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ORIGINAL PAPER

Effects of geopolitical risks on trade flows: evidence from the gravity model

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Abstract

Using a classical gravity model, this paper examines the effects of geopolitical risks on the trade flows, among 164 developing and developed countries, for the period of 1985–2013. For this purpose, we use the new index of geopolitical risks (GPR index). To the best of our knowledge, this is the first paper in the literature that considers the new GPR index in a gravity model. The paper implements the fixed-effects (FE), the random-effects (RE), the Hausman–Taylor (HT), and the Poisson Pseudo-maximum Likelihood estimations. The findings indicate that geopolitical risks negatively affect the trade flows. The paper also discusses the potential policy implications.

Keywords Geopolitical risks · Trade flows · International trade · Gravity model · Emerging economies · Panel data estimation techniques

JEL Classification F51 · F14 · F17 · D74 · D81 · C33

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1 Introduction

Geopolitical risks are considered as one of the determinants of investment decisions by business investors, central bankers, financial sector, and the press. Hence, geopolitical risks are likely to affect not only business cycles and financial markets, but also international trade, as shown to be the case for the United States (U.S.) by Caldara and Iacoviello (2018). Geopolitics is used to describe the practice of states to control and compete for territory (Pollins 1989a). However, recently, power struggles and other events involving corporations, civil organizations, political parties, and rebel groups, are considered as a part of geopolitics. Therefore, the current usage of the word "geopolitics" covers a diverse set of events with a wide range of causes and effects, from terrorist incidents to nuclear tensions and from global warming to the great trade collapse in 2009 (Caldara and Iacoviello 2018).

Not surprisingly, these events being global in nature and with the modern world being highly interconnected are likely to affect all economies and their international economic relations, i.e. international trade. Traditionally, the so-called gravity models used for studying the trade flows relate the same to measures of joint economic activity and costs of trade (Baier and Bergstrand, 2009). Geopolitical risks are likely to affect international trade by raising the costs to private agents engaging in international business through not only new risks being created but also via escalation of existing risks. This line of reasoning is validated by the international monetary fund (IMF) that highlighted geopolitical uncertainties as a salient risk to the economic outlook (International Monetary Fund 2017). Furthermore, wars and other militarized conflicts may affect trade among partners as those events are mostly followed by the partial or total trade embargoes (Glick and Taylor 2010). At this point, Glick and Taylor (2010) and International Monetary Fund (2017) theoretically and empirically illustrate that there are the direct effects of geopolitical risks on the trade flows.

On the other hand, there could be the indirect effects of geopolitical risks on trade flows via the investment channel. For instance, geopolitical risks can cause the decline of investments due to the increasing costs of doing business and transaction; thus, geopolitical risks can indirectly affect exporting and importing decisions of firms (Balcilar et al. 2018). In addition, geopolitical risks can affect the trade via the exchange rate, the fiscal policy, and the monetary policy channels. According to the theoretical models, the real value of the exchange rates is mainly determined by expectations (Engel 2014). At this stage, geopolitical risks can affect the expectations on monetary and fiscal policy, and these issues can provide significant effects on the exchange rates, thus can affect trade flows (Mueller et al. 2017). The objective of our paper is to investigate the effects of the geopolitical risks, which is measured by a new index of geopolitical risks (GPRs) in 18 emerging economies, on trade flows among 164 countries for the period from 1985 to 2013.

It is noteworthy to note that the importance of the new GPR index comes from the issue that it measures the real time geopolitical risk as perceived by the global

investors, policymakers, the press, and public. We use the news-based indices of GPRs recently developed by Caldara and Iacoviello (2018) and Caldara et al. (2018), who define the geopolitical risks as the risk associated with tensions, terrorist acts, and wars between states that affect the normal and peaceful course of international relations. These indices do not only relate to geopolitical events of the global world, but are also available country-specific levels in 18 emerging economies. Hence, this index helps us to capture geopolitical risks of various forms continuously and enables us to go beyond the impact of specific events at a specific point in time, and in turn, provides a more holistic view of geopolitical risks, beyond just wars and terrorist attacks.[1]

While there exist some studies in economics literature[2] that analyze the relation of international trade to political disturbances and conflict (see e.g., Blomberg and Hess 2006; Glick and Taylor 2010; Martin et al. 2008), our paper aims to analyze the impact of emerging country-specific GPR indices on its international trade relations. We go beyond Caldara and Iacoviello (2018), who just concentrate on the impact of the U.S. gross trade (i.e., the sum of the exports and the imports), and focus on trade flows among 164 countries.[3] Indeed, the GPR indices have recently been used in empirical papers since they have provided useful measures of conflicts, political instability, and terrorism (see e.g., Apergis et al. 2018; Bouri et al. 2018).

