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DUONG, Huu Nhan
Monash University

ISHIKAWA, Jota
RIETI

NISHIDE, Katsumasa
Waseda University

RHEE, S. Ghon
University of Hawai‘i

SASAHARA, Akira
Keio University

RIETI
Research Institute of Economy, Trade & Industry, IAA

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Geopolitical Risk and Corporate Behaviors: Propagation of shocks through global operations*

Huu Nhan DUONG
Monash University

Jota ISHIKAWA
Gakushuin University,
Hitotsubashi University, and RIETI

Katsumasa NISHIDE
Waseda University

S. Ghon RHEE
University of Hawai'i at Mānoa

Akira SASAHARA
Keio University

Abstract

This study examines the impact of geopolitical risk (hereafter GPR) on the behavior of multinational manufacturing firms from Japan. We construct firm-level exposures to GPR indices using data on foreign direct investment and international trade. We find that only large firms respond to GPR, whereas small firms exhibit no significant reaction. Furthermore, the effect of GPR on accounting-based decisions, such as cash holdings and investment, varies depending on firms' modes of internationalization. In particular, the results indicate that firms exposed to GPR through FDI reduce asset-side variables, such as cash holdings and capital expenditures.

Keywords: Geopolitical risk; Foreign direct investment; International trade; Cash holding; Capital expenditure
JEL classification: G32, G15, F14

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1 Introduction

Rising global tensions—including the Russia–Ukraine War, the Gaza War, and the growing influence of emerging powers in Asia, as shown in Figure 1–have led national policymakers to implement measures such as sanctions, export controls, and investment restrictions. These trends have prompted economists to incorporate not only economic factors but also geopolitical dimensions when modeling and analyzing the global economy (e.g., Eichengreen et al., 2019; Broner et al., 2024; Fernández-Villaverde et al., 2024, Thoenig, 2024; Clayton et al., 2025).[1] Understanding how firms respond to rising geopolitical risks is crucial for economists accurately modeling the global geopolitical economy and for policymakers designing policies to mitigate the adverse effects of rising political tensions.

This study aims to investigate the impact of geopolitical risk (GPR) on Japanese multinational manufacturing firms by constructing two firm-level measures of GPR, utilizing country-level geopolitical risk indicators from Caldara and Iacoviello (2022) and firm-level foreign direct investment (FDI) and international trade. Our firm-level GPR variables are based on the idea that firms with overseas subsidiaries are exposed to risks of declining business performance due to rising procurement costs and/or sluggish sales when GPR increases in the countries where their subsidiaries operate. In addition to GPR, we examine the effects of economic policy uncertainty (EPU) obtained from Baker et al. (2016).

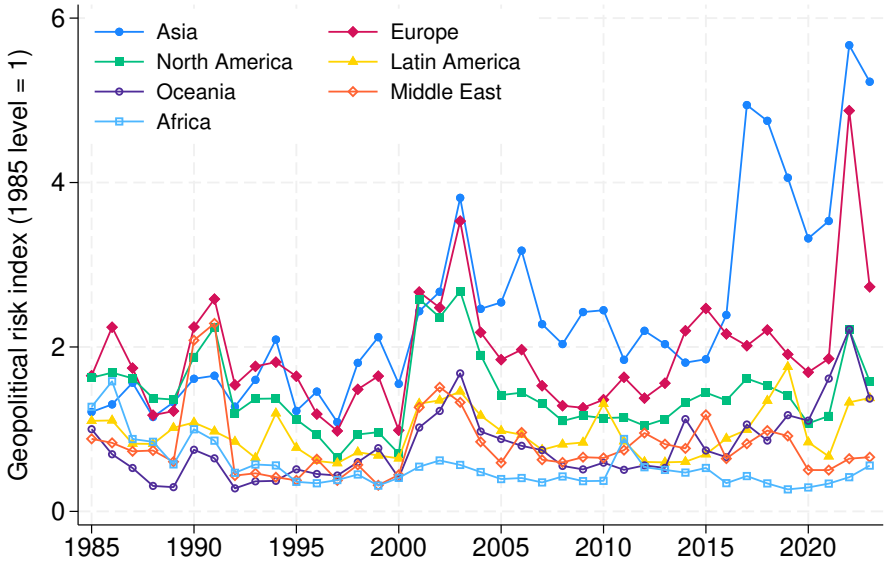
We investigate the effects of international propagation of GPR and EPU through FDI and trade on corporate outcomes of Japanese firms between 2002 and 2022. We find that GPR affects only large firms, while medium and small firms do not appear to respond to changes in GPR. Large firms typically have more structured decision-making processes and tend to utilize more information regarding local markets compared to smaller firms, enabling large firms to adjust more effectively to shocks. Moreover, large firms often engage in multiple business projects, allowing them the flexibility to adapt their business portfolios as needed. This finding highlights the advantages of large multinational firms in responding to shocks.

Second, we find that FDI-based GPR, trade-based GPR, FDI-based EPU, and trade-based EPU affect corporate behaviors differently. The results suggest that large firms respond to FDI-based GPR by reducing their cash holdings and to trade-based GPR by increasing them, while their cash holdings do not appear to respond to FDI-based or trade-based EPU. Additionally, large firms reduce asset purchases and capital expenditures in response to FDI-based GPR but increase these expenditures in response to FDI-based EPU.

These different effects are consistent with the magnitudes of the adverse effects of the variables:

[1] Eichengreen et al. (2019) show that military alliances influence countries' currency choices in their foreign reserves. Broner et al. (2024) show that by analyzing trade and treaty data from 1800 to 2020, hegemonic countries increased their trade agreements with allied nations, and these political actions led to a rise in trade. Fernández-Villaverde et al. (2024) show that political divisions have led to adverse effects on the global economy, with globally connected sectors suffering the most. Thoenig (2024) examines how international trade and wars interact in determining countries' welfare by introducing a gravity model of trade into a game-theoretic environment. Clayton et al. (2025) consider how governments utilize their financial powers and trade relationships to achieve their goals in a game-theoretic environment. See Mohr and Trebesch (2024) and Hodula et al. (2024) for literature reviews.

FIGURE 1: Time-series Changes in GPR Indices



Note: The figure shows the average GPR indices for seven regions where country-level GPR indices are aggregated into the region level by taking weighted averages where the weights are GDP in 1985. The original GPR index data come from Caldara and Iacoviello (2022).

FDI-based GPR $>$ trade-based GPR $\approx$ FDI-based EPU $>$ trade-based EPU. Comparing FDI with trade, the propagation of shocks through FDI is expected to be greater than through trade because FDI involves the relocation of capital to establish local physical assets, such as production plants and distribution networks, whereas international trade consists merely of transactions of goods and involves less capital relocation. Comparing GPR and EPU, GPR tends to prompt firms to make long-term changes in their local corporate strategy, as it is associated with ideological tensions and infrastructure destruction. In contrast, EPU could be a short-term economic policy shock that does not lead to devastating effects. These considerations are consistent with the order of the magnitudes of adverse effects associated with each of the four shocks.

When the negative effects are severe, they reduce firms' sales and profits, leading to a decline in cash holdings and investment, consistent with the adverse effects of FDI-based GPR on cash holdings and investment. When the negative effects are moderate, they prompt firms to hold more cash as a precautionary buffer, reallocate capital from foreign local markets, and/or increase investment to cope with rising tensions. This is consistent with the positive effects of trade-based GPR on cash holdings and the positive effects of FDI-based EPU on investment.[2]

Our study makes two main contributions to the existing literature. We extend an emerging literature on the effect of geopolitical risks on corporate outcomes. For example, existing studies

[2]The differing effects of adverse shocks on firm behavior are also documented in the context of the effects of import competition on innovation. Whereas Bloom et al. (2016) find that import competition stimulates European firms' innovation, Autor et al. (2020) provide evidence that it hinders US firms' innovation. Autor et al. (2020) argue that the differences in distances to the technological frontiers reconcile the different results.

using macro dependent variables investigate the impact of GPR on financial market returns (Balcilar et al., 2018; Lee, 2019; Liu et al., 2019), tourism and GDP growth rates (Akadiri et al., 2020), FDI flows (Aiyar et al., 2024; Gopinath et al., 2025), capital flows (Feng et al., 2023), and inflation (Caldara et al., 2024).[3] Existing firm-level investigations examine the effect of GPR on investment (Caldara and Iacoviello, 2022; Wang et al., 2024; Rumokoy et al., 2023; Shen, 2025),[4] and cash holdings (Wang et al., 2021; Lee and Wang, 2021).[5] While these papers enhance our understanding of how GPR affects corporate decisions, they do not consider firms' cross-border exposure to GPR. This is an important omission, given that firms have increased their reliance on global production and supply chains (Alfaro et al., 2019; Bena et al., 2022; Lafrogne-Joussier et al., 2023).[6] To the best of our knowledge, this is the first study to account for such cross-border exposures to GPR in examining the international propagation of adverse shocks.

Additionally, we add to the body of research on accounting decisions, particularly regarding corporate cash holdings and investments. In a similar vein to research on geopolitical risks, the EPU index, introduced by Baker et al. (2016), has been widely utilized in studies examining its impact on corporate management decisions. For instance, existing studies find that higher EPU decreases investment and increase cash reserves using firm-level data from the U.S. (Duong et al., 2020) and Japan (Fujitani et al., 2023).[7] It is also shown that higher EPU increases stock market volatility and lowers stock prices, especially when it leads to monetary tightening (Caldara et al., 2016), and that higher EPU reduces the length of trade credit (Jory et al., 2020).

From a corporate finance and management perspective, while research on EPU is well-established, studies on GPR and firm behavior are relatively recent. Nevertheless, a small but growing number of studies exist (e.g., Wang et al., 2021; Lee and Wang, 2021; Alam et al., 2023; Rumokoy et al., 2023; and Wang et al., 2024). One of the key features that differentiate this study from existing research is the use of firm-level exposures to GPR. This approach allows us to control for unobserved macroeconomic shocks that uniformly affect all firms by introducing year fixed effects.

[3] Balcilar et al. (2018) find that GPR effects on stock returns vary across BRICS countries. Lee (2019) show a negative correlation between GPR and 37 stock market indices. Liu et al. (2019) show that GPR increases oil market returns. Akadiri et al. (2020) find that rising GPR negatively impacts tourism and GDP in Türkiye. Aiyar et al. (2024) show that greater political distance reduces FDI flows. Gopinath et al. (2025) find that wars lead to economic blocs based on FDI data. Feng et al. (2023) show that rising GPR reduces capital flows, especially to developing countries. Caldara et al. (2024) find that GPR-driven military spending raises inflation via higher public debt and money supply.

[4] In these studies, the data from the Compustat North America Database (Caldara and Iacoviello, 2022), the CRSP/Compustat Merged Database (Wang et al., 2024), firm-level data from the Australian natural resources sector (Rumokoy et al., 2023), and US firm-level data (Shen, 2025) are used to show that a higher GPR index is associated with a lower firm-level investment.

[5] Wang et al. (2021) use firm-level data from the Chinese oil sector and find that rising geopolitical risks lead firms to increase their cash holdings. Lee and Wang (2021) use Chinese firm-level data and show that rising geopolitical risks increase firms' cash holdings, particularly for financially constrained firms.

[6] Bena et al. (2022) show that adverse shocks to an economy propagate through non-financial multinational firms. Lafrogne-Joussier et al. (2023) show that a negative COVID shock in the Chinese economy was transmitted to French firms through international business operations.

[7] Other prior studies show similar results. For example, Ogawa and Suzuki (2000) and Morikawa (2016) show that higher economic uncertainty reduced investment in Japan. Morikawa (2016) show that uncertainty affected Japanese firms' managerial decisions based on their survey responses. Other studies also document that cash holdings declined following rising EPU using firm-level data from the Worldscope Database (Li, 2019) and US firm-level data from Compustat (Phan et al., 2019).

Previous empirical studies utilize textual analyses to construct firm-level exposures to uncertainties (Hassan et al., 2019; Hassan et al., 2023; Hassan et al., 2024; Hassan et al., 2024; and Benguria et al., 2022).[8] In contrast, we construct firm-level exposures to GPR using firm-level FDI and trade, examining how firms respond to GPR as it propagates through their international business linkages. This study complements prior research by providing an alternative method for constructing firm-level exposures. One advantage of our approach is that our measure of exposure to foreign GPR is based on actual FDI and trade data, making it a more robust representation of firm exposure. In contrast, textual analysis may capture mere "mentions" in financial statements or earnings conference calls, which could reflect future international operation plans rather than actual exposure.

The rest of the paper is organized as follows. In Section 2, we describe the empirical methodology we employ in this study. We present our main results in Section 3. The robustness on the results are checked in Section 4, followed by detailed discussions on the main results in Section 5. The concluding remarks on this study are given in Section 6. Additional data details and results are presented in the Appendix.

2 Data and Methodology

In this section, we describe our approach for the analysis on the effect of GPR. Concretely, we present our regression models and the data we use in the analysis. We also propose new GPR indices for the research motivations we discussed in the introductory section. The current study examines how GPR and EPU affect corporate behavior, however, our main focus is the effect of GPR.

2.1 Construction of Variables Measuring Geopolitical Risks

When parent firms in the same country–in our context, Japan–engage in international businesses in different countries, they may experience varying impacts from geopolitical risks. A geopolitical event affecting one foreign country may have significant consequences for firms with business activities in the country while leaving others relatively unaffected. To account for this variation, we develop a geopolitical risk (GPR) index that reflects each firm's exposure based on country-specific trade relationships.

The geopolitical risk indices, $gpr_{c,t}$ for country c in year t, are available from 44 countries. Our firm-level dataset includes information on firms' FDI (foreign subsidiaries), exports, and imports. Utilizing the number of foreign subsidiaries in each destination country, we construct the following

[8] Firm-level risk measures are constructed from texts in earnings conference calls and used to analyze their effects on investment and lobbying activities (Hassan et al., 2019), stock returns during epidemics (Hassan et al., 2023), investment and hiring during Brexit-related uncertainties (Hassan et al., 2024), and the international transmission of risks and their impact on capital flows (Hassan et al., 2024). Similarly, Benguria et al. (2022) examine the effects of uncertainties from the US-China trade war on Chinese firms by constructing firm-level uncertainty measures based on annual reports.

FDI-based exposure to GPRs:

$$\widetilde{\Delta gpr}_{f,t}^{FDI} = \sum_{c} \left(\Delta gpr_{c,t} \times \frac{FDI_{f,c,t-1}}{\sum_{c'} FDI_{f,c',t-1}} \right), \tag{1}$$

where $FDI_{f,c,t-1}$ denotes firm f's FDI in country c in year $t-1$ measured by the nominal value of capital. The variable $\Delta gpr_{c,t} = gpr_{c,t} - gpr_{c,t-1}$ denotes changes in GPR. We use the lagged FDI data to avoid endogenous changes in exports reacting to GPR affecting the exposure variable.[9]

We also construct trade-based exposures to GPR using data on exports and imports. The firm level exports and imports are available at the destination region level: Asia, Europe and Central Asia, Latin America, Middle East, Africa, North America, and Oceania. Therefore, we compute weighted averages of changes in GPR using the region-level data as follows:

$$\widetilde{\Delta gpr}_{f,t}^{Trade} = \sum_{r} \left(\Delta gpr_{r,t} \times \frac{Trade_{f,r,t-1}}{\sum_{r'} Trade_{f,r',t-1}} \right), \tag{2}$$

with $Trade_{f,r,t-1} = EX_{f,r,t-1} + IM_{f,r,t-1}$ where $EX_{f,r,t-1}$ denotes firm f's export sales in destination region r in year $t-1$ and $IM_{f,r,t-1}$ denotes firm f's import purchases. The GPR indices used in equations (2) are at the region level r, computed as weighted averages of the country-level GPR using GDP in 1995 as weights.[10] The region-level GPR indices are constructed as follows: $gpr_{rt} = \sum_{c \in r} \left(gpr_{ct} \times \frac{GDP_{c,1995}}{\sum_{c' \in r} GDP_{c',1995}} \right)$, where r is a region including country c. Throughout the sample period, only GDP from the year 1995 is used to avoid time-series fluctuation of gpr_{rt} caused by changes in GDP.

It is worth remarking that FDI is a stock variable, and trade is a flow variable. As the subsequent results will show, this distinction leads to different effects of the weighted average GPRs on the management decisions.

To control for the effects of economic policy uncertainties (hereafter EPU), we also construct the following variables:

$$\widetilde{\Delta epu}_{f,t}^{FDI} = \sum_{c} \left(\Delta epu_{c,t} \times \frac{FDI_{f,c,t-1}}{\sum_{c'} FDI_{f,c',t-1}} \right), \quad \widetilde{\Delta epu}_{f,t}^{Trade} = \sum_{r} \left(\Delta epu_{r,t} \times \frac{Trade_{f,r,t-1}}{\sum_{r'} Trade_{f,r',t-1}} \right),$$

where the region-level EPUs are constructed as follows: $epu_{r,t} = \sum_{c \in r} \left(epu_{c,t} \times \frac{GDP_{c,1995}}{\sum_{c' \in r} GDP_{c',1995}} \right)$. To control for the effects of GDP growth rates, we also construct the following variables:

$$\widetilde{g}_{f,t}^{FDI} = \sum_{c} \left(g_{c,t} \times \frac{FDI_{f,c,t-1}}{\sum_{c'} FDI_{f,c',t-1}} \right), \quad \widetilde{g}_{f,t}^{Trade} = \sum_{r} \left(g_{r,t} \times \frac{Trade_{f,r,t-1}}{\sum_{r'} Trade_{f,r',t-1}} \right),$$

where the region-level GDP growth rates are constructed as follows: $g_{r,t} = \sum_{c \in r} \left(g_{c,t} \times \frac{GDP_{c,1995}}{\sum_{c' \in r} GDP_{c',1995}} \right)$.

[9] It does not include firm f's domestic sales in Japan, $EX_{f,r,t-1}$ with r = Japan. Therefore, it does not consider Japan's GPR.

[10] The year 1995 is chosen because it precedes the start of our sample period (2002), ensuring a sufficiently large lag to prevent endogenous changes in weight caused by GPR.

When constructing $epu_{r,t}$ and $g_{r,t}$, we use the same set of countries in each region as the weighted average GPRs.

2.2 Regression Model

In our regression analysis, we categorize Japanese firms in two groups, depending on the asset size. To examine if large firms respond to GPRs differently than other firms, we also estimate the following equation:

$$\begin{aligned} y_{ft} =& \beta_1 \widetilde{\Delta gpr}_{ft}^{FDI} + \beta_2 (\widetilde{\Delta gpr}_{ft}^{FDI} \times D_f^{\text{Large}}) \\ &+ \beta_3 \widetilde{\Delta gpr}_{ft}^{Trade} + \beta_4 (\widetilde{\Delta gpr}_{ft}^{Trade} \times D_f^{\text{Large}}) \\ &+ \beta_5 \widetilde{\Delta epu}_{ft}^{FDI} + \beta_6 (\widetilde{\Delta epu}_{ft}^{FDI} \times D_f^{\text{Large}}) \\ &+ \beta_7 \widetilde{\Delta epu}_{ft}^{Trade} + \beta_8 (\widetilde{\Delta epu}_{ft}^{Trade} \times D_f^{\text{Large}}) \\ &+ \beta_9 \widetilde{g}_{ft}^{FDI} + \beta_{10} \widetilde{g}_{ft}^{Trade} + \mathbf{X}_{ft} \boldsymbol{\beta}'_{11} + \beta_{12} D_f^{\text{Large}} + \phi_{st} + \phi_{pt} + \phi_f + u_{ft}, \end{aligned} \tag{3}$$

where D_f^{Large} is a dummy variable taking unity for firms with sales that are greater than the 90 percentile of the sales distribution in the previous year. To identify the coefficient β_2, the interactions between the large firm dummy D^{Large} are also introduced. The variable $\mathbf{X}$ denotes a vector of control variables, including log(employment), log(sales/employment), log(capital/employment), log(total assets/employment), the foreign capital ratio, and log(number of foreign subsidiaries), all of which are lagged. The variable ϕ_{st} denotes sector-year fixed effects, ϕ_{pt} denotes prefecture-year fixed effects (based on parent firm f), and ϕ_f denotes firm fixed effects. Lastly, u_{ft} denotes the error term.

Before going further, we make an important remark on the advantages of our data. The data we use in the analysis contains country-level information on the amount of Japanese firms' FDI, imports, and exports. Thanks to the detailed data, we can construct GPR indices of each firm that capture its exposure to the risks. A distinguishing feature of our research is constructing an index based on this highly granular data.

2.3 Dependent Variables

We examine the effects of GPR on three sets of variables: (i) cash holdings, (ii) asset purchases, and (iii) capital expenditures. The cash holdings variables are defined as follows:

$$
\begin{aligned}
cash_{ft}^{\text{Consolidated}} &= 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Consolidated}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
cash_{ft}^{\text{Standalone}} &= 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Standalone}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
cash_{ft}^{\text{Subsidiaries}} &= 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Subsidiaries}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
cash_{ft}^{\text{Ratio}} &= 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Standalone}}}{\text{cash and deposit}_{ft}^{\text{Consolidated}}}.
\end{aligned}
$$

Note that 'consolidated cash holdings' refer to the cash holdings of the consolidated firm (renketsu), while 'standalone cash holdings' represent the cash holdings of the standalone firm (tantai).[11] 'Cash holdings by subsidiaries' are calculated as the difference between consolidated and standalone cash holdings. Therefore, these cash holdings–especially standalone cash holdings–primarily reflect cash held by parent firms located in Japan rather than by foreign subsidiaries.

The asset purchase variables are defined as follows:

$$
\begin{aligned}
asset_{ft}^{\text{Fixed}} &= 100 \times \frac{\text{fixed asset purchase}_{ft}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
asset_{ft}^{\text{Share, tangible}} &= 100 \times \frac{\text{fixed asset purchase}_{ft}^{\text{tangible}}}{\text{fixed asset purchase}_{ft}}, \\
asset_{ft}^{\text{Share, intangible}} &= 100 \times \frac{\text{fixed asset purchase}_{ft}^{\text{intangible}}}{\text{fixed asset purchase}_{ft}}, \\
asset_{ft}^{\text{Share, others}} &= 100 \times \frac{\text{fixed asset purchase}_{ft}^{\text{others}}}{\text{fixed asset purchase}_{ft}}.
\end{aligned}
$$

The capital expenditure variables are defined as follows:

$$
\begin{aligned}
ppe_{ft} &= 100 \times \frac{\text{property, plant, and equipment}_{t}}{\text{property, plant, and equipment}_{t-1} + \text{intangible assets}_{t-1}}, \\
capex_{ft} + rd_{ft} &= 100 \times \frac{\text{capital expenditure}_{ft} + \text{research and development expenses}_{ft}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{t-1}}, \\
capex_{ft} &= 100 \times \frac{\text{capital expenditure}_{ft}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{t-1}}, \\
rd_{ft} &= 100 \times \frac{\text{research and development expenses}_{ft}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}.
\end{aligned}
$$

[11] 'Renketsu' financial statements are consolidated reports that include a parent company and its subsidiaries, while 'tantai' financial statements are standalone reports covering only a single firm, excluding its subsidiaries.

Our regression model's control and independent variables are consistent with those employed in previous studies, such as Lee and Wang (2021). In line with Fujitani et al. (2023), investigating the effect of EPU on firm behavior, we scale our variables using lagged fixed assets.[12]

2.4 Data Sources

The dependent variables are constructed using the data from Nikkei Needs-FinancialQUEST (FQ). The data on GPR variables are obtained from the website by Caldara and Iacoviello (2022).[13] The data on EPU are obtained from the website by Baker et al. (2016).[14] As mentioned, firm-level FDI data are retrieved from the *Basic Survey on Overseas Business Activities (Kaigai Jigyō Katudō Kihon Chōsa)*, and the data on firm-level exports and imports are obtained from the *Basic Survey of Japanese Business Structure and Activities (Kigyō Katsudō Kihon Chōsa)* of Japan's Ministry of Economy, Trade and Industry. See Appendix A for a list of countries included when constructing firm-level exposures to GPR, EPU, and foreign GDP growth rates.

2.5 Baseline Sample

We focus on the following eleven manufacturing sectors: manufacturers of (i) food, (ii) textiles, (iii) paper and pulp, (iv) tires and tubes*, (v) glass*, (vi) chemicals*, (vii) machinery*, (viii) communication equipment*, (ix) autos and transport equipment*, (x) furniture and accessories, (xi) miscellaneous manufacturing products.[15] The six manufacturing sectors marked with * are defined as "heavy manufacturing sectors" and are used in a subsample analysis because these sectors have a greater reliance on global supply chains and are expected to face stronger shock propagation (see, for example, Ando et al., 2024).

Our baseline sample is an unbalanced panel of Japanese manufacturing firms during the 2002-2022 period, with 10,614 observations. We focus on the manufacturing sector because manufacturing firms tend to expand their production and sales internationally by relocating their capital and other resources, potentially leading to greater exposures to geopolitical risks than firms from other sectors. For instance, maintaining and developing factories, machinery, and other physical assets

[12] Previous studies on the effects of uncertainty on cash holdings have used different denominators for cash holdings. Some divide cash holdings by the book value of assets or net assets (the book value of assets minus cash and marketable securities) (Harford et al., 2008; Phan et al., 2017; Phan et al., 2019), while others use the book value of total assets, net of liquid assets (Opler et al., 1999), or total assets (Bates et al., 2009; Goodell et al., 2021; Li, 2019). Our definition of 'fixed assets' includes tangible and intangible assets but excludes cash, marketable securities, and other liquid assets, following Harford et al. (2008), Phan et al. (2017), Phan et al. (2019), and Opler et al. (1999). The AK production model, including the early work of Frankel (1962), aligns with our methodology when fixed assets are used as a proxy for capital.

[13] The data are retrieved from https://www.matteoiacoviello.com/gpr_files/data_gpr_export.xls. Caldara and Iacoviello (2022) construct their GPR variables based on the frequency of mentions of geopolitical tensions in ten newspapers: Chicago Tribune, The Daily Telegraph, Financial Times, The Globe and Mail, The Guardian, Los Angeles Times, The New York Times, USA Today, The Wall Street Journal, and The Washington Post. While these newspapers come from the US, Canada, and the UK, there is likely a strong correlation between the mentions in these newspapers and those in Japanese newspapers, as they primarily cover global issues.

[14] The data are retrieved from https://www.policyuncertainty.com/media/All_Country_Data.xlsx.

[15] As a result, we exclude financial firms, consistent with Duong et al. (2020), noting that financial firms' operations are subject to industry-specific regulations, making it challenging to observe the effects of exogenous shocks.

in the manufacturing sector is crucial, whereas this is less relevant for firms in other sectors, such as general trading firms.

It is important to highlight the rationale for scaling the dependent variables by fixed assets (property, plant, and equipment + intangible assets). Manufacturing firms often experience significant increases in inventory levels due to challenges such as difficulties in sourcing essential materials or unexpected delays in collecting outstanding payments. In such cases, using total assets as a scaling variable may not be appropriate. Moreover, for manufacturing firms, fixed assets—such as machinery and land—serve as the foundation of their production processes.

2.6 Summary Statistics

Table 1 presents the summary statistics of the variables.[16] The mean of FDI-based GPR, $\widetilde{\Delta gpr}_{ft}^{FDI}$, is 0.0091, with a standard deviation of 0.2511. The 5th percentile is -0.312, and the 95th percentile is 0.371, indicating that while some firms experienced a decrease in exposure to GPR via FDI, others experienced an increase. The median, 0.001, is close to zero, suggesting that the median firm experienced little to no change in exposure to GPR via FDI. The mean of trade-based GPR, $\widetilde{\Delta gpr}_{ft}^{Trade}$, is 0.0072, with a standard deviation of 0.1570. The 5th percentile is -0.170, the median is zero, and the 95th percentile is 0.243.

The summary statistics of the EPU variables, $\widetilde{\Delta epu}_{ft}^{FDI}$, $\widetilde{\Delta epu}_{ft}^{Trade}$ foreign GDP variables, $\widetilde{g}_{ft}^{FDI}$ and $\widetilde{g}_{ft}^{Trade}$, also show that average firms experience small changes in exposure to these variables. The table also presents summary statistics for FDI-based GPR, $\widetilde{\Delta gpr}ft^{FDI,\text{region level}}$, and EPU, $\widetilde{\Delta epu}ft^{FDI,\text{region level}}$, constructed using region-level FDI data. These variables are used in robustness checks.

