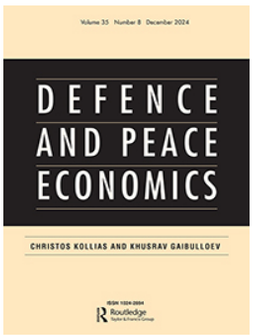

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Do Geopolitical Risks Impact Trade Patterns in Latin America?

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ABSTRACT

The rapid rise of China as a major economic power, characterized by its expanding global trade and financial connections, has significantly heightened geopolitical tensions, particularly with the US. The primary objective of this study is to examine the ramifications of such geopolitical risks (GPR) on trading patterns within Latin America, employing a gravity model. The selection of Latin America stems from its ongoing transformation in power dynamics, with China emerging as the second largest partner, posing substantial competition to the US, which has historically been the region's primary trading partner. This region has also emerged as an attractive investment and trade destination with abundant natural resources and a growing middle class. By focusing on seven of the largest economies in Latin America – Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela – from 2000 to 2020, our study yields valuable insights into the influence of GPR on trade dynamics. The findings underscore the overall detrimental impact of GPR on trade, with a disproportionately adverse effect on imports. This study represents a significant contribution by bridging existing gaps in the literature, particularly within the underexplored context of Latin America, while providing crucial guidance for policy formulation and informing future research endeavours.

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Introduction

China has emerged as a formidable economic and military power in recent years, presenting a substantial challenge to the US. It has driven this seismic shift through its rapid expansion in global trade and financial connectivity and its rise as a major manufacturing hub. China's extensive infrastructure investments, most notably through the Belt and Road Initiative (BRI), have also played a pivotal role in bolstering its global engagements (Schulhof, van Vuuren, and Kirchherr 2022). The BRI has specifically prioritized the development of robust infrastructure networks in emerging markets, thereby amplifying China's global influence and presence and positioning it as a formidable competitor to the US (Wiig and Silver 2019). The increasing influence of China is particularly conspicuous in Latin America, where its share in the region's trade has experienced a remarkable surge from less than 2% in 2000 to becoming the second largest trading partner by 2021 (Roy 2023). Along with trade, China has also emerged as a significant investor, accounting for 9% of the region's overseas foreign direct investment (OFDI) (Roy 2023).

Latin America presents a compelling opportunity for studying the dynamics of the US-China rivalry due to several significant factors (Berg and Bena 2021; Devlin, Estevadeordal, and Rodríguez-Clare 2006). First, the region possesses abundant and highly sought-after natural resources that attract both the US and China. Latin America is rich in reserves of minerals,

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energy resources, and agricultural products, including oil, natural gas, copper, soybeans, and coffee. These resources play a vital role in both nations' economic growth and development, making the region an attractive destination for investment and trade. Second, Latin America offers a substantial consumer market with a rapidly growing middle class. With a population exceeding 650 million (UN 2022), the region provides a sizable customer base for goods and services worldwide. As China and the US compete for market access and trade dominance, the region presents an alluring opportunity for these countries to expand their export markets and strengthen their economic presence. Besides, Latin America has undergone significant political and economic shifts in recent decades. Historically, the US has been the dominant trading partner in the region, characterized by strong economic ties and shared cultural heritage. However, Latin America encompasses diverse political ideologies, ranging from left-wing governments to market-oriented democracies. China has leveraged its state-led economic model to establish alliances with left-leaning governments, providing attractive financial assistance and infrastructure investments through initiatives like the BRI. This clash between divergent political and economic ideologies has heightened the competition between the US and China for regional influence. Also, in recent years, many nations in the region have tried diversifying their trading partners, seeking closer ties with emerging economies such as China and engaging in regional integration efforts like Mercosur and the Pacific Alliance (Lehoczki 2020).

While international trade offers numerous advantages, it exposes countries to vulnerabilities and potential disruptions arising from geopolitical risks (GPR)[1] for several reasons. First, deepening trade ties fosters a growing reliance among countries to exchange goods, services, and resources. This interdependence creates vulnerabilities that can impact interconnected economies. Disturbances in one country's economy propagating to its trade partners, resulting in supply chain disruptions, market volatility, and economic downturns, exemplify the interconnectivity and vulnerability within the global trading system. For example, during the Ukraine conflict, the European countries' dependence on Russian oil rendered them vulnerable to disruptions in such vital resources (IEA 2022). Several studies, such as Bekkers and Góes (2022), document the cost of trade disruption due to geopolitical conflicts. Second, expanding trade relationships entails dependence on specific trade routes and transportation networks. Geopolitical tensions in regions critical to these trade routes, such as maritime chokepoints or transit corridors, pose significant risks. Disruptions to these routes can impede the smooth flow of goods, causing delays, increased costs, and potential shortages. Several studies, such as Chapman (2016) and Michail and Melas (2022), document the impact of geopolitical tensions on trade routes and transportation. Third, using trade as a political leverage or retaliation tool can escalate GPR further. Imposing tariffs, trade barriers, or sanctions in response to geopolitical tensions can disrupt trade flows, impede economic growth, intensify geopolitical uncertainties and impact consumer welfare (Cerutti, Gopinath, and Mohammed 2014). Finally, GPR from one region can have far-reaching spillover effects, impacting global markets and trade networks. The eruption of geopolitical tensions can trigger a chain reaction, influencing commodity prices, supply chains, investor confidence, and overall market stability (Sweidan 2022; Zhang, Wang, and Li 2023). Thus, given the interconnectedness of the global economy, disruptions in one region can have ripple effects worldwide, thereby amplifying the impact of GPR.

The increasing prominence of China as a major trading partner in Latin America brings forth the significance of the associated GPR arising from China's involvement, which can have far-reaching consequences for regional trade dynamics. This study aims to explore the effects of GPR on trading patterns within Latin America by utilizing the GPR index developed by Caldara and Iacoviello (2022).[2] This index effectively captures geopolitical events reported in prominent US, UK, and Canadian newspapers through automated text searches.[3] Notably, the GPR index has been widely employed in existing literature to examine its impact on various aspects such as corporate investments (Dissanayake, Mehrotra, and Wu 2018), stock market volatility (Singh and Roca 2022), tourism demand (Tiwari, Das, and Dutta 2019), gold prices (Baur and Smales 2020), as well as oil returns and volatility (Demirer et al. 2020; Drobetz et al. 2021).