The contributions of our paper to the existing literature are as follows. This is the first paper investigating the effects of the geopolitical risks on trade flows in the panel dataset by using the GPR index recently developed by Caldara and Iacoviello (2018). Our paper provides the first empirical evidence in the literature for the effects of the GPRs on the global trade flows. To achieve the objective of the paper, we implement various econometric estimation techniques (the random-effects, the fixed-effects, the Hausman–Taylor (HT), and the Poisson Pseudo-Maximum-Likelihood (PPML) within a classical gravity model of Glick and Rose (2016). It is important to note that the gravity model uses various control variables; and therefore,

[1] While there are other indicators of geopolitical risks, the GPR indices created by Caldara et al. (2018) and Caldara and Iacoviello (2018) overcome various shortcomings of these indices that make them poorly suited for empirical analysis. First, many of the other indices either do not define geopolitical risk or use a wide-ranging definition that includes very different events, ranging from wars to the major economic crises to climate change. Naturally, it is unclear what these indices measure. Second, existing indices are extremely hard to replicate, with these indices, primarily constructed by private companies often not publicly available, being constructed subjectively, and come with a less-than-transparent methodology. Third, many of the indices exhibit very little variation and are available only for a few years. Also, many of them are qualitative indicators of whether countries are politically stable, and are reported using color-coded maps or integer numbers ranging from one to five.

[2] The relation between conflict and international trade has been the focus of mainly political scientists who examine the impact of trade on the likelihood of conflict among countries and also the impact of conflict on international trade. The latter line of research among the scientists; see e.g., Anderton and Carter (2001), Barbieri and Levy (1999), Garfinkel et al. (2008, 2015), Keshk et al. (2004), Mansfield and Bronson (1997), Mansfield and Pevehouse (2000), Morrow et al. (1998, 1999), and Pollins (1989a, b).

[3] Caldara and Iacoviello (2018) also examine the impact of global GPRs on capital inflows in 22 advanced economies, 23 emerging markets, and the U.S. Their results indicate that the GPR indices reduce capital inflows into the emerging markets, but causes an increase into the advanced economies.

addresses a possible omitted variable bias. In addition, we include a relatively long time period (from 1985 to 2013) in the dataset. Finally, we focus on 164 developing and developed countries in our dataset. Our paper shows that the global trade flows have been significantly and negatively affected by the GPR indexes of 18 emerging economies.

The rest of the paper is organized as follows. Section 2 reviews the related literature on the effects of the conflicts, geopolitical risks, terrorism, and wars on trade flows. Section 3 provides the data, the empirical model, and the econometric estimation techniques to estimate the gravity model. Section 4 provides the baseline empirical results as well as the discussions and policy implications. Section 5 concludes.

