazil (Fig. 5): the truck drivers’ strike in May (indicated as ●) and the Brazil general elections in October (indicated as ▲).

In late May, a nationwide strike by truck drivers paralyzed Brazil. The conflict over fuel prices led to supply disruptions, airport closures, and factory shutdowns. The strike soon escalated into a national debate about corruption and led to calls for military intervention (Darlington and Andreoni, 2018; Phillips, 2018). The high level of grassroots SPR during the strike is visible in Panel A. The case also highlights the importance of the power balance of institutional players. While grassroots protests increased pressure on the government for institutional change, the government resisted this pressure with the threat of an authoritarian top-down military intervention.

In Panel B, we analyze changes in the four SPR categories compared to grassroots SPR at the beginning of the year (indicated as ■). We observe that the truck drivers’ strike affected multiple institutional players equally and led to a simultaneous increase in grassroots SPR in the economy, government, and security categories. Our data characterizes the strike as an event where issues related to Brazil’s

Table 10

Empirical strategy applied and results obtained in the study.

Part 1: Theoretical foundations		Explanation
Conceptualization of risk (Knight, 1921)		Risk is a measurable ex-ante probability of change
Political risk (Kobrin, 1979)		Risks originating in a socio-political environment are a property of a firm if the firm is exposed to potentially negative outcomes
Institutional perspective in IB (North, 1990; Scott, 1995)		Institutions regulate firm behavior
Institutional work (Berger and Luckmann, 1967; Lawrence et al., 2013; Zilber, 2013; Thornton and Ocasio, 2008)		Institutions must be distinguished from institutional players Institutions ultimately receive their legitimacy from institutional players and are created by them Changes in issue salience of representative samples of institutional players can be used to predict institutional change
Definition of grassroots socio-political risk: The antecedents of institutional change in terms of changes in attitudes, issue salience, and behavior of a majority of the populace.		
Part 2: Construction of the SPR index		Description
1. Identification of relevant sub-categories	We review literature on SPR to identify components of the theoretically derived economy, government, security, and society categories of the SPR index.	
2. Collection of terms that capture interest in SPR categories	We review literature on SPR measures to identify terms related to the SPR sub-categories identified in Step 1.	
3. Translation of terms in search topics for Google Trends	We use Google Trends to identify search topics that relate to the terms collected in Step 2. These topics allow for a language-independent measure robust to keyword contamination and dilution.	
4. Download search volume data for topics from Google Trends and data normalization	We use the globaltrends R package to download data on search volume from Google Trends. The package normalizes results for different search topics in different countries using a benchmark of reference topics.	
5. Aggregation of SPR index	We aggregate SPR scores as the mean of all search scores for topics within a category. Next, we create a total country SPR score as the average of SPR scores in the index's four categories. To create a global SPR index, we computed a global weighted average SPR. We alternatively use share in GDP and share in global internet users for weighting of country SPR scores.	
a. Aggregation of search volume for topics to country SPR by category		
b. Aggregation of category SPR to country SPR		
c. Aggregation of country SPR to global SPR		
Part 3: Results of the SPR index		Findings
1. Descriptive results	We observe that SPR decreased from high levels in 2013 until 2015. Since then, the trend reversed to a continuous increase. Overall, we find that SPR somewhat converged since 2015. This results in a decrease in SPR for most parts of Africa and Asia and an increase in SPR for many countries in America and Europe.	
a. Trends in global SPR index		
b. Country SPR changes between 2010 and 2020		
c. Country SPR scores in 2010 and 2020		
2. Internal consistency	We find a positive but imperfect correlation between SPR scores in the index's four categories, this points to SPR as a multidimensional construct. We also find that countries with greater SPR experience greater volatility in SPR. In addition, we find strong positive correlations between the proposed approaches for aggregation, supporting the robustness of the applied aggregation.	
a. Across-category correlation		
b. Correlation between mean and variance		
c. Correlation between alternative aggregation approaches		
3. External validity: Macroeconomic data	We find negative relations between GDP/capita ($p = 0.49$), HDI ($p = 0.00$), and the SPR index. We regress the scores of the SPR index's four categories on the related components of the Fragile States Index. Except for the Society component, we observe positive relations ($p < 0.10$). This indicates a negative relation between macroeconomic development and SPR. Yet the results also show SPR as distinct from macroeconomic development.	
a. Relation between GDP/capita and SPR		
b. Relation between HDI and SPR		
c. Relation between Fragile States Index and the respective category SPR scores		
4. External validity: Alternative risk indices	We find negative relations between POLCON ($p < 0.05$) and ICRG ($p < 0.10$) and the SPR index. In addition, we obtain statistically significant results from a test for Granger causality of the SPR index for both risk indices ($p < 0.10$). Moreover, we find positive relations between the EPU index, the EURQ index, and the SPR index. Yet the relations between these alternative indices and the SPR index differ by SPR category. We interpret this as support for the index's validity and distinctiveness from established measures.	
a. Political constraints index (POLCON)		
b. International Country Risk Guide (ICRG)		
c. Economic Policy Uncertainty index (EPU)		
d. Economic Uncertainty Queries index (EURQ)		
5. Robustness checks	We find that results from tests for external validation are robust to alternative reference terms for normalization, alternative approaches to aggregation, and adjustments for local internet usage. These tests highlight the robustness of our findings.	
a. Alternative reference terms for normalization		
b. Alternative method for SPR aggregation		
c. Correction for local internet usage		
6. Country-level case studies	We discuss four country-level case studies that relate changes in the SPR index to specific socio-political events in the respective country. On the one hand, this serves as a micro-level validation of the index and, on the other hand, highlights that for different events, different institutional players are drivers of potential institutional change.	
a. Brazil (2018)		
b. Hong Kong (2019)		
c. South Africa (2019)		
d. USA (2020)		

economy, government, and internal security were the main reasons individuals were more likely to demand institutional change.