3 Baseline Results

In this section, we present our main results with regression equations (3). Here, we are interested in the coefficients βs because they represent how GPR affects the dependent variable y. In particular, by constructing the weighted average of GPR, we will effectively show how Japanese firms react to the GPR with their exposures.

3.1 Effects on Cash Holdings

Table 2 displays the effects on cash holdings. All GPR variables' coefficients are normalized to represent the effects of a one-standard-deviation change in the corresponding GPR variables. The table presents the results from running regressions with FDI-based and trade-based GPR variables

[16] The sample size for 'consolidated cash holdings' and 'cash holdings by subsidiaries' is 10,447, while for 'cash holdings ratio, Standalone/Consolidated,' it is 10,519. This difference arises because the first two variables are scaled by 'lagged property, plant, and equipment,' whereas the last variable is not. Correlation matrices for the key explanatory variables are shown in Appendix A.

TABLE 1: Summary Statistics

	Obs	Mean	Std. dev.	p5	p25	p50	p75	p95
Key explanatory variables								
$\widetilde{\Delta gpr}_{ft}^{FDI}$	10,775	0.0091	0.2511	-0.31	-0.06	0.00	0.06	0.37
$\widetilde{\Delta gpr}_{ft}^{Trade}$	10,775	0.0072	0.1570	-0.17	-0.03	0.00	0.03	0.24
$\widetilde{\Delta epu}_{ft}^{FDI}$	10,775	0.1194	0.5886	-0.69	-0.13	0.03	0.38	1.08
$\widetilde{\Delta epu}_{ft}^{Trade}$	10,775	0.0786	0.3952	-0.48	-0.02	0.00	0.19	0.86
$\widetilde{g}_{ft}^{FDI}$	10,775	-0.0002	0.0157	-0.03	0.00	0.00	0.00	0.02
$\widetilde{g}_{ft}^{Trade}$	10,775	-0.0005	0.0247	-0.03	0.00	0.00	0.00	0.05
$\widetilde{\Delta gpr}_{ft}^{FDI,\text{region level}}$	10,775	0.0069	0.2380	-0.30	-0.07	0.00	0.05	0.31
$\widetilde{\Delta epu}_{ft}^{FDI,\text{region level}}$	10,775	0.1006	0.4715	-0.87	-0.14	0.07	0.31	0.87
Dependent variables								
Cash holdings, consolidated	10,450	69.62	112.11	9.08	23.56	43.69	81.31	194.15
Cash holdings, standalone	10,447	44.23	90.83	1.65	9.74	22.98	49.81	137.95
Cash holdings by subsidiaries	10,447	25.58	35.76	0.75	7.43	15.91	32.39	79.12
Cash holdings ratio, Standalone/Consolidated	10,519	0.56	0.25	11.30	36.89	57.47	76.77	94.36
Exp. on fixed asset purchases	10,590	15.14	12.54	3.50	8.18	12.82	19.33	33.06
Share of tangible fixed asset purchases	10,590	60.73	44.41	0.00	0.00	88.89	98.46	100.00
Share of intangible fixed asset purchases	10,590	4.66	9.90	0.00	0.00	0.00	4.59	25.00
Share of other asset purchases	10,590	0.96	6.07	0.00	0.00	0.00	0.00	2.76
Property, plant, and equipment, *ppe*	10,616	95.61	21.30	69.63	90.45	96.17	101.87	116.35
Capital and R&D expenditures	10,410	26.25	27.80	6.79	14.35	21.84	32.77	57.55
Capital expenditures	10,508	15.39	12.66	3.50	8.26	13.02	19.47	34.08
R&D expenditures	10,491	10.82	23.17	0.89	3.25	6.95	13.15	33.18
Control variables								
Lagged ln(employment)	10,775	7.06	1.21	5.32	6.19	6.92	7.78	9.34
Lagged ln(sales/employment)	10,775	3.82	0.55	2.96	3.46	3.80	4.14	4.74
Lagged ln(capital/employment)	10,775	1.84	0.84	0.48	1.36	1.87	2.38	3.14
Lagged ln(total assets/employment)	10,775	4.12	0.61	3.22	3.70	4.10	4.52	5.15
Lagged share of equity held by foreigners, %	10,775	14.17	28.04	0.00	0.50	7.20	20.20	40.00
Lagged share of capital invested abroad, %	10,775	37.95	25.46	1.68	15.88	36.33	57.18	82.15

Note: See the main text for the sources of the data used to construct the key explanatory variables. See the main text for data sources.

included in each regression.[17]

Columns (1)-(3) show that the effects of FDI-based GPR on large manufacturing firms' cash holdings—consolidated cash holdings, standalone cash holdings, and cash holdings by subsidiaries—are statistically different from the other firms. In contrast, as shown in column (4), there is no difference between large firms and other firms regarding the effects on the cash holding ratio—"standalone" divided by "consolidated."

The bottom of the table reports the sum of coefficients, $\hat{\beta}_1 + \hat{\beta}_2$, representing the effects of FDI-based GPR on cash holdings variables of large manufacturing firms. Column (1) shows that a one-standard-deviation change in GPR reduces large manufacturing firms' consolidated cash holdings by about 4.3 percentage points (pp). Column (2) shows that the same change in GPR reduces large manufacturing firms' standalone cash holdings by about 2.7 pp. Column (3) reduces their cash holdings by subsidiaries by about 1.6 pp. Column (4) shows that the effects on large manufacturing firms' cash holding ratios—"standalone" divided by "consolidated"—are null.

[17] See Appendix B for results with only FDI-based or trade-based GPR variables. See Appendix C for results with only the EPU exposure variables, without the GPR exposure variables.

TABLE 2: Effects on Cash Holdings, Baseline Results

	Cash hold., consol-idated (1)	Cash hold., stand-alone (2)	Cash hold., subsidiaries (3)	Cash hold., ratio standalone/ consolidated (4)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.37	0.09	0.30	-0.06
	(0.86)	(0.71)	(0.31)	(0.19)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-4.65 ***	-2.76 ***	-1.94 ***	0.01
	(1.24)	(0.99)	(0.50)	(0.38)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$	-0.50	-0.59	0.02	-0.04
	(0.82)	(0.65)	(0.37)	(0.25)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$	3.19 **	1.50	1.78 **	0.25
	(1.29)	(0.92)	(0.73)	(0.50)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.22	-0.21	0.32	0.19
	(1.38)	(1.27)	(0.57)	(0.43)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-0.61	0.49	-0.88	-0.96
	(2.33)	(1.80)	(0.96)	(1.12)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$	2.41	2.61	-0.08	-0.81
	(2.79)	(2.42)	(0.92)	(0.70)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$	2.37	-1.09	3.16 **	1.87
	(4.08)	(3.72)	(1.31)	(1.52)
Lagged ln(employment)	-12.17	-8.04	-4.38 *	1.35
	(7.94)	(7.00)	(2.66)	(1.91)
Lagged ln(sales/employment)	23.13 ***	17.92 ***	5.34 *	5.15 ***
	(6.75)	(5.29)	(2.81)	(1.61)
Lagged ln(capital//employment)	-0.05	-1.43	1.40	-2.11 *
	(3.28)	(2.86)	(1.00)	(1.13)
Lagged ln(total assets/employment)	-1.02	-0.59	-0.90	1.26
	(12.24)	(11.06)	(3.22)	(2.31)
Lagged share of equity held by foreigners	0.09 **	0.08 **	0.01	0.03 ***
	(0.03)	(0.03)	(0.01)	(0.01)
Lagged share of capital invested abroad	-0.16	-0.17 *	0.01	-0.14 ***
	(0.10)	(0.09)	(0.04)	(0.03)
Large firm dummy	-6.93	-6.95	0.00	-1.81
	(7.02)	(5.14)	(2.91)	(2.95)
Sample size	10,448	10,445	10,445	10,519
R-sq.	0.82	0.81	0.68	0.77
Sum of coefficients				
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-4.28***	-2.67***	-1.64***	-0.05
	(1.25)	(0.99)	(0.50)	(0.37)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$	2.69**	0.91	1.81**	0.21
	(1.15)	(0.74)	(0.70)	(0.47)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	-0.39	0.28	-0.56	-0.77
	(2.41)	(1.73)	(1.07)	(1.14)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$	4.78	1.52	3.08**	1.06
	(4.27)	(3.84)	(1.36)	(1.52)

Note: Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the FDI-based weighted average of foreign GDP growth rates, trade-based weighted average of foreign GDP growth rates, firm fixed effects, sector-year fixed effects, and prefecture-year fixed effects. The sample period is 2002-2022. The large firm dummy D^{Large} takes unity if the firm's sales is greater than the 90th percentile of the sales distribution in the previous year. The coefficients of $\widetilde{\Delta gpr}_{ft}^{FDI}$, $\widetilde{\Delta gpr}_{ft}^{Trade}$ (and therefore their interaction terms with the large firm dummy) are normalized to represent the effects of a one-standard-deviation change in the corresponding GPR variable.

Another sum of coefficients, $\hat{\beta}_3 + \hat{\beta}_4$, representing the effects of trade-based GPR on cash holdings variables of large manufacturing firms, indicates that the impact of trade-based GPR on large manufacturing firms' consolidated cash holdings and standalone cash holdings are positive

and statistically significant.

When firms face a higher GPR through FDI, it is important to mitigate the potential risks associated with asset freezes. In such scenarios, businesses may reduce their cash and deposit holdings. In contrast, when firms face a higher GPR through trade, firms prioritize increasing their cash reserves, maintaining higher levels of cash, and deposits serve as a financial buffer to weather periods of poor performance or unexpected economic shocks. In summary, while FDI-based GPR exposure is related to specific external threats, trade-based GPR exposure leads to building resilience against economic fluctuations.

3.2 Effects on Asset Purchases

Table 3 summarizes the effects of FDI-based and trade-based GPR variables on asset purchases by manufacturing firms. Column (1) shows that the effect of FDI-based GPR on small manufacturing firms' expenditures for fixed assets is positive and statistically significant at the 10% level. However, the impact of a one-standard-deviation change in the GPR index is only 0.23 pp, indicating a small magnitude. The same column shows that FDI-based GPR decreases large manufacturing firms' fixed asset purchases by 0.56 pp.

Column (2) indicates that both FDI-based and trade-based GPR variables reduce the share of tangible asset purchases for large manufacturing firms. A one-standard-deviation change in FDI-based GPR decreases the share of tangible asset purchases for large manufacturing firms by 1.06 pp, while the same increase in trade-based GPR reduces the same dependent variable by 1.55 pp.

Column (3) indicates that FDI-based GPR increases the share of intangible asset purchases by 0.67 pp, while trade-based GPR has a statistically insignificant effect. Column (4) shows that neither FDI-based GPR nor trade-based GPR has a statistically significant effect on the share of other asset purchases.

The contrasting results between tangible and intangible assets may arise from the fact that greater exposure to GPR increases the relative importance of intangible assets. This is because tangible assets are associated with higher relocation costs, whereas intangible assets can be maintained with minimal expenses for physical plants and equipment.

3.3 Effects on Capital Expenditures

Table 4 summarizes the results from estimating the effects on capital expenditure variables. Column (1) shows that FDI-based GPR reduces large manufacturing firms' "property, plant, and equipment" by 1.17 pp, while it does not affect the same variable for other firms. Trade-based GPR is also shown to decrease small manufacturing firms' "property, plant, and equipment" by about 0.54 pp. However, the effects of trade-based GPR on large manufacturing firms are shown to be negligible.

Column (2) indicates that FDI-based GPR decreases large manufacturing firms' capital and R&D expenditures by about 0.93 pp. It also shows that trade-based GPR decreases the same vari-

TABLE 3: Effects on Asset Purchases, Baseline Results

	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases
	(1)	(2)	(3)	(4)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.23 *	-0.21	0.05	0.17 *
	(0.12)	(0.30)	(0.13)	(0.10)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-0.79 ***	-0.85	0.62 **	-0.19 *
	(0.22)	(0.60)	(0.26)	(0.10)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$	-0.28 **	0.18	0.07	-0.19 **
	(0.13)	(0.33)	(0.13)	(0.08)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$	0.36	-1.72 **	-0.23	0.14
	(0.25)	(0.68)	(0.33)	(0.10)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.17	0.2	-0.29	0.04
	(0.29)	(0.43)	(0.23)	(0.14)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	0.39	-0.88	-0.23	0.25
	(0.43)	(1.16)	(0.38)	(0.40)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$	-0.24	-0.23	-0.36	0.21
	(0.61)	(0.83)	(0.49)	(0.30)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$	0.36	-2.16	0.35	-0.36
	(0.75)	(1.78)	(0.66)	(0.50)
Lagged ln(employment)	0.53	5.23 **	0.53	-1.14 **
	(1.15)	(2.55)	(0.87)	(0.57)
Lagged ln(sales/employment)	7.97 ***	0.38	(0.35)	0.13
	(1.16)	(2.07)	(0.76)	(0.34)
Lagged ln(capital//employment)	(0.51)	1.57	-1.23 **	0.00
	(0.49)	(1.16)	(0.53)	(0.17)
Lagged ln(total assets/employment)	-4.72 ***	2.54	1.05	(1.06)
	(1.26)	(3.03)	(1.06)	(0.74)
Lagged share of equity held by foreigners	0.01 ***	0.02	-0.01 **	0.00
	0.00	(0.01)	0.00	0.00
Lagged share of capital invested abroad	-0.03 **	0.03	-0.01	0.00
	(0.01)	(0.04)	(0.01)	(0.01)
Large firm dummy	-0.1	-1.5	1.47	1.01
	-0.77	-3.62	-1.47	-0.75
Sample size	10,587	10,587	10,587	10,587
R-sq.	0.36	0.87	0.55	0.63
Sum of coefficients				
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-0.56***	-1.07**	0.67**	-0.02
	(0.19)	(0.58)	(0.26)	(0.05)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$	0.07	-1.53**	-0.16	-0.05
	(0.24)	(0.63)	(0.33)	(0.05)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.55	-0.68	-0.52	0.29
	(0.43)	(1.15)	(0.41)	(0.40)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$	0.12	-2.39	-0.01	-0.14
	(0.67)	(1.86)	(0.66)	(0.48)

Note: See the note for Table 2.

able by 0.37 pp for small manufacturing firms. Column (3) shows that FDI-based GPR reduces large manufacturing firms' capital expenditures by 0.40 pp, while trade-based GPR decreases the same variable by 0.28 pp for small manufacturing firms. Column (4) reveals that FDI-based GPR decreases large manufacturing firms' R&D expenditures by 0.51 pp, whereas the R&D expenditures of small manufacturing firms are not affected by either GPR variable.

In summary, the results indicate that FDI-based GPR adversely affects capital and R&D expenditures in large manufacturing firms, while trade-based GPR has a similar negative impact on small manufacturing firms.

TABLE 4: Effects on Capital Expenditures, Baseline Results

	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	-0.11	0.09	0.22 *	-0.13
	(0.30)	(0.21)	(0.13)	(0.13)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-1.06 ***	-1.02 ***	-0.63 ***	-0.39 *
	(0.36)	(0.31)	(0.17)	(0.20)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$	-0.54 *	-0.37 *	-0.28 *	-0.08
	(0.28)	(0.22)	(0.16)	(0.12)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$	0.27	0.54	0.13	0.42 *
	(0.45)	(0.38)	(0.21)	(0.25)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.79 *	0.71 *	0.47	0.24 *
	(0.44)	(0.38)	(0.31)	(0.14)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-0.03	1.00 *	0.63	0.39
	(0.98)	(0.58)	(0.45)	(0.30)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$	-0.76	-0.26	-0.16	-0.10
	(0.88)	(0.72)	(0.59)	(0.26)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$	1.37	0.18	-0.07	0.21
	(1.41)	(0.90)	(0.77)	(0.41)
Lagged ln(employment)	-7.19 ***	-1.73	-0.15	-1.66 *
	(1.85)	(1.79)	(1.30)	(0.95)
Lagged ln(sales/employment)	10.35 ***	12.56 ***	8.32 ***	4.20 ***
	(1.73)	(1.96)	(1.24)	(0.95)
Lagged ln(capital//employment)	0.13	-0.26	-0.29	-0.02
	(1.03)	(0.83)	(0.52)	(0.47)
Lagged ln(total assets/employment)	-14.99 ***	-12.17 ***	-6.15 ***	-5.90 ***
	(2.28)	(2.05)	(1.27)	(1.10)
Lagged share of equity held by foreigners	0.02 **	0.02 ***	0.01 ***	0.01 *
	(0.01)	(0.01)	0.00	0.00
Lagged share of capital invested abroad	-0.09 ***	-0.07 ***	-0.03 **	-0.03 **
	(0.03)	(0.02)	(0.01)	(0.01)
Large firm dummy	-1.47	-1.67	0.16	-1.79 **
	-1.99	-1.52	-0.99	-0.79
Sample size	10,614	10,403	10,500	10,487
R-sq.	0.34	0.62	0.35	0.85
Sum of coefficients				
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-1.17***	-0.93***	-0.40***	-0.51**
	(0.37)	(0.30)	(0.15)	(0.20)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$	-0.27	0.17	-0.16	0.34
	(0.41)	(0.36)	(0.19)	(0.24)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.76	1.71***	1.10**	0.63*
	(0.92)	(0.60)	(0.46)	(0.33)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$	0.61	-0.08	-0.23	0.11
	(1.16)	(0.78)	(0.65)	(0.38)

Note: See the note for Table 2.

4 Robustness Checks

4.1 Key Considerations

This section reports robustness results. In addition to running regressions using our baseline sample of all manufacturing firms, we estimate the same regressions using the sample of firms in the heavy manufacturing sectors outlined in the data section. Furthermore, in addition to the 90th percentile cutoff of previous year's sales distribution to define "large firms," we use the 75th percentile and 95th percentile cutoffs.

Lastly, we construct FDI-based GPR variables based on the region level FDI data. The aggregation level of the FDI data is at the country level while the aggregation level of the trade data is at the region level. To confirm that the different effects of FDI-based and trade-based GPRs come from the difference between FDI and trade, but not from the different aggregation levels of the data, we construct another FDI-based exposure variable using the region level FDI data computed by aggregating the country level FDI data.

$$\widetilde{\Delta gpr}_{f,t}^{FDI,\text{Region level}} = \sum_{r} \left(\Delta gpr_{r,t} \times \frac{FDI_{f,r,t-1}}{\sum_{r'} FDI_{f,r',t-1}} \right). \tag{4}$$

The, we estimate the following regression model:

$$\begin{aligned} y_{ft} =& \gamma_1 \widetilde{\Delta gpr}_{ft}^{FDI,\text{Region level}} + \gamma_2 (\widetilde{\Delta gpr}_{ft}^{FDI,\text{Region level}} \times D_f^{\text{Large}}) \\ &+ \gamma_3 \widetilde{\Delta gpr}_{ft}^{Trade} + \gamma_4 (\widetilde{\Delta gpr}_{ft}^{Trade} \times D_f^{\text{Large}}) \\ &+ \gamma_5 \widetilde{\Delta epu}_{ft}^{FDI} + \gamma_6 (\widetilde{\Delta epu}_{ft}^{FDI} \times D_f^{\text{Large}}) \\ &+ \gamma_7 \widetilde{\Delta epu}_{ft}^{Trade} + \gamma_8 (\widetilde{\Delta epu}_{ft}^{Trade} \times D_f^{\text{Large}}) \\ &+ \gamma_9 \widetilde{g}_{ft}^{FDI} + \gamma_{10} \widetilde{g}_{ft}^{Trade} + \mathbf{X}_{ft} \boldsymbol{\gamma}_{11}' + \gamma_{12} D_f^{\text{Large}} + \phi_{st} + \phi_{pt} + \phi_f + u_{ft}, \end{aligned} \tag{5}$$

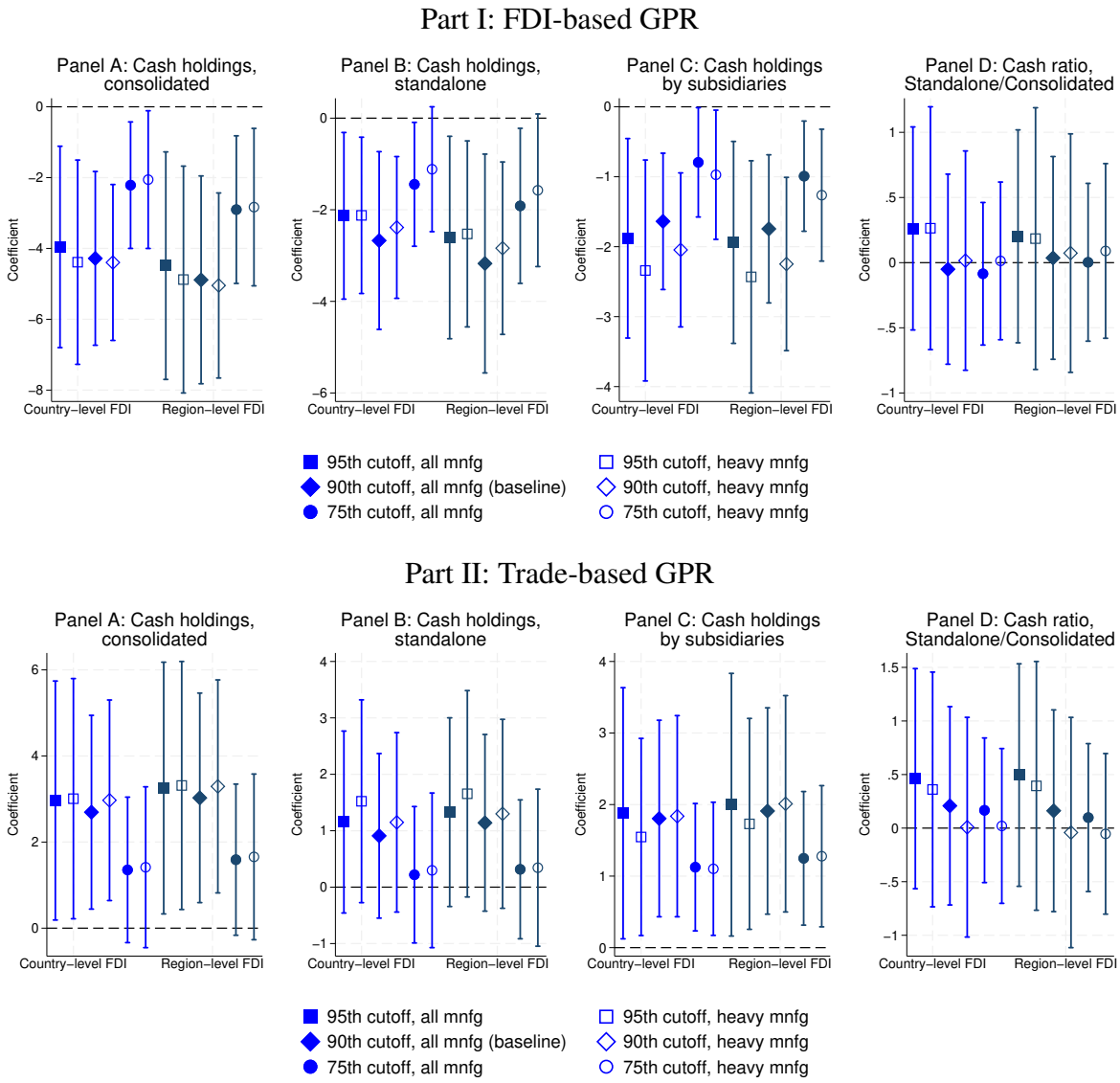
To summarize, as we have two samples—(i) all manufacturing sectors and (ii) heavy manufacturing sectors, three cutoffs: 95th, 90th, and 75th, and two aggregation levels of original data to construct FDI-based GPR variables: (i) country level, equation (1) and (ii) region level, equation (4), we estimate $2 \times 3 \times 2 = 12$ regressions for each dependent variable.

4.2 Results from Robustness Checks

Figure 2 presents estimated effects on the cash holdings variables for large manufacturing firms, with the coefficients for FDI-based GPR in Part I and trade-based GPR in Part II. Panels A-C of Part I show that the effects of FDI-based GPR on large manufacturing firms are consistently negative and statistically significant, except for the case with the 75th percentile to define "large firms." It suggests that adverse effects of FDI-based GPR on cash holdings are only observed in large firms only above the 90th or 95th percentile of sales distribution. The adverse effects of FDI-based GRR on cash holdings tend to be greater with the sample of heavy manufacturing sectors. In addition, the adverse effects even become greater with the FDI-based GPR variables constructed from the region level FDI data.

Figure 2 Part II shows the effects of trade-based GPR variables on large manufacturing firms. The positive effects on consolidated cash holdings are statistically significant except for the 75th percentile cutoff cases. The positive effects on cash holdings by subsidiaries are consistently observed throughout all the specifications considered and are statistically significant. The effects on standalone cash holdings and the cash ratios are statistically insignificant throughout all the specifications.

FIGURE 2: Effects of GPR on Cash Holdings by Large Manufacturing Firms, Robustness Checks



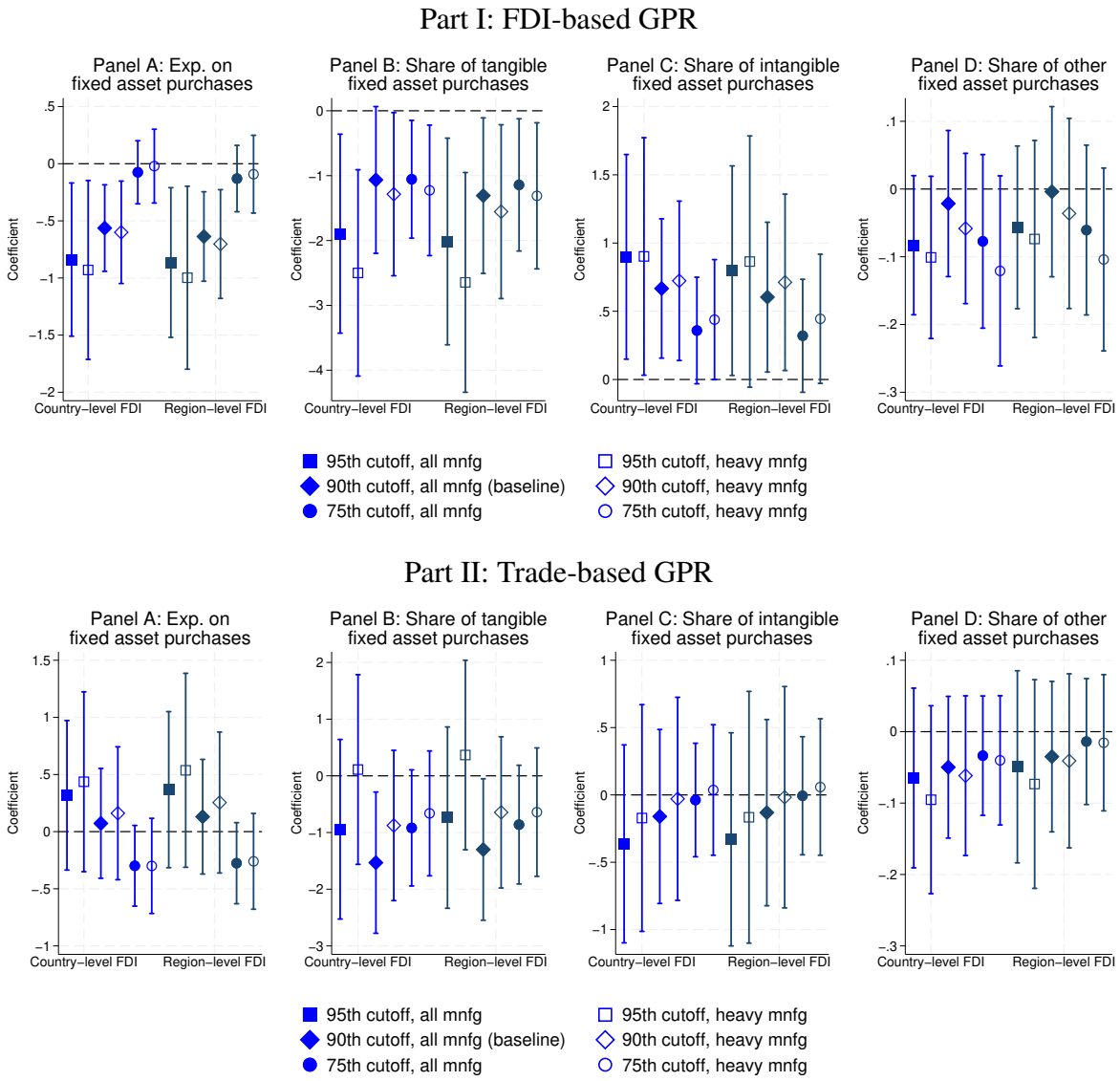
Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

Figure 3 presents results from robustness checks on regressions examining the effects on the asset purchase variables. Panel A of Part I shows the effects of FDI-based GPR on large manufacturing firms' fixed asset purchases. It indicates that the adverse effects are even greater with the 95th percentile cutoff, while the coefficients are almost zero and statistically insignificant with the 75th percentile cutoff. Panel B of Figure 3 Part I also shows that adverse effects on the share of tangible fixed asset purchases are greater with the 95th percentile cutoff.[18]

Panel C of Figure 3 Part I shows that the positive effects of FDI-based GPR on intangible fixed

[18]Panel B of Figure 3 Part I shows that the adverse effects on the share of tangible fixed asset purchases are statistically significant with the 75th percentile. However, the dependent variable is (tangible fixed asset purchases)/(total fixed asset purchases). In addition, Panel A shows that the effects on its denominator, total fixed asset purchases, is null with the 75th percentile. Therefore, the effects on "tangible fixed asset purchases" are likely to be either null or very limited.