The dynamic and evolving environment in Latin America provides a fertile ground for analyzing and comprehending the strategies, alliances, and economic interactions between the US and China, offering valuable insights into the broader implications of their rivalry in global trade. This study represents the first attempt to assess the impact of GPR on trade patterns in Latin America, considering the region's dynamics with China and the US. The research question is: *How do geopolitical risks affect trade in Latin America?* The findings reveal that while GPR originating from the US continues to impact the overall bilateral trade in the region, risks stemming from China are also increasingly influential in shaping trade dynamics with Latin America.

The motivation behind this study lies in the rising prevalence of GPR, which has been exacerbating regional and global tensions and has the potential to disrupt economic and trade activities, leading to welfare losses in Latin America. Therefore, it is imperative to assess the evolution of these risks, particularly considering China's emerging role and the region's longstanding partnership with the US. Moreover, GPR can negatively affect foreign investments by increasing business and transaction costs, indirectly affecting firms' decisions regarding exports and imports (Gupta et al. 2019). Furthermore, such risks can disrupt global value chains, impacting the ability to import and export from various locations (Balcilar et al. 2018).

The study offers several notable contributions. First, while the impact of GPR on global trade is widely acknowledged, there remains a dearth of empirical studies specifically examining this phenomenon in the Latin American region. This study fills this significant gap in the literature by providing evidence and insights into the effects of GPR on trade dynamics in Latin America. Second, the insights hold practical implications for firms and other stakeholders engaged in international trade. By shedding light on the relationship between GPR and trade patterns, the findings can aid these entities in optimizing their risk management strategies and decision-making processes. Armed with a better understanding of the influence of GPR on trade, firms can proactively assess and mitigate potential risks, thereby enhancing the efficiency and resilience of their operations in the face of geopolitical uncertainties. Lastly, the results of this study can inform regional policy-making efforts to address the vulnerabilities arising from GPR. By recognizing the impact of these risks on trade patterns, policymakers can develop more effective strategies to manage and respond to geopolitical uncertainties. This proactive approach can contribute to policies that promote economic stability, reduce trade disruptions, and bolster the region's ability to navigate the challenges posed by geopolitical risks.

The study follows the following outline. After the introduction in Section 1, Section 2 reviews the relevant literature. Section 3 outlines the model and data, and Section 4 presents the results. Finally, Section 5 concludes the study and provides policy implications.

Literature Review

Geopolitical Risk as a Significant Disruptor of International Trade

Several studies in the literature evaluate the impact of GPR on stock market performance (Balcilar et al. 2018; Li et al. 2021; Singh and Roca 2022). Others focus on assessing the influence of GPR on specific markets, such as oil (Lee and Lee 2020), gold (Baur and Smales 2020; Tiwari et al. 2020) and tourism (Demiralay and Kilincarslan 2019; Tiwari, Das, and Dutta 2019).

Unlike political risks, GPR has the potential to transcend national borders, resulting in cross-national spillover effects (Singh and Roca 2022). Geographic proximity, political alignment, and economic ties between nations all influence the transmission of GPR spillovers (Balli et al. 2022). GPR can influence international trade through various mechanisms. One such impact is the rise of protectionism, which can restrict trade flows and hinder globalization efforts, as highlighted by Glick and Taylor (2010). Moreover, GPR can harm foreign investments, impede firms' expansion into global markets (Balcilar 2018), and influence exchange rates by triggering shifts in monetary and fiscal policies (Engel 2014; Mueller, Tahbaz-Salehi, and Vedolin 2017).

Despite the evident concerns surrounding GPR, the literature largely ignores its specific implications for emerging economies. Understanding how GPR affects trade dynamics in emerging markets is crucial for policymakers, businesses, and other stakeholders seeking to navigate the challenges posed by geopolitical uncertainties (Cheng and Chiu 2018). In particular, very few investigate the geopolitical implications of China's emergence as a significant actor in Latin America (Roett and Paz 2016; Vadell 2013). Notably, to the best of our knowledge, there is a paucity of research examining the implications of GPR on trading patterns, particularly in the context of the US-China dynamics within the region. Thus, this study aims to fill this gap in the literature by assessing how GPR originating from the US and China, along with domestic GPR, influences trade dynamics in the region.

China and the US Interact as Significant Economic Players in Latin America

The US and China represent the major trading partners for Latin America (WITS 2022). Due to their abundant natural resource reserves, the region is becoming increasingly attractive to global economic powers. For instance, as the demand for lithium and zinc rises, particularly in the growing electric vehicle industry, Chile and Argentina have emerged as key players, jointly holding 25% of the world's estimated lithium reserves. Additionally, Peru, Mexico, and Bolivia account for 19% of global zinc reserves (Copley 2021). Regarding copper production, Chile is the world's largest producer, followed by Peru (Government of Canada 2022). Brazil is the second-largest iron ore producer globally, ranks among the top 10 nickel producers, and is the largest producer of niobium.

The region's abundant natural resources have attracted foreign investments and triggered shifts in geopolitical dynamics among global superpowers (Nolte and Wehner 2015). The largest economy in the region, Brazil, experienced a notable 20% increase in foreign direct investment (FDI) in 2019, amounting to $72 billion (Montoya, Lemus, and Kaltenecker 2019). Despite experiencing a slowdown, Mexico, the second-largest economy in the region, attracted $33 billion in foreign investments in the same year. Other regional economies also received substantial FDI inflows, with Colombia receiving $14 billion, Chile receiving $11 billion, and Peru receiving $8.9 billion the same year (*Ibid*).

The US has traditionally held a dominant position as an economic and trade partner for Latin American regions. However, China has emerged as a formidable competitor in recent years. Between 2000 and 2021, bilateral trade between China and Latin America experienced significant growth, expanding more than 25 times from an initial base of $12 billion. Moreover, China's share of the region's total trade has increased eightfold, from 1.7% to 14.4% (Larraín and Zhang 2021). Projections indicate that by the end of the decade, trade between China and Latin America is expected to surpass the combined trade between the EU and the UK, constituting approximately 20% of the region's total trade volume (WEF 2021). In addition to its role as a trade, supply chain, and technology source, China has become a significant credit provider, surpassing institutions such as the World Bank and the International Monetary Fund regarding bank loan offerings (Horn, Reinhart, and Trebesch 2021). According to Portada, Lem, and Paudel (2020), Chinese foreign aid in Latin America exists as a complementary strategy to its broader economic objectives, particularly its pursuit of access to raw materials.