Brazil's second major socio-political event was the October general elections ([BBC News, 2018](#)). The elections were accompanied by a controversy that led to heightened levels of grassroots SPR from July onwards (e.g., candidacy by Jair Bolsonaro, rejection of candidacy by Lula). The elections' first round took place on October 7, resulting in a run-off between Bolsonaro and Fernando Haddad

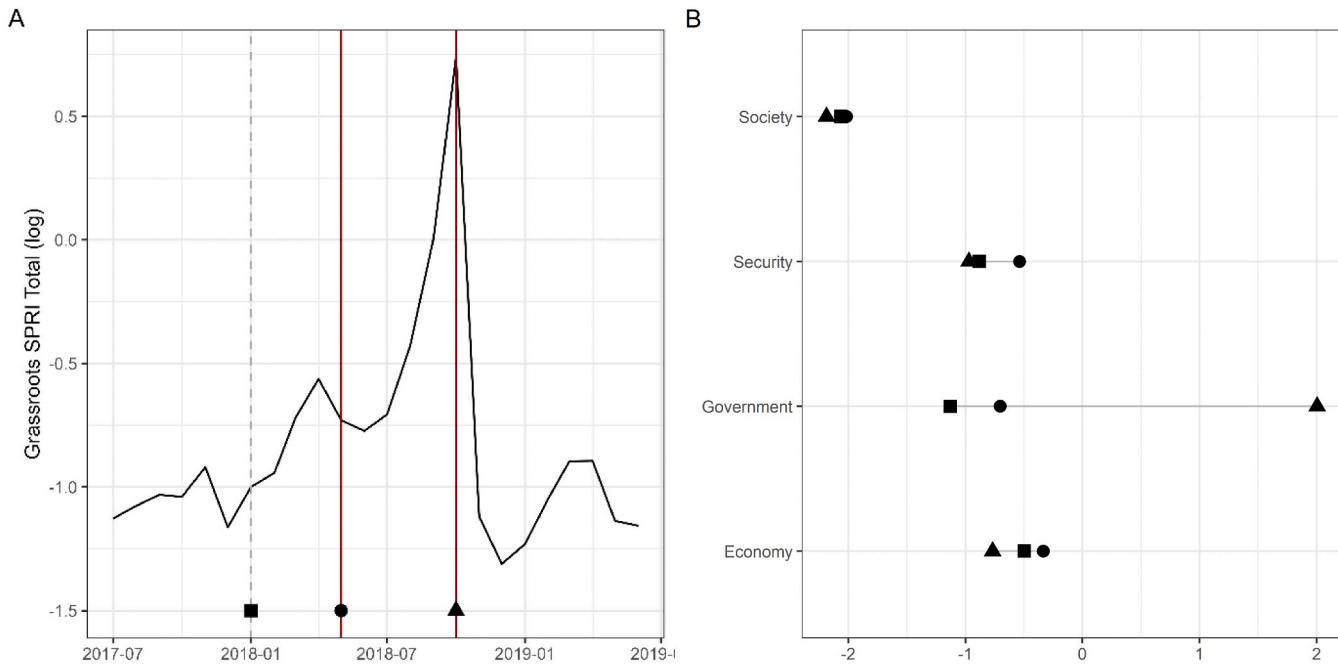


Fig. 5. Grassroots SPR development for Brazil 2018 case study.

Note: Panel A shows the development of the total grassroots SPR index. Panel B shows a decomposition of changes in the grassroots SPR relative to a baseline. ■ indicates the baseline (January 2018), ● indicates the truck drivers' strike (May 2018), and ▲ indicates the Brazil general elections (October 2018). For better visualization, all data is log-transformed.