FIGURE 3: Effects of GPR on Asset Purchases by Large Manufacturing Firms, Robustness Checks

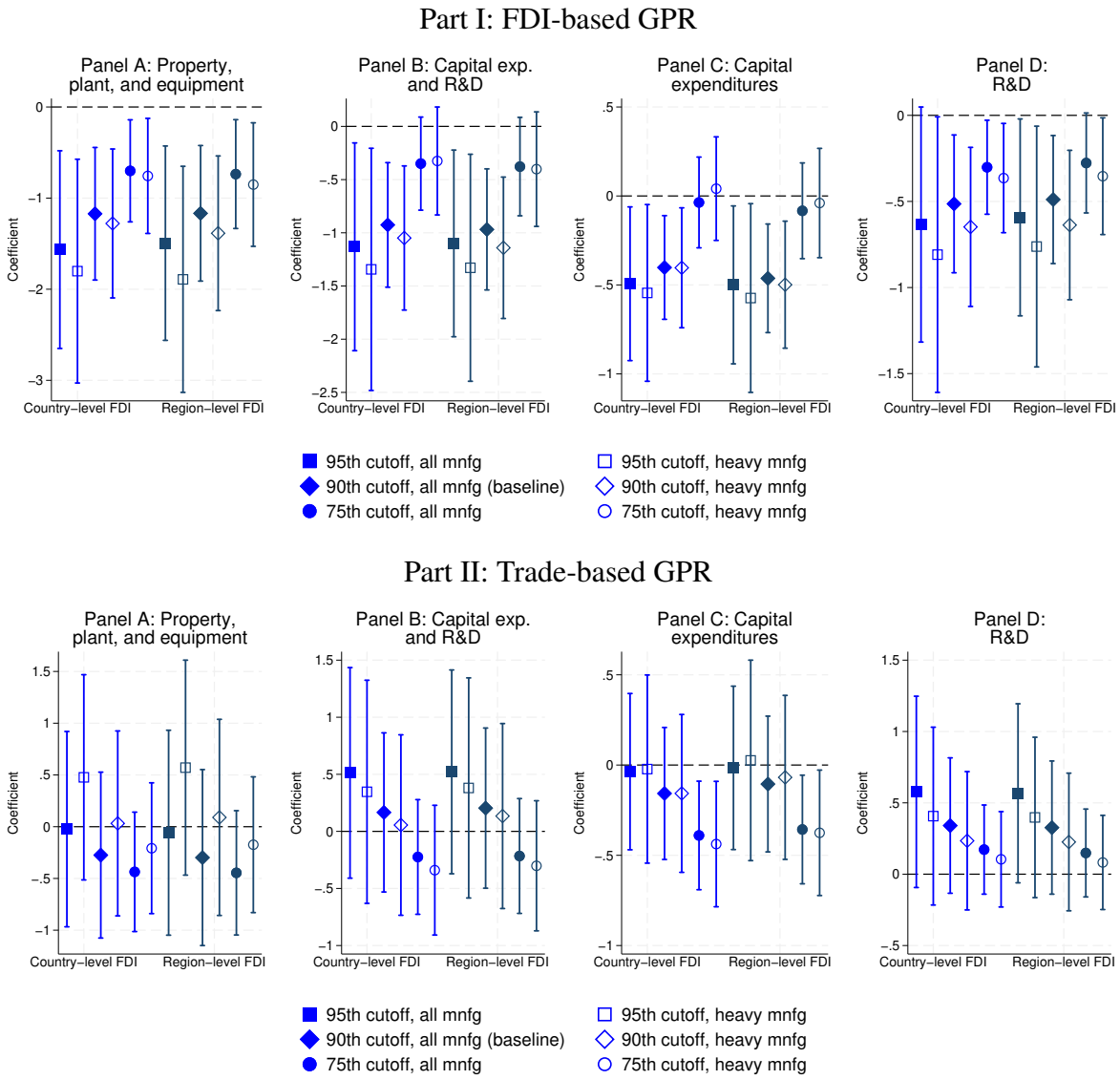


Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

asset purchases are greater with the 95th percentile, while the effects are close to null with the 75th percentile cutoff. Panel D of Part I shows that the effects of FDI-based GPR on the share of other asset purchases are consistently insignificant throughout all the specifications. Figure 3 Part II show that the effects of trade-based GPR on large manufacturing firms' asset purchase variables are consistently null in all the specifications.

Figure 4 displays the effects on large manufacturing firms' capital and R&D expenditure variables. Part I shows that the adverse effects on these variables tend to be greater with the 95th percentile cutoff, while the effects tend to be null with the 75th percentile cutoff, as shown in Panel B (capital expenditure and R&D) and Panel D (R&D). These panels also show that the adverse effects are slightly greater when restricting the sample to firms from the heavy manufacturing sectors. Figure 4 Part II shows that the effects of trade-based GPR on large manufacturing firms'

FIGURE 4: Effects of GPR on Capital Expenditures by Large Manufacturing Firms, Robustness Checks



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

capital and R&D expenditures are generally null. Although Panel C of Part II shows that the coefficient turns out to be negative and statistically significant with the 75th percentile cutoff to define "large firms," it is consistent with the results indicating adverse effects among small firms shown in Table 4.

Overall, the results from the robustness checks show that (i) the effects of FDI-based GPR variables tend to be driven by very large firms, (ii) the effects tend to be greater among firms in the heavy manufacturing firms, and (iii) the results are robust to the FDI-based GPR variable constructed using the region level FDI data. Appendix D provides results from additional robustness checks using a sample of the balanced panel and the large firm dummy consistently taking unity for the same set of firms throughout the sample period.

4.3 Additional Considerations

The baseline analysis incorporates both FDI-based and trade-based GPR variables within the same regression equation. Appendix B presents results separately to illustrate their individual effects. The effects of the EPU variables, without controlling for GPR variables, are presented in Appendix C. The baseline analysis uses an unbalanced panel with the large firm dummy based on lagged sales, while Appendix D re-runs regressions with a balanced panel, keeping the large firm dummy constant for the same firms. Appendix E adds sectoral dummies to examine varying responses to GPR, and Appendix F introduces separate GPR variables by region and allows different responses to GPRs across regions. Appendix G winsorizes dependent variables to mitigate outlier bias. Overall, the results remain consistent with the baseline findings.

Appendix H examines the effects of the GPR variables on the foreign subsidiaries of Japanese manufacturing firms. It finds that these effects are rather limited, likely because our analysis utilizes year-to-year variations, capturing short-run responses to GPR. Appendix I examines whether exchange rate fluctuations drive GPR's adverse effects on Japanese firms' cash holdings by re-running regressions with USD-denominated cash holdings. The results remain consistent with the baseline findings, suggesting that the influence of exchange rate fluctuations on our results is limited. Lastly, Appendix J presents results without year fixed effects to facilitate comparison with previous studies.

5 Discussions

5.1 Why Are Large Firms Strongly Affected?

In this section, we discuss the potential mechanisms underlying our findings in greater detail. First, we explore why GPR primarily affects large firms. Two key factors may account for this pattern. The first factor is the greater flexibility of large firms in procurement and sales operations. Large firms typically have extensive supplier and customer networks, allowing them to adapt more effectively to heightened geopolitical risks. For example, if GPR increases in a country where a key supplier is located, large firms can mitigate the impact by sourcing from alternative suppliers in other regions, which leads to changes in their cash holdings and investments. In contrast, smaller firms with more limited supply chain networks face greater constraints in adjusting to such disruptions.

The second factor is large firms' capacity to assess and respond to GPR. Multinational corporations often maintain dedicated risk management teams that systematically evaluate geopolitical uncertainties. These teams enable firms to identify emerging risks proactively and implement appropriate adjustments to their balance sheets, procurement strategies, and sales operations. In summary, the ability of large firms to swiftly navigate geopolitical risks through operational flexibility and strategic risk management is considered to be the primary driver of our empirical results.

5.2 FDI vs. Trade and GPR vs. EPU

The results suggest that the effects on cash holdings are

$$\underbrace{\text{FDI-based GPR}}_{(-)}, \quad \underbrace{\text{Trade-based GPR}}_{(+)}, \quad \underbrace{\text{FDI-based EPU}}_{(\text{Null})}, \quad \underbrace{\text{Trade-based EPU}}_{(\text{Null})},$$

and the effects on capital expenditures are

$$\underbrace{\text{FDI-based GPR}}_{(-)}, \quad \underbrace{\text{Trade-based GPR}}_{(\text{Null})}, \quad \underbrace{\text{FDI-based EPU}}_{(+)}, \quad \underbrace{\text{Trade-based EPU}}_{(\text{Null})}.$$

We argue that these results can be explained by the differing strengths of the effects of GPR and EPU, as well as the varying magnitudes of their propagation through FDI and trade.

Regarding GPR versus EPU, we contend that the adverse effects of GPR are greater than those of EPU because rising GPR may be associated with infrastructure destruction and may compel firms to adjust their long-term operational plans in affected locations. In contrast, the effects of EPU may be more short-term, as political regime changes—resulting from events such as elections—could lead to future shifts in economic policies.

Regarding FDI versus trade, we argue that the propagation of shocks through FDI is stronger than through trade because FDI involves the international movement of capital, whereas trade consists merely of cross-border transactions of goods, which entail fewer international capital movements and, consequently, lower sunk costs. These considerations lead to the following order of the size of adverse effects:

$$\text{FDI-based GPR} > \text{Trade-based GPR} \approx \text{FDI-based EPU} > \text{Trade-based EPU},$$

which is consistent with our results regarding the effects on firms' cash holdings and capital expenditures.

When a firm experiences a severe negative shock from FDI-based GPR, it significantly reduces its sales and profits, leading to a decline in cash holdings. In contrast, when a firm faces a moderate negative shock from trade-based GPR, it accumulates cash holdings as a precautionary buffer and/or reallocates capital from foreign subsidiaries to the home parent firm.

Similarly, a severe negative shock of FDI-based GPR decreases investment while a moderately negative shock of FDI-based EPU increases it. Different effects of adverse shocks are documented in the context of import competition: while it increases European firms' investment (Bloom et al., 2016), it decreases US firms' investment (Autor et al., 2020). Autor et al. (2020) argue that, in Europe, the impacted firms were primarily technological leaders, whereas in the U.S., they mainly were technological laggards. Consequently, adverse shocks spurred investment among the former but discouraged it among the latter. The same logic may apply in our context. Firms investing in countries with rising GPR might be technological laggards, whereas those investing in countries with rising EPU might be technological leaders, resulting in different investment responses to FDI-

driven GPR and EPU.

5.3 Limitations

This section acknowledges the limitations of the current study. Our firm-level measure of GPR accounts only for the propagation of shocks through FDI and trade, but not for exposure to foreign GPR through domestic input-output linkages—such as when firms indirectly source inputs from abroad via domestic wholesalers.

Additionally, we employ GPR measure constructed by Caldara and Iacoviello (2022), which is based on English-language newspapers. We acknowledge that the most appropriate measure of geopolitical risk for Japanese firms would ideally be derived from Japanese newspapers. However, there is likely a strong correlation between English-based and Japanese-based GPR. Nevertheless, Bondarenko et al. (2024) show that their GPR measure, based on Russian-language newspapers, outperforms the English-based GPR in explaining variables related to the Russian economy. However, they also demonstrate that the English-based GPR has a similar effect to the Russian-based GPR, albeit with a smaller magnitude. This suggests that the current study is estimating a lower bound for the effect of GPR variables.

6 Conclusions

In this study, we examine whether and how GPR influences corporate decision-making. To assess firms' exposure to GPR, we propose two new measures based on the magnitude of their FDI and international trade (exports and imports). Utilizing a novel dataset on Japanese multinational manufacturing firms' FDI and trade, we find that GPR affects only large multinational manufacturing firms, with no significant impact on medium- or small-sized firms. Moreover, the effect of GPR on cash holdings and fixed asset purchases is negative, except in the case of intangible assets. Additionally, we find that FDI-based GPR influences both balance sheet variables (asset-side variables) and profit and loss statement variables (flow variables).

This study contributes to the literature by providing new insights into whether and how internationally operating firms are affected by GPR. Existing research has primarily focused on aggregate GPR indices at the country level, allowing for no variation in firms' individual exposures to geopolitical risks. By differentiating GPR exposure based on FDI and trade, we show that FDI-based GPR has a negative impact on asset-side variables. Our findings underscore the importance of distinguishing sources of GPR exposure to better understand firms' varied strategic responses in the face of geopolitical uncertainty.

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Appendix for "Geopolitical Risk and Corporate Behaviors: Propagation of Shocks through Global Operations"

Huu Nhan Duong, Jota Ishikawa, Katsumasa Nishide, and S. Ghon Rhee, and Akira Sasahara

A Data Details

This section provides details of the dataset. We construct the large firm dummy based on the previous year's sales distribution, using the 90th percentile as the baseline and the 95th and 75th percentiles for robustness checks. These cutoffs are calculated based on all available observations of manufacturing firms in the sample. However, some observations are excluded from the regression due to missing data for control variables. Table A1 presents the structure of the baseline sample used in the analysis. It shows that more firms are included in the later years due to fewer missing observations. Consequently, the average share of firms classified as large increases to 9%, 17%, and 37% using the 95th, 90th, and 75th percentile cutoffs, respectively.

Table A2 lists the countries included in the construction of FDI-based GPR, trade-based GPR, FDI-based EPU, trade-based EPU, FDI-based exposure to foreign GDP growth, trade-based exposure to foreign GDP growth, and FDI-based GPR using region-level FDI data. It shows that 41 countries are considered for GPR variables, 19 for EPU variables, and 40 for GDP exposure variables. The lists of countries are determined by data availability.

Table A3 shows correlation matrices for the explanatory variables: Panel A presents the correlation matrix without firm fixed effects, while Panel B presents the one with firm fixed effects.

TABLE A1: Share of 'Large Firms' in the Baseline Sample

		Share of "large firms"		
	N	95th pc	90th pc	75th pc
2002	348	0.13	0.22	0.47
2003	339	0.13	0.22	0.46
2004	359	0.11	0.20	0.42
2005	365	0.10	0.19	0.40
2006	408	0.09	0.18	0.39
2007	422	0.09	0.17	0.39
2008	541	0.09	0.16	0.35
2009	529	0.09	0.16	0.34
2010	526	0.09	0.17	0.35
2011	486	0.09	0.17	0.36
2012	504	0.09	0.17	0.37
2013	565	0.08	0.16	0.36
2014	582	0.08	0.16	0.34
2015	610	0.08	0.15	0.34
2016	589	0.08	0.15	0.34
2017	624	0.08	0.15	0.34
2018	612	0.08	0.15	0.33
2019	600	0.08	0.15	0.33
2020	590	0.08	0.14	0.33
2021	589	0.07	0.14	0.32
2022	587	0.07	0.13	0.32
Sum	10,775			
Mean		0.09	0.17	0.37

Note: The table shows the number of observations and the share of "large firms" with the three definitions, the 95th, 90th, and 75th percentile cutoffs in the sales distribution in the previous year, in each year during the sample period. The 'mean' denotes 'simple mean.'

TABLE A2: List of Countries

ISO	Country Name	GPRC	EPU	GDP growth rate	Region level FDI-based GPRC	Region
ARG	Argentina	✓		✓	✓	Latin America
AUS	Australia	✓	✓	✓	✓	Oceania
BEL	Belgium	✓		✓	✓	Europe
BRA	Brazil	✓	✓	✓	✓	Latin America
CAN	Canada	✓	✓	✓	✓	North America
CHE	Switzerland	✓		✓	✓	Europe
CHL	Chile	✓	✓	✓	✓	Latin America
CHN	China	✓	✓	✓	✓	East and South Asia
COL	Colombia	✓		✓	✓	Latin America
DEU	Germany	✓	✓	✓	✓	Europe
DNK	Denmark	✓		✓	✓	Europe
EGY	Egypt	✓		✓	✓	Africa
ESP	Spain	✓	✓	✓	✓	Europe
FIN	Finland	✓		✓	✓	Europe
FRA	France	✓	✓	✓	✓	Europe
GBR	United Kingdom	✓	✓	✓	✓	Europe
GRC	Greece		✓			
HKG	Hong Kong	✓		✓	✓	East and South Asia
HUN	Hungary	✓		✓	✓	Europe
IDN	Indonesia	✓		✓	✓	East and South Asia
IND	India	✓	✓	✓	✓	East and South Asia
IRL	Ireland		✓			
ITA	Italy	✓	✓	✓	✓	Europe
KOR	South Korea	✓	✓	✓	✓	East and South Asia
MEX	Mexico	✓	✓	✓	✓	North America
MYS	Malaysia	✓		✓	✓	East and South Asia
NLD	Netherlands	✓		✓	✓	Europe
NOR	Norway	✓		✓	✓	Europe
PAK	Pakistan		✓			
PER	Peru	✓		✓	✓	Latin America
PHL	Philippines	✓		✓	✓	East and South Asia
POL	Poland	✓		✓	✓	Europe
PRT	Portugal	✓		✓	✓	Europe
RUS	Russia	✓	✓	✓	✓	Europe
SAU	Saudi Arabia	✓		✓	✓	Middle East
SWE	Sweden	✓	✓	✓	✓	Europe
THA	Thailand	✓		✓	✓	East and South Asia
TUN	Tunisia	✓		✓	✓	Africa
TUR	Türkiye	✓		✓	✓	Europe
TWN	Taiwan	✓			✓	East and South Asia
USA	United States	✓	✓	✓	✓	North America
VEN	Venezuela	✓		✓	✓	Latin America
VNM	Vietnam	✓		✓	✓	East and South Asia
ZAF	South Africa	✓		✓	✓	Africa
		41	19	40	41	

TABLE A3: Correlation Matrix for the Explanatory Variables

Panel A: Without firm fixed effects

		Var 1	Var 2	Var 3	Var 4	Var 5	Var 6	Var 7	Var 8	Var 9	Var 10	Var 11	Var 12	Var 13
Var 1	$\widetilde{\Delta gpr}_{ft}^{FDI}$	1												
Var 2	$\widetilde{\Delta epu}_{ft}^{FDI}$	0.085	1											
Var 3	$\widetilde{g}_{ft}^{FDI}$	-0.001	-0.068	1										
Var 4	$\widetilde{\Delta gpr}_{ft}^{Trade}$	0.662	0.075	-0.007	1									
Var 5	$\widetilde{\Delta epu}_{ft}^{Trade}$	0.138	0.708	-0.074	0.147	1								
Var 6	$\widetilde{g}_{ft}^{Trade}$	-0.011	-0.490	0.322	-0.008	-0.602	1							
Var 7	Lagged ln(employment)	-0.022	-0.022	0.014	-0.012	-0.027	0.007	1						
Var 8	Lagged ln(sales/employment)	-0.043	-0.014	-0.011	-0.034	-0.017	-0.001	0.346	1					
Var 9	Lagged ln(capital/employment)	-0.021	-0.021	0.002	-0.016	-0.010	0.003	0.001	0.386	1				
Var 10	Lagged ln(total assets/employment)	0.013	0.001	-0.011	0.022	0.012	-0.009	0.261	0.768	0.618	1			
Var 11	Lagged share of equity held by foreigners, %	-0.107	-0.031	-0.023	-0.067	-0.037	-0.011	0.302	0.200	0.139	0.243	1		
Var 12	Lagged share of capital invested abroad, %	0.042	0.022	0.010	0.047	0.027	0.008	0.303	0.130	-0.226	0.131	0.121	1	
Var 13	Large firm dummy (baseline, 90th pc)	-0.023	-0.022	0.008	-0.021	-0.027	0.006	0.697	0.449	0.118	0.366	0.252	0.255	1

Panel B: With firm fixed effects

		Var 1	Var 2	Var 3	Var 4	Var 5	Var 6	Var 7	Var 8	Var 9	Var 10	Var 11	Var 12	Var 13
Var 1	$\widetilde{\Delta gpr}_{ft}^{FDI}$	1												
Var 2	$\widetilde{\Delta epu}_{ft}^{FDI}$	0.135	1											
Var 3	$\widetilde{g}_{ft}^{FDI}$	-0.160	-0.099	1										
Var 4	$\widetilde{\Delta gpr}_{ft}^{Trade}$	0.492	0.092	-0.115	1									
Var 5	$\widetilde{\Delta epu}_{ft}^{Trade}$	0.133	0.623	-0.087	0.207	1								
Var 6	$\widetilde{g}_{ft}^{Trade}$	-0.058	-0.430	0.290	-0.116	-0.598	1							
Var 7	Lagged ln(employment)	0.031	0.045	-0.014	0.026	0.024	-0.007	1						
Var 8	Lagged ln(sales/employment)	-0.014	0.012	-0.009	-0.009	0.005	-0.002	0.278	1					
Var 9	Lagged ln(capital/employment)	-0.007	0.011	0.000	-0.004	0.017	-0.003	0.037	0.3752	1				
Var 10	Lagged ln(total assets/employment)	0.012	0.033	-0.009	0.013	0.037	-0.008	0.214	0.762	0.611	1			
Var 11	Lagged share of equity held by foreigners, %	0.034	0.013	-0.053	0.058	0.003	-0.028	0.225	0.137	0.122	0.158	1		
Var 12	Lagged share of capital invested abroad, %	0.038	0.025	0.008	0.043	0.030	0.007	0.267	0.113	-0.248	0.117	0.074	1	
Var 13	Large firm dummy (baseline, 90th pc)	0.009	0.017	-0.007	0.009	0.003	-0.002	0.620	0.394	0.108	0.324	0.187	0.231	1

B Results with FDI- or Trade-based GPR Variables Only

The regression tables in the main text report results with both FDI-based GPR and trade-based GPR included simultaneously in the regression equation. This section presents results for FDI-based GPR without trade-based GPR and for trade-based GPR without FDI-based GPR.

TABLE A4: Effects on Cash Holdings, Results with FDI- or Trade-based GPR Variables Only

	FDI only				Trade only			
	Cash hold., consol-idated (1)	Cash hold., stand-alone (2)	Cash hold., subsidiaries (3)	Cash hold., ratio standalone/ consolidated (4)	Cash hold., consol-idated (5)	Cash hold., stand-alone (6)	Cash hold., subsidiaries (7)	Cash hold., ratio standalone/ consolidated (8)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.12	-0.08	0.20	-0.08				
	(0.87)	(0.69)	(0.32)	(0.19)				
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-3.04 ***	-2.04 **	-1.01 **	0.17				
	(0.95)	(0.86)	(0.42)	(0.32)				
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					0.36	-0.10	0.40	-0.05
					(0.84)	(0.63)	(0.38)	(0.24)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-0.73	-0.85	0.17	0.26
					(0.98)	(0.86)	(0.57)	(0.42)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.40	0.09	0.22	0.06				
	(1.36)	(1.18)	(0.58)	(0.42)				
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	0.49	-0.04	0.62	-0.09				
	(1.11)	(0.81)	(0.78)	(0.72)				
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					3.10	2.79	0.37	-0.59
					(2.67)	(2.20)	(0.96)	(0.67)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					1.41	-0.75	2.10 **	0.87
					(2.22)	(2.26)	(1.01)	(0.95)
Sample size	10,448	10,445	10,445	10,519	10,448	10,445	10,445	10,519
R-sq.	0.82	0.81	0.68	0.77	0.82	0.81	0.68	0.77
Sum of coefficients								
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-2.92***	-2.12**	-0.80*	0.10				
	(1.03)	(0.94)	(0.43)	(0.33)				
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-0.36	-0.93	0.55	0.24
					(0.93)	(0.78)	(0.59)	(0.42)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.90	0.05	0.84	-0.03				
	(1.53)	(1.28)	(0.92)	(0.82)				
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					4.51	2.04	2.46**	0.28
					(3.09)	(3.02)	(1.17)	(1.13)

Note: Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the control variables outlined in the main text, firm fixed effects, sector-year fixed effects, and prefecture-year fixed effects. The sample period is 2002-2022. The large firm dummy D^{Large} takes unity if the firm's sales is greater than the 90th percentile of the sales distribution in the previous year. The coefficients of $\widetilde{\Delta gpr}_{ft}^{FDI}$, $\widetilde{\Delta gpr}_{ft}^{Trade}$ (and therefore their interaction terms with the large firm dummy) are normalized to represent the effects of a one-standard-deviation change in the corresponding GPR variable.

Table A4 reports the effects on the cash holdings variables. Columns (1)–(4) show the effects of FDI-based GPR, while columns (5)–(8) show the effects of trade-based GPR. The results suggest that FDI-based GPR reduces the cash holdings of large manufacturing firms, whereas trade-based GPR has essentially no effect. Since the baseline results in Table 2 indicate that trade-based GPR has a positive effect on the cash holdings of large manufacturing firms, the results in columns (5)–(8) are likely affected by omitted variable bias due to the exclusion of the FDI-based GPR variable.

Table A5 reports the effects on asset purchase variables. Columns (1) and (2) show that

FDI-based GPR reduces asset purchases, with the adverse effects being statistically significant. Columns (5) and (6) show that trade-based GPR also reduces asset purchases. While the effects of FDI-based GPR are similar to those presented in Table 3, the effects of trade-based GPR differ slightly, likely due to omitted variable bias in Table A5.

TABLE A5: Effects on Asset Purchases, Results with FDI- or Trade-based GPR Variables Only

	FDI only				Trade only			
	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.17	-0.09	0.07	0.13				
	(0.11)	(0.29)	(0.12)	(0.09)				
$D^{\text{Large}} \times \widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_2$	-0.59 ***	-1.73 ***	0.51 ***	-0.12 *				
	(0.15)	(0.48)	(0.19)	(0.06)				
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					-0.11	0.29	-0.03	-0.13 **
					(0.14)	(0.31)	(0.13)	(0.06)
$D^{\text{Large}} \times \widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_4$					-0.31 *	-2.44 ***	0.31	-0.01
					(0.17)	(0.55)	(0.24)	(0.06)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.13	0.24	-0.34	0.08				
	(0.30)	(0.42)	(0.23)	(0.13)				
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	0.55	-1.90 **	-0.04	0.07				
	(0.36)	(0.90)	(0.25)	(0.23)				
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					-0.18	0.04	-0.49	0.19
					(0.60)	(0.82)	(0.46)	(0.27)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					0.7	-3.14 **	0.14	-0.13
					(0.62)	(1.38)	(0.44)	(0.24)
Sample size	10,587	10,587	10,587	10,587	10,587	10,587	10,587	10,587
R-sq.	0.36	0.87	0.55	0.63	0.36	0.87	0.54	0.63
Sum of coefficients								
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-0.42***	-1.83***	0.58***	0.02				
	(0.14)	(0.49)	(0.20)	(0.06)				
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-0.42**	-2.16***	0.28	-0.14**
					(0.18)	(0.55)	(0.27)	(0.06)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.68*	-1.65*	-0.38	0.14				
	(0.37)	(0.94)	(0.32)	(0.25)				
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					0.51	-3.11**	-0.34	0.06
					(0.66)	(1.57)	(0.60)	(0.32)

Note: See the note for Table A4.

