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RESEARCH ARTICLE



The Ascent of Geopolitics: Scientometric Analysis and Ramifications of Geopolitical Risk

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ABSTRACT

In recent years, geopolitical risk (GPR) has been a crucial factor in investment decisions and stock markets. Therefore, we explore the research on the GPR by employing bibliometric and scientometric analytical techniques. We find 366 scientific contributions in December 2021 from the Scopus database by searching 'Geopolitical risk' in abstracts, keywords, and titles. Our findings show that GPR research has gained momentum in the last three years. Specifically, the journal *Defence and Peace Economics* has one of the highest numbers of research and citation on GPR. Authors in Asia also dominate the GPR literature. Overall, this study contributes to the literature by presenting the existing research that may give new insights for prospective studies in GPR.

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Introduction

Geopolitical risk (GPR) is a critical ingredient for financial markets and investment choices by central bank executives, entrepreneurs, and market contributors. GPR, as a vital factor, shapes financial cycles and macroeconomic policies. As Caldara and Iacoviello (2018) recently show its importance, GPR negatively impacts economic activities and stock returns; that is why the liquidity flows from unstable markets to stable markets.

GPR has become a growing scientific subject due to its relevance in the global world in the last decade. Caldara and Iacoviello present the worldwide impact events between 1985 and 2018 (2018, 35), as in Figure 1. These events are as follows: United States (US) bombs Libya, US invasion of Panama, Kuwait invasion, Gulf war, Iraq disarmament crisis, 9/11, Iraq invasion, London bombings, Iran nuclear tensions, Arab spring, the Syrian war, Russia annexes Crimea, Islamic State in Iraq and Syria (ISIS) escalation, Paris attacks and North Korea. Mainly, all these events trigger the attention to the GPR research.

This study employs the bibliometric analytical technique by investigating the GPR research. Utilizing the Scopus database and the bibliometric analysis, we aim to assess the development in GPR research by describing quantitatively and evaluating all information in the dataset. Hence, this study contributes to the literature by presenting the existing research that may give new insights for prospective studies in GPR.

We retrieved 366 scientific contributions in December 2021 from the Scopus database by searching 'Geopolitical risk' in abstracts, keywords, and titles. The findings mention that the GPR research has gained momentum in the last three years. Especially, *Defence and Peace Economics* leads the GPR research in economics with one of the highest numbers of research and citation.

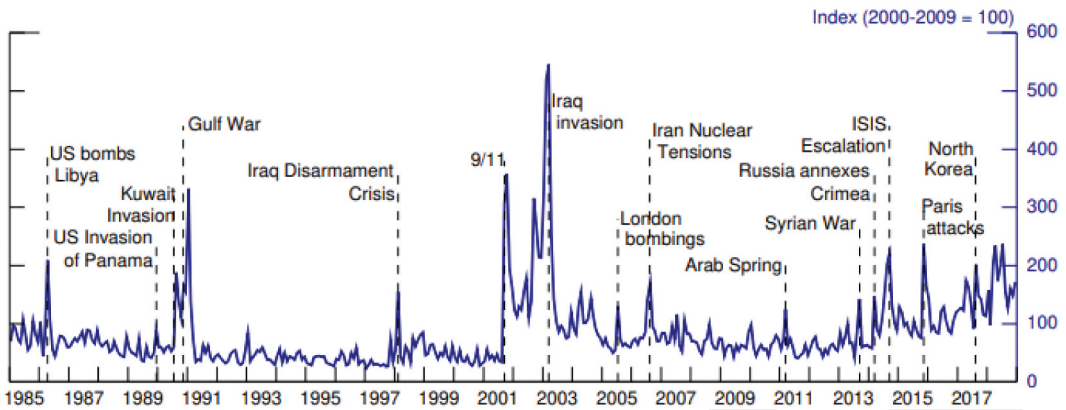


Figure 1. Geopolitical risk by year. Source: Caldara and Iacoviello (2018, 35).

One of the primary findings of this paper is that geopolitical risk is becoming more popular in recent years. The number of publications in this field increases rapidly after 2016 due to the rise in incidents that increase geopolitical risks. Similarly, authors in countries that are involved in international conflicts and have relatively higher geopolitical risks, such as Turkey, Russia, China, South Africa, contribute more to this field. Hence, authors from high geopolitical risk countries tend to be academically interested in geopolitical risk research. In addition, the creation of the GPR index by Caldara and Iacoviello in February 2018 allows the researchers to measure the geopolitical risk. This appears to be another reason for the parabolic increase of geopolitical risk studies in recent years. Another finding of this paper is that geopolitical risk studies can be clustered as in social science, financial, and energy studies when abstracts are analyzed with co-occurrence. Besides, it can be seen from the journals that *Defence and Peace Economics* leads economics journals while energy journals are not at the center.