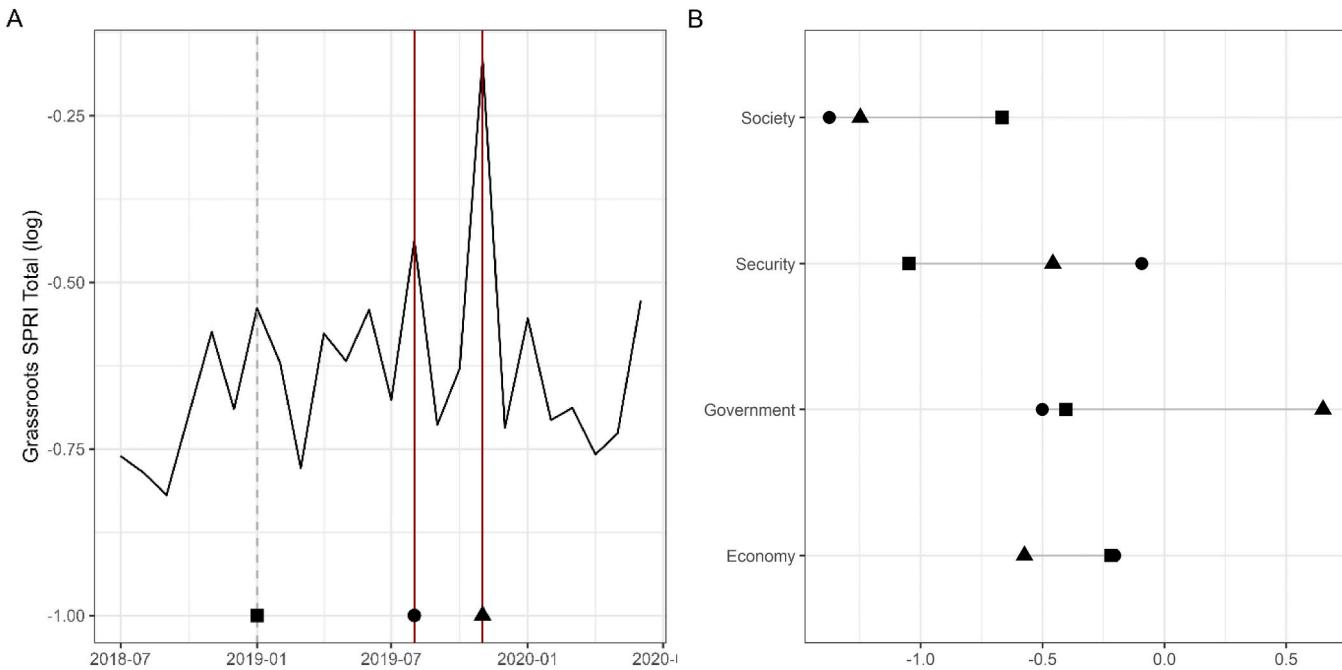


Fig. 6. Grassroots SPR development for Hong Kong 2019 case study.

Note: Panel A shows the development of the total grassroots SPR index. Panel B shows a decomposition of changes in the grassroots SPR relative to a baseline. ■ indicates the baseline (January 2019), ● indicates the general strike and HKIA blockade (August 2019), and ▲ indicates the city-wide strike and Hong Kong district council elections (November 2019). For better visualization, all data is log-transformed.

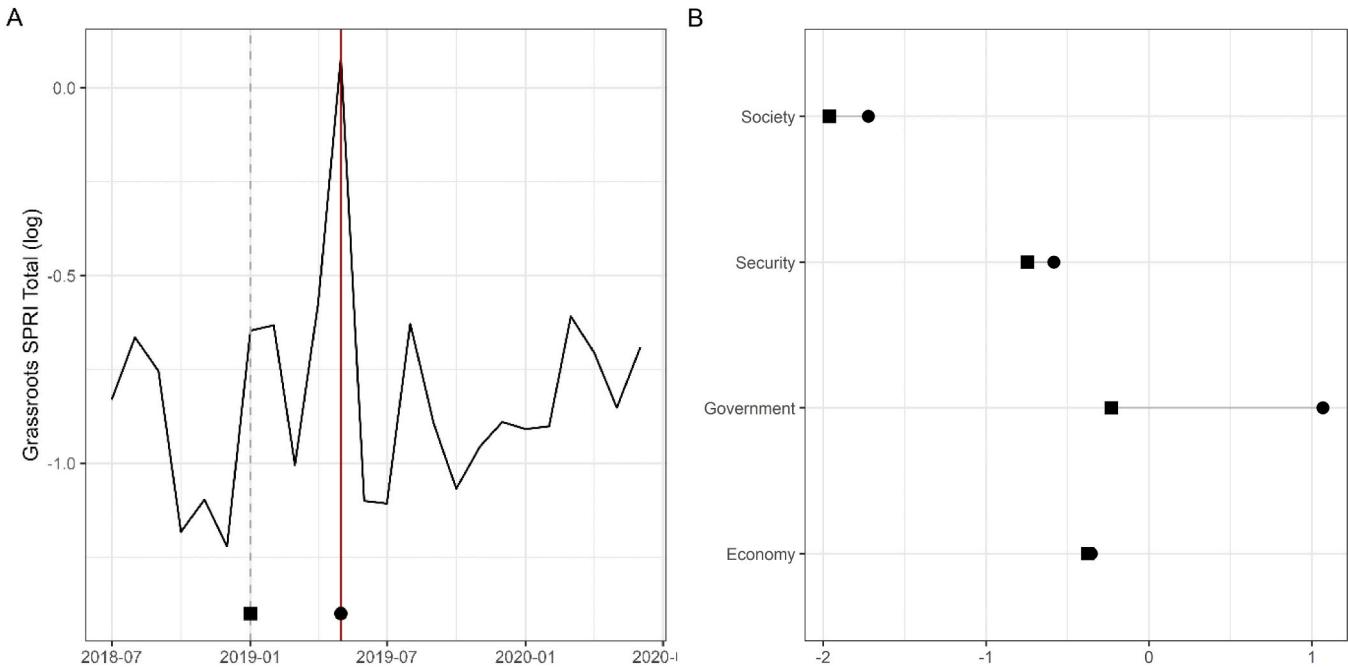


Fig. 7. Grassroots SPR development for South Africa 2019 case study.

Note: Panel A shows the development of the total grassroots SPR index. Panel B shows a decomposition of changes in the grassroots SPR relative to a baseline. ■ indicates the baseline (January 2019) and ● indicates the South Africa general elections (May 2019). For better visualization, all data is log-transformed.

