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Firm Heterogeneity in Responses to Trump Tariffs 2.0: Evidence from Japanese manufacturing firms *

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Abstract

This study uses an original firm-level survey fielded during the Trump 2.0. negotiations to examine how firm characteristics relate to (i) whether and how strongly firms perceive tariff impacts and (ii) whether and how they adjust (including measures under consideration). Impacts are widespread among U.S. exporters and are largest for firms engaged in related-party (intrafirm) exports, consistent with rigid internal transactions and compliance constraints (e.g., rules of origin, pricing, regulation). Among firms with limited direct exposure to North America, more upstream firms report stronger impacts, suggesting supply-chain spillovers beyond direct exports. Adjustments are more selective, rising with firm size, and are most advanced among large, high-productivity firms. Adjustment menus differ by exposure, with intrafirm exporters favoring U.S. localization via foreign direct investment, arms-length exporters relying more on price/cost adjustments, and China/Asia exporters shifting toward third-country markets. Policy should lower export-related fixed costs for smaller firms and expand support for third-country expansion.

Keywords: Trump tariffs; productivity; intrafirm trade; foreign direct investment (FDI)
JEL Classification: F13; F14; F23; C25; L25

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1. Introduction

How do firms respond to large trade policy shocks, and how heterogeneous are these responses? The heightened trade uncertainty since the 2018 U.S.–China trade conflict raises an important question about how firms in third countries, such as those in Japan, reassess their production and trade strategies in light of direct exposure to shocks and indirect transmission through global supply chains. Our study investigates this question by leveraging an original survey of Japanese manufacturing firms conducted during the Trump tariffs 2.0 negotiations on reciprocal tariffs with Japan and other countries in 2025. Evidence on the effect of tariff shocks on third-country firms has been limited to aggregate trade data (Fajgelbaum et al., 2024; Hayakawa et al., 2024; Yang & Hayakawa, 2023), such as the effect on overall trade flows in Japan (Ito, 2022) or production adjustments by Japanese affiliates in the U.S. (Licheng & Matsuura, 2023). While these studies generally find limited spillover effects of tariff shocks on third countries, aggregate data do not allow us to examine how individual firms differ in their exposure to and adjustment to tariff shocks. An important exception is a pathbreaking study on listed firms in Taiwan, which finds that Trump tariffs 2.0 had no pronounced adverse effects on monthly firm sales as of July 2025 (Chang & Hayakawa, 2026). This study aims to fill this gap by linking an original firm survey on Trump's second round of tariffs to comprehensive firm-level data, enabling a study of firm heterogeneity in tariff exposure and adjustment strategies among Japanese manufacturing firms. In doing so, we provide firm-level evidence of the heterogeneity in vulnerability and adaptive behavior among Japanese manufacturing firms under Trump tariffs 2.0.

Whether and how strongly firms are affected by tariffs, and how they respond, likely vary significantly across firms. Even among exporters, firms with greater exposure to the U.S. market are expected to be more affected. Such heterogeneity may reflect differences in (i) trading relationships, such as related-party (intrafirm) exports versus arm's-length exports; (ii) geographic portfolios across the U.S., China, and Asia; and (iii) internal capabilities, such as productivity and financial capacity. We also anticipate significant variation in adjustment strategies. Historical evidence from U.S.–Japan trade frictions suggests that tariff-jumping foreign direct investment (FDI) was greater in sectors facing higher tariff rates (Brainard, 1997). Structural adjustments of this kind are likely to be undertaken disproportionately by more capable firms, whereas less capable firms may respond primarily through short-run measures—such as waiting, incremental price/cost adjustments, or limited reallocation—rather than large-scale reconfiguration. Understanding how these contrasts map into specific firm attributes requires firm-level evidence.

We administered a questionnaire to 15,000 Japanese manufacturing firms between April and June 2025, which yielded 1,855 valid responses. The survey captures firms' assessments of the impacts of Trump's second round of tariffs, their choice of adjustment strategies, and the progress they have made in adjustment measures as of the time of our survey. We then linked these responses to firm-level microdata from the Ministry of Economy, Trade and Industry's Basic Survey of Japanese Business Structure and Activities (BSBSA). We provided descriptive evidence of the association between responses and firm attributes. Our empirical strategy is intentionally descriptive: rather than identifying causal effects, we document robust associations using binary- and ordered-choice models to assess anticipated impact and intensity, and a multinomial logit framework to assess adjustment strategies.