Despite the appealing factors for foreign investment in Latin America, the region has historically faced significant challenges regarding high trade costs due to the region's geographical characteristics, inadequate transportation and logistics infrastructure, and shortcomings in hard and soft infrastructures (Aguilera et al. 2017). Moreover, political instability resulting from rapid shifts in ideological orientations in several countries has created an environment of unpredictability and hostility towards FDI (Morgenstern and Bohigues 2021). Notably, nationalistic trends have emerged, such as the potential threat of nationalizing the Camisea gas project in Peru and Mexico's plans to nationalize domestic lithium extraction and production (UNCTAD 2020) and the rise of the left-leaning leaders such as the incoming President of Brazil (Berg and Bena 2023). These developments further contribute to the complexity and uncertainty surrounding investment prospects in the region.

A pivotal complement to China's global economic juggernaut has been its BRI initiative to drive global trade connectivity and improve trade cooperation with its core component, the 'Digital Silk Road.' The initiative holds substantial geopolitical implications as China invests in communication and technological infrastructure across BRI participant countries. By fostering partnerships with emerging markets, the BRI strategy promotes global development and trade (Montoya, Lemus, and Kaltenecker 2019) by constructing roads and maritime ports (Goswami and Panthamit 2022). These infrastructure investments aim to bolster bilateral trade and contribute to the overall economic development of local economies (Portada, Lem, and Paudel 2020). In response to China's growing influence through the BRI, the US and its Western allies have initiated the Build Back Better World (B3W) initiative,[4] representing a unified vision for global infrastructure development partnerships (Portada, Lem, and Paudel 2020).

The Latin American region has gained strategic importance due to its significant role as a supplier of crucial commodities such as agricultural produce and minerals. This has intensified geopolitical tensions between the US and China (Malamud and Schenoni 2020). The dynamics of globalization and its impact on trade and supply chain optimization have also affected the relationships, prompting Latin American countries to adopt distinct positions (Zhang and Engelke 2021). The historical dominance of the US in the region has further contributed to escalating tensions, leading some countries, like Mexico, to oppose China's influence in an attempt to counterbalance US power (Hongbo et al. 2016). However, "despite great regional heterogeneity, most countries have publicly opted for a neutral position, demonstrating a willingness to work with both parties in respective areas of interest (Zhang and Engelke 2021). For instance, Brazil has actively sought to strengthen its ties with China, a trend that gained momentum with the election victory of the left-leaning leader, President Luiz Inácio Lula da Silva (Berg and Bena 2023; Tavares and Nedal 2009).

Hypothesis

In this study, we contend that the GPR originating from Latin American countries, the US and China will have a detrimental effect on trade flows in the region. To evaluate this impact, we employ an index measuring the GPR level in Latin American countries and those in the US and China. Given the significant role of the US and China as major trading partners in Latin America, we posit that the GPR emanating from both countries serves as a critical determinant of the region's trade patterns.

We decompose the impact of GPR into two distinct components: direct effects and indirect effects. For instance, a higher level of GPR from China can lead to a decline in trade between China and Latin American countries (direct effect). Conversely, due to the global rivalry between the US and China, the GPR from the US can prompt Latin American countries to intensify their trade with China (indirect effect). Similarly, the GPR from China can increase trade between Latin America and the US. Based on these considerations, we formulate the following hypotheses:

H1: Both the GPR originating from China and the domestic GPR on Latin American countries negatively affect trade between Latin America and China (direct effect), while the impact of GPR from the US is positive (indirect effect).

H2: Both the GPR originating from the US and the domestic GPR negatively affect trade between Latin America and the US (direct effect), whereas the impact of GPR from China is positive (indirect effect).

Model and Data

We use a modified gravity model to capture the impact of GPR in Latin America as follows[5]:

$$Y_{i,j} = a + b_1 GDP_{it} + b_2 GDP_{jt} + b_3 GPR_{it} + b_4 GPR_{jt} + b_5 distance + \varepsilon_t$$

where
$y = \ total\ trade(exports + imports); exports; imports$
$GDP = real\ Gross\ DomesticProduct$
$GPR_{it} = geopolitical\ risk\ index$
$distance = distance\ as\ the\ crow\ flies\ between\ the\ capitals$
t = *time*
$i = Latin\ American\ countries(Argentina, Brazil, Colombia, Peru, Chile, Mexico\ and\ Venezuela)$
$j = China, US.$

When examining the impact of GPR, it is imperative to consider domestic risks and the factors contributing to the transmission of these risks across countries. Factors such as geographic proximity, political alignment, and economic ties between countries can amplify the spillover effects of GPR (Balli et al. 2022). For Model 1, we include all independent variables, including GPR from China and the US, to measure both the direct and indirect effects. In Model 2, we exclude the GPR from China and the US when measuring trade with the US and China, respectively, to isolate the direct effect of domestic GPR.

Furthermore, we conduct separate tests for each Latin American country to assess the impact of domestic GPR and the GPR from the US and China. The gravity model incorporates geographic distance, as previous studies have demonstrated its negative effect on bilateral trade as an influencer of GPR spillover across borders (Balli et al. 2022; Gupta 2019). Real GDP estimates a country's real income and serves as a proxy for welfare gains, so a higher GDP is likely to result in higher trade volumes (Zestos and Tao 2002).

In our estimation process, we adopt a robust least square model, which is known for its reduced sensitivity to outliers. Specifically, we utilize the MM-estimators proposed by Yohai (1987) due to their ability to handle outliers present in the variables, as observed in our dataset. The identification of outliers is depicted in **Figure A.1,** provided in the Appendix. The model's underlying principle involves minimizing an objective function by incorporating weighting functions that diminish the impact of outliers, thereby enhancing the robustness of the estimation.