2 Literature review

There are previous papers in the literature for analyzing the effects of conflict, terrorism, war, and violence on trade flows. For instance, Pollins (1989a) examines the impact of international politics upon trade flows between 25 countries by using the gravity model. It is found that cooperation and international conflict affect trade flows significantly and continuously implying the importance of cooperation among nations. By using the trade patterns between major powers at the beginning of the twentieth century, namely the U.S., the Great Britain, France, Germany, Russia, and Italy, Morrow et al. (1998, 1999) show that common interests and mutual democratic institutions increase trade flows between those countries. The impact of alliances is not clear; however, trade flows are higher between allies in a "multipolar system" compared to allies in a "bipolar system". However, Barbieri and Levy (1999) show that war has almost no statistically significant effect on trade flows and even when war causes a decrease, this is almost always temporary. Moreover, trade between dyads rises during the post-war period. By implementing an interrupted time-series methodology to 14 major power and 12 non-major power war dyads, Anderton and Carter (2001) mostly provide the supportive evidence for the trade disruption premise implying that a war depress trade between countries compared to the pre- and the post-war periods. Nitsch and Schumacher (2004) use a larger data set composed of 200 countries for the period from 1960 to 1993 and analyze the impact of terrorism and warfare on international trade. The augmented gravity model implies that terrorist actions decrease the trade volume. Blomberg and Hess (2006) document that the existence of terrorism with external conflicts acts as a barrier to international trade and their effects are equivalent to a 30% tariff on trade. This effect is even larger than the tariff-equivalent cost of border and language. Martin et al. (2008) examine the interaction between military conflicts and trade. The authors find that military conflicts substantially decrease trade openness and the probability of escalation is lower in countries that trade bilaterally. Interestingly, multilateral trade openness increases the probability of bilateral war as it decreases the bilateral trade dependence between counties. With the data of extending back to 1870, Glick and Taylor (2010) find strong and persistent impacts of wars not only on the trade but also the national income and the global economic welfare. Qureshi (2013) documents the negative effects of the regional conflict on trade flows by using both intrastate

and international warfare in neighboring states in 145 countries over the period 1948–2006. It is also noted that even if the trading partners are not engaged in any conflict themselves, they are still affected. The impact lasts around 3 years for interstate conflicts in neighboring states and 5 years in international conflicts.

By using a sample of more than 160 countries, Pham and Doucouliagos (2017) show that terrorism in a neighboring country decreases the bilateral trade and this effect lasts around up to 5 years after the event. Even terrorist attacks with zero or one death are likely to reduce the trade openness. Lastly, Caldara and Iacoviello (2018) show that geopolitical risks cause a persistent decrease in international trade, and also industrial production and employment in the U.S.

To conclude the literature review, we observe that there are several papers to analyze the effects of conflict, terrorism, war, and violence on trade flows. At this stage, our paper considers the new index of the GPR, which is able to capture all aspects of geopolitical risk, such as, the risk associated with tensions, terrorist acts, and wars. In addition, the GPR index does not only relate to geopolitical events of the global world, but also covers a diverse set of events, such as the climate change and the global financial crisis of 2008–2009. However, the main limitation of the GPR index is that it is only available in 18 emerging economies. Using the new GPR index, our paper provides the evidence on the effects of geopolitical risks on the global trade flows. At this stage, our paper implements various panel data econometric techniques with a longer time-span and a higher number of countries than the previous papers.

3 Data, model, and methodology

3.1 Data and empirical model

We focus on bilateral trade flows among 164 countries for the period from 1985 to 2013.[4] The countries in the dataset are provided in "Appendix 1". The data on geopolitical risk (GPR) index are downloaded from https://www2.bc.edu/matteo-iacoviello/gpr.htm, and it is based on the works of Caldara et al. (2018) and Caldara and Iacoviello (2018). At this point, Caldara and Iacoviello (2018) construct the GPR index by counting the occurrence of words related to geopolitical tensions, derived from automated text-searches in leading 11 national and international newspapers. Then, Caldara and Iacoviello (2018) calculate the index by counting, in each of the above-mentioned 11 newspapers, the number of articles that contain the search terms above for every month starting in 1985. The index is then normalized to average a value of 100 in the 2000–2009 decade.

The search identifies articles containing references to six groups of words.[5] To arrive at the country-level index for each of 18 emerging economies (Argentina,

[4] Note that due to the limitation of the dataset, we use the GPR index of 18 countries in the empirical analysis. This makes our dataset as trade flows from 18 emerging countries to 164 countries.

[5] See "Appendix 2" for the details of each group to construct the GPR index.