The analysis yields three main findings. First, anticipated tariff shocks are widespread and closely tied to firms' exposure structures—most notably exports to the U.S., particularly related-party exports. In contrast, a firm's choice of adjustment strategies is more strongly associated with firm size (sales); productivity does not operate uniformly but instead appears to play a complementary role among large firms. Second, firms engaged in related-party (intrafirm) exports to the U.S. report particularly large impacts and display a stronger preference for localization through FDI. At the same time, arm's-length exporters are more likely to adapt to anticipated tariffs through price and cost adjustment. Third, firms exporting to China and Asia prefer geographic portfolio rebalancing through third-country shifts, including deeper reorientation within the region. Additionally, for firms with low direct exposure to North American exports, upstreamness in supply chains may complement export exposure in shaping anticipated impacts, suggesting supply-chain spillovers that are difficult to capture with direct export measures alone.

The remainder of the study is organized as follows. Section 2 describes the data and the empirical framework. Section 3 presents descriptive patterns from the survey and then examines associations between firm attributes and anticipated impacts and adjustments using regression analyses. Section 4 concludes by summarizing key findings, discussing policy implications, and outlining directions for future research.

2. Data and Empirical Framework

2.1 Overview of the Firm Survey

This study combines two data sources: (i) a questionnaire survey designed to measure the anticipated impacts of and adjustments to Trump tariffs 2.0, fielded from April 4 to June 17, 2025, and (ii) firm-level microdata from the BSBSA. The questionnaire was administered to 15,000 manufacturing firms, yielding 1,855 valid responses (a response rate of 12.4%). The sample was drawn using stratified sampling by firm size and industry, and the fieldwork sought to minimize industry imbalance in completed responses.

The questionnaire has three blocks. The first block measures the anticipated impact of tariff increases and the introduction of reciprocal tariffs by the U.S. administration. Respondents selected one of five ordered categories: 1 = no impact at all, 2 = minor impact, 3 = neutral, 4 =

moderate impact, and 5 = significant impact. The second block measures adjustment status to the same policy changes, again on a five-point ordered scale: 1 = no action taken (and no plans to do so); 2 = minimal action—primarily under consideration, with no implementation yet; 3 = some measures implemented; 4 = mostly implemented; and 5 = fully implemented. The third block captures the content of adjustments. Firms reporting categories 2–5 in the adjustment status question were asked to select all applicable measures from a list that includes: (i) price reductions and cost-cutting efforts, (ii) establishing or expanding production bases in the U.S., (iii) partnerships with or acquisitions of U.S. firms, (iv) expanding exports to third-country (non-U.S.) markets, (v) lobbying the U.S. government (including through industry associations), (vi) shifting from goods to services exports, and (vii) other actions (open-ended). Using the variable definitions described below, we convert the survey responses into analyzable variables and link them to firm attributes from the BSBSA for empirical analysis.

2.2 Response Distributions and Variable Construction

Table 1 reports the distribution of anticipated impacts on a five-point scale. Forty-two percent of respondents reported a moderate or significant impact (550 + 220 firms), indicating that concerns about tariff impacts are widespread in the sample. In contrast, 24.6% of firms report a combination of no impact and a minor impact, while 33.5% report a neutral impact. When responses are weighted by economic size, the concentration of anticipated impacts becomes more pronounced among responding firms, with those reporting a moderate or significant impact accounting for 75.4% of total sales (39.9% + 35.5%) and 64.3% of total employment (38.7% + 25.6%). These patterns indicate that anticipated impacts are not only prevalent in terms of firm counts but also economically meaningful when viewed through the lens of sales and employment. While these distributions suggest that larger firms or firms with higher employment intensity may be more prevalent in higher-impact categories, these differences are descriptive; formal assessment is deferred to the regression analyses in subsequent sections.

(Table 1. Distribution of Anticipated Impacts of Trump Tariffs 2.0)

Table 2 summarizes the status of adjustment implementation as of the survey. A majority of firms report having prepared no concrete plan or strategy (60.6%; 1,106 firms), while 32.2% (587 firms) indicate having taken minimal action—primarily under consideration, with no implementation yet. Only 7.2% of firms (114 + 17 + 0) report being in implementation stages (categories 3–5), while no firm reports having fully implemented an adjustment strategy (category 5). As a descriptive reference, the mean of sales per employee is higher among firms that report implementation: 36,849 thousand yen for those firms that have taken no action, 39,810 thousand yen for those taking minimal action, 62,133 thousand yen for firms engaged in partial adjustment, and 50,570 thousand yen for those whose adjustment strategies are largely completed. Although this pattern is consistent with the idea that implementation may be more common among more productive firms, these comparisons do not control for differences in industry composition or firm size; thus, they should be interpreted as descriptive correlations only.