Lastly, we utilize the impulse response function (IRF) to evaluate the impact of a singular shock on trade by employing the generalized impulses proposed by Pesaran and Shin (1998). It constructs a set of orthogonal innovations that are not influenced by the ordering of variables in the Vector Autoregression (VAR) model. The generalized impulse responses, which depict the effect of innovation on the j-th variable, are obtained by applying a variable-specific Cholesky factor where the j-th variable is placed at the top of the Cholesky ordering. This Cholesky factorization identifies the causal relationship between variables. It allows us to trace the effect of innovation in one variable (GPR) on the subsequent values of the other variables (trade with Latin America).

The monthly GPR index data spanning from 2000 to 2020, which captures the geopolitical risk from the US, China, and Latin American countries, are sourced from Caldara and Iacoviello website (https://www.matteoiacoviello.com/gpr.htm). In addition, the control variables used in the analysis include GDP and distance. Distance data obtained from Google Maps measures the direct distance between the capital cities of the respective countries. For example, we calculate the distance between the US and Brazil by determining the distance between Washington and Brasilia.[6] The quarterly GDP and monthly trade data, encompassing imports and exports, are sourced from the World Bank.

Results

Trade Dynamics

Over the period from 2000 to 2020, there has been a significant transformation in foreign trade dynamics between Latin American countries and their major trading partners. Notably, the US has witnessed a decline in its share of total trade with all seven Latin American countries during this period. In contrast, China's share has experienced a corresponding increase (see Figures 1 and 2). Except for Colombia and Mexico, the remaining countries have relied more on China as a trading partner than the US. Among these nations, Chile stands out as the most dependent, with China accounting for 29% of its trade in 2020 as opposed to a mere 5% in 2000. Following closely behind is Brazil, the largest economy in the region, which exhibits a trade dependency of 26% on China.

Mexico and Colombia were the only Latin American countries relying more on trade with the US than China. In 2000, the US accounted for the largest share of Mexico's international trade, amounting to 81%. The North American Free Trade Agreement (NAFTA) and its successor, the United States-Mexico-Canada Agreement (USMCA), can be attributed to facilitating trade between the two nations, supported by their geographic proximity. However, the US share gradually decreased to 63% by 2020. In contrast, China's presence in Mexico's trade portfolio experienced a notable upswing, with its share rising from 1% in 2000 to 9% in 2020, reflecting the impact of the ongoing US-China trade dispute.

Similarly, the US was the primary trading partner for Colombia, although its share declined from 51% to 30% during the same period. Meanwhile, China's footprint in Colombia's trade landscape expanded from 2% in 2000 to 16% in 2020. In the case of Venezuela, the ongoing trade sanctions had a significant impact, leading to a substantial decline in trade with the US. The US share of Venezuela's total trade plummeted from 45% to 8%.

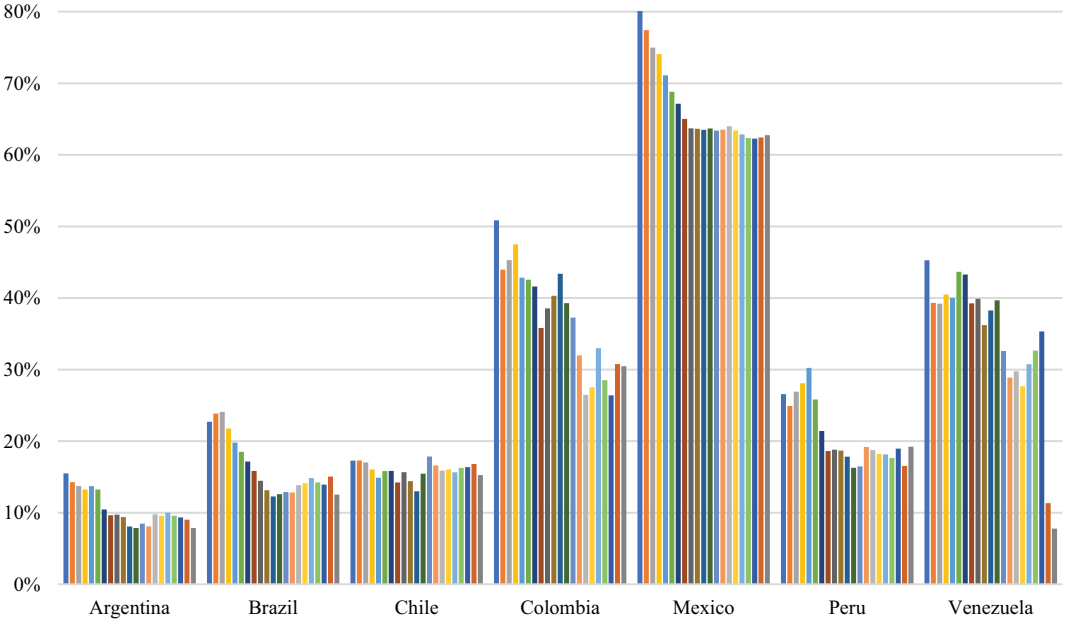

Figure 1. Trade with the US as % of total trade (2000-2020). Source: World Bank.