Table 1 A summary of descriptive statistics Source: Caldara and Iacoviello (2018) & Glick and Rose (2016)

Variables	Observations	Mean	SD	Minimum	Maximum
Log trade flows (nominal $)	43,013	1.826	3.103	− 13.718	11.566
Log GPR Index	55,062	4.565	0.268	3.581	5.494
Currency union (dummy with transitivity correction)	55,062	0.004	0.060	0.000	1.000
Log distance	55,062	8.389	0.698	3.813	9.403
Regional trade agreement (dummy)	55,062	0.029	0.168	0.000	1.000
Common language (dummy)	55,062	0.144	0.351	0.000	1.000
Land border (dummy)	55,062	0.028	0.166	0.000	1.000
Common colonizer, Post 1945 (dummy)	55,062	0.050	0.218	0.000	1.000
Pairs ever in colonial relationship (dummy)	55,062	0.004	0.061	0.000	1.000
Log GDP of the exporter (nominal $)	55,062	26.779	0.847	24.889	30.123
Log GDP of the importer (nominal $)	55,062	23.470	2.041	16.761	30.123

Brazil, China, Colombia, India, Indonesia, Israel, Korea Republic, Malaysia, Mexico, the Philippines, Russia, Saudi Arabia, South Africa, Thailand, Turkey, Ukraine, and Venezuela), Caldara et al. (2018) include in their search the name of the specific country and words from the above six groups. Note that the data on the GPRs are available at the monthly frequency, which we convert to annual by taking averages over a 12-month period.

In order to examine the effects of the GPR indices on trade flows, we consider a classical gravity model, which is a major workhorse for empirical investigation of the determinants of the bilateral trade flows (see e.g., Head and Mayer 2014). Specifically, we estimate the following gravity equation:

$$\ln Trade_{ijt} = \beta_0 + \beta_1 G_{ijt} + \lambda \ln GPR_{it} + \varepsilon_{ijt}, \quad (1)$$

where i denotes the 18 emerging economies having GPR data, j denotes their trading partners and t denotes time. $Trade_{ijt}$ is the average nominal value of bilateral trade flows (exports plus imports) between 18 countries and their trading partners. G_{ijt} is the vector of a set of variables from the gravity literature (see e.g., Bilgin et al. 2017, 2018; Cieślik et al. 2012; Glick and Rose 2016; Gómez-Herrera 2013; Rasoulinezhad 2018). The control variables are the real gross domestic products (GDPs) of exporter- and importer countries, the distance between countries, dummy variables for the colonial relationship, the common land border, the common language, the currency union, and the regional trade agreement. The bilateral trade data and the control variables in the gravity model are obtained from the dataset of Glick and Rose (2016), in which all of the listed variables are available in 164 countries for the period from 1985 to 2013. The descriptive statistics of the variables are also given in Table 1.

In addition, the correlation matrix for the related variables are provided in Table 2.

Table 2 Correlation matrix

	Log trade flows	Log GPR Index	Currency union (dummy with transitivity correction)	Log distance	Regional trade agreement dummy	Common language dummy	Land border dummy	Dummy for common colonizer post 1945	Dummy for pairs ever in colonial relationship	Log GDP of the exporter	Log GDP of the importer
Log trade flows (nominal $)	1.000										
Log GPR Index	− 0.043	1.000									
Currency union (dummy with transitivity correction)	0.003	0.014	1.000								
Log distance	− 0.294	0.013	− 0.017	1.000							
Regional trade agreement dummy	0.217	− 0.020	0.001	− 0.244	1.000						
Common language dummy	0.108	0.042	0.049	− 0.128	0.061	1.000					
Land border dummy	0.230	0.018	0.003	− 0.407	0.207	0.079	1.000				
Dummy for common colonizer post 1945	0.060	− 0.030	− 0.011	− 0.066	0.090	0.219	0.042	1.000			

Table 2 (continued)

	Log trade flows	Log GPR Index	Currency union (dummy with transitivity correction)	Log distance	Regional trade agreement dummy	Common language dummy	Land border dummy	Dummy for common colonizer post 1945	Dummy for pairs ever in colonial relationship	Log GDP of the exporter	Log GDP of the importer
Dummy for pairs ever in colonial relationship	0.063	0.011	− 0.003	− 0.148	0.074	0.005	0.179	− 0.015	1.000		
Log GDP of the exporter (nominal $)	0.293	0.063	− 0.013	0.036	0.067	− 0.055	0.048	− 0.011	0.033	1.000	
Log GDP of the importer (nominal $)	0.622	− 0.009	− 0.020	0.021	0.109	− 0.048	0.083	− 0.079	0.005	0.025	1.000

Table 2 provides that both the GDPs of exporters and importers are positively related to trade flows. All dummy variables (currency union, regional trade agreement, common language, land border, common colonizer post-1945, and pairs ever in the colonial relationship) are also positively correlated to trade flows. Finally, geopolitical risk index and distance are negatively related to the trade flows. All of these preliminary findings are in line with the theoretical background of the classical gravity models (see e.g., Head and Mayer 2014; Shepherd 2016).