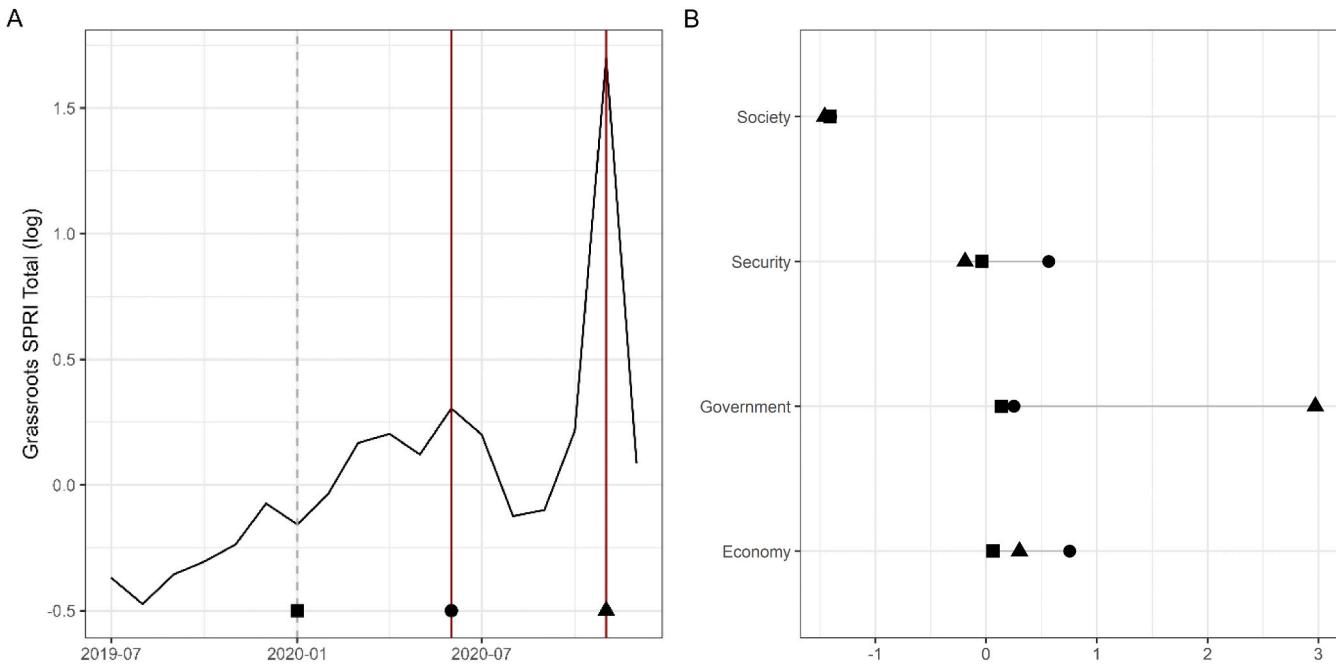


Fig. 8. Grassroots SPR development for USA 2020 case study.

Note: Panel A shows the development of the total grassroots SPR index. Panel B shows a decomposition of changes in the grassroots SPR relative to a baseline. ■ indicates the baseline (January 2020), ● indicates the BLM protests (June 2020), and ▲ indicates the United States elections (November 2020). For better visualization, all data is log-transformed.

on October 28. The grassroots SPR index captures the uncertainty shock accompanying the general elections (Panel A). At the same time, the risk decomposition (Panel B) shows that the increase in grassroots SPR relates to the government category. Thus, government-related issues were the main trigger for a greater propensity for institutional change in this situation. The case highlights the importance of elections in grassroots SPR. Because elections provide grassroots institutional players a democratic opportunity to change institutions, grassroots SPR related to institutional change is naturally high during such periods.

6.6.2. Case study 2: Hong Kong 2019

During 2019 and early 2020, Hong Kong experienced constant protests and demonstrations (Fig. 6). The protests were triggered by the proposition of the Extradition Law Amendment Bill in March 2019 and transformed into a greater struggle for democracy and the relationship between Hong Kong and China (Chik, 2020). Amidst the many protests, strikes, and riots during this period, we want to highlight four major events: the general strike and airport occupation in August (indicated as ●) and the city-wide strike and local elections in November (indicated as ▲).

July and August were characterized by ongoing protest marches and clashes with police (e.g., the storming of the LegCo building). These actions culminated in a general strike on August 5 that paralyzed Hong Kong. The strike blocked major transport routes, bringing the rail network and airport to a standstill (Regan et al., 2019). On August 9, protesters began mass sit-ins at Hong Kong International Airport (HKIA). The sit-ins lasted until August 12 and led to a breakdown of air travel to and from HKIA (Ingber, 2019). We observe that the grassroots SPR index peaks in August (Panel A), probably the result of these interruptions to Hong Kong's daily life. We also find that the rising grassroots SPR index is the outcome of increased security and, to a lesser extent, economy categories of the index (Panel B). Thus, we argue that this potential institutional change was mainly driven by issues concerning (internal) security.

Protests and clashes between police and demonstrators continued in September and October. On November 11, another general strike paralyzed Hong Kong. The strike lasted until November 15 and included road and public traffic blockades. In connection to the strike, Hong Kong police besieged protesters at Chinese Hong Kong University and Hong Kong Polytechnic University (Griffiths et al., 2019; BBC News, 2019a). These dramatic events led to widespread concerns regarding military intervention by China. On November 24, pro-democracy candidates won a landslide victory in the Hong Kong district council elections (Bradsher et al., 2021). The grassroots SPR index rises from October to November, indicating an increase in grassroots SPR due to these events (Panel A). The decomposition (Panel B) shows that the increase in SPR during November is attributable to heightened grassroots SPR in the government category. It is interesting to note that, although below its level in August, grassroots SPR in the security category also remained high. Hence, we consider political and security-related issues the main reason the populace became more likely to instigate institutional change. Like the truck drivers' strike in Brazil, the case highlights the explosive connection between grassroots SPR driven by political issues and the incumbent government. During such events, grassroots pressure is directed at political players who are the current beneficiaries of the institutional status quo. This clash of interests in the institutional circle (depicted in Fig. 2) can trigger violent clashes between institutional players.