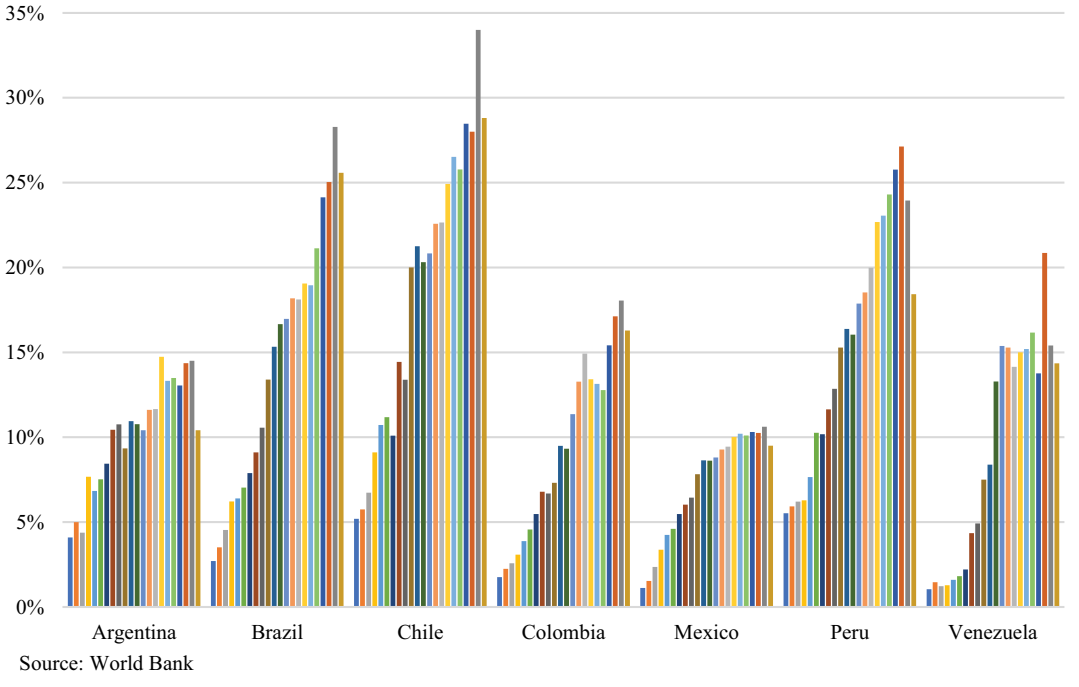

Figure 2. Trade with China as % of total trade (2000-2020). Source: World Bank.

The remaining countries in the region also experienced a reduction in the US share of their trade. Argentina's trade with the US decreased from 15% to 8%, Brazil's from 23% to 13%, Chile's from 17% to 15%, and Peru's from 27% to 19%. Concurrently, China's share of trade with these countries increased: Argentina from 4% to 10%, Brazil from 3% to 26%, Chile from 5% to 29%, Peru from 6% to 18%, and Venezuela from 1% to 14%.

It is noteworthy that while Mexico, Argentina, and Chile exhibited a trade deficit with China (imports exceeding exports), Brazil and Peru experienced a trade surplus. China emerged as the primary destination for exports and a significant source of imports for Brazil, Peru, and China itself while ranking as Argentina's second most important trading partner. This shift in trade patterns underscores the growing significance of China as a major player in the Latin American trade landscape, marking a substantial departure from the historical dominance of the US.

Regression Results

The regression analysis yields noteworthy findings regarding the impact of GPR on total trade between the US/China and Latin America. The findings on trade between Latin America and China reveal that the Chinese GPR does not significantly influence the overall trade volume between the two regions. However, it is worth noting that imports from China are directly affected by GPR (refer to Table 1), thereby supporting H1 concerning imports. The indirect effects are only observed for exports as the US GPR leads to higher exports to China. Interestingly, domestic GPR only negatively impacts exports from China but positively impacts imports. Thus, risks originating from Latin American countries increased reliance on China.

The results for trade between Latin America and the US indicate a negative association between GPR and the US on total trade (Table 1). Consequently, these results support a direct effect as

Table 1. Total trade, exports, and imports (regression estimates).

	Total Trade		Exports		Imports	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Trade with China						
constant	−35.994***	−35.956***	−35.164***	−33.949***	−38.447***	−38.832***
	(0.66)	(0.60)	(1.14)	(1.03)	(0.62)	(0.56)
GPR_{CHINA}	−0.057	−0.053	0.284*	0.380**	−0.265***	−0.302***
	(0.09)	(0.09)	(0.16)	(0.15)	(0.09)	(0.08)
GPR_{LATIN}	−0.507	−0.501	−6.044***	−5.851***	1.380***	1.302***
	(0.32)	(0.32)	(0.55)	(0.55)	(0.30)	(0.30)
GPR_{US}	0.002		0.065**		−0.022	
	(0.02)		(0.03)		(0.01)	(0.02)
GDP_{LATIN}	0.830***	0.830***	0.563***	0.558***	0.907***	0.908***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
GDP_{CHINA}	0.858***	0.857***	0.988***	0.952***	0.870***	0.882***
	(0.03)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)
distance	−0.009*	−0.009*	0.052***	0.053***	−0.024***	−0.025***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)
R^2	0.671	0.671	0.417	0.415	0.695	0.694
N	1764	1764	1764	1764	1764	1764
Trade with the US						
constant	−2.639	−0.697	5.520**	6.697***	−22.871***	−20.962***
	(2.39)	(1.96)	(2.53)	(2.07)	(1.41)	(1.15)
GPR_{LATIN}	4.615***	4.553***	−0.076	3.629***	−0.122**	−1.672***
	(0.32)	(0.31)	(0.09)	(0.33)	(0.05)	(0.18)
GPR_{US}	−0.043***	−0.050***	3.680	−0.036**	−1.582***	−0.030***
	(0.01)	(0.01)	(0.33)	(0.01)	(0.19)	(0.01)
GPR_{CHINA}	−0.126		−0.032**		−0.024***	
	(0.09)		(0.02)		(0.01)	
GDP_{LATIN}	0.816***	0.817***	0.843***	0.845***	0.643***	0.645***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)
GDP_{US}	−0.281***	−0.353***	−0.603***	−0.647***	0.529***	0.457***
	(0.09)	(0.07)	(0.09)	(0.08)	(0.050	(0.04)
distance (x1000)	−0.267***	−0.268***	−0.352***	−0.353***	−0.083***	−0.083***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.000	(0.00)
R^2	0.481	0.480	0.575	0.575	0.448	0.447
N	1764	1764	1764	1764	1764	1764

Note: ***, **and *signify significance levels of the coefficients at 1%, 5% and 10%, respectively. The standard errors are in brackets. The results depict the estimates of the gravity model. Model 1 includes all independent variables, including GPR from China and the US, to measure both the direct and indirect effects. Model 2 excludes the GPR from China and the US when measuring trade with the US and China, respectively, to isolate the direct effect of domestic GPR.

postulated in H2. On the other hand, GPR from China also demonstrates a negative effect on Latin American imports and exports with the US, thereby negating the hypothesis of an indirect effect in H2. Similar to the results for China, the domestic GPR increases trade with the US, including imports and exports.

Consistent with our expectations, the analysis demonstrates a negative association between distance and trade for trade with China and the US. Furthermore, in line with the predictions set forth by the gravity model, the empirical findings provide evidence of a positive relationship between GDP and trade with the US and China – this indicates that a higher domestic, US and Chinese GDP is associated with increased levels of trade with these two countries.