(Table 2. Distribution of Firms' Adjustment Status to Trump Tariffs 2.0)

Table 3 presents the distribution of selected adjustment measures (multiple responses allowed), with 541 total selections across firms. The most frequently selected measure is price reductions/cost cutting (43.8%; 237 selections), followed by expanding exports to third-country markets (24.0%; 130 selections). Measures related to U.S.-bound investment—establishing or expanding U.S. production bases (8.5%; 46 selections) and seeking partnerships/acquisitions of U.S. firms (3.1%; 17 selections)—account for 11.6%. Lobbying (6.7%) and shifting toward services exports (2.0%) are less common measures, yet still appear as non-negligible options. Using an approximate productivity proxy (the unadjusted mean of sales per employee), investment-type measures are associated with relatively high values (about 100,000–160,000 thousand yen), and third-country expansion is also relatively high (59,340 thousand yen). In contrast, cost-cutting measures are lower on average (42,186 thousand yen). Given the multiple-response design, these figures should be interpreted as indicative rather than definitive; nevertheless, they suggest that more extensive, outward-oriented adjustments—such as third-country expansion and investment/localization—are more prevalent among firms with greater capabilities.

(Table 3. Distribution of Reported Adjustment Measures to Trump Tariffs 2.0)

Taken together, the descriptive evidence indicates that (i) anticipated impacts are widespread both in terms of firm counts and economic-weighted measures, (ii) the status of adjustment implementation is concentrated in the stage of minimal action, with limited implementation, and (iii) productive firms are more likely to have implemented adjustment strategies than nonresponders. Finally, (iv) cost- and price-cutting measures and third-country shifts in supply chains dominate the choice of adjustment strategies, while U.S.-bound investment, although less frequent, tends to be concentrated among higher-capability firms.

We further explore heterogeneity across industries. Figure 1 plots industry-level averages with the horizontal axis illustrating the average North American export share (percent) and the vertical axis illustrating the share of firms reporting any stage of adjustment (including minimal action). The bubble size captures the share reporting an impact of increased tariffs (moderate + significant), discretized into four bins. A clear positive association emerges: industries with higher North American export dependence generally report larger anticipated tariff impacts and higher adjustment rates. Industries such as transport equipment, information and communication machinery, and electrical machinery appear in the upper-right region of the plot, consistent with the view that direct exposure to the U.S. market accelerates both the impact of anticipated shocks and the initiation of adjustments.

At the same time, Figure 1 also highlights industries—such as steel and rubber—that, while exhibiting relatively low North American export shares, still report sizable anticipated impacts and nontrivial adjustment rates. A natural interpretation is that these upstream material and component industries are indirectly affected through input–output (I–O) linkages: negative shocks to downstream U.S.-exposed industries (e.g., transport equipment) can be transmitted upstream via reduced demand, price renegotiations, or procurement pattern adjustments. While it is often difficult to control for such indirect exposure at the firm level using only direct trade measures, we address this limitation by constructing a firm-level measure of supply-chain position. Following Antràs et al. (2012), we build an upstreamness indicator—the average distance to final demand—by combining I–O transactions with firm-by-product sales information and computing a sales-weighted firm average. In the subsequent regressions, we incorporate this upstreamness measure to account for firms that, despite having low direct export exposure to North America, face substantial impacts because they operate in more upstream segments of supply chains. We also control for import exposure where feasible and include industry fixed effects to account for other unobserved industry-specific factors, thereby testing the robustness of the estimated associations.

(Figure 1: North American export dependence, anticipated impacts, and adjustments across industries)

2.3 Empirical Strategy

We analyze tariff impacts and firm adjustments by first defining the original five-category ordered responses as the main outcome variables and, when needed, derive binary outcomes by applying a common threshold rule. Across all specifications, we use a unified set of covariates—firm attributes combined with industry fixed effects—enabling consistent comparisons of estimates across outcomes.

For each firm i, let $Y_i^{(k)} \in \{1,2,3,4,5\}$ denote the five-point response for $k \in \{imp, res\}$, where higher values indicate greater intensity of impacts or more advanced progress in adjustments. From these ordered outcomes, we construct the following binary indicator using a threshold function:

$$\tilde{Y}_i^{(k)}(\tau) = 1\left\{Y_i^{(k)} \geq \tau\right\}.$$

In the baseline definition, we set $\tau_{imp} = 4$ for impacts (i.e., a moderate or significant impact equals 1) and $\tau_{res} = 2$ for adjustments (i.e., any status other than no action taken/no plan equals one).

The empirical approach then depends on the outcome's measurement scale. First, for binary indicators of whether firms are affected and whether firms adjust, we estimate logit models for the conditional probability of $\tilde{Y}_i^{(k)}(\tau) = 1$ given firm covariates X_i and industry fixed effects. Specifically,

$$\Pr\left(\tilde{Y}_i^{(k)}(\tau) = 1 \middle| X_i\right) = \Lambda\left(\alpha^{(k)} + X_i'\beta^{(k)} + \delta_{s(i)}\right), \qquad \Lambda(z) = \frac{1}{1 + e^{-z}},$$

where $s(i)$ indexes the industry of firm i and $\delta_{s(i)}$ denotes industry fixed effects.