Table A6 reports the effects on capital expenditure variables. Columns (1)–(4) show that FDI-based GPR reduces these capital expenditure variables, with the adverse effects being statistically significant. Columns (5) and (7) show that trade-based GPR also reduces the corresponding capital expenditure variables. While the effects of FDI-based GPR are similar to those presented in Table 4, the effects of trade-based GPR differ—specifically, they are entirely statistically insignificant in Table 4. This suggests that, as in Tables A4 and A5, the results in Table A6 suffer from omitted variable bias.

TABLE A6: Effects on Capital Expenditures, Results with FDI- or Trade-based GPR Variables Only

	FDI only				Trade only			
	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	-0.21	0.01	0.18	-0.16				
	(0.32)	(0.22)	(0.12)	(0.14)				
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-0.87 ***	-0.73 ***	-0.55 ***	-0.17				
	(0.30)	(0.27)	(0.14)	(0.19)				
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					-0.38	-0.18	-0.14	-0.04
					(0.29)	(0.23)	(0.14)	(0.13)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-0.66 *	-0.35	-0.41 **	0.07
					(0.38)	(0.34)	(0.18)	(0.24)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.68	0.68 *	0.46	0.23 *				
	(0.41)	(0.38)	(0.32)	(0.13)				
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	0.57	1.08 **	0.57	0.50 **				
	(0.61)	(0.44)	(0.39)	(0.21)				
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					-0.39	-0.11	-0.07	-0.04
					(0.77)	(0.68)	(0.57)	(0.24)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					1.26	1.15	0.53	0.59 **
					(0.89)	(0.71)	(0.66)	(0.28)
Sample size	10,614	10,403	10,500	10,487	10,614	10,403	10,500	10,487
R-sq.	0.34	0.62	0.35	0.85	0.34	0.61	0.35	0.85
Sum of coefficients								
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-1.08***	-0.71***	-0.37***	-0.33*				
	(0.31)	(0.27)	(0.13)	(0.19)				
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-1.04***	-0.53	-0.54***	0.04
					(0.36)	(0.34)	(0.19)	(0.23)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	1.24*	1.75***	1.03**	0.73***				
	(0.64)	(0.50)	(0.40)	(0.27)				
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					0.88	1.04	0.45	0.55
					(0.91)	(0.77)	(0.65)	(0.35)

Note: See the note for Table A4.

C Results with EPU Variables Only

The results in the main text indicate that the effects of EPU variables tend to be statistically insignificant. Since the regression model estimated in the main text includes both GPR and EPU variables simultaneously, we cannot determine whether the EPU variables have no effect *after controlling for* GPR variables. Therefore, this section runs regressions with EPU variables only.

Table A7 reports the effects of FDI-based and trad-based EPU variables on cash holdings variables. It shows that statistically significant results come from columns (7) and (11), which indicate that trade-based FDI positively affects cash holdings by subsidiaries. This result is consistent with Duong et al. (2020), which investigates the effects of EPU on U.S. firms' cash holdings.

Table A8 reports the effects of EPU variables on asset purchase variables. Columns (9)–(12), which include both FDI-based EPU and trade-based EPU, show that FDI-based EPU reduces the share of intangible asset purchases, and trade-based EPU reduces the share of tangible asset purchases.

Table A9 reports the effects of EPU variables on capital expenditure variables. Columns (9)–(12), which include both FDI-based EPU and trade-based EPU, show that while the effects of FDI-based EPU on capital expenditures are positive and significant, the effects of trade-based EPU are insignificant.

Overall, the results suggest that the EPU variables have fewer statistically significant coefficients than the GPR variables. There are at least four reasons why GPR may have more substantial adverse effects than EPU. First, armed conflicts resulting from geopolitical tensions can lead to the destruction of critical infrastructure, causing prolonged economic decline. Second, geopolitical tensions often lead to significant shifts in trade and FDI flows, thereby amplifying negative global spillovers. Third, geopolitical risks can trigger refugee crises, which alter labor supply. Finally, ideological conflicts associated with geopolitical risks may complicate resolution efforts, resulting in more severe and lasting economic disruptions.

TABLE A7: Effects on Cash Holdings, EPU Variables Only

	FDI only				Trade only				FDI and trade			
	Cash holdings, consolidated	Cash holdings, standalone	Cash holdings by subsidiaries	Cash holdings ratio, Standa./Cons.	Cash holdings, consolidated	Cash holdings, standalone	Cash holdings by subsidiaries	Cash holdings ratio, Standa./Cons.	Cash holdings, consolidated	Cash holdings, standalone	Cash holdings by subsidiaries	Cash holdings ratio, Standa./Cons.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta epu_{ft}^{FDI}}, \hat{\beta}_1$	0.66	0.28	0.28	0.06					0.39	-0.08	0.36	0.20
	(1.36)	(1.19)	(0.57)	(0.41)					(1.38)	(1.28)	(0.55)	(0.43)
$D^{\text{Large}} \times \widetilde{\Delta epu_{ft}^{FDI}}, \hat{\beta}_2$	0.22	-0.21	0.52	-0.07					-0.26	0.79	-0.82	-1.00
	(1.11)	(0.82)	(0.79)	(0.73)					(2.38)	(1.87)	(0.94)	(1.12)
$\widetilde{\Delta epu_{ft}^{Trade}}, \hat{\beta}_3$					3.21	2.82	0.44	-0.62	3.07	2.99	0.19	-0.83
					(2.71)	(2.22)	(0.98)	(0.67)	(2.81)	(2.41)	(0.95)	(0.71)
$D^{\text{Large}} \times \widetilde{\Delta epu_{ft}^{Trade}}, \hat{\beta}_4$					1.12	-1.10	2.18 *	0.98	1.40	-1.91	3.03 **	2.01
					(2.37)	(2.45)	(1.11)	(0.98)	(4.32)	(4.04)	(1.36)	(1.54)
Sample size	10,448	10,445	10,445	10,519	10,448	10,445	10,445	10,519	10,448	10,445	10,445	10,519
R-sq.	0.82	0.81	0.68	0.77	0.82	0.81	0.68	0.77	0.82	0.81	0.68	0.77
FDI-based EPU, $\hat{\beta}_1 + \hat{\beta}_2$	0.88	0.07	0.80	-0.01					0.13	0.71	-0.46	-0.80
	(1.52)	(1.28)	(0.91)	(0.82)					(2.46)	(1.81)	(1.03)	(1.13)
Trade-based EPU, $\hat{\beta}_3 + \hat{\beta}_4$					4.33	1.72	2.62**	0.36	4.47	1.08	3.23**	1.18
					(3.17)	(3.15)	(1.23)	(1.16)	(4.38)	(4.03)	(1.40)	(1.54)

Note: See the note for Table A4.

TABLE A8: Effects on Asset Purchases, EPU Variables Only

	FDI only				Trade only				FDI and trade			
	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta epu}^{FDI}_{ft}, \hat{\beta}_1$	0.15	0.39	-0.39 *	0.07					0.17	0.27	-0.32	0.03
	(0.30)	(0.42)	(0.23)	(0.13)					(0.29)	(0.43)	(0.23)	(0.14)
$D^{\text{Large}} \times \widetilde{\Delta epu}^{FDI}_{ft}, \hat{\beta}_2$	0.51	-1.98 **	-0.02	0.05					0.47	-0.46	-0.32	0.25
	(0.36)	(0.92)	(0.24)	(0.23)					(0.42)	(1.15)	(0.37)	(0.40)
$\widetilde{\Delta epu}^{Trade}_{ft}, \hat{\beta}_3$					-0.19	0.19	-0.50	0.17	-0.17	0.09	-0.47	0.20
					(0.60)	(0.84)	(0.46)	(0.27)	(0.61)	(0.84)	(0.49)	(0.30)
$D^{\text{Large}} \times \widetilde{\Delta epu}^{Trade}_{ft}, \hat{\beta}_4$					0.60	-3.88 ***	0.24	-0.13	0.12	-3.35 *	0.55	-0.39
					(0.62)	(1.46)	(0.44)	(0.23)	(0.74)	(1.83)	(0.63)	(0.49)
Sample size	10,587	10,587	10,587	10,587	10,587	10,587	10,587	10,587	10,587	10,587	10,587	10,587
R-sq.	0.36	0.87	0.54	0.63	0.36	0.87	0.54	0.63	0.36	0.87	0.54	0.63
FDI-based EPU, $\hat{\beta}_1 + \hat{\beta}_2$	0.66*	-1.59*	-0.41	0.12					0.64	-0.19	-0.64	0.28
	(0.37)	(0.95)	(0.32)	(0.25)					(0.42)	(1.13)	(0.40)	(0.39)
Trade-based EPU, $\hat{\beta}_3 + \hat{\beta}_4$					0.41	-3.69**	-0.27	0.03	-0.05	-3.26*	0.09	-0.19
					(0.66)	(1.62)	(0.59)	(0.32)	(0.67)	(1.92)	(0.64)	(0.47)

Note: See the note for Table A4.

TABLE A9: Effects on Capital Expenditures, EPU Variables Only

	FDI only				Trade only				FDI and trade			
	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_1$	0.77 *	0.74 *	0.48	0.26 *					0.86 *	0.75 **	0.47	0.27 *
	(0.42)	(0.38)	(0.32)	(0.14)					(0.45)	(0.38)	(0.31)	(0.14)
$D^{\text{Large}} \times \widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_2$	0.54	1.03 **	0.53	0.50 **					0.15	1.11 *	0.72	0.41
	(0.60)	(0.44)	(0.39)	(0.21)					(0.97)	(0.58)	(0.44)	(0.31)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_3$					-0.43	-0.13	-0.08	-0.05	-0.65	-0.15	-0.11	-0.05
					(0.79)	(0.69)	(0.57)	(0.24)	(0.90)	(0.73)	(0.59)	(0.27)
$D^{\text{Large}} \times \widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_4$					1.07	1.02	0.39	0.61 **	0.95	-0.11	-0.35	0.20
					(0.91)	(0.72)	(0.67)	(0.28)	(1.45)	(0.92)	(0.76)	(0.42)
Sample size	10,614	10,403	10,500	10,487	10,614	10,403	10,500	10,487	10,614	10,403	10,500	10,487
R-sq.	0.34	0.61	0.35	0.85	0.34	0.61	0.35	0.85	0.34	0.61	0.35	0.85
FDI-based EPU, $\hat{\beta}_1 + \hat{\beta}_2$	1.31**	1.77***	1.01**	0.77***					1.01	1.86***	1.19***	0.68**
	(0.64)	(0.50)	(0.40)	(0.28)					(0.90)	(0.60)	(0.45)	(0.34)
Trade-based EPU, $\hat{\beta}_3 + \hat{\beta}_4$					0.64	0.90	0.30	0.56	0.30	-0.26	-0.45	0.15
					(0.93)	(0.77)	(0.65)	(0.35)	(1.18)	(0.77)	(0.64)	(0.38)

Note: See the note for Table A4.

D Results with Balanced Panel Dataset

The analysis in the main text is based on an unbalanced panel dataset, with a dummy variable that takes unity for firms whose previous year's sales exceed the 90th percentile of the sales distribution. Consequently, the same firm may transition between being classified as a 'large firm' and a 'non-large firm,' which could potentially affect our results in an unexpected manner. This section addresses this potential concern by re-running regressions using a balanced panel dataset.

Table A10 summarizes the structure of the balanced panel dataset. Column (1) shows that 573 firms are consistently included throughout the entire period from 2002 to 2022. In the baseline analysis in this section, a firm is classified as a 'large firm' if its average sales during the 2002–2022 period exceed the 90th percentile of the distribution of average sales. Additionally, the 95th and 75th percentile cutoffs are used for robustness checks. Columns (2)–(4) show the share of large firms based on each cutoff, indicating that 5%, 10%, and 25% of firms are classified as large firms using the 95th, 90th, and 75th percentile cutoffs, respectively.

However, due to the availability of control variables, not all 573 firms are included in the regression analysis. Column (5) shows the number of firms used in the analysis in each period, indicating that as data availability improves over time, more firms are included in the analysis in the later years of the sample period. Since some firms are dropped from the analysis sample, and these firms tend to be small, the average share of large firms in the sample increases to 8%, 16%, and 35% with the 95th, 90th, and 75th percentile cutoffs, respectively.

Table A11 presents the effects of FDI-based and trade-based GPR on cash holdings. Columns (1)–(4) report results for FDI-based GPR, while columns (5)–(8) focus on trade-based GPR. The last four columns, (9)–(12), incorporate both FDI-based and trade-based GPR, following the same structure as Table 2. The results are largely consistent with our baseline findings using an unbalanced panel dataset–FDI-based GPR reduces cash holdings in large manufacturing firms, while trade-based GPR has no significant effect.

Table A12 presents the effects on asset purchases. The results in columns (9)–(11) show that FDI-based GPR negatively affects fixed asset purchases, tangible asset purchases, and intangible asset purchases. Additionally, trade-based GPR has a negative impact on tangible asset purchases but has no significant effect on other asset purchase variables. These results are qualitatively the same as those presented as the baseline results in Table 3.

Table A13 presents the effects on capital expenditures. The results in columns (9)–(11) show that FDI-based GPR negatively affects 'property, plant, and equipment' and capital expenditures. Additionally, trade-based GPR has no significant effect on these variables. These results are qualitatively the same as those presented as the baseline results in Table 4.

Furthermore, the same robustness checks as the main text are conducted using the balanced panel dataset. The results are presented in Figures A1, A2, and A3, which are qualitatively very similar to the results in the main text.

TABLE A10: Share of 'Large Firms' in the Sample of Balanced Panel

	Full sample				Sample used in the analysis			
		Share of "large firms"				Share of "large firms"		
	N	95th pc	90th pc	75th pc	N	95th pc	90th pc	75th pc
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2002	573	0.05	0.10	0.25	228	0.10	0.20	0.43
2003	573	0.05	0.10	0.25	218	0.11	0.20	0.43
2004	573	0.05	0.10	0.25	221	0.11	0.20	0.41
2005	573	0.05	0.10	0.25	225	0.08	0.17	0.39
2006	573	0.05	0.10	0.25	256	0.09	0.17	0.36
2007	573	0.05	0.10	0.25	264	0.08	0.16	0.35
2008	573	0.05	0.10	0.25	328	0.07	0.15	0.33
2009	573	0.05	0.10	0.25	319	0.08	0.16	0.33
2010	573	0.05	0.10	0.25	311	0.08	0.16	0.33
2011	573	0.05	0.10	0.25	303	0.08	0.17	0.34
2012	573	0.05	0.10	0.25	309	0.08	0.16	0.34
2013	573	0.05	0.10	0.25	323	0.07	0.15	0.34
2014	573	0.05	0.10	0.25	323	0.07	0.15	0.33
2015	573	0.05	0.10	0.25	342	0.08	0.15	0.33
2016	573	0.05	0.10	0.25	339	0.08	0.15	0.33
2017	573	0.05	0.10	0.25	346	0.08	0.15	0.33
2018	573	0.05	0.10	0.25	337	0.07	0.15	0.33
2019	573	0.05	0.10	0.25	335	0.07	0.15	0.33
2020	573	0.05	0.10	0.25	332	0.08	0.15	0.33
2021	573	0.05	0.10	0.25	324	0.07	0.14	0.32
2022	573	0.05	0.10	0.25	326	0.07	0.14	0.32
Sum	12,033				6,309			
Mean		0.05	0.10	0.25		0.08	0.16	0.35

TABLE A11: Effects on Cash Holdings, with Balanced Panel

	FDI only				Trade only				FDI and trade			
	Cash holdings, consolidated	Cash holdings, standalone	Cash holdings by subsidiaries	Cash holdings ratio, Standa./Cons.	Cash holdings, consolidated	Cash holdings, standalone	Cash holdings by subsidiaries	Cash holdings ratio, Standa./Cons.	Cash holdings, consolidated	Cash holdings, standalone	Cash holdings by subsidiaries	Cash holdings ratio, Standa./Cons.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	-1.20	-1.18 *	-0.01	-0.03					-1.19	-1.15	-0.02	0.03
	(0.79)	(0.67)	(0.29)	(0.22)					(0.82)	(0.70)	(0.29)	(0.22)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-2.70 **	-1.99	-0.73 **	0.54					-3.18 **	-2.24	-1.04 *	0.08
	(1.35)	(1.31)	(0.37)	(0.42)					(1.60)	(1.36)	(0.54)	(0.43)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					0.62	0.10	0.44	-0.22	0.24	-0.13	0.27	-0.20
					(1.03)	(0.82)	(0.40)	(0.30)	(1.03)	(0.83)	(0.41)	(0.31)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-1.69	-1.23	-0.39	0.93 *	1.04	0.73	0.46	0.82
					(1.27)	(1.28)	(0.39)	(0.51)	(1.41)	(1.14)	(0.60)	(0.52)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	-1.18	-1.14	-0.18	0.09					-1.42	-1.55	-0.03	0.21
	(2.00)	(1.84)	(0.74)	(0.59)					(2.07)	(1.95)	(0.71)	(0.60)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	1.51	0.63	0.89	-0.81					2.95	3.92	-0.73	-1.48
	(1.52)	(1.31)	(1.02)	(0.93)					(3.16)	(2.68)	(1.11)	(1.36)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					1.27	1.73	-0.36	-0.66	1.68	2.48	-0.62	-1.02
					(2.76)	(2.21)	(1.35)	(0.98)	(2.91)	(2.45)	(1.34)	(1.04)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					-0.27	-3.50	2.94 **	-0.17	-3.06	-7.34	3.77 ***	1.30
					(2.85)	(3.16)	(1.34)	(1.05)	(5.28)	(5.16)	(1.45)	(1.66)
Sample size	6,129	6,126	6,126	6,183	6,129	6,126	6,126	6,183	6,129	6,126	6,126	6,183
R-sq.	0.83	0.82	0.72	0.77	0.83	0.82	0.72	0.77	0.83	0.82	0.72	0.77
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-3.90***	-3.17**	-0.75*	0.52					-4.38***	-3.38**	-1.07**	0.11
	(1.44)	(1.37)	(0.39)	(0.45)					(1.61)	(1.36)	(0.53)	(0.43)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-1.07	-1.13	0.05	0.68	1.28	0.61	0.72	0.61
					(1.00)	(1.00)	(0.41)	(0.50)	(1.14)	(0.87)	(0.53)	(0.47)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.34	-0.51	0.72	-0.72					1.53	2.36	-0.76	-1.27
	(2.22)	(2.08)	(1.26)	(1.05)					(3.25)	(2.64)	(1.34)	(1.39)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					0.99	-1.77	2.58*	-0.87	-1.38	-4.85	3.15	0.29
					(3.88)	(3.87)	(1.56)	(1.28)	(5.42)	(5.10)	(1.47)	(1.58)

Note: Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the control variables outlined in the main text, firm fixed effects, sector-year fixed effects, and prefecture-year fixed effects. The sample period is 2002-2022. The large firm dummy D^{Large} takes unity if the firm's sales are greater than the 90th percentile of the average value of $\ln$(sales) during the 2002-2022 period where the distribution is computed using firms included in the balanced panel only. The coefficients of $\widetilde{\Delta gpr}_{ft}^{FDI}$, $\widetilde{\Delta gpr}_{ft}^{Trade}$ (and therefore their interaction terms with the large firm dummy) are normalized to represent the effects of a one-standard-deviation change in the corresponding GPR variable.

TABLE A12: Effects on Asset Purchases, with Balanced Panel

	FDI only				Trade only				FDI and trade			
	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.11	-0.56	0.20	0.12					0.17	-0.59	0.18	0.15
	(0.13)	(0.39)	(0.13)	(0.12)					(0.13)	(0.41)	(0.14)	(0.13)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-0.70 ***	-2.06 ***	0.52 **	-0.20 ***					-0.94 ***	-1.19	0.52	-0.25 **
	(0.21)	(0.73)	(0.26)	(0.07)					(0.35)	(0.97)	(0.35)	(0.12)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					-0.17	-0.13	0.09	-0.12	-0.35 **	-0.23	0.15	-0.19 *
					(0.18)	(0.47)	(0.17)	(0.08)	(0.17)	(0.50)	(0.18)	(0.11)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-0.33	-2.54 ***	0.46	-0.10	0.43	-1.56	0.02	0.10
					(0.21)	(0.72)	(0.34)	(0.07)	(0.36)	(0.95)	(0.44)	(0.13)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.24	0.18	-0.31	-0.15					0.23	0.18	-0.36	-0.16
	(0.35)	(0.55)	(0.29)	(0.14)					(0.33)	(0.58)	(0.28)	(0.15)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-0.04	-3.81 ***	0.14	0.11					-0.23	-2.73	0.24	-0.04
	(0.41)	(1.31)	(0.33)	(0.15)					(0.55)	(1.75)	(0.52)	(0.16)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					0.51	0.20	0.28	0.24	0.35	-0.51	0.50	0.27
					(0.72)	(1.15)	(0.65)	(0.31)	(0.72)	(1.17)	(0.70)	(0.34)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					0.16	-5.28 ***	0.13	0.33	0.51	-2.38	-0.15	0.42
					(0.62)	(1.96)	(0.52)	(0.32)	(0.83)	(2.60)	(0.81)	(0.38)
Sample size	6,184	6,184	6,184	6,184	6,184	6,184	6,184	6,184	6,184	6,184	6,184	6,184
R-sq.	0.41	0.86	0.53	0.51	0.41	0.86	0.53	0.51	0.41	0.86	0.53	0.51
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-0.59***	-2.62***	0.73***	-0.08					-0.77**	-1.78*	0.71**	-0.11
	(0.20)	(0.76)	(0.28)	(0.09)					(0.32)	(0.96)	(0.35)	(0.07)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-0.50*	-2.67**	0.56	-0.22	0.08	-1.78**	0.17	-0.09
					(0.26)	(0.70)	(0.38)	(0.07)	(0.38)	(0.85)	(0.45)	(0.06)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.20	-3.62***	-0.17	-0.04					-0.004	-2.55	-0.13	-0.20
	(0.53)	(1.36)	(0.40)	(0.17)					(0.62)	(1.71)	(0.54)	(0.15)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					0.67	-5.09**	0.41	0.58	0.86	-2.89	0.35	0.69*
					(0.86)	(2.19)	(0.72)	(0.39)	(0.89)	(2.66)	(0.75)	(0.38)

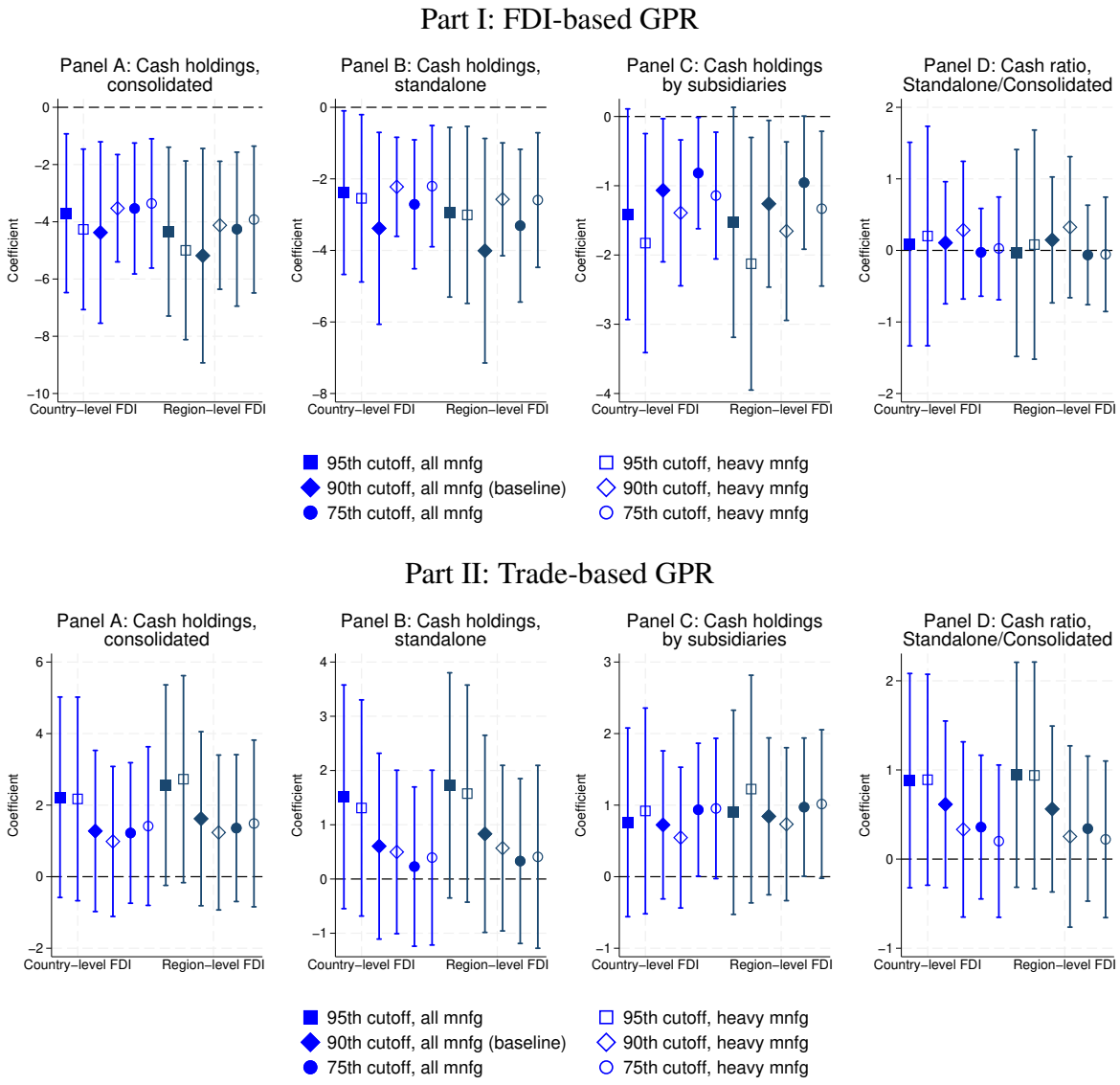
Note: See the note for Table A11.