3.2 Econometric methodology

We employ a number panel data estimation methodologies, namely the fixed-effects estimation, the random-effects estimation, Hausman and Taylor (1981) estimation, and the PPML estimation.[6] The fixed-effects estimation is a widely used methodology as it can successfully control for the unobserved pair specific fixed-effects. However, it has a major drawback that the observed time-invariant variables are also dropped from the equation in the estimation process. Hence, we also utilize the random-effects estimation to obtain these estimates, which are the estimates of the coefficient of the aforementioned dummy variables in the model.

In the random-effects estimations, the pair-specific unobservable factors are assumed to be independent to the regressors. The violation of the independence assumption gives rise to biased and inconsistent estimates. Hausman and Taylor (1981) propose the method, which allows for the correlation between some of the regressors and the individual-specific unobservable factors. This estimator is called HT estimator and produces unbiased and consistent estimates (Baltagi et al. 2003). In order to generate the HT estimators, the real GDPs of the countries are assumed to be correlated with the unobserved random factors. Lastly, we employ the PPML estimation methodology. Silva and Tenreyro (2006) argue that when the gravity equation is log-linearized and the standard errors suffer from heteroscedasticity, which is very likely in practice, then estimates may be biased and inconsistent. This kind of heteroscedasticity cannot be handled by adopting the robust standard errors; and hence, the presence of heteroscedasticity in the original nonlinear gravity equation requires a different estimation methodology. The PPML estimator provides a solution and produces consistent estimates of the original equation. Besides, the existences of zeros in the trade data are a problem for log-linearization. In the ordinary least squares (OLS) models, zero observations are dropped and this potentially causes to sample selection bias. The PPML estimator has the ability to include zero observations without any addition to the basic model (Shepherd 2016; Silva and Tenreyro 2006, 2011).

[6] For the details of the estimation techniques in the gravity model, refer to Gómez-Herrera (2013) and Shepherd (2016).

4 Empirical results

4.1 Baseline results

Table 3 shows the estimation results, which are obtained from the different estimation methods. All estimations suggest that a higher level of GPR indices significantly reduces the bilateral trade flows. The elasticity of trade to the GPR is varying between − 0.12 and − 0.18. Specifically, the results from fixed-effects estimation indicate that a 1% increase in GPR index leads to a 0.18% decrease in the trade volume. The lowest elasticity estimate is found from the PPML estimator which suggests that a 1% increase in the GPR index decreases the total trade volume by a 0.12%.

The results in Table 3 show that the distance between the countries is highly important for trade flows. The random-effects and the HT estimations suggest that the distance elasticity of trade is higher than unity. Besides, the estimate of the regional trade agreement is found to be positive and statistically significant. According to the results of the HT and the PPML estimations, having a regional trade agreement expands trade by 37%.[7] The random-effects estimations also suggest a similar increase in the trade volume when there is a regional trade agreement between the countries. Additionally, sharing a common colonizer after 1945 are found to positively affect the trade volume. The remaining control variables (currency union, speaking a common language, and sharing a land border) do not have any statistically significant effects on trade flows.

Lastly, the estimates of both the GDP of exporters and the GDP of importers are significantly positive. The elasticity of trade to importers' GDP is higher than 1. Additionally, the elasticity of trade to exporters' GDP is also higher than 1 according to the results of the fixed-effects, the random-effects, and the HT estimations. However, the PPML estimation finds that it is less than 1.