Second, for impact intensity (the original five-category scale) and adjustment progress (the ordered scale), we employ proportional-odds ordered logit models. In this specification, covariates shift the cumulative log-odds by the same amount across cutpoints. Formally, for $j = 1, \cdots, 4$,

$$\Pr\left(Y_i^{(k)} \leq j \middle| X_i\right) = \Lambda\left(\kappa_j{}^{(k)} + X_i'\beta^{(k)} + \delta_{s(i)}\right),$$

where $\kappa_j{}^{(k)}$ are category-specific cutpoints. Category probabilities are obtained as differences in adjacent cumulative probabilities, i.e.,

$$\Pr\left(Y_i^{(k)} = j \middle| X_i\right) = \Lambda\left({\kappa_j}^{(k)} - X_i'\beta^{(k)} - \delta_{s(i)}\right) - \Lambda\left({\kappa_{j-1}}^{(k)} - X_i'\beta^{(k)} - \delta_{s(i)}\right),$$

where ${\kappa_0}^{(k)} = -\infty$ and ${\kappa_5}^{(k)} = +\infty$ by convention.

Finally, we analyze the content of adjustments by converting the multiple-response checklist into five mutually exclusive categories: (1) no action taken, (2) other measures/lobbying/service reorientation, (3) price or cost adjustment, (4) third-country market shift, and (5) U.S.-oriented investment/localization. When firms select multiple items, we assign a primary adjustment type using a priority rule—U.S. investment/localization > third-country shift > cost adjustment > other—so that each firm is mapped to a single category. With category 1 (no action taken) as the base outcome, we estimate a multinomial logit model. For $j \in \{2,3,4,5\}$, the choice probability is as follows:

$$P_{ij} \equiv \Pr\left(Y_i^{type} = j \middle| X_i\right) = \frac{\exp\left(\alpha_j + X_i'\beta_j + \delta_{j,s(i)}\right)}{1+\sum_{m=2}^{5}\exp\left(\alpha_m + X_i'\beta_m + \delta_{m,s(i)}\right)},$$

where $\delta_{j,s(i)}$ allows for industry fixed effects in the relative utility of each adjustment type.

This unified framework allows us to compare three outcomes—(i) the likelihood and intensity of impacts, (ii) the likelihood (and progress) of adjustments, and (iii) the chosen adjustment menu—under a common set of firm characteristics and industry controls. In interpreting the results, we focus on average marginal effects on predicted probabilities, which allow a more direct assessment of how firm attributes relate to the asymmetry suggested by the descriptive evidence—namely, that anticipated impacts are broadly reported across firms, whereas implemented adjustments are more selective.

2.4 Firm Characteristics

Firm-level covariates are drawn primarily from the FY2023 BSBSA microdata for the (reflecting 2023 outcomes). We merge the survey responses with the BSBSA using corporate identification numbers and firm names as keys. Potential duplicates and inconsistencies are checked on a case-by-case basis, and the baseline analysis uses information from the most recent year available at the time of writing.

The BSBSA covers firms with at least 50 employees and paid-in capital (or equity contributions) of at least 30 million yen and provides core financial and operational information. Using these data, we construct the following main firm attributes.

A key measure of capability is total factor productivity (TFP). We address endogeneity in input choices by estimating TFP using the Levinsohn and Petrin (2003) approach. Specifically, we estimate industry-specific production functions and recover firm-level productivity after controlling for the joint determination of output and inputs.[1] We also include log sales as a size

[1] Intermediate inputs are calculated as (cost of goods sold + selling, general and administrative expenses) − (total payroll + temporary − staff payroll + rental expenses + depreciation + taxes and public dues). Value added is then computed as sales minus intermediate inputs.

measure to capture the role of firm scale.

To proxy for a firm's position in the supply chain—whether upstream (supplying intermediate inputs) or downstream—we extend upstreamness from the I–O level to the firm level. For industry k, upstreamness U_k is computed following Antràs et al. (2012) using the I–O transaction structure. Let Ω denote the allocation matrix constructed from intermediate transactions, where Ω_{kl} is the share of industry k's output sold as intermediate inputs to industry l, defined as $\Omega_{kl} = Z_{kl}/Y_k$. Here, Z_{kl} is the value of intermediate transactions from k to l, and Y_k is the gross output (total domestic production) of industry k. Upstreamness is then obtained as ($\mathrm{U} = (\mathrm{I} - \Omega)^{-1}1$). We use the (integrated) medium industrial classification I–O table with 108 sectors. To isolate domestic linkages, each cell of the intermediate transaction is constructed by subtracting the imports (included) component from the producer-price-based transaction values, thereby preventing inconsistencies, such as row sums of Ω exceeding one due to imported inputs.