The rest of the article proceeds as follows: the next section overviews the GPR papers in journals that published the highest number of documents and reviews some highly cited documents more in detail. The following section presents the data and methodology. Then, the subsequent sections analyze the overview of the geopolitical risk and authors, respectively. The last section concludes.

Geopolitical Risk in the Literature

Regarding the GPR literature, we select the papers in five journals, which published the highest number of documents: *Resources Policy*, *Defence and Peace Economics*, *Finance Research Letters*, *Energy*, and *Energy Economics*.

First, the papers in *Resources Policy* mainly focus on the resources like *oil* (Plakandaras, Gupta, and Wong 2019; Godil et al. 2020; Olanipekun and Alola 2020; Drachal 2021; Kisswani 2021; Kumar, Khalfaoui, and Tiwari 2021; Li et al. 2021; Razek and McQuinn 2021), *precious metals* (Zhou, Huang, and Chen 2020; Yilanci and Kilci 2021), and *gold* (Godil et al. 2020; Li, Huang, and Chen 2021; Li et al. 2021; Triki and Maatoug 2021). Papers in *Resources Policy* are more concerned with gold, oil, precious metals, resources.

Next, papers related to *energy* are Muñoz, García-Verdugo, and San-Martín (2015) in *Energy*, and Qin et al. (2020) and Shen et al. (2021) in *Energy Economics*. The GPR literature in *Energy* (Mohsin et al. 2018; Su et al. 2021; Alqahtani and Klein 2021; Dutta, Bouri, and Saeed 2021; Salisu, Pierdzioch, and Gupta 2021; Tiwari et al. 2021; Wang, Su, and Umar 2021) and *Energy Economics* (Bouoiyour et al. 2019; Liu et al. 2019; Abdel-Latif and El-Gamal 2020; Mei et al. 2020; Storhas, De Mello, and Singh 2020; Tiwari et al. 2020; Gu, Zhu, and Yu 2021) mainly examine the relationship between GPR and *oil*

Table 1. Selected journals in GPR: A literature overview.

Journals	# of GPR papers	Focused keywords
Resources Policy	19	gold, oil, precious metals, resources
Defence and Peace Economics	15	defence, gold, oil, stocks, terrorism
Finance Research Letters	11	cryptocurrency, oil, stocks, volatility
Energy	9	energy, oil
Energy Economics	9	energy, oil, volatility

Source: Scopus & Authors' compilation

market. Recent research in *Energy Economics* (Liu et al. 2019; Mei et al. 2020; Qin et al. 2020) evaluates the impact of GPR on *volatility*. Papers in *Energy* and *Energy Economics* are more concerned with energy, oil, and energy, oil, and volatility, respectively.

The documents in *Finance Research Letters* analyze the relationship between GPR and *cryptocurrencies* (Aloui, Ben Hamida, and Yarovaya 2021; Colon et al. 2021), *oil* (Antonakakis et al. 2017), *stock markets* (Kannadhasan and Das 2020; Abakah et al. 2021; Choi 2021; NguyenHuu 2022; Phan, Tran, and Iyke 2021), and *volatility* (Gkillas, Gupta, and Wohar 2018; Gkillas, Gupta, and Pierdzioch 2020; Nonejad 2021). Table 1 summarizes the literature overview above. Paper in the *Finance Research Letters* mainly focuses on the cryptocurrency, oil, stocks, volatility issues.

The papers in *Defence and Peace Economics* examine the effect of GPR on *financial markets* (Aslam and Kang 2015; Apergis et al. 2018; Kim, Kang, and Lee 2018; Bouri et al. 2019; Bilgin, Gozgor, and Karabulut 2020; Bouri, Gupta, and Vo 2020; Khan, Su, and Rizvi 2022; Lee 2020; Kyriazis and Economou 2021; Pyo 2021), *gold* (Huang et al. 2021) and *oil markets* (Su et al. 2021; Cunado et al. 2020; Aloui, Ben Hamida, and Yarovaya 2021; Khan, Su, and Tao, 2021). The main keywords for the *Defence and Peace Economics* stand as defence, gold, oil, stocks, terrorism (Table 1).

Considering its importance, the journal of *Defence and Peace Economics* (DPE) leads the GPR to the earliest literature in economics by having one of the highest numbers of documents in this bibliometric analysis. We also give more information about some of the highly cited articles in this journal. First, Aslam and Kang (2015), as the earliest paper of DPE, examine terrorist attacks and stock markets in Pakistan and find that the *Karachi* stock market gives different responses to various terrorist attacks. Then, as another growing literature, Kim, Kang, and Lee (2018) use big data to predict the military aggression of North Korea. They show that news articles published by the United Kingdom media have significant predictive power for North Korean military attacks. Another Korean case-based paper, Pyo (2021), more recently assesses whether the GPR is a matter for the South Korean stock markets and finds that while positive geopolitical events positively affect stock prices, adverse geopolitical events have restricted impacts. Lee (2020) examines GPR from the Middle East to Korea and indicates that while the cases associated with GPR increase in China, Korea, Russia, and Korea, those related to GPR decrease in Israel, Saudi Arabia, and Turkey.