6.6.3. Case study 3: South Africa 2019

The most important socio-political event in South Africa during 2019 (Fig. 7) was undoubtedly the South Africa general elections (indicated as ●) that took place on May 8 (BBC News, 2019b). The grassroots SPR index shows a rapid rise in risk from March onwards and peaking in May (Panel A). We attribute this increase in SPR to the election campaign and uncertainty surrounding the election results—particularly regarding the African National Congress's performance. The risk decomposition (Panel B) supports this assumption. In comparison to the baseline (January 2019, indicated as ■), grassroots SPR increased across all four categories. Yet the change was most dramatic in the government category, explaining the largest share of the rise in grassroots SPR. Intuitively, our SPR index highlights government-related issues as the main reason for popular calls for institutional change during South Africa's general elections. The case of South Africa supports the importance of elections for grassroots SPR, which was also found in the case study on Brazil.

6.6.4. Case study 4: USA 2020

In 2020, two major socio-political events shook the US: the BLM protests in June (indicated as ●) and the US elections in November (indicated as ▲). Both events substantially affected grassroots SPR in the US (Fig. 8) and beyond.

In late May, the murder of George Floyd by police in Minneapolis (MI) led to nationwide protests and demonstrations against police brutality and in support of the BLM movement. Protests began at the end of May, spread across all 50 US states, and lasted into June (Luscombe and Ho, 2020). As the protests partly turned violent, the government deployed the National Guard—the greatest peacetime military operation in US history (National Guard, 2020). The increase in grassroots SPR related to these protests is visible in the index (Panel A). Risk composition also shows that this increase in grassroots SPR was triggered by a rise in the security and economic categories (Panel B). While the rise in the security category underlines the role of internal security concerns as drivers of potential change, the increase in the economy category may point to reactions to the socio-economic fallout from the movement.

Presidential, congressional, and several state elections took place in the US in November—the major event was the presidential election (CNN, 2020). The election was accompanied by heightened uncertainty regarding the outcome and Donald Trump's reaction to a potential loss. The election's aftermath was characterized by delays in the presentation of results, litigation, and attempts to delay the declaration of a winner (Balz, 2020). We observe a massive surge in grassroots SPR in November (Panel A). As shown in Panel B, this increase was mainly driven by rising grassroots SPR in the government category—highlighting issues related to government and transfer of executive power as major triggers of popular calls for institutional change during election periods.

We draw two important conclusions from these case studies. First, the grassroots SPR index tracks major socio-political events.

Elections, in particular, trigger grassroots SPR since elections offer a democratic expression of grassroots sentiment and a legitimized opportunity for individuals to change countries' institutions. The higher the grassroots SPR before an election, the more likely such changes are and the larger their magnitude will be. Although we cannot claim a causal relation between events and changes in the grassroots SPR index, we consider the correlation with major events to be a micro-level validation of our grassroots SPR index. Second, the case studies support the distinction between grassroots and structuralist institutions. When grassroots pressures are directed towards governments, the incumbent government's interests and grassroots sentiment clash. This can result in open conflict between competing institutional players and may trigger top-down measures to quell bottom-up demands for change. Depending on the institutional environment, this conflict will differ from one country to the next. Third, the case studies highlight the importance of a multidimensional approach to SPR. As shown in the risk decomposition, different socio-political issues drive the potential for institutional change triggered by different events and consequently lead to changes in different categories of SPR.

7. Internal and external views of grassroots SPR

Adding to the empirical validation of our proposed grassroots SPR index, we seek to highlight its theoretical and empirical usefulness to IB and IM scholarship by applying it to a research question that cannot be addressed using traditional measures of SPR. We build on the strength that the grassroots SPR index is rooted in individuals' sentiments. Google Trends data allows us to distinguish between locals' and foreigners' sentiments on a specific issue within a specific country. In other words, it allows us to obtain two different measures for SPR within a country and as it is perceived outside the country.

This differentiation between internal and external perceptions of SPR gives IB researchers an opportunity to study differences between the two indices in terms of liability of foreignness (Zaheer, 1995) or information asymmetry. Managers consider SPR in host countries relative to reference points (Jacowitz and Kahneman, 1995; Tversky and Kahneman, 1974), often their home countries (Yasuda and Kotabe, 2021). Yet distance between home and host countries can lead to misperceptions of these risks (Weber et al., 2020). Corresponding to our focus on cross-country differences in perceptions, we consider the impact of psychic distance (Beugelsdijk et al., 2018; Håkanson and Ambos, 2010). Therefore, psychic distance between home and host countries limits managers' knowledge about SPR in host countries (Karhunen and Ledyayeva, 2012) and increases differences between the internal and external grassroots SPR indices. This is because, under high psychic distance and information asymmetry, foreign managers find it more difficult to assess a host country's SPR. As a result, their (external) SPR perceptions differ from locals' (internal) SPR perceptions. In other words, the differences between internally measured and externally perceived SPR will be more pronounced between country pairs characterized by high psychic distance. In line with these arguments, we formulate the following proposition:

Proposition 1. Psychic distance between countries moderates the relation between internal and external views of SPR.