Evaluating the US trade relationships with specific Latin American nations, it is evident that the overall trade volume between the US and Argentina, as well as Mexico, experienced detrimental consequences due to GPR originating from the US. This finding provides supporting evidence for H2 regarding the direct effects, as illustrated in Table A2. Additionally, the GPR originating from the US had a notable influence on exports to Colombia, Mexico, and Venezuela. This phenomenon

impacted imports from the US to Argentina and Brazil. Furthermore, we observed an indirect effect where Chinese GPR increased trade with the US, specifically affecting exports to Colombia. On the other hand, Chilean and Colombian exports to China directly experienced the trade-disrupting effects of GPR from China. Moreover, domestic GPR impacted the total trade volume and exports between the US and Brazil. Domestic GPR also affected exports to Peru and Venezuela, along with imports to Mexico.

Similarly, several countries exhibited susceptibility to GPR originating from China, as indicated in Table A3. Notably, Argentina and Chile demonstrated a negative correlation between their total trade with China and the GPR from China, thereby supporting the direct effects posited by Hypothesis 1. Furthermore, the GPR from China impacted Chilean and Mexican exports to China, while a similar effect affected Chinese imports from Argentina, Chile, Colombia, and Peru. Consequently, a greater number of countries reported vulnerability to Chinese GPR compared to that from the US. Regarding indirect effects, GPR from the US caused an increase in both total trade and imports with Chile, while a similar trend is evident for exports to Mexico. Additionally, domestic GPR reduced Chinese trade with Colombia and Peru, driven by Colombia's vulnerability in exports and imports, as well as Peru's imports.

In summary, the imports of Chinese goods and services to Latin America are influenced by GPR from China, providing evidence supporting the direct effects in Hypothesis 1 (H1). Indirect effects that support H1 are observed as the GPR from the US enhances Latin American exports to China. Specifically, Argentina experiences vulnerability in total trade and exports, while Chile demonstrates vulnerability in total trade, exports, and imports due to the Chinese GPR. Moreover, Chinese imports to Colombia and Peru, as well as exports from Mexico, are affected by GPR from China. On the other hand, the GPR from the US impacted the overall trade volume in Latin America, supporting the direct effects proposed in Hypothesis 2 (H2). However, the results do not support the indirect effects suggested in H2, as the GPR from China does not positively influence Latin American trade with China. Argentina and Mexico exhibit vulnerability regarding their overall trade volume to GPR from the US. Additionally, exports from Colombia, Mexico, and Venezuela, as well as imports to Argentina and Brazil, are impacted by GPR from the US.

Impulse Response

Thus far, we have attempted to determine the impact of the GPR index on trade. We now assess whether shocks to GPR impact trade dynamics in Latin America. For this, we employ the impulse response function (IRF) methodology. The IRF allows us to examine the effects of a one-time shock to a particular innovation on the current and future values of the endogenous variables. In our case, the shock is applied to the GPR index, and the trade variable serves as the response.

Figure 3 illustrates the response to a generalized one standard deviation shock in the case of trade with China. Notably, a negative response is observed in the fourth and fifth periods for Chinese GPR, while the reaction is more immediate, commencing in the second and concluding in the third periods for domestic GPR. On the other hand, the IRF presents a different pattern for trade with the US (Figure 3(a,b). The response to a GPR shock from the US emerges in the second period and persists until the sixth period. In contrast, the response to a domestic GPR shock is immediate, beginning in the first and concluding in the third period. The shocks to trade with both countries are transitory. However, it is noteworthy that the response to shocks originating from the US is considerably more substantial than those from China. These findings align with the outcomes obtained from the regression model and emphasize that the US continues to exert the most significant impact on regional trade patterns despite China's increasing influence over the past two decades.

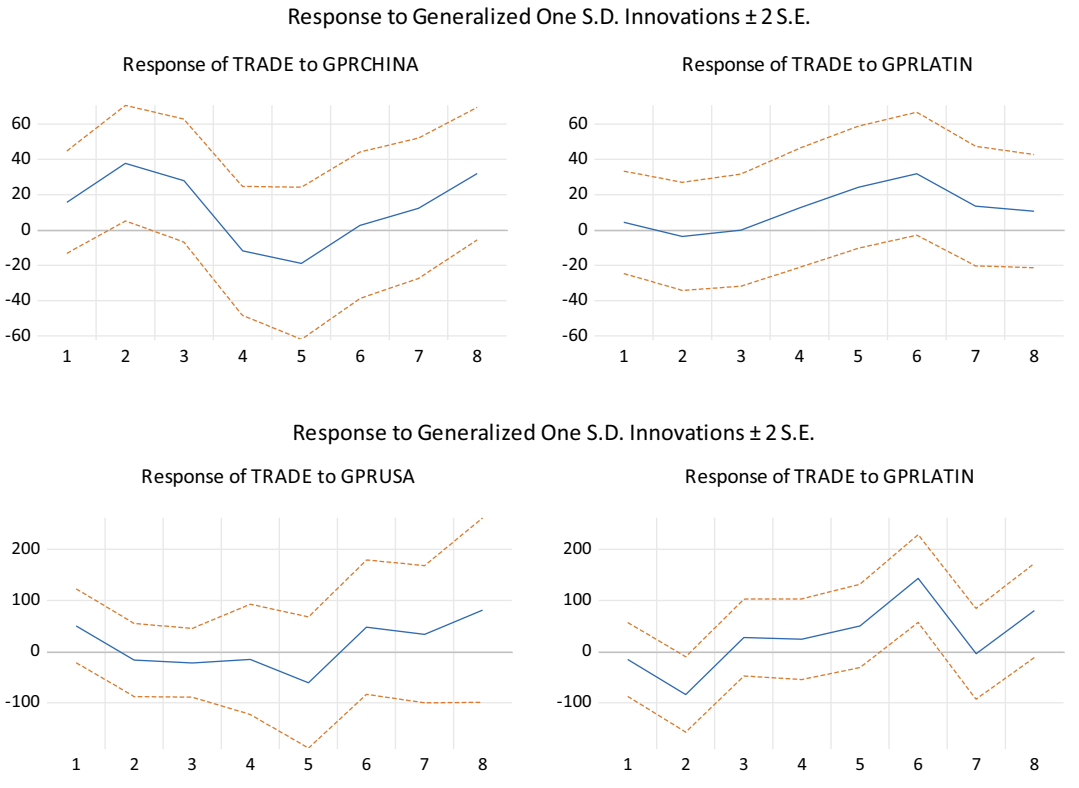

Figure 3. (a) Trade with China. (b) Trade with the US. Note: The response standard errors are analytical (asymptomatic) using generalized impulses.