Since oil markets are directly related to the GPR, DPE contributes to the relationship between the GPR and oil markets with the following four papers. Aloui and Hamida (2021) indicate that news of geopolitical tensions influences the stock market in *Saudi Arabia*, which has high GPR and is a rich oil-exporting country with high-frequency bands. Also, Khan, Su, and Tao (2021) demonstrate a positive association between oil prices and financial liquidity in *Saudi Arabia* in the medium run. Su et al. (2021) utilize Caldara and Iacoviello's (2018) GPR index comprising 11 national and international newspapers. They examine the association between the GPR and oil prices *worldwide* and reveal a positive relationship between wars and oil prices. Still, the GPR does not influence a sudden decrease in oil prices. Last, Cunado et al. (2020) explore how oil supply shocks affect GPR and oil prices. They show that the geopolitical tensions in the Middle East drive the relationship between the GPR and oil supply shocks; that is why higher GPR means higher oil prices.

Next, Apergis et al. (2018) examine 24 global defense companies whether the GPR may forecast actions in stock markets and volatility. They find that international geopolitical events are apt to influence the risk profile of defense companies, but these events are less likely to predict stock

returns. Bouri et al. (2019) analyze the GPR and movements in Islamic bond and equity markets and indicate that GPR affects both Islamic equity market volatility and returns. Bouri, Gupta, and Vo (2020) investigate the jumps in the cryptocurrency market and GPR in the context of Bitcoin. They show that jumps in GPR only impact Bitcoin in all cryptocurrencies; hence, this makes 'Bitcoin is a hedge against GPR' (2020, 1). More recently, Kyriazis and Economou (2021) assess the association between GPR and the Turkish lira. They find that the uncertainty that arises from the GPR reduces the value of the Turkish lira against other currencies such as the Euro and the US dollar. Huang et al. (2021) explore whether GPR influences the returns in the gold market employing high-frequency data. They indicate that GPR impacts volatility more depending on the type and content of geopolitical events.

Bilgin, Gozgor, and Karabulut (2020), on the other hand, analyze the association between government investment and GPR by using panel data for 18 countries. They find that the GPR drives government investment. Khan, Su, and Rizvi (2022) assess defense expenditures and GPR. They mention that the relationship between defense expenditure and GPR is positive in China, India, and Saudi Arabia, but it is negative in South Korea and Turkey. However, they do not find any causality between defense expenditures and GPR in Brazil, Israel, and Russia, in which the internal political system determines defense expenditures.

Data and Methodology

We use the Scopus database by searching 'Geopolitical risk' in abstracts, keywords, and titles in December 2021 since Scopus provides a high-quality, well-organized and indexed database for bibliometric/scientometric studies (Cobo et al. 2011; Baas et al. 2020). There are 366 scientific publications until the time we downloaded the data. Scopus provides data such as citation numbers, publication date, authors, countries, institutions. Science mapping is crucial for bibliometric studies and in this paper, we use VOSviewer (Van Eck and Waltman 2010; Powell et al. 2016). VOSviewer is often used in other studies on bibliometric analyses (Liao et al. 2018; Shah et al. 2019; Hamidah, Sriyono, and Hudha 2020). VOSviewer allows analysis like co-authorship, co-occurrence, citation, bibliographic coupling, and co-citation. In co-authorship analysis, the relatedness of items is based on the authors' number of co-authored documents. In citation analysis, the relatedness of items is based on the number of times they cite each other. In co-occurrence, the relatedness of items is determined based on the number of documents in which they occur together. In bibliographic coupling, the relatedness of items is based on the number of references they share. In co-citation, the relatedness of items is based on the number of times the papers are cited together (Van Eck and Waltman 2013; Bi et al. 2020; Mourao and Martinho 2020; Aysan, Demirtaş, and Saraç 2021).

Overview of the Geopolitical Risk

In this section, we discuss the overview of the GPR. Significant peaks of GPR are around Gulf War, 9/11, the invasion of Iraq by the US, the Russia-Ukraine War, and the Paris terrorist attacks in 2015 (Caldara and Iacoviello 2018). Although the number of publications on GPR increases during or after the GPR index spikes, there is a continuous and parabolic increase in the number of publications after 2016 (see Figures 1 and 2).