TABLE A13: Effects on Capital Expenditures, with Balanced Panel

	FDI only				Trade only				FDI and trade			
	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.01	0.08	0.10	-0.02					0.04	0.15	0.16	-0.02
	(0.20)	(0.18)	(0.13)	(0.09)					(0.21)	(0.19)	(0.14)	(0.10)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-1.31 ***	-0.66 **	-0.53 ***	-0.12					-1.09 ***	-0.79 **	-0.57 ***	-0.22
	(0.31)	(0.31)	(0.18)	(0.19)					(0.33)	(0.31)	(0.21)	(0.17)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					-0.15	-0.27	-0.34 *	0.07	-0.34	-0.43 *	-0.46 **	0.04
					(0.25)	(0.23)	(0.19)	(0.10)	(0.27)	(0.24)	(0.21)	(0.11)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-1.28 ***	-0.41	-0.38 *	-0.05	-0.39	0.23	0.08	0.14
					(0.45)	(0.39)	(0.22)	(0.24)	(0.48)	(0.37)	(0.25)	(0.20)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.53	0.34	0.20	0.15					0.45	0.35	0.15	0.21
	(0.46)	(0.43)	(0.35)	(0.16)					(0.45)	(0.42)	(0.35)	(0.16)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-0.44	0.25	-0.31	0.55 *					-0.12	0.11	0.06	0.05
	(0.84)	(0.60)	(0.46)	(0.30)					(1.26)	(0.80)	(0.56)	(0.37)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					1.08	0.09	0.44	-0.28	0.88	-0.02	0.39	-0.35
					(0.86)	(0.72)	(0.60)	(0.32)	(0.90)	(0.76)	(0.63)	(0.35)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					-0.72	0.36	-0.76	1.15 ***	-0.48	0.34	-0.74	1.12 **
					(0.95)	(0.80)	(0.67)	(0.40)	(1.58)	(1.03)	(0.80)	(0.46)
Sample size	6,201	6,129	6,150	6,169	6,201	6,129	6,150	6,169	6,201	6,129	6,150	6,169
R-sq.	0.47	0.67	0.43	0.88	0.47	0.67	0.43	0.88	0.47	0.67	0.43	0.88
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-1.30***	-0.57*	-0.43**	-0.15					-1.05***	-0.64**	-0.40**	-0.24
	(0.32)	(0.31)	(0.17)	(0.20)					(0.30)	(0.28)	(0.19)	(0.16)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-1.42***	-0.68	-0.72***	0.02	-0.73	-0.20	-0.38	0.17
					(0.50)	(0.42)	(0.27)	(0.24)	(0.48)	(0.37)	(0.26)	(0.19)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	0.10	0.58	-0.11	0.70*					0.33	0.46	0.21	0.25
	(0.96)	(0.75)	(0.56)	(0.36)					(1.34)	(0.90)	(0.63)	(0.42)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					0.35	0.46	-0.32	0.87	0.40	0.32	-0.35	0.77*
					(1.10)	(0.94)	(0.78)	(0.47)	(1.45)	(0.97)	(0.78)	(0.42)

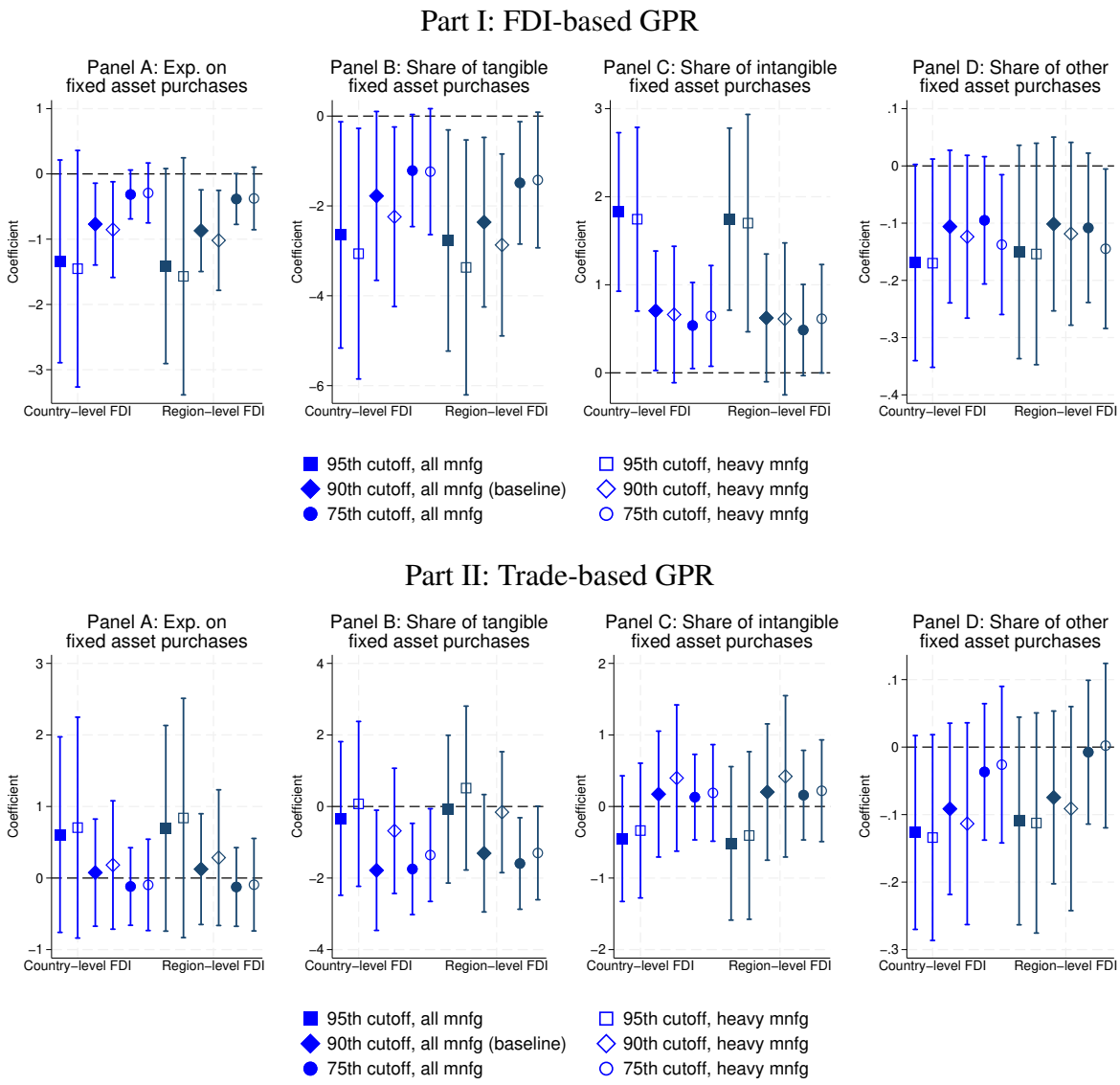
Note: See the note for Table A11.

FIGURE A1: Effects of GPR on Cash Holdings by Large Manufacturing Firms, Robustness Checks, with Balanced Panel



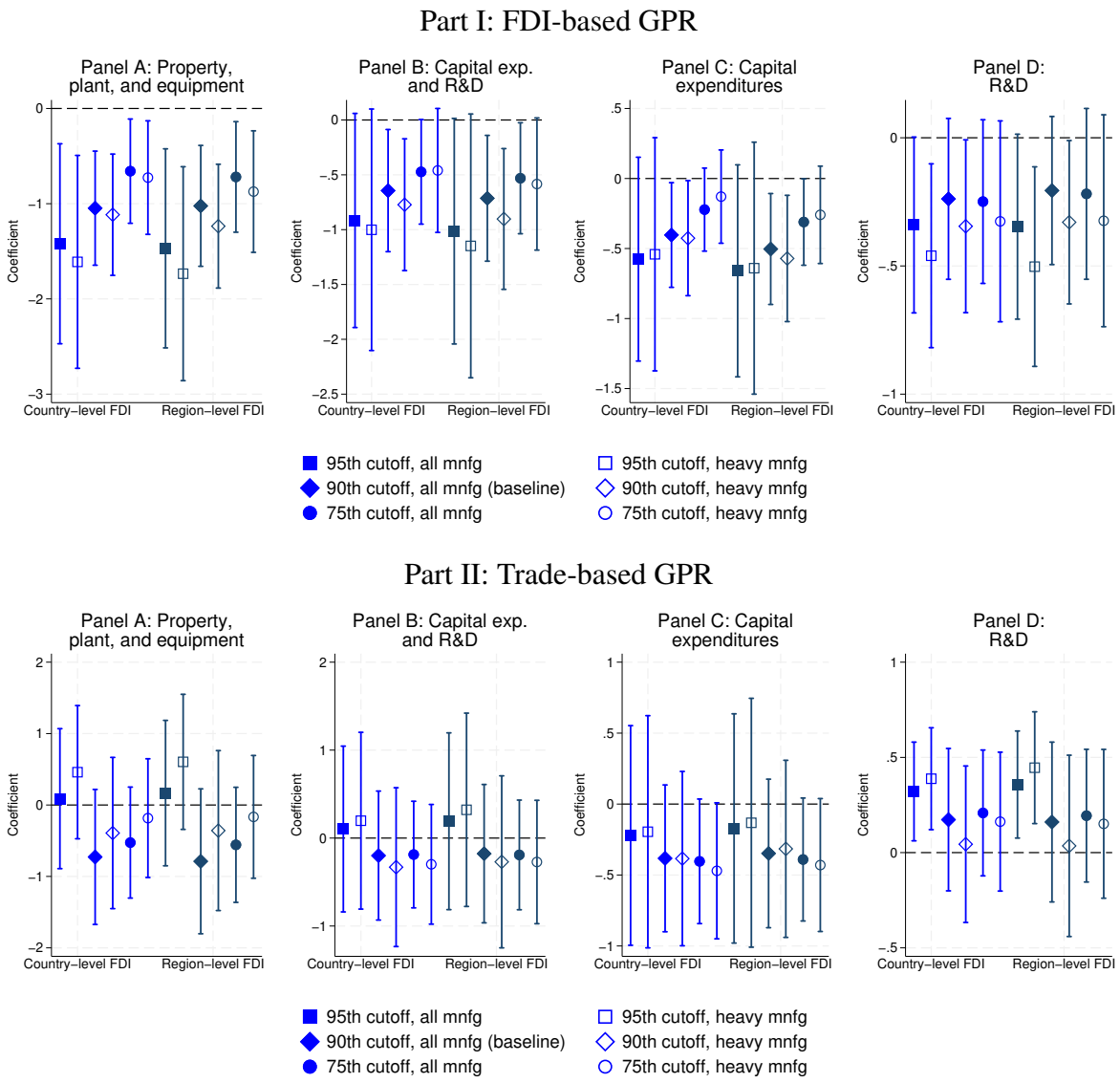
Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

FIGURE A2: Effects of GPR on Asset Purchases by Large Manufacturing Firms, Robustness Checks, with Balanced Panel



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

FIGURE A3: Effects of GPR on Capital Expenditures by Large Manufacturing Firms, Robustness Checks, with Balanced Panel



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

E Effects by Sector

This section explores sectoral differences in responses to GPR by introducing interaction terms with sectoral dummy variables into the regression equation. To do so, we introduce eight sectoral dummy variables for (1) food, (2) textiles, paper, and glass, (3) tires and tubes, (4) chemicals, (5) machinery, (6) autos and transport equipment, (7) communication equipment, and (8) furniture and accessories. We exclude the sample of 'miscellaneous manufacturing products' because it includes only a small number of manufacturing firms, and results suggest that they are outliers.

In particular, we estimate the following regression equation:

$$
\begin{aligned}
y_{ft} = & \sum_{s \in S} \beta_{1s} (\widetilde{\Delta gpr}_{ft}^{FDI} \times \mathbf{1}\{s\}) + \sum_{s \in S} \beta_{2s} (\widetilde{\Delta gpr}_{ft}^{FDI} \times D_f^{\text{Large}} \times \mathbf{1}\{s\}) \\
& + \sum_{s \in S} \beta_{3s} (\widetilde{\Delta gpr}_{ft}^{Trade} \times \mathbf{1}\{s\}) + \sum_{s \in S} \beta_{4s} (\widetilde{\Delta gpr}_{ft}^{Trade} \times D_f^{\text{Large}} \times \mathbf{1}\{s\}) \\
& + \beta_5 \widetilde{\Delta epu}_{ft}^{FDI} + \beta_6 (\widetilde{\Delta epu}_{ft}^{FDI} \times D_f^{\text{Large}}) \\
& + \beta_7 \widetilde{\Delta epu}_{ft}^{Trade} + \beta_8 (\widetilde{\Delta epu}_{ft}^{Trade} \times D_f^{\text{Large}}) \\
& + \beta_9 \widetilde{g}_{ft}^{FDI} + \beta_{10} \widetilde{g}_{ft}^{Trade} + \mathbf{X}_{ft} \boldsymbol{\beta}'_{11} + \beta_{12} D_f^{\text{Large}} + \phi_{st} + \phi_{pt} + \phi_f + u_{ft},
\end{aligned}
\tag{A1}
$$

where $\mathbf{1}\{s\}$ denotes the dummy variable taking unity for firms from sector s, and S denotes the set of eight manufacturing sectors. For the effects of FDI-based GPR, since the variable $\mathbf{1}\{s\}$ is interacted with $\widetilde{\Delta gpr}_{ft}^{FDI}$ and also with $\widetilde{\Delta gpr}_{ft}^{FDI} \times D_f^{\text{Large}}$ without excluding one of the sectoral dummies, β_{1s} measures the effect of FDI-based GPR on the outcome variable for non-large firms in sector s. The coefficient β_{2s} measures the difference in response to GPR between large and non-large firms in sector s. Similar interpretations apply to β_{3s} and β_{4s}, measuring the effects of trade-based GPR.

Table A14 shows estimated coefficients of β_{2s}'s and β_{4s}'s, measuring the differences in responses to GPR between large and non-large firms in each sector s. It shows that, for example, in the "tires and tubes," "chemicals," and "machinery" sectors, large firms' cash holdings tend to react more negatively to FDI-based GPR than non-large firms'. Additionally, in the "food," "chemicals," and "communication equipment" sectors, large firms' fixed asset purchases tend to react more negatively to FDI-based GPR than non-large firms'. Regarding capital expenditures, large firms in the "tires and tubes," "chemicals," "machinery," and "auto and transport equipment" sectors tend to react more negatively to FDI-based GPR than non-large firms.

The top half of Table A15 presents the sum of the coefficients, measuring the effects of FDI-based GPR on large firms in each sector. It shows that the adverse effects of FDI-based GPR on cash holdings and capital expenditures come from the "chemicals," "machinery," and "communication equipment" sectors. It also shows that the adverse effects on asset purchases come from the 'chemicals" and "communication equipment" sectors.

The bottom half of Table A14 estimated coefficients of β_{4s}'s, measuring the differences in responses to trade-based GPR between large and non-large firms. It shows that, for example, capital expenditures of large firms respond more positively than non-large firms in the "machinery" sector. It also shows that cash holdings of large firms respond more positively than non-large firms in the "autos and transport equipment" sector. Nevertheless, as shown in the bottom half of Table A15, these effects of trade-based GPR on large firms (the sum of the coefficients) are statistically insignificant.

TABLE A14: Effects by Sector, Coefficients of the Triple Interaction Terms

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Food}\}$	1.21	1.00	0.17	-0.14	-0.12	-0.27	0.16	0.13	-0.24	-0.34	-0.26	-0.02
	(1.01)	(1.04)	(0.36)	(0.71)	(0.32)	(1.07)	(0.32)	(0.18)	(0.72)	(0.45)	(0.41)	(0.10)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Textiles, paper, and glass}\}$	4.92	1.72	3.20	3.61	-1.62	-2.01	-0.99	0.03	-1.68	-0.62	-1.11	0.50
	(4.58)	(3.30)	(1.96)	(3.26)	(1.97)	(12.95)	(1.21)	(0.19)	(2.21)	(2.16)	(1.99)	(0.43)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Tires and tubes}\}$	-9.76 **	-5.14 *	-2.66	-3.84	-0.73	1.91	-0.10	0.21	-4.77 **	-2.23	-1.85	-0.26
	(3.85)	(2.70)	(2.58)	(2.77)	(1.86)	(1.54)	(0.85)	(0.18)	(2.10)	(2.43)	(2.08)	(0.55)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Chemicals}\}$	-5.36 **	-2.29	-3.19 **	1.00	-0.86 **	-1.64	0.63	-0.27 *	-2.71 ***	-1.37	-0.45	-0.98
	(2.51)	(1.59)	(1.39)	(0.73)	(0.34)	(1.15)	(0.73)	(0.15)	(0.98)	(1.01)	(0.42)	(0.72)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Machinery}\}$	-5.61 ***	-2.98 **	-2.66 ***	0.45	-0.50 **	-0.36	0.41	-0.33	-0.61	-1.06 ***	-0.67 **	-0.37 *
	(1.65)	(1.33)	(0.81)	(0.69)	(0.21)	(0.95)	(0.47)	(0.23)	(0.45)	(0.41)	(0.28)	(0.20)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Autos and transport equip.}\}$	-0.44	-0.85	0.32	-1.88 **	-2.49 *	-1.67	0.96 **	-0.20 *	-0.57	-1.25 *	-1.11 **	-0.10
	(1.96)	(1.48)	(0.93)	(0.85)	(1.44)	(1.77)	(0.43)	(0.11)	(0.69)	(0.68)	(0.52)	(0.31)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Commun. equip.}\}$	-9.43 *	-5.22	-4.26	-0.99	-0.75	1.55	2.58 ***	-0.03	-1.03	-1.29	-1.05	-0.26
	(4.91)	(3.35)	(3.06)	(2.03)	(0.94)	(2.01)	(0.75)	(0.15)	(1.29)	(1.14)	(0.91)	(0.67)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{\text{Furniture}\}$	0.25	0.39	-0.11	1.96	-0.57	-0.58	1.36 *	-0.04	-0.90	-0.13	-0.45	0.30 *
	(2.37)	(2.05)	(0.67)	(1.85)	(0.37)	(1.70)	(0.80)	(0.14)	(0.75)	(0.48)	(0.40)	(0.16)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Food}\}$	-3.35	-1.91	-1.35 *	1.85	-1.09 **	-6.77 ***	-0.30	0.05	-1.81	-0.95	-1.01	-0.01
	(3.02)	(2.56)	(0.80)	(1.45)	(0.54)	(2.58)	(0.38)	(0.22)	(1.96)	(0.89)	(0.72)	(0.26)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Textiles, paper, and glass}\}$	-10.42	-4.56	-5.83 *	-5.00	1.27	-10.18	1.00	-0.01	2.92	-0.67	0.30	-1.04
	(7.17)	(5.32)	(3.30)	(5.84)	(2.64)	(19.87)	(1.85)	(0.32)	(3.36)	(3.29)	(3.05)	(0.81)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Tires and tubes}\}$	1.21	1.06	-1.23	4.36	-0.41	-1.72	0.00	-0.14	2.70	0.72	0.75	-0.12
	(2.59)	(1.98)	(2.17)	(2.81)	(1.68)	(1.23)	(0.74)	(0.16)	(2.06)	(2.13)	(1.85)	(0.46)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Chemicals}\}$	5.24	-0.42	5.82 **	-3.28 **	-0.11	-0.54	0.76	0.19 *	0.23	-0.78	-0.59	-0.08
	(3.57)	(1.86)	(2.54)	(1.29)	(0.75)	(1.72)	(1.55)	(0.11)	(1.91)	(1.73)	(0.81)	(1.09)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Machinery}\}$	4.30	2.86	1.54	-1.02	1.37 **	-0.71	-0.49	0.40 *	2.20 **	2.15 ***	1.37 **	0.87 **
	(2.97)	(2.00)	(1.49)	(1.06)	(0.57)	(1.24)	(0.69)	(0.24)	(1.02)	(0.76)	(0.56)	(0.35)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Autos and transport equip.}\}$	1.96	2.02 **	0.06	2.17 ***	1.43	-0.62	-0.37	0.04	-0.17	0.58	0.47	0.09
	(1.37)	(0.91)	(0.76)	(0.64)	(1.03)	(1.40)	(0.40)	(0.06)	(0.65)	(0.54)	(0.44)	(0.18)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Commun. equip.}\}$	7.18	5.44	1.72	0.47	-0.13	-3.34	-1.98 *	-0.03	1.19	-0.40	-0.06	-0.38
	(6.62)	(4.81)	(3.45)	(2.40)	(0.85)	(2.53)	(1.11)	(0.20)	(2.31)	(1.46)	(1.08)	(0.85)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}} \times \mathbf{1}\{\text{Furniture}\}$	2.83	3.12	-0.36	3.17 ***	0.54	-4.05 *	-0.79	-0.63	-1.09	-0.32	-0.07	-0.27
	(4.91)	(4.54)	(1.05)	(1.09)	(0.82)	(2.37)	(0.99)	(0.62)	(1.21)	(0.86)	(0.76)	(0.23)
Sample size	10,161	10,158	10,158	10,231	10,306	10,306	10,306	10,306	10,331	10,123	10,218	10,206
R-sq.	0.81	0.80	0.67	0.77	0.36	0.87	0.55	0.63	0.34	0.61	0.36	0.85

Note: See the note for Table A4.

TABLE A15: Effects by Sector, Sum of Coefficients

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Effects of FDI-based GPRs on large firms												
Food	0.59	0.12	0.45	-1.06	-0.44***	-0.91	-0.17	0.24	-0.39	-0.47	-0.37	-0.07
	(0.62)	(0.56)	(0.30)	(0.81)	(0.17)	(1.51)	(0.36)	(0.20)	(0.68)	(0.27)	(0.21)	(0.10)
Textiles, paper, and glass	3.65	1.19	2.49	2.32	-1.20	-0.53	-0.87	0.05	-1.65	-0.20	-0.73	0.58
	(4.53)	(3.25)	(1.90)	(3.46)	(1.90)	(12.96)	(1.23)	(0.19)	(2.12)	(2.01)	(1.83)	(0.43)
Tires and tubes	-4.58	-2.14	-0.45	-1.13	-1.09	1.55	-0.06	0.01	-4.69***	-2.39	-1.79	-0.44
	(2.26)	(1.70)	(1.98)	(2.48)	(1.65)	(1.24)	(0.75)	(0.12)	(1.65)	(2.04)	(1.81)	(0.41)
Chemicals	-4.64	-1.71	-2.98**	0.63	-0.55*	-2.69**	1.03	-0.05	-2.27**	-0.89	-0.20	-0.77
	(2.45)	(1.42)	(1.35)	(0.66)	(0.33)	(1.06)	(0.72)	(0.09)	(0.95)	(0.99)	(0.40)	(0.72)
Machinery	-4.56***	-2.46**	-2.16**	0.47	-0.28	-0.84	0.39	-0.07	-0.90**	-1.19***	-0.45*	-0.70***
	(1.68)	(1.15)	(0.86)	(0.66)	(0.19)	(0.88)	(0.46)	(0.09)	(0.43)	(0.37)	(0.24)	(0.21)
Autos and transport equip.	-1.20	-1.34	0.06	-0.32	-2.00	-0.21	0.62	-0.18	-0.53	-0.99	-0.57	-0.39
	(2.38)	(2.00)	(0.84)	(0.86)	(1.31)	(1.76)	(0.44)	(0.11)	(0.60)	(0.64)	(0.39)	(0.41)
Commun. equip.	-10.1**	-7.49*	-2.65	-1.04	-1.26**	1.43	2.04***	0.00	-3.85	-2.22**	-1.69***	-0.56
	(4.52)	(4.28)	(1.93)	(1.98)	(0.58)	(1.88)	(0.67)	(0.10)	(2.84)	(1.06)	(0.65)	(0.57)
Furniture	-2.13	-2.55	0.46	0.50	-0.33	1.11	0.92	0.07	0.29	-0.31	-0.45	0.22
	(4.67)	(4.36)	(0.64)	(1.77)	(0.41)	(1.82)	(0.85)	(0.14)	(0.86)	(0.44)	(0.37)	(0.15)
Effects of trade-based GPRs on large firms												
Food	-1.35	-0.83	-0.52	0.39	-0.80*	-5.99**	-0.76**	0.01	-1.58	-1.16	-1.04*	-0.10
	(1.28)	(1.19)	(0.55)	(1.35)	(0.45)	(2.52)	(0.32)	(0.19)	(1.90)	(0.75)	(0.54)	(0.22)
Textiles, paper, and glass	-8.57	-4.84	-3.89	-5.47	1.88	-8.89	0.89	-0.02	3.71	0.14	0.89	-0.80
	(7.24)	(5.43)	(3.14)	(5.92)	(2.77)	(19.78)	(1.86)	(0.31)	(3.49)	(3.42)	(3.16)	(0.80)
Tires and tubes	2.75	1.71	-0.25	3.02	0.84	-1.85	-0.17	-0.19	4.76***	1.72	1.54	0.09
	(2.30)	(1.64)	(2.14)	(2.79)	(1.57)	(1.30)	(0.75)	(0.19)	(1.84)	(1.93)	(1.73)	(0.40)
Chemicals	3.71	-0.65	4.39*	-2.04*	-0.18	-0.81	0.63	0.05	-0.24	-0.69	-0.39	-0.20
	(3.26)	(1.35)	(2.53)	(1.13)	(0.71)	(1.54)	(1.56)	(0.09)	(1.85)	(1.72)	(0.78)	(1.09)
Machinery	3.54	1.85	1.75	-1.54	0.88*	0.34	-0.16	0.00	1.56*	1.43**	0.95*	0.58*
	(2.82)	(1.75)	(1.36)	(0.97)	(0.52)	(1.16)	(0.63)	(0.11)	(0.93)	(0.71)	(0.54)	(0.30)
Autos and transport equip.	1.08	0.84	0.29	1.60***	0.99	-1.37	-0.35	-0.06	-0.65	-0.22	-0.30	0.06
	(1.08)	(0.79)	(0.56)	(0.49)	(1.05)	(1.34)	(0.44)	(0.04)	(0.48)	(0.37)	(0.27)	(0.14)
Commun. equip.	4.19	1.61	2.64	0.28	-0.95**	-0.95	-0.64	-0.07	-1.18	-0.38	-0.70	0.31
	(3.39)	(2.82)	(2.36)	(2.03)	(0.42)	(1.61)	(0.71)	(0.16)	(0.73)	(0.73)	(0.45)	(0.47)
Furniture	-0.92	-0.02	-0.90**	2.48***	0.10	-5.33***	-1.03**	-0.04	-1.90***	0.07	0.24	-0.17**
	(1.77)	(1.51)	(0.36)	(0.50)	(0.18)	(0.89)	(0.50)	(0.08)	(0.66)	(0.22)	(0.18)	(0.08)

Note: The table shows the sum of the coefficients, the sum of the coefficient for $\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}} \times \mathbf{1}\{s\}$ and the coefficient for $\widetilde{\Delta gpr}_{ft}^{FDI} \times \mathbf{1}\{s\}$ for each sector s. Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

F Effects by Region

This section runs regressions with separate GPR variables by region to allow potentially different responses to regional GPRs. In particular, we estiamte the following regression equation:

$$
\begin{aligned}
y_{ft} = & \sum_{r \in R} \beta_{1r} \widetilde{\Delta gpr}_{ft}^{FDI,r} + \sum_{r \in R} \beta_{2r} (\widetilde{\Delta gpr}_{ft}^{FDI,r} \times D_f^{\text{Large}}) \\
& + \sum_{r \in R} \beta_{3r} \widetilde{\Delta gpr}_{ft}^{Trade,r} + \sum_{r \in R} \beta_{4r} (\widetilde{\Delta gpr}_{ft}^{Trade,r} \times D_f^{\text{Large}}) \\
& + \beta_5 \widetilde{\Delta epu}_{ft}^{FDI} + \beta_6 (\widetilde{\Delta epu}_{ft}^{FDI} \times D_f^{\text{Large}}) \\
& + \beta_7 \widetilde{\Delta epu}_{ft}^{Trade} + \beta_8 (\widetilde{\Delta epu}_{ft}^{Trade} \times D_f^{\text{Large}}) \\
& + \beta_9 \widetilde{g}_{ft}^{FDI} + \beta_{10} \widetilde{g}_{ft}^{Trade} + \mathbf{X}_{ft} \boldsymbol{\beta}'_{11} + \beta_{12} D_f^{\text{Large}} + \phi_{st} + \phi_{pt} + \phi_f + u_{ft},
\end{aligned}
\tag{A2}
$$

where r indicates region and R indicates the set of regions, including Asia, Europe, North America, Latin America, Oceania, Middle East, and Africa. The variable $\widetilde{\Delta gpr}_{ft}^{FDI,r}$ denotes the region level GDP variable used to construct $\widetilde{\Delta gpr}_{ft}^{FDI,\text{Region level}}$ used in equation (5).

Table A16 presents the estimated coefficients for the FDI-based GPRs and their interaction terms with the large firm dummy, while Table A17 presents the ones for trade-based GPR. Note each column in these two tables shows the result from estimating one regression equation. Table A18 shows the sum of coefficients, measuring the effect of GPR on large firms' variables.

The results shown in Table A18 suggest that the adverse effects of FDI-based GPR on large manufacturing firms' cash holdings, asset purchases, and capital expenditures mainly stem from GPR in North America. The positive effects of trade-based GPR on large firms' cash holdings also originate from North America. Additionally, the results indicate that large manufacturing firms respond to FDI-based GPR in Africa by increasing fixed asset purchases and capital expenditures, in contrast to the adverse effects of FDI-based GPR in North America. This suggests that firms in North America reduce capital expenditures to mitigate uncertainty, possibly due to the region's larger market size and the greater adverse effects of rising GPRs. In contrast, increasing GPRs in Africa may be perceived as an opportunity, possibly due to a decline in local businesses, which could create more business opportunities for foreign firms, including Japanese firms.