The construction of the external grassroots SPR index follows the construction of the internal grassroots SPR index outlined above. As an adaption, we combine the search terms related to SPR with the name of the country for which we want to gather the external SPR data (e.g., Switzerland corruption). To limit complexity, we construct the external grassroots SPR index only from the perspective of six English-language countries and use only the most important search terms (PCA loading ≥ 0.001). To account for the relative importance of each country to internet users, we divide the grassroots SPR index score by the normalized search volume for the respective country name.¹⁵

We compare internal and external perceptions of SPR by regressing scores for the external grassroots SPR index on scores of the internal grassroots SPR index. To test our proposition about the moderating impact of psychic distance, we add an interaction between internal grassroots SPR perceptions and distance to the model. To operationalize psychic distance, we use data provided by Dow and Karunaratna (2006) that captures psychic distance as differences in industrial development, education, political systems, religion, and language.

We present results from the comparison between internal and external grassroots SPR for each risk category separately (Table 11). For better interpretation, regression coefficients are standardized. The results indicate that psychic distance affects the impact of internal SPR on external grassroots SPR. Yet the relation between internal and external grassroots SPR and the effect of psychic distance on this relation differ substantially between the four categories. Our results show that psychic distance strengthens the effect of internal SPR perceptions for the government and security categories. Moreover, except for the society category, we find that psychic distance increases external perceptions of SPR. Furthermore, we observe that psychic distance negatively affects the relationship between internal and external grassroots SPR. Regarding effect size, psychic distance appears to be a stronger driver of external SPR perceptions about a country than internal perceptions in the respective country. For example, at average levels of psychic distance, a one standard deviation increase in the internal grassroots SPR index's security dimension leads to a 0.06 standard deviation increase in external perceptions. However, at high levels of psychic distance (one standard deviation above the mean), the size of this effect drops to 0.007 standard deviations. This points to the importance of psychic distance in explaining differences in SPR perceptions.

¹⁵ For our analysis, we consider Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States to be "home countries"—i.e., the countries whose external views we capture. To limit complexity from translation, we measure external grassroots SPR views only for "host countries" (i.e., the countries about which we capture external views) that use Dutch, English, French, German, Spanish, or Portuguese as main languages. This leaves us with a total of 3000 search terms for six countries each. In Table B2 (Online Appendix B), we highlight these countries in bold. Since not all keyword and country combinations are available as predefined search topics on Google Trends, we use search terms rather than search topics as above.

Table 11

Regression analysis for external and internal grassroots SPR index (monthly).

Grassroots SPR category (external)	Economy (11)	Government (12)	Security (13)	Society (14)
<i>Grassroots SPR (internal)</i>	-0.011 p = 0.315	0.014 p = 0.000	0.060 p = 0.000	-0.001 p = 0.751
<i>Psychic distance</i>	0.165 p = 0.000	0.054 p = 0.000	0.270 p = 0.000	0.003 p = 0.200
<i>SPRI × Psychic distance</i>	-0.001 p = 0.939	-0.014 p = 0.000	-0.053 p = 0.000	-0.007 p = 0.086
<i>Constant</i>	1.036 p = 0.130	0.057 p = 0.767	0.706 p = 0.193	-0.175 p = 0.003
Observations	55,339	55,339	55,339	55,339
Countries	6	6	6	6
Languages	7	7	7	7
Years	2010–2020	2010–2020	2010–2020	2010–2020
AIC	181,347	95,754	187,354	53,879
BIC	181,472	95,878	187,479	54,003

Note: standardized regression coefficients; linear-mixed effect models used for estimation. Models include random intercepts for “home country” (i.e., the countries whose external views we capture), the “host country’s” main languages (i.e., the countries about which we capture external views), and year.

These results use data from six countries and apply a simplified version of the grassroots SPR index. Therefore, we advise caution in their interpretation. Still, these findings show that for the government and security dimensions, our grassroots SPR index can capture perceptions of SPR from the perspective of internet users in different countries. The results indicate stark differences in internal and external perceptions of SPR. We also observe that except for the economy dimension, psychic distance between countries partially explains these differences between internal and external perceptions.

We consider this comparison between internal and external perceptions of SPR as the basis for further methodological innovation. Because of issues related to keyword translation and the usage of search terms rather than more reliable search topics, we do not present this comparison as an out-of-the-box tool. Instead, we provide this analysis to demonstrate features of the index that are unavailable for other measures.

8. Discussion

IB research has made great contributions to the study of the effects of SPR on MNEs (Cavusgil et al., 2020; Eduardsen and Marinova, 2020; Giambona et al., 2017; Kelly and Philippatos, 1982; Minor, 1994). Historically, both the theoretical concept and measurement of SPR focused on political risk through governmental interventions and used structural constraints as empirical measures in the study of MNEs’ vulnerability to political risk in a specific country. However, direct government interventions and overt seizures through unconstrained sovereigns “essentially evaporated by 1980” (Henisz and Zelner, 2010). At the same time, other institutional actors have been emancipated. Technological change and democratization have empowered individuals to change countries’ institutions (Rice and Zegart, 2018). This, in turn, has increased firms’ exposure to grassroots SPR that results from changes in institutions from the collective actions of individuals. Structural measures of SPR do not fully capture these antecedents of bottom-up institutional change.