We then map the industry-level upstreamness U_k to the firm level using product (or business) sales breakdowns available in the BSBSA.[2] Specifically, we compute a sales share-weighted average across industries: firm i's upstreamness is defined as $U_i = \sum_i s_{ik} U_k$, where s_{ik} denotes firm i's sales share in industry k. A larger U_i indicates that, on average, the firm's main

[2] Specifically, we map firm i's product (or business) classification categories to the 108-sector classification in the I–O table. When necessary, a single product (or business) category is allocated across multiple I–O sectors. Allocation shares are determined using weights based on the domestic output (gross production) of the recipient sectors as reported in the input–output table.

activities lie further upstream from final demand.

We characterize international exposure along two dimensions. First, the BSBSA reports export values by destination region, allowing us to identify whether a firm exports to North America, China, the rest of Asia, Europe, the Middle East, and other regions, and to construct export dummies and export shares by region. North America is the relevant regional proxy for U.S.-centered exposure in our setting. Second, the BSBSA provides a breakdown of regional exports into related-party transactions, enabling us to distinguish related-party (intrafirm) exports from arm's-length exports, particularly for North America and China, where export intensity is high. Related-party exports are plausibly subject to tighter operational constraints, such as transfer pricing discipline and strict compliance with rules of origin. In contrast, being market transactions, arm's-length exports may allow relatively greater scope for reoptimizing destinations in adjustment to tariff shocks. This distinction helps isolate cases where North American exposure is likely to lead to greater vulnerability versus cases where avoidance and reallocation margins may be more available.

We also include a multinational enterprise (MNE) dummy, defined as 1 for firms reporting outstanding overseas-related-party investments/financing. MNEs usually possess stronger organizational capabilities—global networks, financing capacity, managerial and compliance resources—potentially facilitating adjustments, such as overseas expansion or third-country reorientation. At the same time, greater integration into intrafirm trade may amplify initial exposure to tariff shocks. Controlling for MNE status enables us to disentangle the role of global organizational capacity from the effects of export modes and destination composition.

Because the MNE dummy captures the presence of overseas operations but may not fully reflect the strength of headquarters-level capabilities for managing cross-border business, we construct an additional proxy for organizational capacity: the employment share of the international business division, defined as employees in the headquarters' international business division divided by total employment. Intuitively, a greater share indicates greater in-house capacity to manage trade and regulatory operations—customs procedures, rules of origin, transfer pricing documentation, certification, supplier audits, dealings with local authorities, risk management, and cross-border contracting—potentially reducing organizational frictions in implementing tariff adjustments.

Firm age is included because it may capture both rigidity and resilience: while older firms may face more entrenched supply chain relationships that impede rapid adjustment, they may also benefit from greater credibility, financing capacity, and internal know-how that facilitate adjustment.

We further account for production outsourcing through contract manufacturing. Although outsourcing can improve efficiency, it may make relocating production sites more difficult. In particular, offshore contract manufacturing can entail relationship-specific investments—such as long-term contracts, process compatibility and quality certification, shared know-how, and routinized trade and customs procedures—making short-run shifts toward third-country reallocation or U.S.-oriented localization costly. Domestic contract manufacturing may provide greater flexibility owing to geographic and institutional proximity, although switching costs can still occur depending on supplier geography and certification requirements. Accordingly, we construct mutually exclusive dummies relative to the baseline of no contract manufacturing—(i) domestic-only outsourcing, (ii) offshore-only outsourcing, and (iii) both domestic and offshore outsourcing—and examine how these types are associated with impacts and adjustment choices.

We capture the breadth of adjustment options by including a service-exporter dummy, which may proxy business-model flexibility and the feasibility of shifting margins from goods toward services—an option listed in the survey's tariff adjustment menu. Similarly, we include a technology-exporter dummy, taking the value 1 for firms that receive patent royalty income (e.g., licensing revenues). Technology exports often involve significant fixed costs and institutional constraints—such as contracts, intellectual property, standards, and certification—potentially making rapid geographic switching (e.g., third-country shifts) more difficult. Thus, we employ this dummy as a proxy for rigidity in adjustment options and implementation feasibility.

Finally, to capture potential financial constraints, we include a leverage measure—

borrowing dependence, defined as interest-bearing debt divided by total assets—which may affect firms' ability to move from consideration to implementation. We control for unobserved, time-invariant industry factors using industry fixed effects. Descriptive statistics for these variables are reported in Appendix Table 1.