TABLE A16: Effects by Region, FDI-based GPR

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}^{FDI,\text{Asia}}_{ft}$	0.31	-0.39	0.65	0.12	0.01	0.26	-0.22	-0.09	-0.36	0.05	-0.03	0.08
	(1.12)	(0.81)	(0.55)	(0.27)	(0.19)	(0.31)	(0.15)	(0.07)	(0.42)	(0.23)	(0.20)	(0.11)
$\widetilde{\Delta gpr}^{FDI,\text{Europe}}_{ft}$	0.31	-0.11	0.41	0.20	0.21	0.06	-0.03	-0.02	0.03	0.15	0.20	-0.04
	(0.67)	(0.57)	(0.38)	(0.17)	(0.13)	(0.21)	(0.12)	(0.03)	(0.24)	(0.19)	(0.14)	(0.08)
$\widetilde{\Delta gpr}^{FDI,\text{North America}}_{ft}$	0.08	-0.50	0.57	-0.08	0.19	0.00	-0.09	0.24	-0.36	0.11	0.18	-0.07
	(1.52)	(1.24)	(0.54)	(0.35)	(0.20)	(0.50)	(0.19)	(0.15)	(0.51)	(0.33)	(0.21)	(0.19)
$\widetilde{\Delta gpr}^{FDI,\text{Latin America}}_{ft}$	-0.01	0.01	-0.03	0.05	0.09	-0.16	0.12 *	0.00	0.15	0.15 *	0.09	0.06 **
	(0.16)	(0.13)	(0.06)	(0.08)	(0.06)	(0.10)	(0.07)	(0.01)	(0.11)	(0.08)	(0.06)	(0.03)
$\widetilde{\Delta gpr}^{FDI,\text{Oceania}}_{ft}$	-0.20	-0.47 **	0.27	-0.11	0.09	0.03	-0.05	-0.01	0.17	0.20	0.08	0.14
	(0.24)	(0.20)	(0.18)	(0.07)	(0.10)	(0.13)	(0.06)	(0.02)	(0.21)	(0.17)	(0.12)	(0.09)
$\widetilde{\Delta gpr}^{FDI,\text{Middle East}}_{ft}$	-1.14	-0.96	-0.23	-0.61 **	-0.98 ***	-0.17	0.32	-0.04	-2.11 ***	-1.47 ***	-1.23 ***	-0.14
	(0.94)	(0.88)	(0.21)	(0.27)	(0.21)	(0.35)	(0.27)	(0.05)	(0.37)	(0.32)	(0.19)	(0.10)
$\widetilde{\Delta gpr}^{FDI,\text{Africa}}_{ft}$	-0.03	0.00	-0.02	-0.03	0.00	0.00	-0.01	0.02	0.00	0.00	0.00	0.00
	(0.04)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.00
$\widetilde{\Delta gpr}^{FDI,\text{Asia}}_{ft} \times D^{\text{Large}}$	-0.26	-0.47	0.19	0.56	-0.15	0.14	0.03	-0.10	0.06	-0.05	-0.18	0.12
	(0.89)	(0.72)	(0.53)	(0.64)	(0.30)	(0.59)	(0.23)	(0.11)	(0.56)	(0.36)	(0.30)	(0.13)
$\widetilde{\Delta gpr}^{FDI,\text{Europe}}_{ft} \times D^{\text{Large}}$	-0.72	0.18	-0.93 *	-0.04	-0.51 **	1.50 ***	-0.17	-0.02	0.08	-0.43	-0.27	-0.17
	(0.89)	(0.72)	(0.49)	(0.39)	(0.22)	(0.52)	(0.24)	(0.06)	(0.36)	(0.32)	(0.22)	(0.15)
$\widetilde{\Delta gpr}^{FDI,\text{North America}}_{ft} \times D^{\text{Large}}$	-6.43 ***	-3.84 **	-2.65 ***	0.02	-1.10 ***	-2.34 ***	0.96 **	-0.27 *	-1.68 ***	-1.49 ***	-0.97 ***	-0.51 **
	(2.02)	(1.60)	(0.79)	(0.60)	(0.27)	(0.89)	(0.43)	(0.16)	(0.51)	(0.42)	(0.26)	(0.25)
$\widetilde{\Delta gpr}^{FDI,\text{Latin America}}_{ft} \times D^{\text{Large}}$	0.59	0.44	0.15	-0.09	-0.04	-0.27	0.01	0.01	-0.04	-0.10	-0.04	-0.05
	(0.55)	(0.31)	(0.29)	(0.24)	(0.15)	(0.27)	(0.22)	(0.04)	(0.21)	(0.15)	(0.13)	(0.04)
$\widetilde{\Delta gpr}^{FDI,\text{Oceania}}_{ft} \times D^{\text{Large}}$	-0.17	0.16	-0.33	0.33	0.01	-0.20	0.01	-0.01	-0.14	-0.11	-0.01	-0.11
	(0.30)	(0.24)	(0.20)	(0.31)	(0.11)	(0.21)	(0.08)	(0.02)	(0.23)	(0.18)	(0.13)	(0.09)
$\widetilde{\Delta gpr}^{FDI,\text{Middle East}}_{ft} \times D^{\text{Large}}$	1.84 *	1.70 *	0.18	0.69	0.82 ***	-0.12	-0.46	0.03	1.65 ***	1.43 ***	1.17 ***	0.15
	(1.03)	(1.01)	(0.40)	(0.47)	(0.24)	(0.48)	(0.29)	(0.05)	(0.44)	(0.34)	(0.21)	(0.12)
$\widetilde{\Delta gpr}^{FDI,\text{Africa}}_{ft} \times D^{\text{Large}}$	1.03	0.69	0.34	-0.51	0.99 ***	-1.18	-0.38 **	0.01	1.56 ***	1.48 ***	1.29 ***	0.17
	(1.33)	(1.12)	(0.44)	(0.96)	(0.28)	(0.93)	(0.19)	(0.04)	(0.39)	(0.39)	(0.33)	(0.13)

TABLE A17: Effects by Region, Continued, Trade-based GPR

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}^{Trade,\text{Asia}}_{ft}$	0.29	0.12	0.11	-0.38 **	-0.37 **	-0.22	0.03	0.05	-0.12	-0.39 *	-0.43 ***	0.04
	(0.62)	(0.53)	(0.30)	(0.18)	(0.14)	(0.22)	(0.11)	(0.07)	(0.20)	(0.20)	(0.16)	(0.08)
$\widetilde{\Delta gpr}^{Trade,\text{Europe}}_{ft}$	-0.06	0.54	-0.59 **	-0.16	-0.10	-0.46	0.13	0.04	-0.54 **	-0.32	-0.12	-0.18
	(0.82)	(0.75)	(0.27)	(0.20)	(0.15)	(0.34)	(0.23)	(0.09)	(0.24)	(0.24)	(0.14)	(0.15)
$\widetilde{\Delta gpr}^{Trade,\text{North America}}_{ft}$	-0.86	-1.35	0.40	0.21	-0.22	0.84	-0.04	-0.38 **	-0.28	-0.17	-0.18	0.01
	(1.23)	(0.99)	(0.55)	(0.43)	(0.21)	(0.55)	(0.22)	(0.16)	(0.38)	(0.31)	(0.24)	(0.15)
$\widetilde{\Delta gpr}^{Trade,\text{Latin America}}_{ft}$	-0.74	-0.85 **	0.11	-0.77 ***	-0.05	-0.14	0.09	-0.06	-0.43	-0.15	-0.07	-0.08 *
	(0.46)	(0.36)	(0.21)	(0.21)	(0.11)	(0.41)	(0.12)	(0.05)	(0.31)	(0.11)	(0.10)	(0.05)
$\widetilde{\Delta gpr}^{Trade,\text{Oceania}}_{ft}$	-0.29	-0.21	-0.08	0.03	0.02	-0.84 ***	0.00	-0.01	-0.47	-0.07	0.00	-0.07 *
	(0.20)	(0.14)	(0.16)	(0.19)	(0.06)	(0.31)	(0.04)	(0.01)	(0.35)	(0.07)	(0.06)	(0.03)
$\widetilde{\Delta gpr}^{Trade,\text{Middle East}}_{ft}$	0.17	0.27	-0.08	-0.07	-0.06	0.18	0.07	0.01	-0.30	-0.13	-0.11	-0.06
	(0.56)	(0.53)	(0.18)	(0.24)	(0.17)	(0.53)	(0.10)	(0.03)	(0.21)	(0.22)	(0.20)	(0.07)
$\widetilde{\Delta gpr}^{Trade,\text{Africa}}_{ft}$	1.07	0.38	0.65 **	0.12	0.18	1.06	-0.04	-0.03	0.95 **	0.49 **	0.45 **	0.06
	(0.68)	(0.55)	(0.28)	(0.34)	(0.26)	(0.77)	(0.23)	(0.04)	(0.42)	(0.23)	(0.19)	(0.10)
$\widetilde{\Delta gpr}^{Trade,\text{Asia}}_{ft} \times D^{\text{Large}}$	0.84	-0.08	0.92	-0.81	0.64	0.09	-0.18	0.07	0.44	0.35	0.40	0.06
	(1.17)	(1.03)	(0.72)	(0.66)	(0.40)	(0.68)	(0.27)	(0.11)	(0.68)	(0.43)	(0.36)	(0.19)
$\widetilde{\Delta gpr}^{Trade,\text{Europe}}_{ft} \times D^{\text{Large}}$	-0.14	-1.04	0.92	-0.80	0.11	1.35 *	-0.07	-0.02	0.62	0.42	-0.05	0.43 *
	(1.67)	(1.14)	(0.84)	(0.58)	(0.25)	(0.76)	(0.38)	(0.10)	(0.46)	(0.37)	(0.23)	(0.25)
$\widetilde{\Delta gpr}^{Trade,\text{North America}}_{ft} \times D^{\text{Large}}$	5.46 **	3.54 **	2.08	1.32	0.24	-4.26 ***	0.03	0.26	-0.76	0.36	0.04	0.30
	(2.13)	(1.67)	(1.27)	(0.96)	(0.37)	(1.43)	(0.73)	(0.20)	(0.84)	(0.61)	(0.37)	(0.34)
$\widetilde{\Delta gpr}^{Trade,\text{Latin America}}_{ft} \times D^{\text{Large}}$	-3.89	-3.98	0.08	0.54	0.40 **	-2.59 **	-0.06	0.04	0.69 *	0.86 **	0.56 ***	0.30
	(3.86)	(3.98)	(0.40)	(0.54)	(0.19)	(1.05)	(0.32)	(0.06)	(0.37)	(0.41)	(0.21)	(0.26)
$\widetilde{\Delta gpr}^{Trade,\text{Oceania}}_{ft} \times D^{\text{Large}}$	0.32	0.30	0.01	-0.48	0.01	0.60	-0.21 **	0.00	0.58	0.05	0.00	0.04
	(0.31)	(0.26)	(0.21)	(0.35)	(0.10)	(0.55)	(0.09)	(0.02)	(0.36)	(0.12)	(0.09)	(0.05)
$\widetilde{\Delta gpr}^{Trade,\text{Middle East}}_{ft} \times D^{\text{Large}}$	-0.15	-0.15	-0.01	0.18	0.06	-0.15	-0.10	-0.02	0.13	0.19	0.14	0.08
	(0.56)	(0.53)	(0.18)	(0.24)	(0.17)	(0.55)	(0.10)	(0.04)	(0.21)	(0.22)	(0.20)	(0.07)
$\widetilde{\Delta gpr}^{Trade,\text{Africa}}_{ft} \times D^{\text{Large}}$	-0.55	0.27	-0.79 **	-0.54	-0.46	-4.00 ***	0.02	-0.01	-1.26 *	-0.84 **	-0.68 **	-0.18
	(1.09)	(1.00)	(0.39)	(0.51)	(0.34)	(1.06)	(0.29)	(0.05)	(0.66)	(0.36)	(0.29)	(0.12)
Sample size	10,448	10,445	10,445	10,518	10,587	10,587	10,587	10,587	10,614	10,403	10,500	10,487
R-sq.	0.82	0.81	0.68	0.77	0.36	0.87	0.55	0.63	0.34	0.62	0.36	0.85

Note: See the note for Table A4.

TABLE A18: Effects by Region, Sum of Coefficients

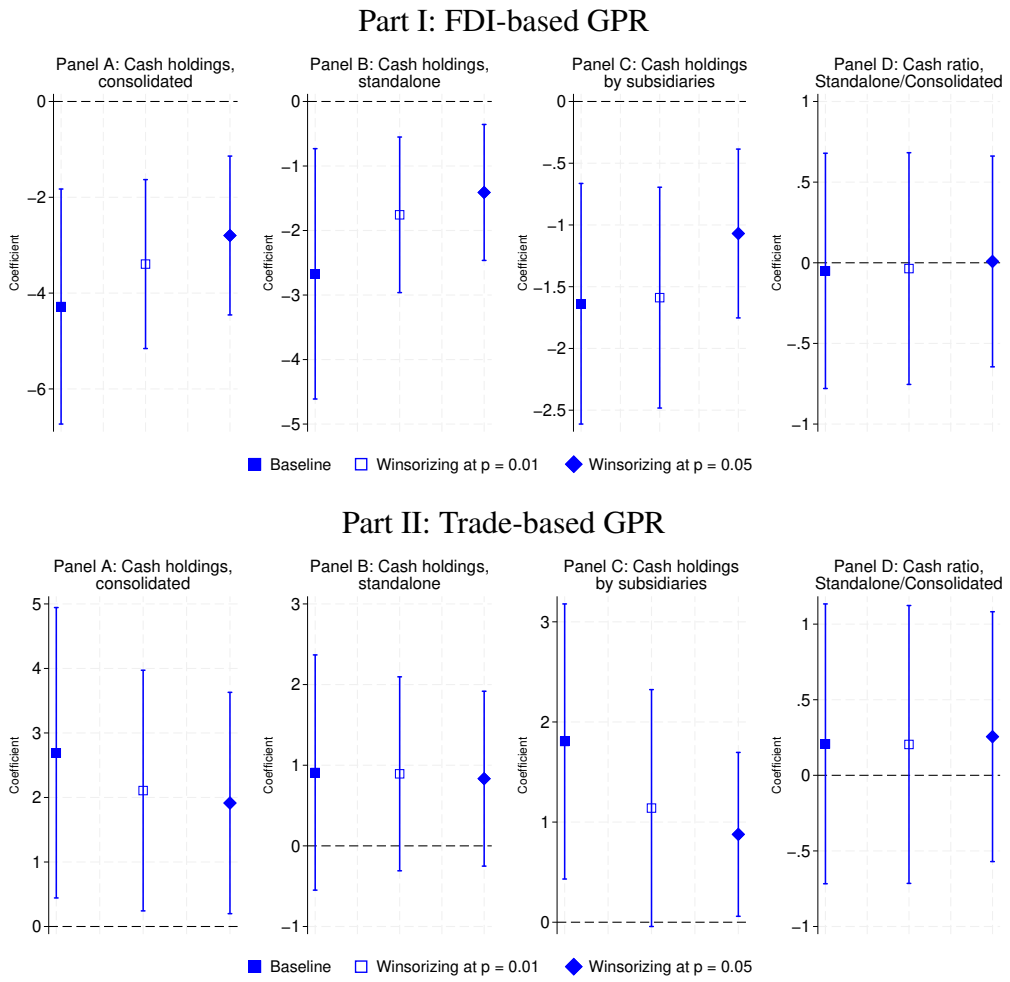
	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Effects of FDI-based GPRs on large firms												
Asia	0.05	-0.85	0.83	0.68	-0.14	0.40	-0.19	-0.19	-0.30	0.01	-0.21	0.20
	(1.36)	(0.97)	(0.79)	(0.71)	(0.32)	(0.64)	(0.27)	(0.12)	(0.71)	(0.40)	(0.33)	(0.17)
Europe	-0.41	0.07	-0.52	0.16	-0.30	1.56***	-0.20	-0.04	0.12	-0.28	-0.07	-0.21
	(0.85)	(0.63)	(0.40)	(0.36)	(0.20)	(0.47)	(0.21)	(0.04)	(0.33)	(0.30)	(0.19)	(0.15)
North America	-6.35***	-4.34**	-2.08**	-0.06	-0.90***	-2.34***	0.87**	-0.02	-2.04***	-1.38***	-0.79***	-0.57**
	(2.20)	(1.69)	(0.85)	(0.59)	(0.25)	(0.89)	(0.43)	(0.11)	(0.60)	(0.39)	(0.24)	(0.24)
Latin America	0.58	0.46	0.12	-0.03	0.05	-0.42*	0.13	0.01	0.11	0.06	0.05	0.01
	(0.54)	(0.28)	(0.29)	(0.22)	(0.13)	(0.24)	(0.19)	(0.03)	(0.17)	(0.12)	(0.11)	(0.03)
Oceania	-0.37	-0.32	-0.06	0.22	0.10	-0.17	-0.04	-0.02	0.03	0.09*	0.07	0.03
	(0.22)	(0.16)	(0.10)	(0.31)	(0.05)	(0.16)	(0.05)	(0.01)	(0.09)	(0.05)	(0.04)	(0.04)
Middle East	0.70	0.74	-0.05	0.09	-0.15	-0.30	-0.14	-0.02	-0.46*	-0.05	-0.06	0.01
	(0.45)	(0.52)	(0.35)	(0.39)	(0.12)	(0.31)	(0.09)	(0.01)	(0.24)	(0.12)	(0.09)	(0.06)
Africa	1.01	0.68	0.31	-0.54	0.99***	-1.18	-0.39**	0.03	1.56***	1.48***	1.29***	0.17
	(1.33)	(1.12)	(0.44)	(0.96)	(0.28)	(0.93)	(0.19)	(0.04)	(0.39)	(0.39)	(0.33)	(0.13)
Effects of trade-based GPRs on large firms												
Asia	1.13	0.04	1.02	-1.20	0.28	-0.12	-0.16	0.12	0.32	-0.03	-0.03	0.10
	(1.01)	(0.85)	(0.71)	(0.63)	(0.37)	(0.64)	(0.24)	(0.10)	(0.65)	(0.38)	(0.33)	(0.18)
Europe	-0.20	-0.51	0.33	-0.96	0.006	0.89	0.05	0.02	0.09	0.10	-0.18	0.25
	(1.41)	(0.84)	(0.79)	(0.55)	(0.20)	(0.69)	(0.32)	(0.06)	(0.40)	(0.29)	(0.18)	(0.20)
North America	4.60***	2.18*	2.48**	1.54*	0.02	-3.42**	-0.01	-0.13	-1.04	0.19	-0.14	0.31
	(1.76)	(1.27)	(1.23)	(0.89)	(0.33)	(1.34)	(0.72)	(0.10)	(0.79)	(0.55)	(0.31)	(0.32)
Latin America	-4.63	-4.83	0.20	-0.23	0.35**	-2.74***	0.03	-0.02	0.25	0.71*	0.49**	0.22
	(3.91)	(4.07)	(0.36)	(0.49)	(0.17)	(0.99)	(0.29)	(0.04)	(0.24)	(0.40)	(0.19)	(0.26)
Oceania	0.02	0.09	-0.07	-0.45	0.02	-0.23	-0.21***	-0.01	0.11	-0.01	0.00	-0.02
	(0.25)	(0.22)	(0.14)	(0.29)	(0.08)	(0.46)	(0.08)	(0.02)	(0.14)	(0.10)	(0.08)	(0.04)
Middle East	0.02	0.11	-0.09**	0.11**	-0.01	0.03	-0.02	0.00	-0.17	0.06	0.03	0.02
	(0.11)	(0.11)	(0.04)	(0.05)	(0.02)	(0.17)	(0.03)	(0.01)	(0.04)	(0.03)	(0.03)	(0.02)
Africa	0.52	0.65	-0.13	-0.41	-0.28	-2.94***	-0.02	-0.04	-0.31	-0.35	-0.23	-0.12
	(0.97)	(0.94)	(0.28)	(0.38)	(0.22)	(0.73)	(0.20)	(0.04)	(0.52)	(0.28)	(0.23)	(0.08)

Note: The table shows the sum of the coefficients, the sum of the coefficient for $\widetilde{\Delta gpr}_{ft}^{FDI,r}$ and the coefficient for $\widetilde{\Delta gpr}_{ft}^{FDI,r} \times D^{\text{Large}}$ for each region r. Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

G Winsorizing the Dependent Variables

This section addresses potential concerns about outliers in the dependent variables by presenting results with dependent variables winsorized at $p = 0.01$ and $p = 0.05$. Figure A4 displays the results for the cash holdings variables. It shows that winsorizing tends to decrease the absolute values of the coefficients. For the FDI-based GPR, statistical significance remains the same. For the trade-based GPR, the effect on cash holdings by subsidiaries turns out to be barely statistically significant. Nevertheless, the results remain qualitatively similar.

FIGURE A4: Winsorizing the Cash Holdings Variables



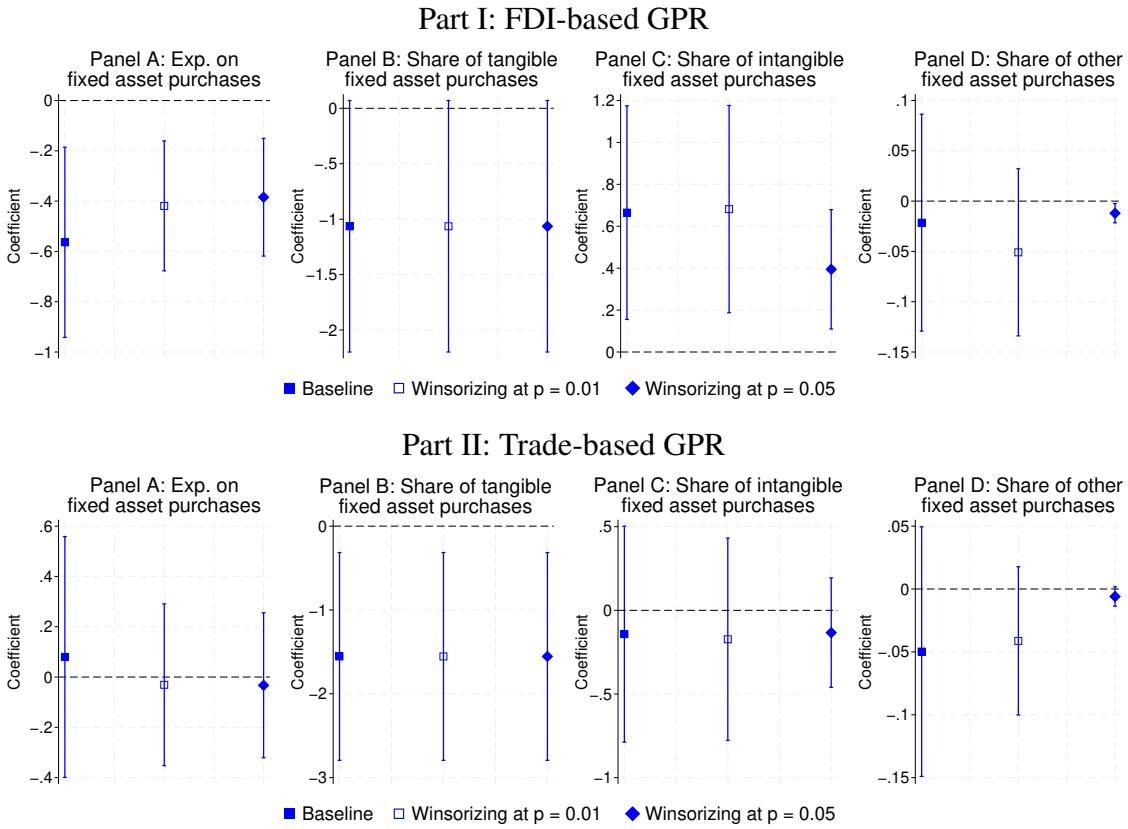
Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

Figure A5 displays the effects on the asset purchase variables. It also shows that winsorizing tends to decrease the absolute values of the coefficients. However, most results remain unchanged. The only notable change is that the confidence intervals become much tighter in Panel D, which shows the effects on the "share of other fixed asset purchases." As a result, the effect of FDI-based GPR becomes statistically significant at the 5% level, while the effect of trade-based GPR remains insignificant.

Figure A6 displays the effect on the capital expenditure variables. Again, most results remain unchanged even after winsorizing the dependent variables. The confidence intervals for Panel D, which shows the effects on R&D expenditures, become tighter. As a result, the effect of trade-

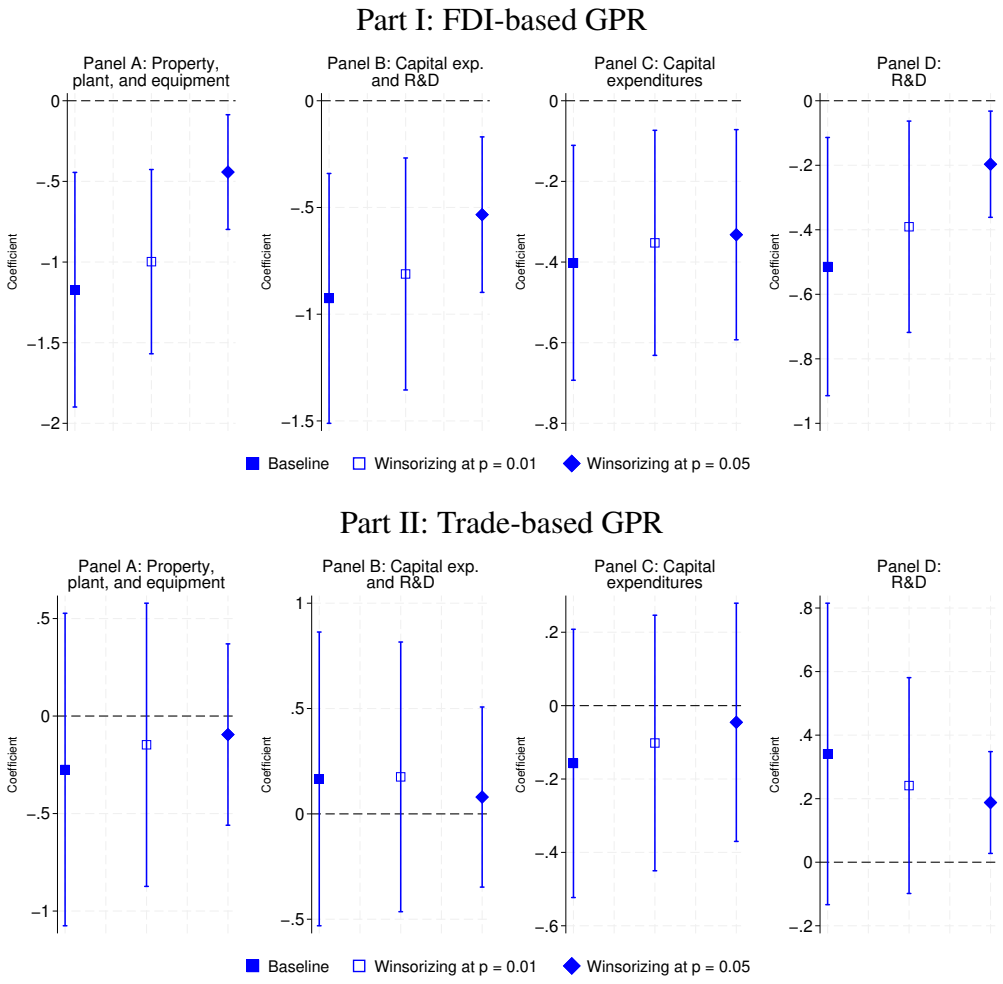
based GPR on that variable turns out to be statistically significant. Other than this variable, the results remain qualitatively the same without winsorizing.

FIGURE A5: Winsorizing the Asset Purchases Variables



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

FIGURE A6: Winsorizing the Capital Expenditures Variables



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

H Effects on Foreign Subsidiaries' Variables

H.1 Definitions of Foreign Subsidiaries' Variables

The main text examines the effects of the GPR variables on the variables of parent firms located in Japan. This section examines the effects of the GPR variables on foreign subsidiaries' variables: capital, employment, sales, and procurement. Specifically, we estimate regression using the following variables as the dependent variables:

$$\begin{aligned}
\text{capital}_{ft}^{\text{Ratio}} &= 100 \times \frac{\text{capital}_{ft}^{\text{FDI}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
\text{employment}_{ft}^{\text{Ratio}} &= 100 \times \frac{\text{employment}_{ft}^{\text{FDI}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
\text{sales}_{ft}^{\text{Ratio}} &= 100 \times \frac{\text{sales}_{ft}^{\text{FDI}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}}, \\
\text{procurement}_{ft}^{\text{Ratio}} &= 100 \times \frac{\text{procurement}_{ft}^{\text{FDI}}}{\text{property, plant, and equipment}_{f,t-1} + \text{intangible assets}_{f,t-1}},
\end{aligned}$$

where $\text{capital}_{ft}^{\text{FDI}}$ denotes the value of capital invested abroad by firm f in year t, $\text{employment}_{ft}^{\text{FDI}}$ denotes the number of employees in foreign subsidiaries, $\text{sales}_{ft}^{\text{FDI}}$ denotes the value of sales by foreign subsidiaries, and $\text{procurement}_{ft}^{\text{FDI}}$ denotes the value of local procurement by foreign subsidiaries. These variables are obtained from these variables come from the *Basic Survey on Overseas Business Activities (Kaigai Jigyō Katudō Kihon Chōsa)*. The denominator of the variables is the same as the one shown in the main text, measuring the value of fixed asset of foreign subsidiaries' parent firms.