This paper proposes grassroots SPR as a theoretical complement to structural SPR. This novel type of grassroots SPR is engraved not in the structure of political institutions but in an empowered popular majority of individuals in a bottom-up way. MNEs must understand the dynamic sentiment within a society that reflects the social interactions and SPR “on the ground.” We construct the first measure of grassroots SPR that is not based on subjective and potentially biased analysts’ assessments but on individuals’ online information-seeking behavior on Google. Google search volume has been employed in a variety of disciplines, ranging from public health (Brodeur et al., 2021; Nuti et al., 2014), sociology (Corbi and Picchetti, 2020), finance (Cziraki et al., 2021) to economics (Castelnuovo and Tran, 2017) to capture sentiments as it reflects individuals’ social and political information-seeking. Individuals use Google for information gathering in their decision-making processes (Beracha and Wintoki, 2013; Cziraki et al., 2021; Joseph et al., 2011). Our grassroots SPR index captures grassroots SPR in four categories (economy, government, security, society) and as an aggregate measure. We compute the index as a country-level measure and a global measure. For index construction, we use our publicly available globaltrends package for R. The complete R code to compute the grassroots SPR index and detailed data for the index is available on the authors’ website (https://github.com/ha-pu/globaltrends_spr).

For validation, we compare our grassroots SPR index to developments in macroeconomic developments and alternative measures of SPR. We discuss four country case studies to provide a micro-level validation of the grassroots SPR index. Across all these tests, our grassroots SPR index shows expected and intuitive results. Moreover, these tests highlight how our grassroots SPR index tracks differences in the impact of different SPR events on the four categories, thereby supporting the validity of our grassroots SPR index and underlining the importance of a multidimensional perspective on SPR. Finally, we apply our index to a classic IB research question. Our index allows researchers to distinguish between SPR as it emerges within a country (grassroots) and SPR as people outside the country perceive it. Thus, our index lends itself to a test for information asymmetries and liability of foreignness between home and host countries. In our application, we propose and show that the difference between within-country SPR and SPR as perceived externally

increases with psychic distance.

8.1. Contributions

In this paper, we contribute a concept and empirical measure of grassroots SPR focused on the antecedents of institutional change in terms of changes in attitudes, issue salience, and behavior of a majority of the populace. Thus, we make a theoretical and empirical contribution to the literature on SPR.

Theoretically, we conceptualize a complement to structural measures of SPR that focus on top-down political constraints from existing institutions (Henisz, 2000; Tarabishy et al., 2005). Specifically, our concept focuses on the antecedents of bottom-up institutional change driven by individuals' collective action. Recognizing the institutional agency of individuals and their ability to initiate radical change in institutions opens up interesting theoretical avenues into how different institutional actors interact to change institutions. By offering a grassroots evolutionary perspective on institutions, our study emphasizes the change in institutions and the resulting institutional incongruences and interactions as a novel source of SPR (Dau et al., 2022). Yet the ability of individuals to enforce change and the process through which bottom-up change in institutions unfolds (democratic elections vs. violent unrest) differs depending on the institutional setting (e.g., autocracy, freedom of democracy). Our four case studies on countries Brazil, Hong Kong, South Africa, and the US underline the importance of a country's institutional setting and provide strong support for the proposed distinction between structuralist and grassroots SPR. When grassroots pressure is directed at incumbent governments as beneficiaries of the current institutional setting, we observe a high risk of conflict between institutional players (policymakers and individuals). Our case studies also support the important role of elections, which provide a democratic means of grassroots expression to alter the institutional landscape. Naturally, these elections trigger grassroots SPR, but in cases where the democratic process is functional, structuralist and grassroots institutional players are in balance. Thus, we argue that understanding and explaining SPR from institutional change requires considering both bottom-up, grassroots forces and top-down, structural constraints.

As an empirical contribution, we provide a grassroots SPR index based on Google Trends data. Existing attempts to capture such a grassroots perspective on SPR commonly rely on media (Caldara and Iacoviello, 2021; Hassan et al., 2019; Sun et al., 2021) or analyst reports (PRS Group; Marshall and Cole, 2008) and are potentially biased. Using Google Trends data, we base our measures of issue salience on truly individual-level data. We use Trends data on search volume on Google to operationalize attention allocation and information-seeking by individuals to construct an index of grassroots SPR. Thus, we shift the focus from the structure of formal institutions towards attitudes about and perceptions of SPR. In addition, it brings several empirical benefits. The grassroots perspective of the SPR index differs from the view of other established measures of SPR. Our grassroots SPR index thus allows researchers to build methodological alternatives to capture SPR in their research designs. Because of the granularity of Google Trends data, these measures open new research questions regarding SPR for IB, which previously have been difficult to study.

Most strikingly, Google Trends provides data in real time and makes data available for all countries and regions. The data is highly representative of (most) countries and reflects grassroots SPR sentiment in the population. Thanks to this focus on individuals' grassroots SPR sentiment, applying data from Google Trends allows researchers to distinguish internal SPR perceptions by locals from external SPR perceptions by foreigners. In doing so, we add perceived external SPR to IB research as a dimension of SPR. We argue that this subjective perspective by outsiders of a country's SPR is closely linked to corporate reality in MNEs—that is, home-country managers assessing the SPR of potential host countries. We support the validity of this empirical property of our grassroots SPR index by testing the impact of psychic distance on differences between internal and external perceptions of SPR. In line with IB theory, our results suggest that foreign managers' perceptions of a country's SPR become a less reliable predictor of locals' internal perceptions of SPR as the psychic distance between the two countries rises.