3. Firm Attributes Associated with Impacts and Adjustments

This section presents results on how firm attributes are associated with (i) the likelihood of impacts, (ii) the intensity of impacts, (iii) whether firms respond, and (iv) the progress of adjustments. We interpret the estimates as changes in conditional probabilities, meaning differences in predicted probabilities conditional on other firm attributes and industry fixed effects.

3.1. Likelihood and Intensity of Impacts

Table 4 summarizes the logit estimates of the likelihood of tariff impacts (a binary indicator equal to 1 if the firm reports moderate or significant impacts). The first result is that exports to the U.S. amplify anticipated impacts, with the U.S.-export dummy substantially increasing the probability of reporting an impact [1]. When distinguishing transaction types, the increase is approximately 30 percentage points for related-party (intrafirm) exports, and about 12–13 percentage points even for arms-length exports [2], [3]. For exports to China, the simple China-export dummy is positive and statistically significant in a parsimonious specification [1]. However, its significance weakens once we simultaneously control for related-party and arms-length exports and include additional firm attributes [3]. In other words, exposure to U.S.-bound exports is the primary driver of reported tariff impacts, and within that exposure, intrafirm exports are associated with especially pronounced impacts. A plausible mechanism is that intrafirm trade is subject to practical and institutional constraints—such as compliance with rules-of-origin requirements, anticircumvention rules, and transfer-pricing discipline—which can raise fixed costs of reorganization and make internal supply chains more rigid in the face of tariff shocks.

Similar results emerge when regional exposure is measured using export shares rather than export dummies. A one-percentage-point increase in the export share to North America is associated with a small but statistically significant increase in the probability of reporting tariff impacts [4]. When this export share is decomposed into related-party and arms-length exports, both components yield positive marginal effects [5], [6]. Taken together, these results indicate that both dependence on the North American market (as captured by export shares) and the rigidity of intrafirm trade are associated with a higher likelihood of experiencing tariff impacts.

Although TFP is significantly positive in specifications that omit controls, it becomes statistically insignificant once we account for exporting geography and type. This implies that the likelihood of anticipated impacts is shaped more by the structure of exposure than by productivity per se. Additional controls—such as the service-export dummy and indicators related to outsourcing—are statistically significant in some specifications; however, their effects are not large enough to alter the main results.

(Table 4. Impacts (binary) and firm attributes)

The industry-level scatterplot in Figure 1 shows that some sectors—such as steel and rubber—exhibit relatively large reported impacts despite low dependence on North American exports. This suggests the possibility of indirect spillovers through supply-chain linkages that are not well captured by direct export exposure alone. As shown in Table 4, when upstreamness is included on its own, neither the coefficient nor the average marginal effect is statistically significant. However, the effect of upstreamness may not be homogeneous across firms. To examine whether upstreamness matters given North American export exposure, we estimate a model with an interaction between the North American export share and upstreamness. Figure 2 plots the predicted probabilities of reporting an impact as upstreamness varies, holding the North America export share fixed at a low ($25^{th} \approx 7.1\%$) and high level ($75^{th} \approx 51.6\%$). Two patterns emerge. First, among firms with high North America exposure, the predicted probability of reporting an impact is uniformly high regardless of upstreamness, confirming that direct exposure to the U.S. market is the dominant determinant of impacts. Second, among firms with low North

American exposure, the predicted probability increases gradually with (log) upstreamness, consistent with an indirect exposure channel in which upstream firms are more likely to be affected through demand shocks and price renegotiations transmitted from downstream sectors—especially those exporting to the U.S. In contrast, among firms with high North American exposure, the upstreamness gradient is weak, and the predicted impacts remain high and relatively flat. Although the confidence intervals are wide and, thus, call for cautious interpretation, these results suggest that upstreamness does not uniformly amplify tariff impacts. Instead, supply-chain position appears to matter more for firms with in low North American exposure, where upstream firms may experience stronger indirect spillovers.

(Figure 2. Predicted probability of reporting an impact by upstreamness and North America export exposure)

Regarding impact intensity, Table 5 reports results from ordered logit models. Firms engaged in related-party exports to North America systematically reduce the probabilities of the lower categories—[1] no impact, [2] minor impact, and [3] neutral—while increasing the probabilities of the top two categories—[4] moderate impact and [5] significant impact. The marginal effects indicate reductions of 5.24 percentage points, 10.6 percentage points, and 12.8