The primary reason for the significant increase in the publication in recent years is the GPR index¹ created by Caldara and Iacoviello, published in February 2018 in 'Measuring Geopolitical Risk.' After the paper, 'Measuring Geopolitical Risk' of Caldara and Iacoviello (2018), 274 out of 366 papers are published. This rapid increase in GPR is due to the Caldara and Iacoviello index being reliable and covering multiple countries. They used 11 newspapers' digital archives to construct the GPR index. Before their article, every author had to create their own GPR index for subjects like Aslam and Kang (2015). Hence, it was difficult and time-consuming to conduct empirical research on GPR, or studies

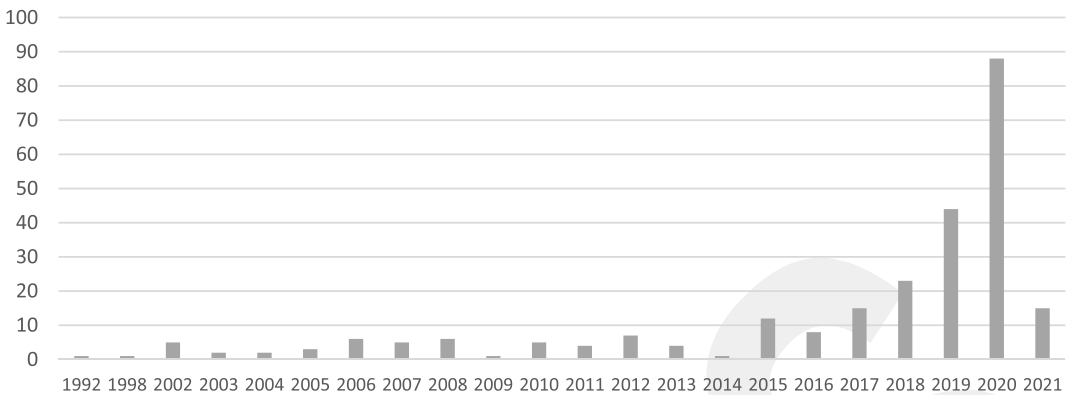


Figure 2. Document numbers by year. Notes: This figure presents the document counts from 1992 to 2021. Source: Scopus.

on this subject were not practical like Suder (2004), Karasalihovic (2006), and Wei (2008). Hence, Caldara and Iacoviello's GPR index help other researchers to study GPR without a need to measure the GPR.

The other significant reason for the increase in GPR papers could be the election of US President Donald Trump and his policies, which increased GPR in the world, especially in China due to the Trade War and in Muslim countries because of the *Muslim Ban* (Shen et al. 2021, 1). Although spikes are shorter in Trump's era, there is a general upward trend after 2016 compared to the previous years. As a result, this increase in tension possibly encouraged GPR research.

Figure 3 shows the citation analysis of sources. *Resources Policy* is linked to energy journals like *Energy Policy*, *Energy*, *International Journal of Energy Sector Management*, or *International Journal of Energy Economics and Policy*. Additionally, fields like sustainability link to the *Resources Policy*. On the other hand, *Defence and Peace Economics* focuses more on general issues and government policies. Hence, it is linked to the *Economic Analysis and Policy*, *International Economics*, *Journal of Public Affairs*. *Economic Modeling* is in the middle of *Resources Policy* and *Defence and Peace Economics*. Apart from them, the *Asia-Pacific Journal of Financial Studies* is an outlier since its research is based on a particular region of the world.

Figure 4 presents the documents by subject area defined by the Scopus database.

Authors affiliated in China, South Africa, Turkey, the United Kingdom (UK), and the US have the greatest total link strength (see Figure 5), and those in Russia can be added to these countries in terms of the number of the publication (see Figure 6). The authors in the US, France, and Greece are in the center of the map in the blue cluster. The authors in other countries in the blue cluster have small link strength and link to these three countries. The authors in China form the biggest red cluster which mostly consists of East Asian countries like Australia, Hong Kong, Japan, New Zealand, South Korea, and Taiwan. Consequently, we can claim that geopolitical proximity is an important factor for citation networks.

The Green Cluster is also significant since leaders of this cluster in terms of total link strength are India, Pakistan, Russia, and Turkey which have high geopolitical risks. If we focus on a country in this cluster, it would be Turkey since it has one of the greatest total link strengths even though the influence of Turkish academy to the world is limited in other fields and Turkey has no or few universities in the top 500 lists.² This can be explained by Turkey's involvement in international political issues in the last years, such as Arab Spring, Syrian War, Libyan Crisis, Eastern Mediterranean Crisis. Additionally, Turkey's GPR generally is higher than the global average (Caldara and Iacoviello 2018). Hence, interest and inquisitiveness towards GPR could be higher in Turkey. Turkey is a part of international political disputes or neighbor of conflicts that could increase the GPR of Turkey, such as ISIS, the US-Iran Tension, the Ukraine-Russia War. As a result, Turkish academic outputs can be seen as the crucial source by the world.