8.2. Limitations and future research

Our approach also has conceptual limitations that may affect the usage of our grassroots SPR measure. First, we use issue salience in the populace as an indicator to capture the probability of changing institutions. This probabilistic property implies that our grassroots SPR measure does not capture ex-post outcomes (e.g., social unrest, political destabilization). Hence, it cannot be interpreted or applied in a deterministic way. Second, our measure attaches equal weight to each online user along the premise of "one query, one vote." This may not reflect institutional reality and power structures in every country equally well. Still, we argue that this objective *vox populi* perspective is not necessarily captured in existing media- or analyst-based measures of grassroots SPR and offers theoretical and empirical nuance. Third, we capture issue salience based on search volume for topics on Google. However, data on search volume does not include the context in which the topics are searched or a user's sentiment (positive or negative) when searching for the topic. Thus, changes in our grassroots SPR index reflect changes in issue salience but do not signify positive or negative sentiment. Moreover, like most other approaches based on textual analysis or natural language processing, our measure of grassroots SPR relies on categorizing individual keywords (Baker et al., 2016; Kupfer and Zorn, 2020; Mellon, 2013). Given the complex, interconnected nature of the socio-political environment, the selection and assignment of keywords is inevitably subjective and can never fulfill criteria of mutual exclusivity or collective exhaustiveness. Finally, measuring grassroots SPR based on Google search volume requires that the populace of a given country consider the internet in general and Google Trends in particular to be a relevant source of information.

Extensive validation of our grassroots SPR index has also revealed three empirical weaknesses, which researchers using our index should be aware of. First, topic categorization by Google Trends algorithms appears more efficient in major Latin-character-based languages. This can distort grassroots SPR scores for countries where languages that use other characters are prevalent (e.g., Arabic). Second, countries vary in the degree to which they censor the internet (e.g., the Freedom of the Net index by Freedom House).

Rigid restrictions on internet access and traffic can change user patterns and reduce the representativity of Google Trends in some countries (e.g., China, Russia, and Egypt). Thus, cross-country comparisons could be problematic for small countries with low freedom of the net. However, as long as these factors remain stable over time, they do not affect within-country predictive power. Suppose researchers apply our grassroots SPR index for cross-country comparison. In that case, we strongly advise controlling for country-level idiosyncrasies by including country fixed effects and the time-variant grassroots SPR index. Third, we observe a decrease in variance in the grassroots SPR index over time. This could indicate that more recent grassroots SPR scores are more reliable than historical values. This may be because internet and Google usage, especially in the least-developed countries, has increased over the observation period. If the internet's relevance as an information source grows, search activity on Google becomes more representative of society's information demands, and the proposed grassroots SPR measure becomes more representative. However, this might also cause structural breaks in the time series. Using our measure over time, scholars are advised to empirically control for time effects in the grassroots SPR to control for such structural changes in user behavior.

Application aside, future research is invited to study our measure's validity, boundary conditions, and constraints. We encourage researchers in IB and beyond to study the country-level contingencies that affect the interplay of top-down structural SPR and our proposed bottom-up grassroots concept of SPR. Interesting characteristics in this regard would be, for example, the degree of democracy and authoritarianism or different electoral systems (majority vs. proportional). Doing so promises not only possible limitations to our proposed measures but also insights into interesting geopolitical questions regarding the long-term dynamics of SPR across the globe (e.g., variance over time, variance across countries, covariance between countries) that are beyond the scope of this paper. We also expect corporate responses to SPR to vary depending on whether the firm faces grassroots or structural SPR. We hope that the inclusion of our proposed grassroots measure can add nuance to theory and empirical testing here.

At the same time, the potential sensitivity of online searches to censorship and political interference offers valuable insights into oppressive state behavior. If online interest in a specific topic abruptly disappears, this may point to state intervention. Sudden divergence in online search trends between countries is a similar signal (Puhr and Kupfer, 2023).

We consider these limitations to be potential caveats for applying our grassroots SPR index. Yet they also point to lines along which future research can apply and develop the proposed measure. While we use tests for Granger causality to demonstrate the predictive power of our measure, future research could leverage the measure's probabilistic properties to predict specific events or incidents. This will also show which types of events search-volume-based issue salience has the greatest predictive power. Along these lines, researchers may also consider under what conditions the internet or Google are particularly important sources of information. Thus, future research can contribute to a better understanding of contingencies that enhance the benefits of Google search volume vis-à-vis alternative measures of grassroots SPR. Furthermore, we encourage scholars to adapt the proposed grassroots SPR index (e.g., using alternative keywords or categorizations) to their needs and research questions. This will, on the one hand, optimize the fit between measure and application and, on the other hand, help overcome issues in categorizing keywords. Moreover, scholars can adapt the grassroots SPR index to gain more fine-grained insights—for example, on a regional level or from different external perspectives. Thus, future research can contribute to a better understanding of inter-regional dynamics in the development of SPR and how the liability of foreignness distorts perceptions of SPR.

Beyond these applications related to SPR, we discuss Google Trends as a data source that opens opportunities to analyze SPR far beyond the current scope of our grassroots SPR measure. For example, Google Trends allows comparing how socio-economic information-seeking evolves in different countries. Thus, it can measure and conceptualize country similarities, differences, and distance. This approach to measuring institutional distance would go far beyond existing empirical approaches that focus on creating indices from selected secondary variables (Berry et al., 2010). It would allow a timely, representative, unbiased measure of inter-country distances.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.intman.2023.101096>.

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