percentage points for categories 1–3, respectively, and increases of 10.3 percentage points for category [4] and 18.3 percentage points for category [5]. In cumulative terms, Pr(impact≥4) increases by 28.6 percentage points (= 10.3 + 18.3), with probability mass shifting toward the upper tail—especially category [5]. Thus, firms with related-party exports to North America are more likely to report severe tariff impacts. This pattern is consistent with the idea that intrafirm trade is accompanied by stringent institutional and operational requirements (e.g., origin documentation, transfer-pricing compliance, anticircumvention enforcement, and related evidentiary procedures) and by more rigid internal supply-chain arrangements, both of which limit adjustment margins under tariff shocks. Arms-length exporters to North America experience qualitatively similar patterns, but with smaller marginal effects. In the case of exports to China, statistical significance is weaker, and the effects are lower than for North American exposure. The technology-export dummy tends to reduce lower categories and increase higher categories, suggesting that firms with greater exposure to intangible assets, contracts, and certification requirements may be more sensitive to tariff shocks. Again, TFP does not yield a strong, consistent pattern, with the structure of North American exposure remaining the key explanatory factor for impact intensity.

(Table 5. Impact intensity and firm attributes (ordered logit))

3.2. Whether Firms Respond and How Far Adjustments Progress

Table 6 reports average marginal effects from logit models in which the dependent variable indicates whether the firm has taken any action (equal to 1 for any category other than no action taken and no plan). Regarding North American exposure, the export dummy shows a large and statistically significant positive marginal effect. The same ranking—related-party exports > arms-length exports—also appears: the probability increases by about 30 percentage points for firms engaged in related-party (intrafirm) exports ([2]) and 20 percentage points for arms-length exporters ([3]). Related-party exports to China are also associated with a positive effect, albeit smaller than that for North America. Using regional export shares instead of dummies yields the same qualitative conclusion: the North American export share is positive and statistically significant overall, and, when decomposed into related-party and arms-length export shares, both components remain positive and statistically significant. In terms of organizational capability, the MNE dummy is consistently positive and significant, indicating that firms with international networks and internal capabilities tend to initiate adjustments earlier.

Similar to the results for impact likelihood, firm size—measured by (log) sales—is stably positive and significant: larger firms are more likely to have initiated some type of adjustment. TFP is not statistically significant on its own. However, its interaction with sales suggests that more productive large firms are more likely to respond. Figure 3 visualizes the interaction between productivity and firm size using a logit model, with “adjustment = 1” (i.e., any category other than no action taken and no plan) as the dependent variable. We standardize TFP and log sales within each industry and define the 25th percentile as low productivity and small size, and the 75th percentile as high productivity and large size. We then plot the predicted probabilities (with confidence intervals) at four combinations: small × low TFP, small × high TFP, large × low TFP, and large × high TFP.

(Figure 3. Size–productivity interaction in firms’ adjustment probability)

As Figure 3 shows, the predicted probability of responding is generally higher for larger firms, and the upward shift associated with higher productivity is more evident among large firms. Put differently, the gap between low- and high-TFP firms is relatively modest among small firms. In contrast, among large firms, high TFP is associated with a noticeably higher likelihood of responding to tariffs. This pattern is consistent with the interpretation that tariff adjustments entail nontrivial fixed costs—such as information acquisition, redesign of buyer–supplier relationships and supply chains, practical compliance with regulations and procedures, and in some cases investments—and that adjustments are more easily initiated and implemented by firms that combine sufficient size (resources and organizational capacity) with high productivity (execution capability).

In contrast, when “impact = 1” is used as the dependent variable, the size × productivity interaction is not statistically significant. Reported impacts are instead driven mainly by exposure structure—especially whether the firm exports to North America and whether those exports are to related parties (intrafirm). Together, these results suggest an asymmetry: although impacts are widespread and largely independent of size or productivity, adjustments are more selective and more closely associated with firm capacity.

Regarding other attributes, upstreamness does not exhibit a statistically clear marginal effect on whether firms respond to tariffs. We tested interactions between upstreamness and North American exposure (either the North American export dummy or export share) to allow the upstreamness effect to vary with exposure; however, the results are not statistically significant. Thus, while upstreamness may complement that explanation of impact likelihood (as noted in Section 3.1), it appears relatively weak in determining whether firms initiate adjustments. Instead, implementation capacity—proxied by size and multinational status—and direct exposure to North America (especially related-party exports) have greater influence. Even when upstream firms report sizable impacts, the ability to respond may depend less on supply-chain position and more on available capacity in terms of finance, personnel, and overseas operations.

(Table 6. Firm attributes and the likelihood of adjustment)

Table 7 presents the average marginal effects from ordered logit models for adjustment progress (four categories). Here, firm size (log sales) is identified as a key correlate: it reduces the probability of firms remaining in the no action taken category and increases the probability of being in higher categories. In cumulative terms, the estimates imply increases of approximately 4.46 percentage points for (Pr(adjustment=2)), 1.5 percentage points for (Pr(adjustment=3)), and 0.3 percentage points for (Pr(adjustment=4)). Hence, size strongly predicts whether firms can get started, in the short run, mainly facilitating the transition from taking no action to minimal action and partial adjustment.