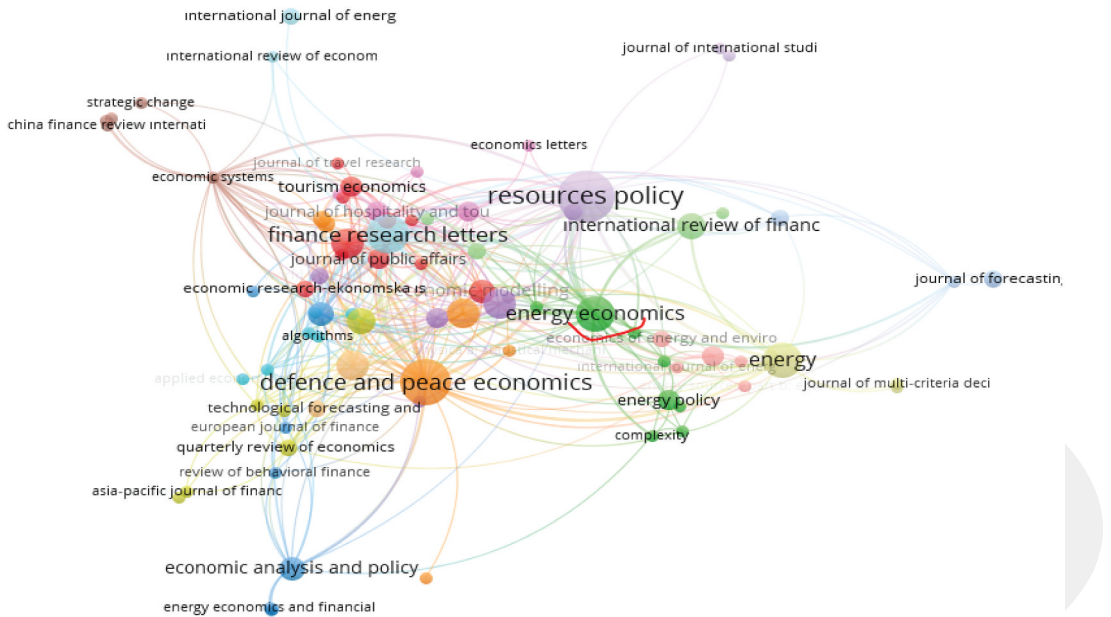


Figure 3. Citation analysis of sources. Source: Scopus.

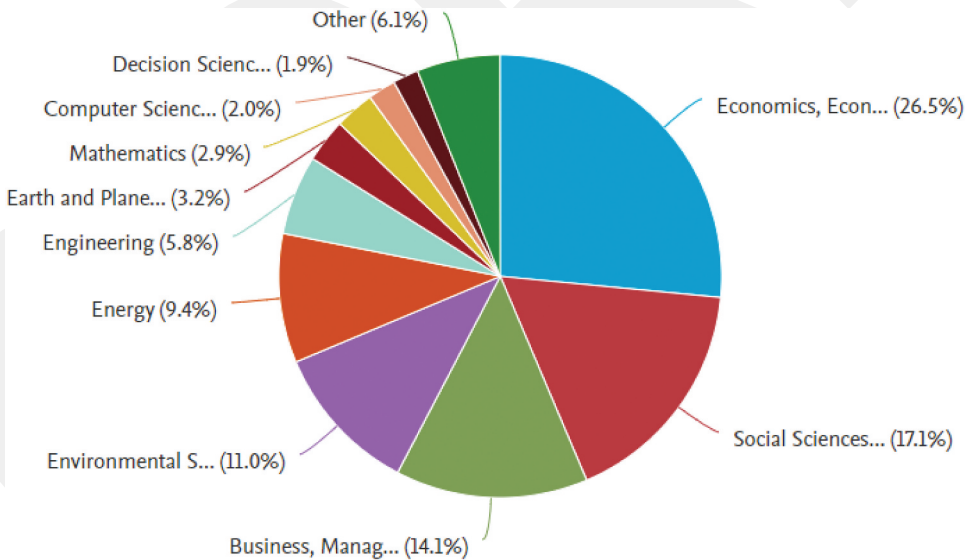


Figure 4. Network map of documents by subject area. Source: Scopus.

The authors affiliated in Russia, France, Greece have also published a substantial number of documents on GPR (see Figure 6). Like Turkey, these countries are also involved in many political disputes. Hence, it can be concluded that the authors affiliated with countries that are implicated in international conflicts or tensions are more likely to study GPR and have greater link strength in the GPR field.