In the aforementioned dependent variables, the numerators come from foreign subsidiaries, and the denominator comes from their parent firms. Therefore, we estimate regressions using another set of dependent variables of log-changes:

$$\begin{aligned}
\text{capital}_{ft}^{\text{log-change}} &= 100 \times (\ln(\text{capital}_{ft}^{\text{FDI}}) - \ln(\text{capital}_{ft-1}^{\text{FDI}})), \\
\text{employment}_{ft}^{\text{log-change}} &= 100 \times (\ln(\text{employment}_{ft}^{\text{FDI}}) - \ln(\text{employment}_{ft-1}^{\text{FDI}})), \\
\text{sales}_{ft}^{\text{log-change}} &= 100 \times (\ln(\text{sales}_{ft}^{\text{FDI}}) - \ln(\text{sales}_{ft-1}^{\text{FDI}})), \\
\text{procurement}_{ft}^{\text{log-change}} &= 100 \times (\ln(\text{procurement}_{ft}^{\text{FDI}}) - \ln(\text{procurement}_{ft-1}^{\text{FDI}})).
\end{aligned}$$

Table A19 shows summary statistics of foreign subsidiaries' variables.

TABLE A19: Summary Statistics of Foreign Subsidiaries' Variables

	Obs	Mean	Std. dev.	p5	p25	p50	p75	p95
Foreign capital ratio	10,593	27.32	84.01	0.48	5.87	16.50	33.29	79.00
Foreign employment ratio	10,593	4.91	8.38	0	0.55	2.24	5.92	17.60
Foreign sales ratio	10,593	96.72	150.33	0	12.27	49.79	126.86	329.10
Foreign procurement ratio	10,593	22.73	56.02	0	0	4.34	23.35	99.82
Foreign capital, log change	9,315	7.35	39.13	-12.11	0	0	4.37	58.18
Foreign employment, log change	8,695	5.05	39.53	-26.90	-3.92	2.08	11.51	49.69
Foreign sales, log change	8,593	7.46	51.74	-42.32	-7.57	6.06	20.35	64.87
Foreign procurement, log change	6,311	8.16	77.27	-90.15	-16.05	6.40	29.74	116.70

H.2 Effects on of Foreign Subsidiaries' *Ratio* Variables

Table A20 shows the effects of the GPR variables on foreign subsidiaries' *ratio* variables, estimated using an unbalanced panel dataset. It shows that FDI-based GPR reduces foreign sales of large manufacturing firms while trade-based GPR has insignificant effects on foreign subsidiaries' variables. It also shows that FDI-based EPU increases small manufacturing firms' foreign sales and procurement. It implies that risks associated with EPU could be positive risks leading to profit opportunities while GPR is not a positive risk.

Table A21 presents the effects on foreign subsidiaries' *ratio* variables using a balanced panel dataset. The results indicate that FDI-based and trade-based GPR have no significant impact on these variables. However, trade-based GPR is shown to have a negative effect on foreign affiliates' employment, though the statistical significance remains at the 10% level. Additionally, the EPU variables are found to have no effect. Figure A7 presents results from robustness checks regarding the impact of the GPR variables on large manufacturing firms' foreign subsidiaries, estimated using the unbalanced panel, while Figure A8 shows robustness check results based on the balanced panel.

Overall, the results suggest that GPR variables have limited effects on foreign subsidiaries' variables. These limited effects might be driven by the fact that we utilize year-to-year variations in the data, estimating the short-run effects of the GPR variables on firm behavior. It suggests that firms may respond to GPR over a longer time horizon rather than in year-to-year adjustments.

H.3 Effects on of Foreign Subsidiaries' *Log-change* Variables

Table A22 presents the effects of the GPR variables on the *log-change* variables of foreign subsidiaries, estimated using an unbalanced panel dataset. The results indicate that FDI-based GPR has a positive effect on the sales of manufacturing firms' foreign subsidiaries and a negative effect on the procurement of large manufacturing firms' foreign subsidiaries. Additionally, trade-based GPR has a negative effect on the procurement of small firms' foreign subsidiaries. In contrast, the GPR variables have insignificant effects on capital and employment.

Table A23 presents results using a balanced panel dataset, which also shows that FDI-based GPR has a positive effect on foreign subsidiaries' sales. However, its effect on local procurement is insignificant. Figure A9 presents results from robustness checks using the unbalanced panel, while Figure A10 shows the ones based on the balanced panel. Overall, these results suggest that the GPR variables have no substantial effects on foreign subsidiaries' outcomes.

TABLE A20: Effects on Foreign Subsidiaries' Variables, Ratio, Unbalanced Panel

	Capital (1)	Employment (2)	Sales (3)	Procurement (4)	Capital (5)	Employment (6)	Sales (7)	Procurement (8)	Capital (9)	Employment (10)	Sales (11)	Procurement (12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.17	0.05	-0.34	-0.44					0.12	0.07	0.01	-0.47
	(0.26)	(0.05)	(0.79)	(0.47)					(0.32)	(0.05)	(0.80)	(0.46)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-0.46	-0.07	-1.47	0.15					-0.51	-0.12 **	-2.77 *	-0.11
	(0.30)	(0.05)	(1.32)	(0.51)					(0.52)	(0.06)	(1.58)	(0.47)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					0.52	-0.07	-0.96	0.30	0.40	-0.10 *	-1.40	0.37
					(0.34)	(0.06)	(1.13)	(0.44)	(0.41)	(0.06)	(1.15)	(0.42)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-0.23	0.01	-0.02	0.49	0.19	0.11	2.40	0.65
					(0.34)	(0.07)	(1.81)	(0.73)	(0.59)	(0.08)	(2.21)	(0.72)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	-1.46 **	0.16	5.60 **	3.02 **					-1.65 *	0.13	5.69 **	2.91 **
	(0.73)	(0.12)	(2.27)	(1.34)					(0.91)	(0.12)	(2.22)	(1.39)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-0.15	-0.16	2.67	-0.90					0.25	-0.03	1.03	-0.05
	(0.42)	(0.10)	(2.44)	(1.20)					(1.03)	(0.13)	(3.15)	(1.28)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					1.05	0.23	2.01	1.63	1.52	0.18	0.24	0.68
					(1.16)	(0.18)	(3.33)	(1.25)	(1.52)	(0.19)	(3.32)	(1.29)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					-0.21	-0.35 **	4.08	-2.44	-0.47	-0.30	3.33	-2.36
					(0.73)	(0.18)	(4.04)	(2.37)	(1.58)	(0.23)	(5.22)	(2.87)
Sample size	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582	10,582
R-sq.	0.91	0.84	0.79	0.73	0.91	0.84	0.79	0.73	0.91	0.84	0.79	0.73
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-0.29	-0.02	-1.80	-0.29					-0.39	-0.05	-2.76*	-0.58
	(0.33)	(0.06)	(1.38)	(0.59)					(0.43)	(0.06)	(1.60)	(0.61)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					0.29	-0.06	-0.98	0.79	0.59	0.01	1.00	1.03
					(0.33)	(0.06)	(1.61)	(0.59)	(0.43)	(0.06)	(1.92)	(0.60)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	-1.61**	-0.003	8.27***	2.12					-1.41**	0.10	6.72*	2.85
	(0.74)	(0.12)	(3.11)	(1.99)					(0.61)	(0.15)	(3.59)	(1.84)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					0.84	-0.12	6.09	-0.81	1.04	-0.12	3.56	-1.68
					(1.02)	(0.21)	(4.80)	(2.44)	(0.88)	(0.22)	(5.19)	(2.71)

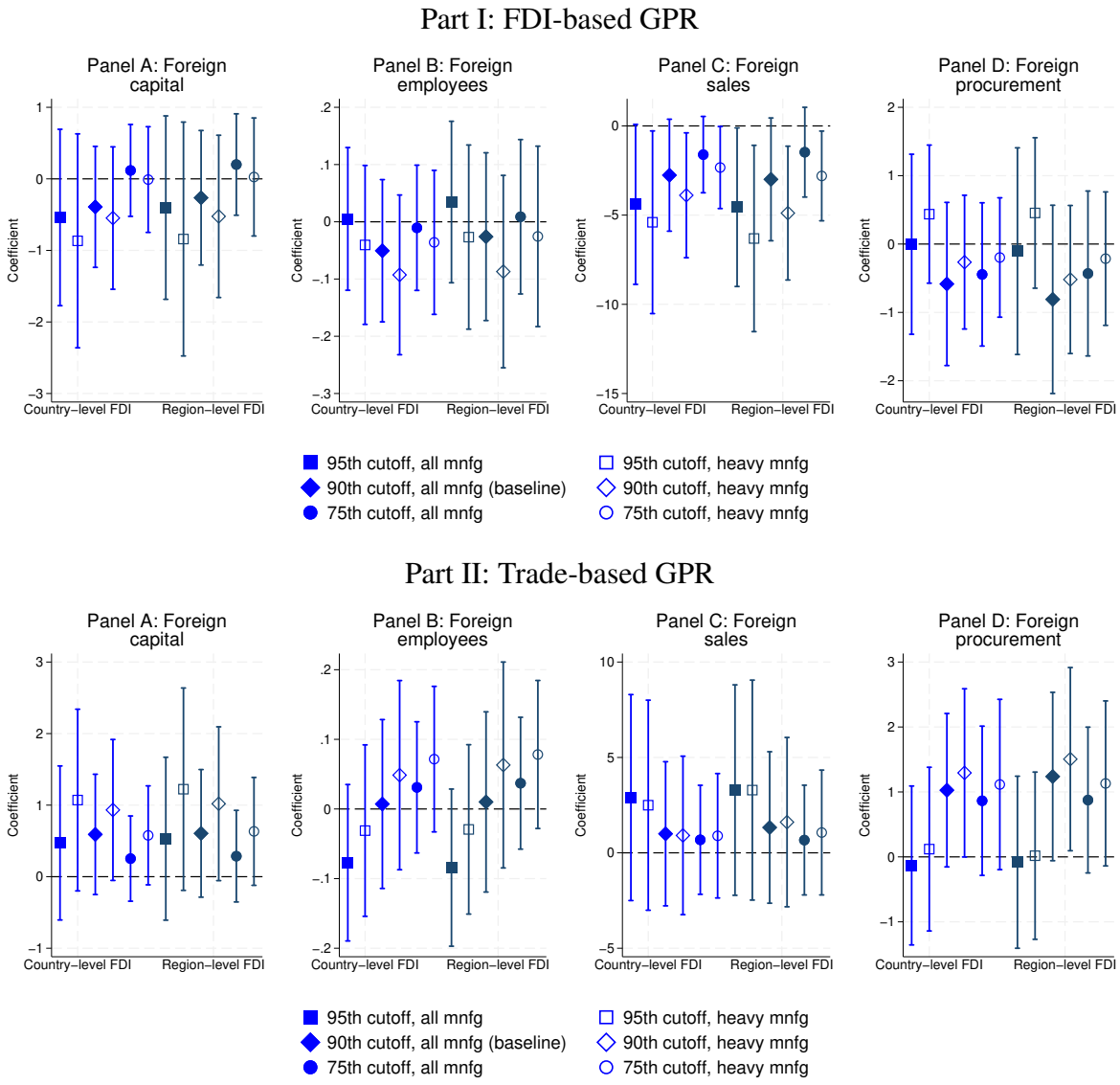
Note: Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the control variables, firm fixed effects, sector-year fixed effects, and prefecture-year fixed effects. The sample period is 2002-2022. The large firm dummy D^{Large} takes unity if the firm's sales are greater than the 90th percentile of the average value of $\ln$(sales) during the 2002-2022 period where the distribution is computed using firms included in the balanced panel only. The coefficients of $\widetilde{\Delta gpr}_{ft}^{FDI}$, $\widetilde{\Delta gpr}_{ft}^{Trade}$ (and therefore their interaction terms with the large firm dummy) are normalized to represent the effects of a one-standard-deviation change in the corresponding GPR variable.

TABLE A21: Effects on Foreign Subsidiaries' Variables, Ratio, Balanced Panel

	Capital (1)	Employment (2)	Sales (3)	Procurement (4)	Capital (5)	Employment (6)	Sales (7)	Procurement (8)	Capital (9)	Employment (10)	Sales (11)	Procurement (12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.22	-0.01	-1.18	-0.63					0.22	0.01	-0.90	-0.67
	(0.24)	(0.06)	(0.79)	(0.58)					(0.24)	(0.06)	(0.81)	(0.61)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-0.40	-0.08	-1.90	-0.02					-0.37	-0.11	-2.00	-0.02
	(0.30)	(0.06)	(1.71)	(0.54)					(0.32)	(0.07)	(2.03)	(0.72)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					0.03	-0.12	-1.90	0.17	-0.08	-0.15 *	-2.11	0.29
					(0.23)	(0.08)	(1.30)	(0.54)	(0.24)	(0.08)	(1.35)	(0.58)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-0.34	-0.02	-1.93	-0.11	-0.06	0.07	-0.18	-0.03
					(0.37)	(0.09)	(2.28)	(0.63)	(0.41)	(0.10)	(2.68)	(0.83)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	-1.32 **	0.02	1.60	3.05					-1.34 *	0.00	2.20	3.11
	(0.67)	(0.12)	(2.74)	(2.46)					(0.71)	(0.13)	(2.75)	(2.58)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-0.09	-0.10	5.45	0.26					0.14	0.01	0.94	-1.07
	(0.52)	(0.13)	(3.33)	(1.67)					(0.76)	(0.17)	(4.19)	(2.19)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					-0.25	0.25	-2.55	1.51	0.07	0.24	-3.23	0.45
					(0.76)	(0.28)	(4.84)	(1.55)	(0.86)	(0.30)	(5.00)	(1.70)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					-0.23	-0.25	10.80 *	0.97	-0.33	-0.25	9.96	2.00
					(0.85)	(0.23)	(5.84)	(3.53)	(1.22)	(0.29)	(7.26)	(4.57)
Sample size	6,030	6,030	6,030	6,030	6,030	6,030	6,030	6,030	6,030	6,030	6,030	6,030
R-sq.	0.68	0.83	0.81	0.71	0.68	0.83	0.81	0.71	0.68	0.83	0.81	0.71
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-0.19	-0.09	-3.07	-0.66					-0.14	-0.10	-2.90	-0.69
	(0.30)	(0.08)	(1.77)	(0.85)					(0.30)	(0.08)	(1.99)	(1.01)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-0.32	-0.15	-3.83	0.07	-0.14	-0.08	-2.29	0.26
					(0.36)	(0.07)	(2.41)	(0.56)	(0.36)	(0.07)	(2.62)	(0.79)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	-1.41*	-0.08	7.04*	3.31					-1.21	0.01	3.14	2.04
	(0.80)	(0.16)	(4.19)	(3.33)					(0.81)	(0.18)	(4.46)	(2.59)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					-0.48	0.00	8.25	2.48	-0.25	-0.01	6.72	2.44
					(1.06)	(0.30)	(6.86)	(3.94)	(1.16)	(0.25)	(7.09)	(4.23)

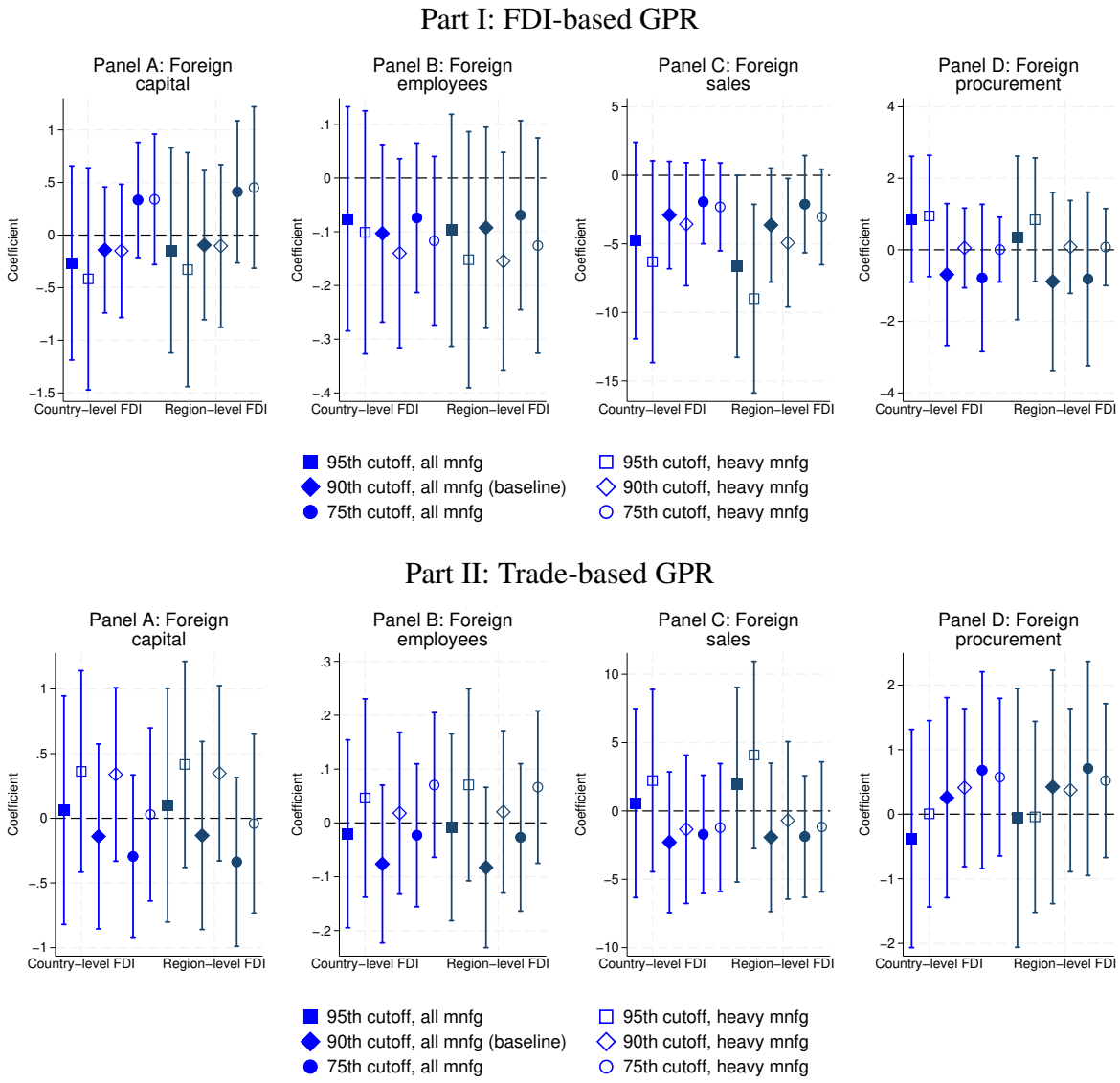
Note: See the note for Table A20.

FIGURE A7: Effects of GPR on Foreign Subsidiaries' Variables, Ratio, Robustness Checks, Unbalanced Panel



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

FIGURE A8: Effects of GPR on Foreign Subsidiaries' Variables, Ratio, Robustness Checks, Balanced Panel



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

TABLE A22: Effects on Foreign Subsidiaries' Variables, Log-change, Unbalanced Panel

	Capital (1)	Employment (2)	Sales (3)	Procurement (4)	Capital (5)	Employment (6)	Sales (7)	Procurement (8)	Capital (9)	Employment (10)	Sales (11)	Procurement (12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	-0.29	-0.29	4.11 ***	-1.49					-0.07	-0.08	4.52 ***	-0.08
	(0.45)	(0.49)	(1.36)	(1.39)					(0.50)	(0.55)	(1.41)	(1.57)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-0.87	0.49	-0.55	-3.19					-0.71	0.22	-0.93	-6.30 **
	(1.08)	(0.53)	(1.33)	(2.21)					(1.65)	(0.63)	(1.61)	(3.05)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					-0.62	-0.51	0.69	-3.08 **	-0.68	-0.44	-1.22	-3.64 **
					(0.54)	(0.55)	(1.54)	(1.54)	(0.59)	(0.63)	(1.61)	(1.74)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-1.23	0.45	0.07	0.45	-0.68	0.24	0.73	5.74 **
					(0.94)	(0.81)	(1.74)	(2.05)	(1.65)	(0.97)	(2.09)	(2.77)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	-1.50	-1.19	-1.09	0.64					-0.66	-0.27	-0.99	0.61
	(0.93)	(1.15)	(1.41)	(2.41)					(1.01)	(1.31)	(1.58)	(2.71)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	0.34	0.51	0.27	-0.57					-2.90	-1.80	1.87	3.00
	(1.37)	(1.74)	(1.64)	(4.29)					(2.38)	(2.03)	(2.20)	(6.67)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					-2.18	-3.59 *	-1.28	1.30	-2.20	-3.90 *	-0.51	0.38
					(1.68)	(1.92)	(2.38)	(4.57)	(1.75)	(2.15)	(2.72)	(4.87)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					4.10	3.16	-2.46	-5.76	7.20 *	4.97	-4.00	-8.47
					(2.64)	(2.67)	(2.36)	(6.37)	(4.23)	(3.05)	(3.14)	(9.91)
Sample size	11,623	10,756	10,644	7,716	11,623	10,756	10,644	7,716	11,623	10,756	10,644	7,716
R-sq.	0.22	0.18	0.24	0.16	0.22	0.18	0.24	0.16	0.22	0.18	0.24	0.16
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-1.17	0.20	3.56**	-4.68**					-0.78	0.14	3.58**	-6.37**
	(1.20)	(0.59)	(1.57)	(2.24)					(1.70)	(0.58)	(1.52)	(2.78)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-1.86	-0.06	0.76	-2.64	-1.35	-0.20	-0.49	2.10
					(0.88)	(0.72)	(1.82)	(2.05)	(1.55)	(0.74)	(1.71)	(2.43)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	-1.15	-0.68	-0.81	0.06					-3.55	-2.08	0.88	3.60
	(1.44)	(1.95)	(2.00)	(4.74)					(2.34)	(2.04)	(2.15)	(6.75)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					1.92	-0.43	-3.74	-4.46	5.00	1.07	-4.51	-8.10
					(2.95)	(2.70)	(2.95)	(7.45)	(4.22)	(2.77)	(2.99)	(10.07)

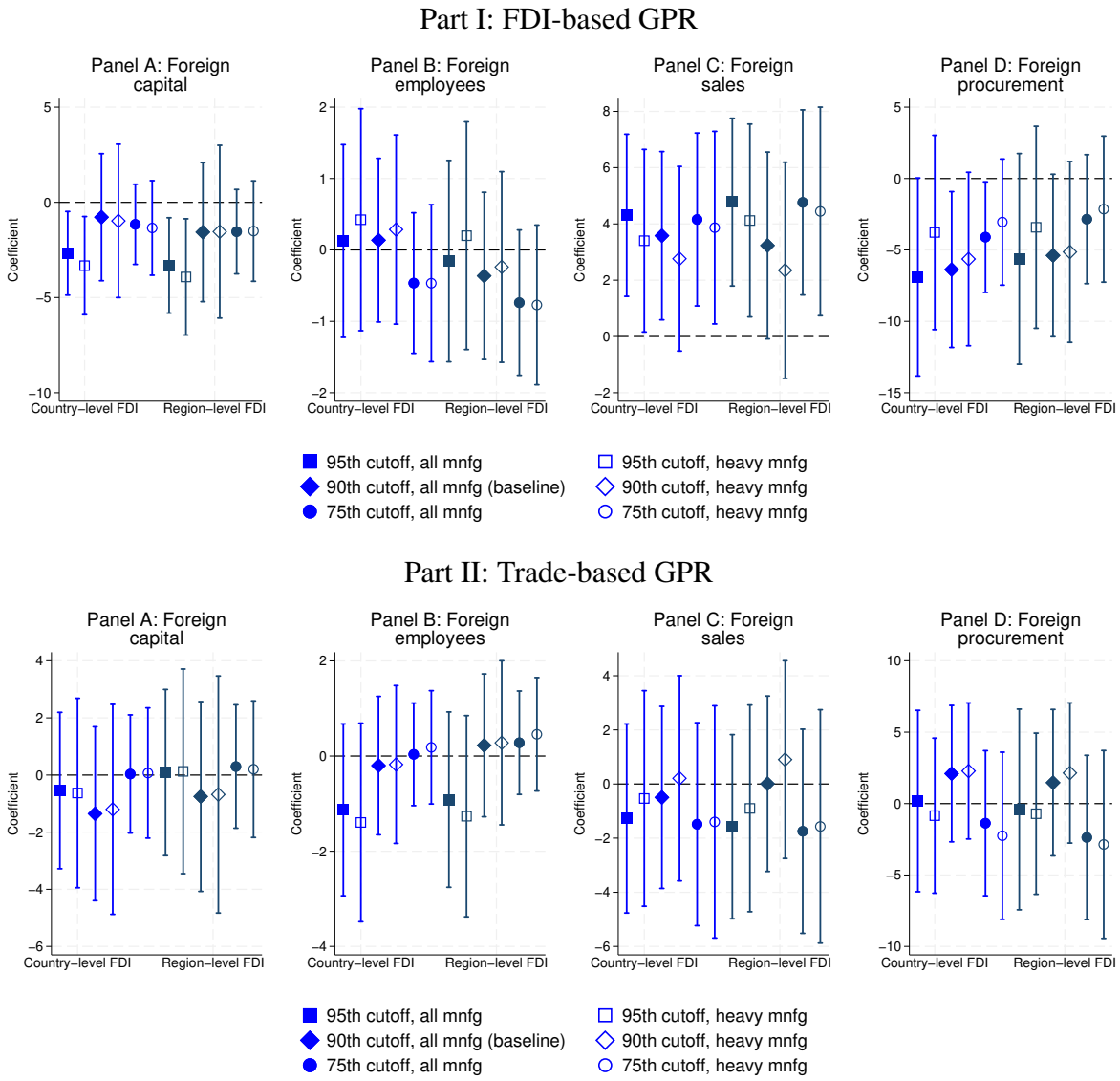
Note: See the note for Table A20.