4.2 Discussion on the results

Our findings show that geopolitical risks negatively affect the global trade flows. To put it differently, our results illustrate that geopolitical risks and tensions have the significant effects on the global trade flows. These results are in line with the previous findings in the literature (e.g., Anderton and Carter 2001; Barbieri and Levy 1999; Glick and Taylor 2010; Martin et al. 2008), but we enhance the previous findings by using a new measure of geopolitical risks. As we have previously discussed, the new geopolitical risk index of Caldara et al. (2018) considers various dimensions of geopolitical risks. We can argue that the rise in protectionist and populist policies is one of the reasons for higher tensions among countries, especially in the developed countries. Considering the coverage period of our data, geopolitical risks have increased during times of the Gulf War, 9/11, 2003 Iraq Invasion, and Iran Nuclear

[7] Note that $37\% \cong (e^{0.32} - 1)$.

Table 3 Results of the benchmark estimations of the gravity model (1985–2013)

	(1) FE	(2) RE	(3) HT	(4) PPML
Log GPR Index	− 0.183*** (− 3.35)	− 0.164** (− 3.07)	− 0.179*** (− 3.49)	− 0.118* (− 2.15)
Log distance	–	− 1.368*** (− 19.34)	− 1.495*** (− 22.10)	− 0.876** (− 12.64)
Regional trade agreement (dummy)	0.333*** (3.74)	0.357*** (4.22)	0.321*** (4.76)	0.320*** (2.61)
Currency union (dummy with transitivity correction)	0.113 (0.32)	0.0845 (0.25)	0.122 (0.32)	− 0.702 (− 1.49)
Common language (dummy)	–	0.912*** (6.39)	0.918*** (7.26)	0.032 (0.25)
Land border (dummy)	–	0.381 (1.46)	− 0.030 (− 0.11)	− 0.059 (− 0.34)
Common colonizer post 1945 (dummy)	–	1.106*** (5.71)	1.179*** (5.40)	0.908*** (3.63)
Pairs ever in colonial relationship (dummy)	–	0.102 (0.32)	− 0.0925 (− 0.22)	0.901*** (4.42)
Log GDP of the exporter	1.224*** (10.70)	1.283*** (19.26)	1.147*** (16.04)	0.814*** (4.43)
Log GDP of the importer	1.182*** (9.32)	1.088*** (19.29)	1.284*** (20.25)	1.298*** (11.90)
Constant term	− 58.35*** (− 27.81)	− 46.71*** (− 23.46)	− 46.56*** (− 32.03)	− 41.136*** (− 10.52)
Observations	43,013	43,013	43,013	43,013
R^2	0.294	0.622	–	0.820

The *t* statistics are obtained from the robust standard errors in parentheses

*$p<0.05$, **$p<0.01$, ***$p<0.001$

Tension in 2006, and we find that those events have negatively affected the trade flows. It is also noteworthy to note that the most noticeable protectionist and populist policies have recently observed in the implications of international trade: Brexit and the protectionist (trade-war) policy of the President Trump in the U.S. (Rodrik 2018). Brexit is a potential withdraw from the largest free-trade area in the world. The protectionist international trade policies of the President Trump are abandoning the Trans-Pacific Partnership (TPP) deal and attempting to reshape the North American Free Trade Agreement (NAFTA).

According to Caldara and Iacoviello (2018), geopolitical risks increase the trade costs and the security spending as well as reduce the insurance coverage of trade flows due to the perception of greater geopolitical risks. Basically, geopolitical risk can affect directly trade flows; especially, there could be direct effects of the geopolitical risks on trade flows via the higher trade costs and higher insurance and security spending.

There could be some policy implications to sustain trade flows during the times of higher geopolitical risks. For example, policymakers can provide the direct subsidies to exporters and importers in order to sustain trade flows during the times of higher geopolitical risks. Specifically, insurance coverage and security spending costs can be set off by public agents. In addition, trade credits with a lower interest rate during the times of higher geopolitical risks can be a significant policy tool to cover the negative effects of geopolitical risk on trade flows. Similarly, implementing tax-relief and tax privilege for exporting and importing firms can be an important policy implications in the period of rising geopolitical risks. Another implication can be that firms should diversify their export markets and this can buffer the negative effects of geopolitical risks on trade flows, especially during the times of higher geopolitical risks. These issues can be specifically crucial in 18 emerging economies in the dataset since they are not only exporters but also importers in our dataset. Indeed, the geopolitical risks have increased during times of the Gulf War, 9/11, 2003 Iraq Invasion, and Iran Nuclear Tension in 2006. These rises in geopolitical risks may lead to postponement (even cancellation) of trade activities and trade decisions due to the concerns of security and stability.