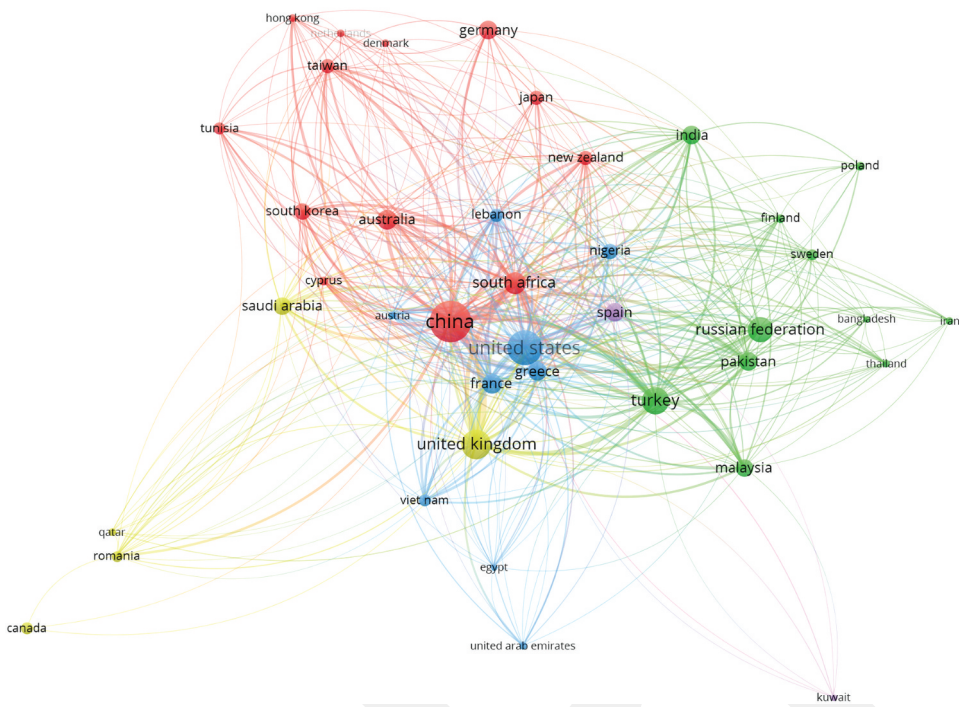


Figure 5. Country-based CITATION Analysis. Notes: The countries where more than two documents were published are taken for the network map. Source: Scopus.

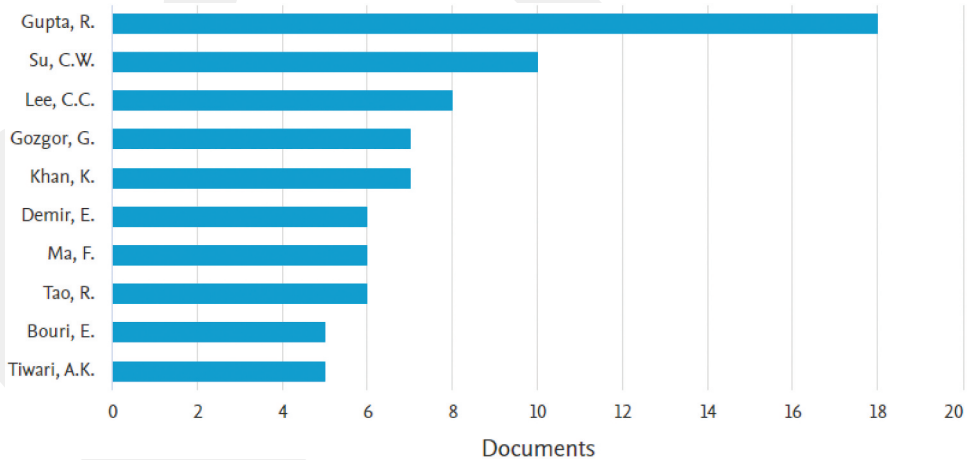


Figure 6. Number of documents by authors' country. Source: Scopus.

Titles are one the most striking part of the studies. Hence, we analyzed the network map of titles of the studies in the GPR field in [Figure 7](#). As expected, GPR is at the center, link with most of the words, and its node's size is prominently greater than any other node, which represents the occurrence of the words in the titles. Uncertainty also has a notable size and is in the same cluster as GPR since they are related and uncertainty links with various clusters like GPR.