Conclusion and Policy Recommendations

This study examines the influence of geopolitical risks on trade between Latin America and, the US and China. We formulate and test hypotheses regarding the direct (negative) and indirect (positive) effects of GPR from both countries on total trade, as well as its components: exports and imports. The findings confirm our expectations, indicating that US GPR has a direct adverse impact on trade with Latin America. Interestingly, risks from China also affect Chinese imports in the region. Moreover, our analysis reveals variations in vulnerability among individual Latin American countries, with some being more susceptible to country-specific risks than others.

Furthermore, the IRF methodology shows that the response to geopolitical shocks from both countries (US and China) was negative and transitory. Notably, the reaction to the shock from China was less than the response to the shock from the US. Additionally, the shocks from the US had a much greater impact than those from China. The results confirm the negative impact of geopolitical risks on Latin American trade and provide a more nuanced view of how GPR affects trade in the region by showing that it significantly impacts imports.

This study makes significant contributions to the literature by being the first to estimate the impact of GPR on trade in Latin America. Furthermore, given the region's economic vulnerability, policymakers must consider GPR risks when formulating trade policies. With China emerging as a major competitor to the US in trade, policymakers and practitioners involved in international trade must comprehend geopolitical dynamics and develop strategies to address future shocks. Hedging techniques should be adopted to mitigate the potential risks associated with GPR.

While this study offers valuable insights into the impact of GPR on trade, it is not without limitations. Our analysis focuses solely on the Latin American region and its trade relations with the US and China. Future research could help strengthen our findings and conclusions by investigating different regions and focusing on how GPR affects trade flows in specific industries. Moreover, by highlighting the various implications on imports and exports, our findings suggest that differences in GPR scores between countries can significantly impact bilateral trade flows, which can be investigated in future studies.

Notes

1. Caldara and Iacoviello (2022) defines GPR as 'the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations.'
2. For detailed description of the methodology and data, see https://www.matteoiacoviello.com/gpr.htm and Caldara and Iacoviello (2022).
3. These newspapers include: The Boston Globe, the Chicago Tribune, The Daily Telegraph, the Financial Times, The Globe and Mail, The Guardian, the Los Angeles Times, The New York Times, The Times, The Wall Street Journal, and the Washington Post.
4. Source: https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/12/fact-sheet-president-biden-and-g7-leaders-launch-build-back-better-world-b3w-partnership/
5. Please note the choice of the selected countries is due to the availability of the GPR country index for these countries. Also, Table A1 in the Appendix provides a summary of the trade between them and China/US. Please note log GPR estimates are used in the model.
6. The capital cities are as follows: US (Washington), China (Beijing), Argentina (Buenos Aires), Brazil (Brasilia), Colombia (Bogota), Peru (Lima), Chile (Santiago) and Venezuela (Caracas).

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No potential conflict of interest was reported by the author(s).

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Appendix

Table A1. Total trade with the selected Latin American countries.

(2020 values in US$ millions)	China	US
Argentina	5244	3310
Brazil	67788	21619
Chile	28550	9698
Colombia	2751	9465
Mexico	7788	330434
Peru	10963	6241
Venezuela	254	550

Source: WITS, World Bank.

Table A2. Trade with the US.

	Argentina		Brazil		Chile		Colombia		Mexico		Peru		Venezuela	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Total trade with the US														
constant	−6.651***	−4.367**	−13.267***	−11.813***	−2.664	−3.530*	3.644**	2.698***	−26.094***	−26.480***	−12.894***	−10.438***	−54.910***	−54.872***
GPR_{US}	−0.018	−0.027**	0.004	0.001	−0.004	−0.002	−0.009	−0.007	−0.011*	−0.010*	0.003	−0.004	−0.014	−0.014
GPR_{LATIN}	−0.347	−0.287	−0.412*	−0.471**	0.335	0.357	−0.038	−0.015	−0.139	−0.118	−1.690***	−1.671***	−0.170	−0.171
GPR_{CHINA}	−0.145**		−0.089*		0.043		0.049		0.028		−0.125**		−0.002	
GDP_{LATIN}	0.423***	0.427***	0.425***	0.433***	1.278***	1.273***	1.193***	1.187***	0.542***	0.536***	0.991***	1.008***	0.236***	0.236***
GDP_{USA}	0.117	0.030	0.384***	0.324***	−0.722***	−0.686***	−0.876***	−0.836***	0.822***	0.841***	−0.113	−0.217	2.014***	2.013***
Exports to the US														
constant	−3.954	−1.311	−13.169***	−11.970***	−8.369***	−11.654***	21.851***	19.155***	−32.083***	−32.169***	−20.432***	−16.113***	−44.772***	−45.055***
GPR_{US}	−0.010	−0.019	0.017	0.014	−0.001	0.007	−0.027**	−0.020**	−0.009*	−0.009*	−0.010	−0.022	−0.027***	−0.026***
GPR_{LATIN}	0.169	0.239	−0.571*	−0.630*	−0.213	−0.109	0.177	0.261	−0.125	−0.120	−3.634***	−3.563***	−0.572***	−0.557***
GPR_{CHINA}	−0.169***		−0.072		0.162*		0.140***		0.006		−0.210**		0.020	
GDP_{LATIN}	−0.009	−0.003	0.149***	0.156***	0.741***	0.723***	1.379***	1.365***	0.517***	0.515***	0.572***	0.598***	0.210***	0.209***
GDP_{USA}	0.360***	0.258**	0.606***	0.556***	−0.096	0.039	−1.710***	−1.599***	1.041***	1.046***	0.483	0.304	1.648***	1.659***
Imports from the US														
constant	−9.616***	−7.525***	−15.848***	−13.968***	−2.459	−1.265	−18.683***	−16.450***	−20.585***	−21.412***	−3.487	−1.914	−64.764***	−64.547***
GPR_{US}	−0.030**	−0.038***	−0.020*	−0.028***	−0.012	−0.015	0.011	0.006	−0.004	−0.001	0.020**	0.015*	−0.003	−0.004
GPR_{LATIN}	−0.683	−0.630	−0.238	−0.316	0.181	0.121	−0.220	−0.278	−0.169*	−0.129	0.000	0.013	0.104	0.093
GPR_{CHINA}	−0.138*		−0.126**		−0.065		−0.108**		0.051		−0.084		−0.017	
GDP_{LATIN}	0.785***	0.789***	0.695***	0.700***	1.671***	1.679***	0.997***	1.013***	0.633***	0.629***	1.484***	1.497***	0.261***	0.261***
GDP_{USA}	−0.108	−0.188**	0.208**	0.134*	−1.080***	−1.130***	0.064	−0.031	0.509***	0.542***	−0.887***	−0.956***	2.322***	2.313***