TABLE A23: Effects on Foreign Subsidiaries' Variables, Log-change, Balanced Panel

	Capital (1)	Employment (2)	Sales (3)	Procurement (4)	Capital (5)	Employment (6)	Sales (7)	Procurement (8)	Capital (9)	Employment (10)	Sales (11)	Procurement (12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	0.57	0.23	5.19 **	-0.10					0.65	0.43	5.54 ***	0.82
	(0.76)	(0.50)	(2.05)	(1.79)					(0.88)	(0.53)	(2.01)	(2.01)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-1.38 *	0.84	-0.02	-3.67					-1.44	0.18	-0.31	-7.29 *
	(0.75)	(0.56)	(1.67)	(2.98)					(1.15)	(0.66)	(1.97)	(4.36)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$					0.12	-0.43	0.13	-1.82	-0.30	-0.54	-1.54	-3.04
					(0.72)	(0.70)	(2.76)	(2.38)	(0.90)	(0.75)	(2.82)	(2.64)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$					-1.06	1.08	0.47	0.65	0.13	0.96	0.61	6.48 *
					(0.85)	(1.01)	(2.59)	(2.50)	(1.32)	(1.24)	(3.08)	(3.85)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	-1.01	-1.34	-1.70	-3.79					-0.32	-0.14	-1.33	-3.76
	(1.15)	(1.53)	(1.84)	(3.49)					(1.24)	(1.71)	(2.26)	(3.86)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	2.97 **	4.97 **	3.76 *	-3.94					3.25 *	1.35	4.75	0.47
	(1.25)	(2.36)	(2.12)	(4.22)					(1.92)	(2.70)	(3.38)	(6.47)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$					-2.46	-4.70 *	-2.64	1.57	-2.15	-4.70	-1.28	2.40
					(2.25)	(2.67)	(3.75)	(6.69)	(2.40)	(3.03)	(4.57)	(7.18)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$					1.52	9.15 **	1.24	-10.47 *	-1.73	7.67 *	-3.23	-10.83
					(1.84)	(3.58)	(2.48)	(6.15)	(2.85)	(4.05)	(4.24)	(9.56)
Sample size	6,304	5,886	5,854	4,126	6,304	5,886	5,854	4,126	6,304	5,886	5,854	4,126
R-sq.	0.20	0.18	0.24	0.16	0.20	0.18	0.23	0.16	0.20	0.18	0.24	0.16
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-0.82	1.07	5.17**	-3.77					-0.78	0.61	5.22**	-6.47
	(0.77)	(0.66)	(2.17)	(3.07)					(0.92)	(0.69)	(2.07)	(4.10)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$					-0.94	0.64	0.59	-1.17	-0.17	0.42	-0.92	3.44
					(0.78)	(0.83)	(2.59)	(2.50)	(1.00)	(0.95)	(2.24)	(3.45)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	1.96	3.64	2.05	-7.73					2.93*	1.21	3.42	-3.29
	(1.39)	(2.65)	(2.60)	(5.11)					(1.75)	(2.78)	(2.95)	(6.34)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$					-0.94	4.45	-1.40	-8.90	-3.87	2.97	-4.52	-8.43
					(2.47)	(3.38)	(4.01)	(8.45)	(2.77)	(3.45)	(3.65)	(9.62)

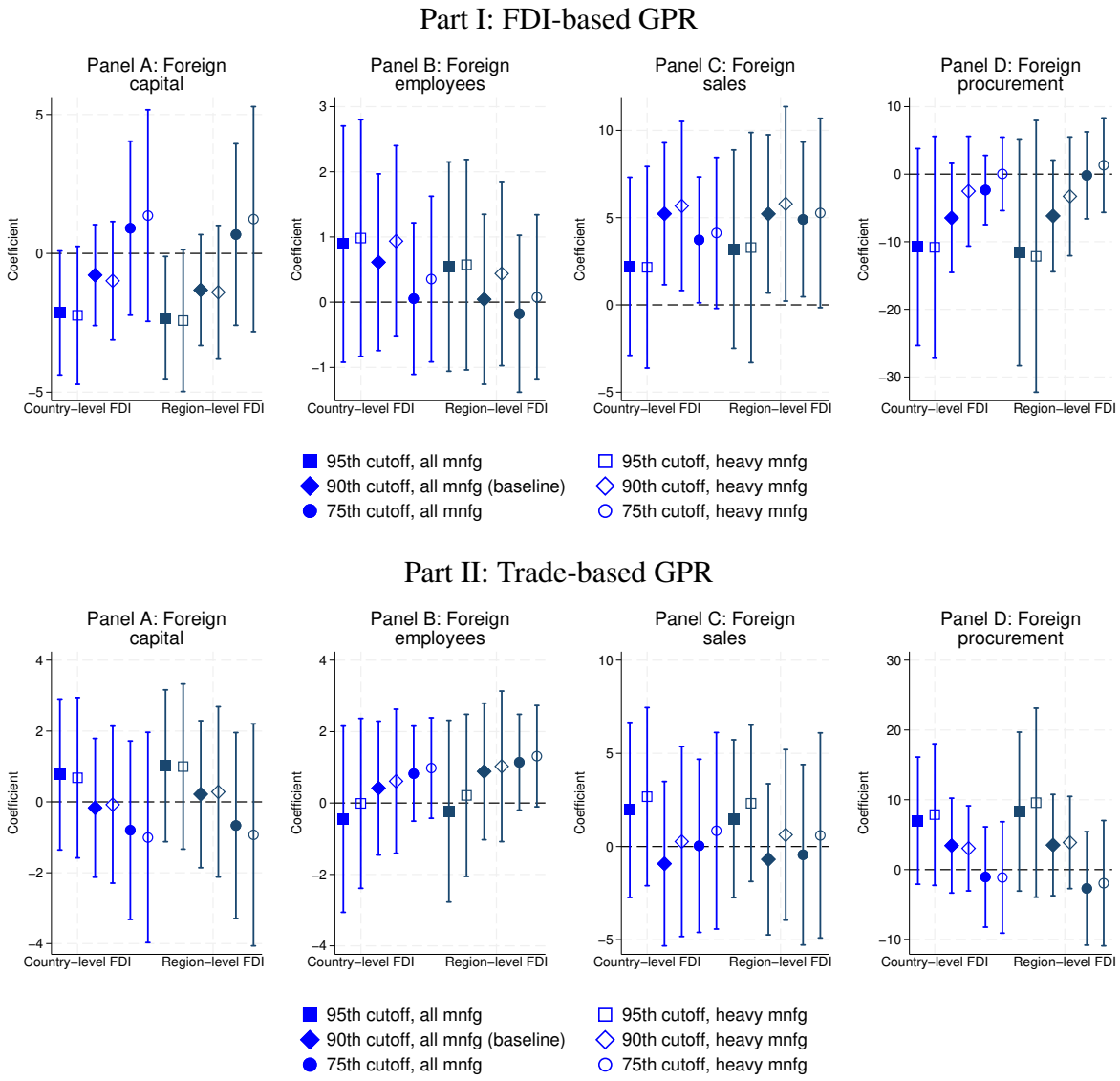
Note: See the note for Table A20.

FIGURE A9: Effects of GPR on Foreign Subsidiaries' Variables, Log-change, Robustness Checks, Unbalanced Panel



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

FIGURE A10: Effects of GPR on Foreign Subsidiaries' Variables, Log-change, Robustness Checks, Balanced Panel



Note: The bands are the 95 percent confidence intervals based on robust standard errors clustered at the firm level.

I Effects on Cash Holdings in USD

This section examines whether the negative effect of GPR on cash holdings is driven by the appreciation of the Japanese yen. If the yen is regarded as an asset, geopolitical risks increase its demand, leading to its appreciation. This, in turn, reduces the face value of cash holdings held by foreign subsidiaries if those holdings are in other currencies, such as the US dollar.

In the baseline analysis, the effect of exchange rate fluctuations on cash holdings is largely controlled for, as the regression model includes sector-year and prefecture-year fixed effects, which absorb the impact of macroeconomic shocks, including exchange rate fluctuations. Additionally, our cash holdings data are obtained from Nikkei Needs-FinancialQUEST, which reflects the cash holdings of Japanese firms rather than their foreign subsidiaries. Nevertheless, to assess the potential impact of exchange rate fluctuations on our results, we re-run the regressions using the following three types of dependent variables:

$$cash_{ft}^{\text{Total, Baseline}} = 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Total, JPY}}}{\text{property, plant, and equipment}_{f,t-1}^{\text{JPY}} + \text{intangible assets}_{f,t-1}^{\text{JPY}}} \quad \text{(A3)}$$

$$cash_{ft}^{\text{Total, USD1}} = 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Total, USD}} \times 100}{\text{property, plant, and equipment}_{f,t-1}^{\text{JPY}} + \text{intangible assets}_{f,t-1}^{\text{JPY}}} \quad \text{(A4)}$$

$$cash_{ft}^{\text{Total, USD2}} = 100 \times \frac{\text{cash and deposit}_{ft}^{\text{Total, USD}}}{\text{property, plant, and equipment}_{f,t-1}^{\text{USD}} + \text{intangible assets}_{f,t-1}^{\text{USD}}} \quad \text{(A5)}$$

where equation (A3) represents consolidated cash holdings as a share of the firm's fixed asset value from the previous year, both denominated in JPY. Equation (A4) presents a version where cash holdings are denominated in USD, while the denominator remains in JPY.[19] Equation (A5) shows a version where both the numerator and denominator are in USD. The World Development Indicators' official exchange rates (JPY per USD) are used to construct equations (A4) and (A5).

Table A24 presents the results. Columns (1)–(3) show the effects on consolidated cash holdings, columns (4)–(6) show the effects on standalone cash holdings, and columns (7)–(9) show the effects on cash holdings by subsidiaries. Columns (1), (4), and (7) reproduce the baseline results—using equation (A3) as the dependent variable—for comparison. Columns (2), (5), and (8) use equation (A4) as the dependent variable, while columns (3), (6), and (9) use equation (A5) as the dependent variable. The table shows that all results are qualitatively similar, suggesting that the impact of exchange rate fluctuations on our findings–specifically, the negative effects of GPRs on cash holdings–is not significant.

[19] To obtain coefficients within a reasonable range, we multiply cash and deposit$_{ft}^{\text{Total, USD}}$ by 100 in equation (A4).

TABLE A24: Effects on Cash Holdings in USD

	Consolidated cash holdings			Standalone cash holdings			Cash holdings by subsidiaries		
Numerator	JPY	USD	USD	JPY	USD	USD	JPY	USD	USD
Denominator	JPY	JPY	USD	JPY	JPY	USD	JPY	JPY	USD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\widetilde{\Delta gpr}_{ft}^{FDI}$, $\hat{\beta}_1$	0.37	0.21	0.29	0.09	-0.07	0.00	0.30	0.28	0.29
	(0.86)	(0.80)	(0.81)	(0.71)	(0.65)	(0.65)	(0.31)	(0.28)	(0.31)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}$, $\hat{\beta}_2$	-4.65 ***	-3.78 ***	-4.02 ***	-2.76 ***	-2.07 **	-2.18 **	-1.94 ***	-1.70 ***	-1.83 ***
	(1.24)	(1.10)	(1.21)	(0.99)	(0.88)	(0.97)	(0.50)	(0.44)	(0.48)
$\widetilde{\Delta gpr}_{ft}^{Trade}$, $\hat{\beta}_3$	-0.50	-0.42	-0.46	-0.59	-0.50	-0.53	0.02	0.08	0.07
	(0.82)	(0.74)	(0.76)	(0.65)	(0.59)	(0.61)	(0.37)	(0.30)	(0.33)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}$, $\hat{\beta}_4$	3.19 **	2.23 **	2.32 **	1.50	0.91	0.88	1.78 **	1.30 **	1.41 **
	(1.29)	(1.06)	(1.14)	(0.92)	(0.85)	(0.93)	(0.73)	(0.55)	(0.59)
$\widetilde{\Delta epu}_{ft}^{FDI}$, $\hat{\beta}_5$	0.22	-0.24	0.05	-0.21	-0.63	-0.42	0.32	0.39	0.48
	(1.38)	(1.18)	(1.44)	(1.27)	(1.13)	(1.34)	(0.57)	(0.52)	(0.58)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}$, $\hat{\beta}_6$	-0.61	-0.78	-1.60	0.49	0.27	-0.50	-0.88	-0.96	-0.99
	(2.33)	(2.04)	(2.45)	(1.80)	(1.64)	(1.89)	(0.96)	(0.83)	(0.96)
$\widetilde{\Delta epu}_{ft}^{Trade}$, $\hat{\beta}_7$	2.41	1.33	1.79	2.61	1.67	1.99	-0.08	-0.32	-0.18
	(2.79)	(2.46)	(2.64)	(2.42)	(2.16)	(2.33)	(0.92)	(0.85)	(0.89)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}$, $\hat{\beta}_8$	2.37	3.17	2.18	-1.09	-0.03	-1.02	3.16 **	3.20 ***	3.20 **
	(4.08)	(3.62)	(4.09)	(3.72)	(3.34)	(3.70)	(1.31)	(1.15)	(1.29)
Sample size	10,448	10,448	10,448	10,445	10,445	10,445	10,445	10,445	10,445
R-sq.	0.82	0.82	0.82	0.81	0.8	0.81	0.68	0.66	0.66
Sum of coefficients									
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-4.28***	-3.57***	-3.74***	-2.67***	-2.13**	-2.18**	-1.64***	-1.42***	-1.54***
	(1.25)	(1.15)	(1.26)	(0.99)	(0.91)	(1.00)	(0.50)	(0.43)	(0.48)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$	2.69**	1.81*	1.86*	0.93	0.43	0.37	1.78**	1.36***	1.46***
	(1.15)	(0.93)	(0.99)	(0.74)	(0.73)	(0.79)	(0.70)	(0.50)	(0.55)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	-0.39	-1.02	-1.55	0.28	-0.36	-0.92	-0.56	-0.57	-0.51
	(2.41)	(2.04)	(2.50)	(1.73)	(1.50)	(1.82)	(1.07)	(0.92)	(1.07)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$	4.78	4.50	3.97	1.52	1.64	0.97	3.08**	2.88**	3.02**
	(4.27)	(3.63)	(4.28)	(3.84)	(3.28)	(3.83)	(1.36)	(1.17)	(1.34)

Note: See the note for Table A4.

J Estimating without Year Fixed Effects

J.1 Regression Model without Year Fixed Effects

One of the key features of our analysis is that our regressions employ firm-level GPR and EPU variables, which makes it possible to include year fixed effects. On the other hand, previous studies employing macro GPR variables do not include year fixed effects in their regressions. As a result, our results and prior results are not entirely comparable. Therefore, this section runs regressions without introducing year fixed effects.

To run regressions that are closely aligned with previous studies, we construct a simple average of foreign GPR variable, $gpr_t = \frac{1}{n(R)} \sum_{r \in R} gpr_t^r$, where gpr_t^r denotes the weighted average of country level GPR for region r and R denotes the set of regions, including Asia, Europe, North America, Latin America, Oceania, Middle East, and Africa, and $n(R) = 7$. Similarly, we construct the macro EPU variable, $epu_t = \frac{1}{n(R)} \sum_{r \in R} epu_t^r$.

The regression equation is as follows:

$$\begin{aligned} y_{ft} =& \beta_1 gpr_t + \beta_2 (gpr_t \times D_f^{\text{Large}}) \\ &+ \beta_3 epu_t + \beta_4 (epu_t \times D_f^{\text{Large}}) \\ &+ \mathbf{X}_{ft} \boldsymbol{\beta}_5' + \beta_6 D_f^{\text{Large}} + \phi_f + u_{ft}, \end{aligned} \tag{A6}$$

where $\mathbf{X}_{ft}$ includes control variables: log(employment), log(sales/employment), log(capital/employment), log(total assets/employment), the foreign capital ratio, and log(number of foreign subsidiaries), all of which are lagged. The variable ϕ_f denotes firm fixed effects. The error term is denoted by u_{ft}. We re-run equation (A6) by replacing gpr_t with $\Delta gpr_t = gpr_t - gpr_{t-1}$ and replacing epu_t with $\Delta epu_t = epu_t - epu_{t-1}$. Additionally, we re-run (A6) by replacing gpr_t with $\widetilde{\Delta gpr}_{ft}^{FDI}$ and $\widetilde{\Delta gpr}_{ft}^{Trade}$ and replacing epu_t with $\widetilde{\Delta epu}_{ft}^{FDI}$ and $\widetilde{\Delta epu}_{ft}^{Trade}$. Table A25 shows summary statistics of marco GPR and EPU variables.

TABLE A25: Summary Statistics of Macro GPR and EPU Variables

	Obs	Mean	Std. dev.	p5	p25	p50	p75	p95
gpr_t	10,775	3.26	0.87	2.41	2.58	3.01	3.63	5.27
epu_t	10,775	2.85	0.99	1.35	2.05	2.63	3.54	4.99
Δgpr_t	10,774	0.05	0.77	-0.89	-0.36	0.01	0.35	2.47
Δepu_t	10,774	0.21	1.07	-2.31	-0.67	0.05	1.26	1.79

J.2 Results without Year Fixed Effects

Table A26 presents the effects of the macro GPR and EPU variables, gpr_t and epu_t, without including year fixed effects. Overall, the results indicate that macro GPR positively affects large manufacturing firms' cash holdings while negatively impacting investment. Additionally, the macro EPU variable appears to increase cash holdings for small manufacturing firms while decreasing investment for larger firms. These findings align with previous studies on the effects of EPU.

Table A27 presents the effects of changes in the macro GPR and EPU variables, Δgpr_t and Δepu_t, without including year fixed effects. The results indicate that a higher Δgpr_t increases cash holdings and investment for small firms, while it decreases cash holdings and investment for larger firms. Additionally, Δepu_t is shown to decrease cash holdings and increase investment for both small and large manufacturing firms.

Table A28 presents the effects of $\widetilde{\Delta gpr}_{ft}^{FDI}$ and $\widetilde{\Delta gpr}_{ft}^{Trade}$ without introducing year fixed effects. The results indicate that FDI-based GPR increases cash holdings for small firms while decreasing them for larger firms, whereas trade-based GPR increases cash holdings for both small and large firms. Additionally, FDI-based GPR negatively affects investment by large firms. The EPU variables appear to have limited effects on corporate behavior; however, FDI-based EPU is shown to increase investment for both small and large firms.

TABLE A26: Without Year Fixed Effects, Macro GPR

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$gpr_t, \hat{\beta}_1$	0.91	0.79	0.08	0.74 ***	-0.23	-15.09 ***	-0.80 ***	-0.14 ***	0.60 ***	-0.56 ***	-0.23	-0.32 ***
	(0.79)	(0.61)	(0.33)	(0.24)	(0.14)	(0.45)	(0.11)	(0.05)	(0.23)	(0.21)	(0.15)	(0.11)
$gpr_t \times D^{\text{Large}}, \hat{\beta}_2$	2.69 *	2.60 **	0.12	1.38 **	-0.37	0.57	-0.12	-0.04	0.37	-0.14	-0.11	-0.01
	(1.56)	(1.30)	(0.52)	(0.58)	(0.42)	(1.17)	(0.31)	(0.09)	(0.42)	(0.36)	(0.25)	(0.19)
$epu_t, \hat{\beta}_3$	10.15 ***	5.23 ***	5.01 ***	-1.91 ***	0.24	18.32 ***	1.52 ***	0.34 ***	-0.10	0.76 ***	0.36 **	0.40 ***
	(1.07)	(0.94)	(0.39)	(0.33)	(0.15)	(0.65)	(0.14)	(0.13)	(0.26)	(0.24)	(0.16)	(0.15)
$epu_t \times D^{\text{Large}}, \hat{\beta}_4$	-8.13 ***	-5.61 **	-2.50 ***	2.41 ***	-1.51 ***	-3.38 **	1.62 ***	-0.18	-2.28 ***	-1.57 ***	-1.20 ***	-0.36
	(2.43)	(2.59)	(0.94)	(0.86)	(0.45)	(1.54)	(0.44)	(0.12)	(0.56)	(0.50)	(0.29)	(0.34)
Sample size	10,491	10,488	10,488	10,562	10,631	10,631	10,631	10,631	10,658	10,448	10,544	10,532
R-sq.	0.81	0.8	0.65	0.76	0.31	0.69	0.51	0.61	0.28	0.58	0.3	0.84
Sum of coefficients												
GPR, $\hat{\beta}_1 + \hat{\beta}_2$	3.60**	3.39***	0.20	2.12***	-0.59	-14.5***	-0.92***	-0.18**	0.97***	-0.70**	-0.35*	-0.33*
	(1.45)	(1.22)	(0.42)	(0.54)	(0.41)	(1.10)	(0.30)	(0.08)	(0.37)	(0.30)	(0.20)	(0.16)
EPU, $\hat{\beta}_3 + \hat{\beta}_4$	2.02	-0.38	2.51***	0.50	-1.26***	14.9****	3.14***	0.16	-2.38***	-0.81*	-0.84***	0.04
	(2.42)	(2.67)	(0.90)	(0.82)	(0.43)	(1.44)	(0.42)	(0.11)	(0.54)	(0.47)	(0.27)	(0.32)

Note: gpr_t denotes the average foreign GPR variable. epu_t denotes the average foreign EPU variable. Standard errors, clustered at the firm level, are in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the control variables outlined in the main text and firm fixed effects. The sample period is 2002-2022. The large firm dummy D^{Large} takes unity if the firm's sales are greater than the 90th percentile of the average value of $\ln$(sales) during the 2002-2022 period where the distribution is computed using firms included in the balanced panel only. The coefficients of $\widetilde{\Delta gpr}_{ft}^{FDI}$, $\widetilde{\Delta gpr}_{ft}^{Trade}$ (and therefore their interaction terms with the large firm dummy) are normalized to represent the effects of a one-standard-deviation change in the corresponding GPR variable.

TABLE A27: Without Year Fixed Effects, Changes in Macro GPR

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\Delta gpr_t, \hat{\beta}_1$	6.64 ***	3.52 ***	3.13 ***	-0.77 ***	-0.04	7.20 ***	0.65 ***	0.23 ***	0.57 **	0.08	0.03	0.04
	(0.79)	(0.60)	(0.37)	(0.19)	(0.13)	(0.42)	(0.11)	(0.07)	(0.26)	(0.21)	(0.15)	(0.12)
$\Delta gpr_t \times D^{\text{Large}}, \hat{\beta}_2$	-5.28 ***	-3.73 ***	-1.60 **	0.25	-0.78 **	-1.3	0.78 ***	-0.21 ***	-1.02 **	-0.70	-0.66 **	-0.02
	(1.47)	(1.36)	(0.69)	(0.58)	(0.32)	(1.07)	(0.29)	(0.07)	(0.49)	(0.46)	(0.29)	(0.27)
$\Delta epu_t, \hat{\beta}_3$	-1.06 ***	-1.18 ***	0.16	-0.72 ***	0.23 **	3.47 ***	0.12 *	0.07 **	-0.08	0.37 ***	0.29 ***	0.08 **
	(0.29)	(0.28)	(0.15)	(0.09)	(0.09)	(0.19)	(0.06)	(0.03)	(0.13)	(0.11)	(0.10)	(0.03)
$\Delta epu_t \times D^{\text{Large}}, \hat{\beta}_4$	0.15	0.25	-0.08	0.02	0.00	0.05	0.21	-0.03	0.13	0.14	-0.03	0.17
	(0.45)	(0.43)	(0.31)	(0.27)	(0.14)	(0.55)	(0.13)	(0.07)	(0.27)	(0.19)	(0.16)	(0.10)
Sample size	10,491	10,488	10,488	10,561	10,631	10,631	10,631	10,631	10,658	10,448	10,544	10,532
R-sq.	0.81	0.80	0.64	0.75	0.31	0.55	0.48	0.61	0.28	0.58	0.30	0.84
Sum of coefficients												
GPR, $\hat{\beta}_1 + \hat{\beta}_2$	1.36	-0.22	1.53**	-0.52	-0.81***	5.90***	1.42***	0.03	-0.45	-0.62	-0.63**	0.02
	(1.21)	(1.21)	(0.59)	(0.54)	(0.29)	(0.98)	(0.26)	(0.05)	(0.42)	(0.40)	(0.25)	(0.23)
EPU, $\hat{\beta}_3 + \hat{\beta}_4$	-0.91**	-0.93***	0.09	-0.71***	0.23**	3.52***	0.33***	0.04	0.05	0.51***	0.26**	0.24**
	(0.37)	(0.34)	(0.27)	(0.26)	(0.11)	(0.51)	(0.11)	(0.07)	(0.23)	(0.16)	(0.13)	(0.10)

Note: Δgpr_t denotes changes in the average foreign GPR variable. Δepu_t denotes changes in the average foreign EPU variable. See the note in Figure A26 also.

TABLE A28: Without Year Fixed Effects, Firm-level GPR

	Cash hold., consol.	Cash hold. standalone	Cash hold. subsid.	Cash hold. ratio, Standa./Cons.	Exp. on fixed asset purchases	Share of tangible asset purchases	Share of intangible asset purchases	Share of other asset purchases	Property, plant, and equipment	Capital exp. and R&D	Capital exp.	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\widetilde{\Delta gpr}_{ft}^{FDI}, \hat{\beta}_1$	2.34 ***	1.28 **	1.08 ***	-0.23	0.24 **	2.86 ***	0.27 ***	0.24 **	0.23	0.23	0.27 **	-0.04
	(0.66)	(0.56)	(0.25)	(0.15)	(0.09)	(0.38)	(0.09)	(0.10)	(0.21)	(0.17)	(0.11)	(0.09)
$\widetilde{\Delta gpr}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_2$	-4.08 ***	-2.50 **	-1.62 ***	-0.20	-0.75 ***	-0.75	0.73 ***	-0.19 **	-1.00 ***	-0.84 ***	-0.57 ***	-0.27
	(1.20)	(0.98)	(0.49)	(0.38)	(0.22)	(0.85)	(0.26)	(0.09)	(0.37)	(0.32)	(0.17)	(0.20)
$\widetilde{\Delta gpr}_{ft}^{Trade}, \hat{\beta}_3$	1.24 **	0.37	0.82 ***	-0.26	-0.32 ***	1.45 ***	0.13	-0.15 **	-0.13	-0.30 **	-0.32 **	0.02
	(0.60)	(0.51)	(0.28)	(0.20)	(0.11)	(0.44)	(0.10)	(0.07)	(0.20)	(0.15)	(0.13)	(0.07)
$\widetilde{\Delta gpr}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_4$	1.77 *	0.63	1.19 *	0.44	0.43 *	-1.16	-0.35	0.12	0.35	0.67 *	0.24	0.44 *
	(1.02)	(0.71)	(0.72)	(0.51)	(0.23)	(0.97)	(0.31)	(0.08)	(0.45)	(0.36)	(0.20)	(0.24)
$\widetilde{\Delta epu}_{ft}^{FDI}, \hat{\beta}_5$	0.42	-0.34	0.69	-0.32	0.44 *	3.19 ***	0.12	-0.02	0.38	0.87 ***	0.63 **	0.24 **
	(1.13)	(0.96)	(0.49)	(0.33)	(0.25)	(0.57)	(0.20)	(0.15)	(0.35)	(0.29)	(0.25)	(0.10)
$\widetilde{\Delta epu}_{ft}^{FDI} \times D^{\text{Large}}, \hat{\beta}_6$	-2.44	-1.16	-1.04	-1.79	0.47	4.76 ***	0.32	0.37	-0.44	0.92 *	0.51	0.42
	(2.30)	(1.66)	(1.04)	(1.16)	(0.40)	(1.77)	(0.39)	(0.39)	(0.94)	(0.55)	(0.42)	(0.28)
$\widetilde{\Delta epu}_{ft}^{Trade}, \hat{\beta}_7$	1.41	1.53	0.06	-1.31 ***	-0.55	5.09 ***	0.23	0.32	-1.60 **	-0.85	-0.75	-0.05
	(2.02)	(1.92)	(0.65)	(0.48)	(0.44)	(0.87)	(0.30)	(0.25)	(0.62)	(0.53)	(0.46)	(0.15)
$\widetilde{\Delta epu}_{ft}^{Trade} \times D^{\text{Large}}, \hat{\beta}_8$	3.54	0.40	2.95 **	2.42	-0.44	-4.54 *	0.09	-0.51	0.79	-0.20	-0.52	0.26
	(4.00)	(3.65)	(1.27)	(1.56)	(0.64)	(2.37)	(0.64)	(0.50)	(1.32)	(0.82)	(0.67)	(0.38)
Sample size	10,491	10,488	10,488	10,562	10,631	10,631	10,631	10,631	10,658	10,448	10,544	10,532
R-sq.	0.81	0.80	0.64	0.75	0.32	0.55	0.48	0.61	0.28	0.59	0.31	0.84
Sum of coefficients												
FDI-based GPR, $\hat{\beta}_1 + \hat{\beta}_2$	-1.74*	-1.21	-0.53	-0.43	-0.51***	2.11***	1.00***	0.05	-0.77**	-0.61**	-0.29**	-0.31*
	(1.02)	(0.83)	(0.42)	(0.35)	(0.20)	(0.77)	(0.25)	(0.04)	(0.31)	(0.26)	(0.12)	(0.18)
Trade-based GPR, $\hat{\beta}_3 + \hat{\beta}_4$	3.02***	1.00*	2.01***	0.18	0.12	0.30	-0.22	-0.04	0.22	0.37	-0.08	0.46*
	(0.85)	(0.52)	(0.66)	(0.46)	(0.20)	(0.87)	(0.30)	(0.04)	(0.40)	(0.33)	(0.15)	(0.23)
FDI-based EPU, $\hat{\beta}_5 + \hat{\beta}_6$	-2.02	-1.49	-0.36	-2.11*	0.92***	7.95***	0.44	0.35	-0.06	1.79***	1.14***	0.66**
	(1.99)	(1.31)	(0.92)	(1.12)	(0.32)	(1.68)	(0.35)	(0.37)	(0.88)	(0.47)	(0.35)	(0.27)
Trade-based EPU, $\hat{\beta}_7 + \hat{\beta}_8$	4.96	1.94	3.01**	1.11	-0.99	0.56	0.32	-0.19	-0.81	-1.05	-1.27**	0.21
	(3.78)	(3.38)	(1.20)	(1.52)	(0.56)	(2.24)	(0.62)	(0.47)	(1.23)	(0.72)	(0.58)	(0.35)

Note: $\widetilde{\Delta gpr}_{ft}^{FDI}$ denotes firm-level FDI-based GPR. See the note in Figure A26 also.