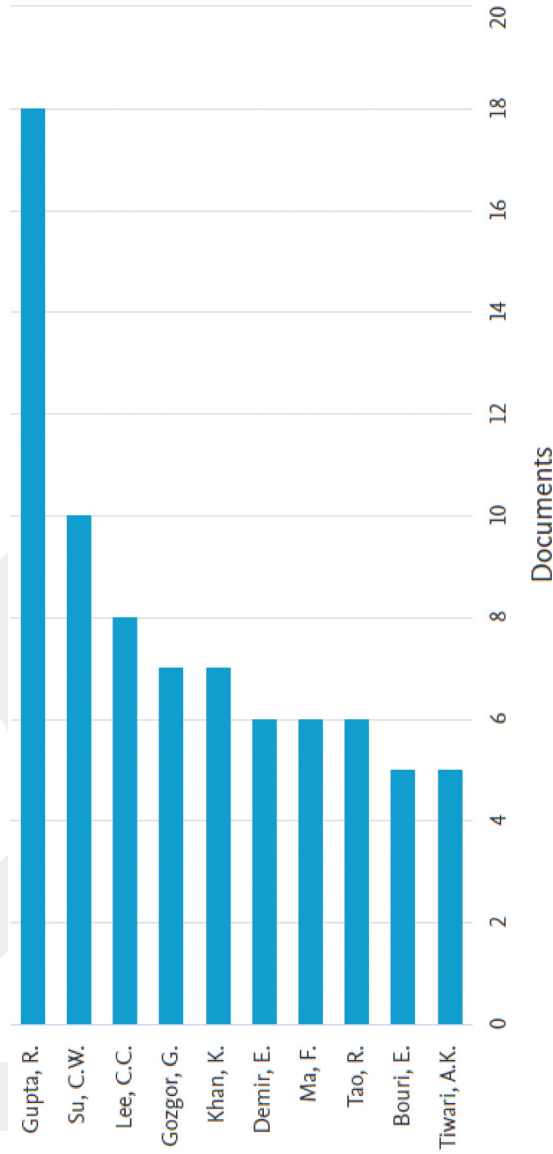


Figure 9. Document numbers by authors. Notes: This figure compares the document counts for up to 10 authors. Source: Scopus.

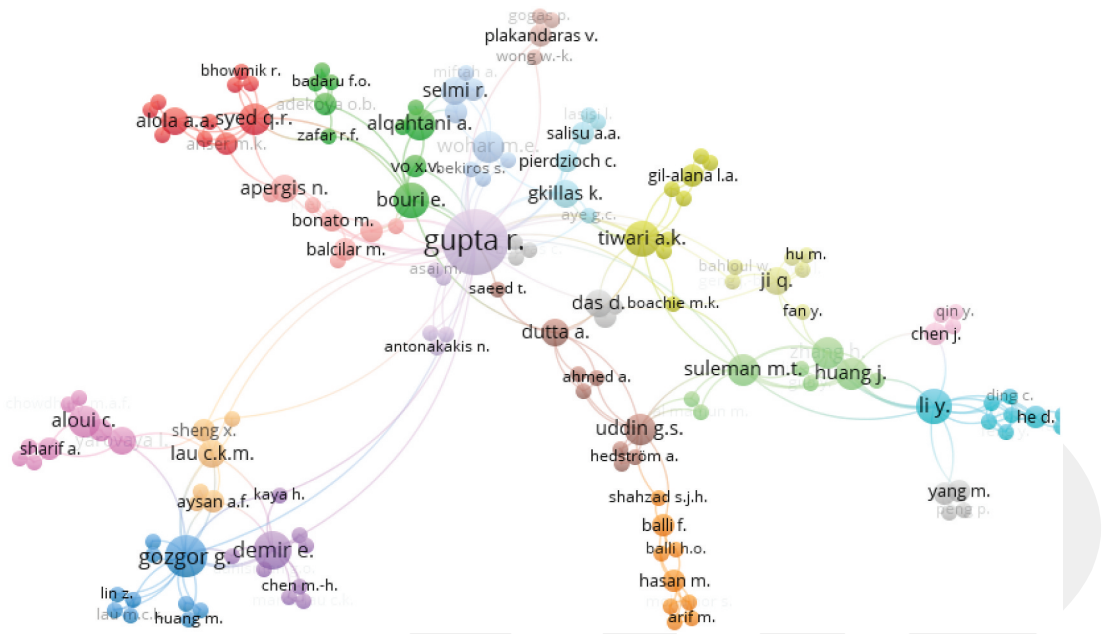


Figure 11. Co-authorship analysis of authors. Source: Scopus.

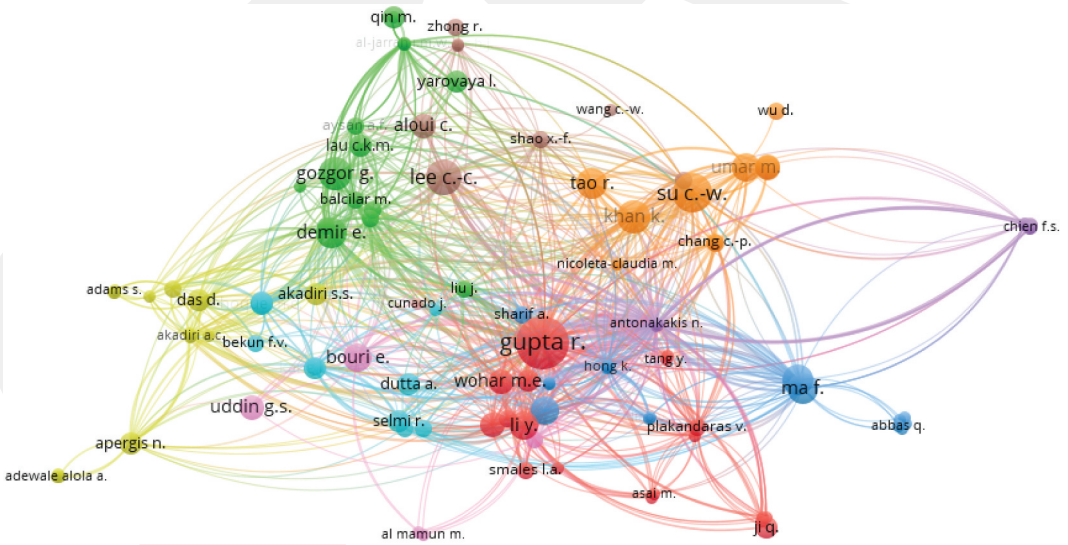


Figure 12. Citation analysis of authors. Notes: Authors with more than ten citations are taken for the network map. Source: Scopus.