Note: ***, **and *signify significance levels of 1%, 5% and 10%, respectively.

Table A3. Trade with China.

	Argentina		Brazil		Chile		Colombia		Mexico		Peru		Venezuela	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
(TOTAL TRADE WITH CHINA)														
constant	−21.689***	−21.474***	−33.812***	−35.386***	−40.293***	−39.215***	−45.312***	−44.902***	−31.718***	−35.229***	−47.963***	−47.860***	−54.898***	−55.277***
GPR_{US}	0.018		−0.049***		0.028**		0.014		−0.080***		0.003		−0.023	
GPR_{LATIN}	−0.654	−0.572	0.554	0.416	0.942	1.133*	−0.582*	−0.583*	−0.028	−0.195	−1.877***	−1.851***	1.176***	1.207**
GPR_{CHINA}	−0.355**	−0.320**	0.145	0.081	−0.169**	−0.131*	−0.101	−0.077	−0.021	−0.105	−0.089	−0.085	0.155	0.122
GDP_{LATIN}	0.338***	0.340***	0.787***	0.824***	1.864***	1.804***	1.326***	1.312***	0.802***	0.901***	2.661***	2.653***	1.245***	1.246***
GDP_{CHINA}	0.755***	0.746***	0.810***	0.829***	0.142**	0.156**	0.742***	0.740***	0.742***	0.773***	−0.263*	−0.259*	1.167***	1.179***
(EXPORTS TO CHINA)														
constant	−7.089**	−6.554**	−32.225***	−33.627***	−42.212***	−41.330***	−67.508***	−67.244***	−54.241***	−43.929***	−37.296***	−38.656***	−74.366***	−74.386***
GPR_{US}	0.023		−0.048*		0.023		0.002		0.165***		−0.029		0.020	
GPR_{LATIN}	1.871	2.059	0.823	0.642	1.850**	1.980**	−2.255***	−2.347***	0.415	0.579***	−2.482**	−2.722***	2.334**	2.289**
GPR_{CHINA}	−0.306	−0.264	0.266*	0.196	−0.187*	−0.161	0.297	0.323*	−0.228*	−0.064	0.056	0.013	0.118	0.145
GDP_{LATIN}	−0.341	−0.346*	0.504***	0.535***	1.954***	1.904***	2.217***	2.193***	1.347***	1.014***	1.477***	1.587***	1.564***	1.571***
GDP_{CHINA}	0.778***	0.764***	0.994***	1.013***	0.113	0.126	0.713***	0.724***	0.944***	0.888***	0.338	0.292	1.571***	1.567***
(IMPORTS FROM CHINA)														
constant	−38.202***	−38.547***	−39.033***	−40.487***	−38.597***	−37.257***	−41.117***	−40.681***	−31.776***	−35.548***	−62.434***	−63.253***	−46.574***	−47.358***
GPR_{US}	−0.014		−0.043**		0.041**		0.015		−0.083***		−0.053***		−0.049	
GPR_{LATIN}	−1.753*	−1.863**	0.324	0.172	−0.456	−0.067	−0.472	−0.474*	−0.062	−0.259	−1.355	−0.799	−0.101	−0.034
GPR_{CHINA}	−0.203*	−0.229**	−0.052	−0.111	−0.184**	−0.122*	−0.197***	−0.171**	−0.019	−0.103	−0.133	−0.193***	−0.182	−0.268
GDP_{LATIN}	1.117***	1.127***	1.229***	1.258***	1.622***	1.548***	1.063***	1.049***	0.812***	0.916***	4.138***	4.260***	1.123***	1.124***
GDP_{CHINA}	0.649***	0.651***	0.556***	0.579***	0.258***	0.276***	0.810***	0.807***	0.732***	0.768***	−1.019***	−1.099***	0.950***	0.974***

Note: ***, **and *signify significance levels of 1%, 5% and 10%, respectively.

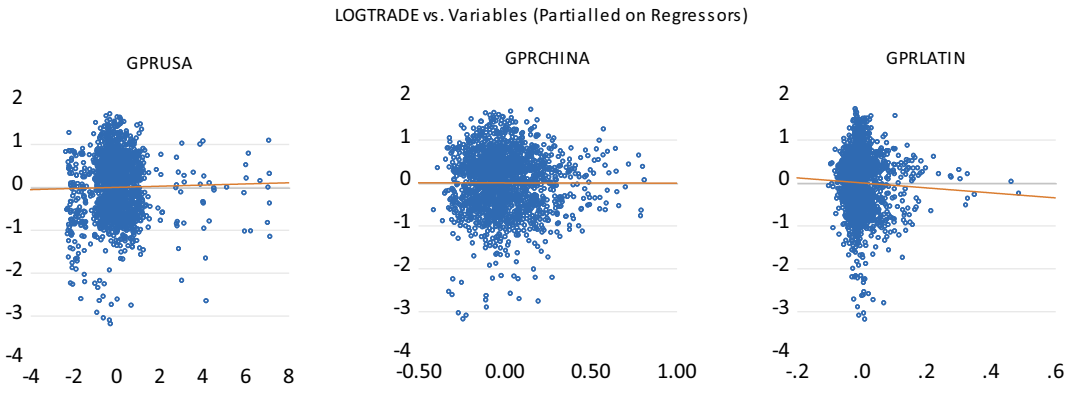

Figure A1. Outlier identification.