Among controls, we find that the GPDs of both the exporter countries and the importer countries are positively related to trade flows. This finding implies that global economic growth is the significant driver of the global trade flows. Indeed, the decline of the global economic activity leads to the decline of trade flows during the global financial crisis of 2008–2009. This issue, known as the great trade collapse of 2008–2009, illustrates the significant role of the economic activity on trade flows.[8] Our results also indicate that regional trade agreements and being a common colonizer after the post-1945 promote trade flows and these findings are in line with the previous results of Head et al. (2010) and Martin et al. (2012). These

[8] For details of the great trade collapse of 2008–2009, refer to Levchenko et al. (2010). There are also different hypotheses to explain the great trade collapse of 2008–2009. For their details, refer to Alessandria et al. (2010), Bems et al. (2011), Chor and Manova (2012), Eaton et al. (2016), and Novy and Taylor (2014).

findings imply that regionalism and trade blocks, as well as historical relationships, are the significant determinants of the global trade flows. It can be said that the continuity of the regional trade agreements in particular plays an important role in the sustainability of the global trade flows. Finally, according to the findings, although the communication and transportation costs have decreased since the 1990s, when the globalization process accelerated, the distance is still a variable that negatively affects the global trade flows. All of the empirical results are robust to implement the fixed-effects, the random-effects, the Hausman–Taylor, and the PPML estimations.

5 Conclusion

In this paper, we considered a classical gravity model to examine the effects of the geopolitical risks on the global trade flows. For this purpose, we focused on the data from 164 countries for the period from 1985 to 2013. Specifically, we used the new index of geopolitical risks, so called as the GPR index of Caldara and Iacoviello (2018) and Caldara et al. (2018). We considered the new GPR index in a classical gravity model. We implemented the fixed-effects, the random-effects, the Hausman–Taylor, and the PPML econometric techniques to estimate the classical gravity model and the dataset of Glick and Rose (2016).

Our findings mainly indicated that geopolitical risks negatively affect the global trade flows. In addition, we found that the GPDs of both the exporter and the importer countries are positively related to trade flows. The regional trade agreements and being a common colonizer after the post-1945 have promoted the global trade flows. Finally, higher distance among the trading partners has decreased trade flows. All of the results are robust to implement the fixed-effects, the random-effects, the Hausman–Taylor, and the PPML estimations.

The novel finding of our paper is that the geopolitical risk index is also the significant driver of the global trade flows; and therefore, during the times of higher geopolitical risks, policymakers should provide necessary incentives to exporters and importers in order to sustain trade flows. Future papers on this subject can focus on the sub-indexes of the geopolitical risk index. At this stage, geopolitical risk indices can be used in the import demand functions or they can be considered as the potential driver of the exports.

Appendix 1: List of the countries in the dataset

Afghanistan, Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo Democratic Republic, Costa Rica, Cote d`Ivoire, Croatia, Cuba, Cyprus, the Czech Republic, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Gabon, Gambia The, Georgia,

Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Iraq, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Korea Republic, Kosovo, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Macao, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Qatar, Romania, Russia, Rwanda, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovak Republic, Slovenia, Solomon Islands, Somalia, South Africa, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenadines, Sudan, Suriname, Swaziland, Syria, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, West Bank and Gaza, Yemen, Zambia, and Zimbabwe.

Appendix 2: Details of six groups in geopolitical risks (GPR) Index

Group 1 includes words associated with explicit mentions of geopolitical risk, as well as mentions of military-related tensions involving large regions of the world and the U.S. involvement. Group 2 includes words directly related to nuclear tensions. Groups 3 and 4 include mentions related to the war threats and terrorist threats, respectively. Finally, Groups 5 and 6 aim at capturing press coverage of actual adverse geopolitical events (as opposed to just risks) which can be reasonably expected to lead to increases in geopolitical uncertainty, such as terrorist acts or the beginning of a war.

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