The citation analyses by various markets can offer better insights into the literature. We classify the various markets such as oil, bond, foreign exchange, and the stock market by searching documents' titles, abstracts, and keywords. There are substantially more articles related to the oil market (125) than the stock market (47). Papers³ focusing on bond and foreign exchange markets is negligible in terms of the number of documents (nine and two, respectively).

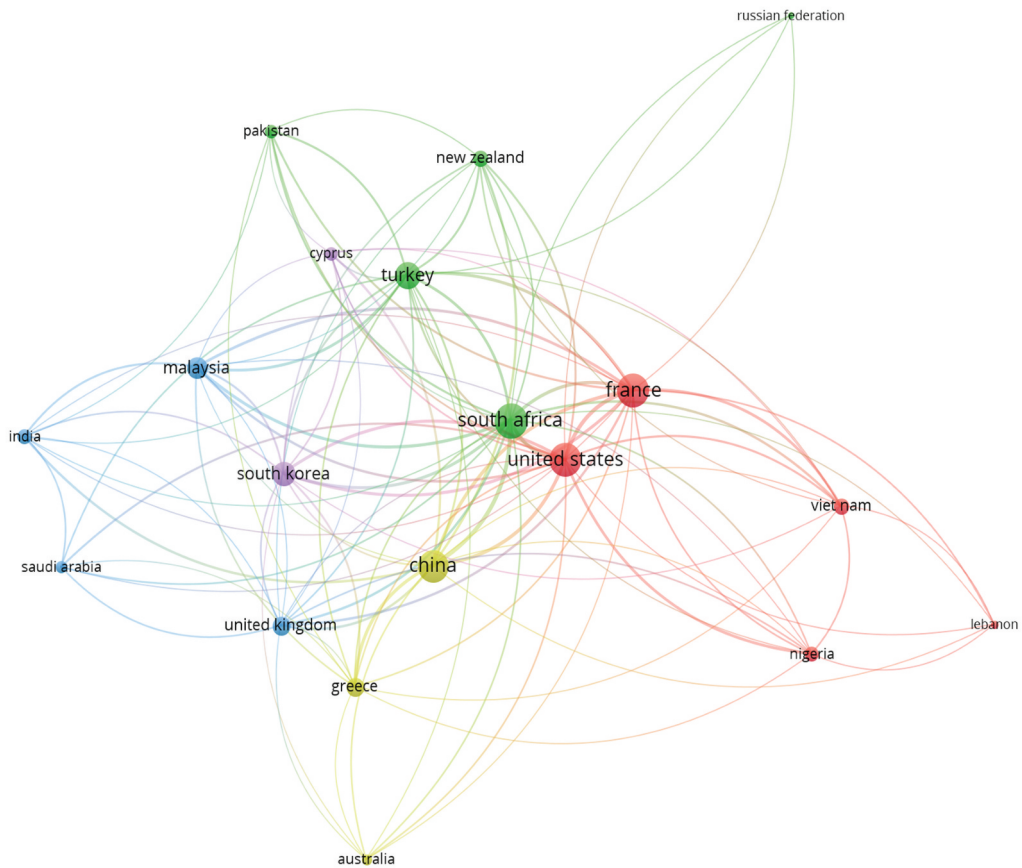


Figure 16. Citation analysis of authors' affiliated country for stock market. Sources: Scopus.

energy although there are some negligible exceptions and interdisciplinary studies. These clusters are observed in the journals as well. The journal *Defence and Peace Economics* leads the GPR research with one of the highest numbers of research and citation. Furthermore, its node is in the center of the citation analysis map and has strong links with social science and finance journals. Besides, there are various energy journals, while they mostly link to each other.

In sum, this study contributes to the literature by presenting the existing research that may give new insights for future works in GPR. Moreover, the GPR research may be extended by interacting with various institutional determinants. For further research, in the coming years, data may be expanded to ensure that momentum in the geopolitical risk continues since parabolic increase exist only couple of years and it may be a temporal and misleading period.

Notes

1. To the best of our knowledge, the GPR index of Caldara and Iacoviello is the main index employed by GPR literature. Other GPR measures are not used by literature since either they are country-specific or not generalizable (e.g. Kim, Park, and Kwon 2019; Kamenopoulos and Agioutantis 2020).
2. See the ranking at <https://www.timeshighereducation.com/student/where-to-study/study-in-turkey>.

- Bond articles are mainly about the US bond market. Foreign exchange market articles are about countries with FX issues like Turkey (Mansour-Ichrakieh and Zeaiter 2019) and some ASEAN countries (Hui 2021).

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