Export exposure also matters for progress in adjustment. Both related-party and arms-length exports to North America are associated with a lower probability that firms take no action and higher probabilities of more extensive adjustments, with category-specific marginal effects that generally diminish as one moves up the response scale (from category [2] to [3] to [4]). For example, related-party exports to North America decrease the likelihood of firms taking no action ([1]) by approximately 26 percentage points, with most of the probability shifting toward minimal action ([2], +16 percentage points) and implementing partial adjustments ([3], +8.5 percentage points). The probability of being in the mostly responded category ([4]) also increases by 1.5

percentage points and is statistically significant, although the magnitude is smaller because the baseline share in the top category is limited. In cumulative terms, both (Pr(adjustment=2)) and (Pr(adjustment=3)) increase substantially, confirming that export exposure—especially intrafirm exposure—strongly encourages firms to initiate adjustment and pushes progress upward incrementally. The MNE dummy similarly reduces no action taken while increasing higher categories, indicating that the foundations of international operations support progress. Export dummies for China and other regions generally point in the same direction, although their statistical significance is weaker than that of the North American dummy. Control variables such as firm age do not show statistically significant effects.

(Table 7. Adjustment progress and firm attributes (ordered logit))

3.3. Response Choices and Firm Attributes

To analyze the responses, we recode multiple responses into five mutually exclusive types and estimate a multinomial logit model. The base category is [1] no action taken. The remaining categories are [2] other/lobbying/switching to service exports, [3] price/cost adjustments, [4] shifting exports to third-country markets, and [5] U.S.-oriented investment (local production expansion and/or M&A). Because the survey allows multiple answers, we assign each firm to a single category using a hierarchical rule (U.S. investment > third-country shift > price/cost adjustments > other). Table 8 presents the average marginal effects (AMEs), which measure the absolute change in the probability of choosing each adjustment type. By construction, the AMEs across the five categories sum to approximately zero.

First, productivity is positively associated with choosing [5] U.S. investment, increasing its predicted probability by approximately 2.1 percentage points, whereas it shows no statistically significant association with other adjustment types. This pattern suggests that more extensive adjustments, which entail higher fixed costs, are more likely among more productive firms. Firm size exhibits a similar pattern: although the effect is smaller than that of productivity, larger firms are also more likely to choose U.S. investment (by about 1 percentage point).

Second, the form of exposure substantially differentiates the adjustment menu. Firms engaged in related-party exports to North America significantly reduce the probability of taking [1] no action by 17.8 percentage points and increase the probability of [5] U.S. investment by 10.2 percentage points. Firms that are closely connected to the U.S. through intrafirm trade, therefore, tend to respond through localization rather than price-based adjustments. One explanation is that intrafirm transactions involve substantial relationship-specific investments and practical and institutional constraints—such as transfer-pricing compliance and other internal governance requirements—which make rapid price/cost adjustments difficult. In this context, localization, although also fixed-cost intensive, may offer a more direct way to eliminate tariff exposure at its source. In contrast, firms with arms-length exports to North America also reduce taking [1] no action by 15.8 percentage points and shift toward making [3] price/cost adjustments and [5] U.S. investment. However, these effects are only significant at the 10% level and, thus, should be interpreted with caution.

Third, exporters to China—regardless of whether exports are related-party or arms-length—are significantly more likely to choose [4] third-country shifts (by 12.5 and 9.4 percentage points, respectively). Firms tied to the China market or China-centered value chains prefer redirecting exports toward third-country destinations rather than investing in the U.S. Exporters to other Asian destinations demonstrate a similar pattern: [4] third-country shifts increase by 6.7 percentage points, while [5] U.S. investment declines by 2.4 percentage points. These suggest that, for China/Asia exporters, third-country reorientation reflects efforts to develop new markets outside the U.S. and a tendency to deepen within-region reallocation that builds on existing relationship-specific investments (sunk costs) in distribution channels, supply networks, and regulatory compliance.

With respect to organization and governance, multinational firms are less likely to take [1] no action, by 10.2 percentage points, whereas they are more likely to choose [3] price/cost adjustments by 5.5 percentage points). For technology-exporting firms, the probability of choosing [4] third-country shifts is significantly lower (−4.5 percentage points). One explanation is that technology-related cross-border activities—such as licensing and joint development—involve substantial relationship-specific investments, intellectual property protection constraints, and high costs of reacquiring standards and certifications, which limit scope for rapid geographic reallocation in the short run. Firms engaged in offshore contract manufacturing also have less preference for making extensive adjustments: the probability of [4] third-country shifts falls by 6.5 percentage points. That of [5] U.S. investment decreases by 4.0 percentage points. This pattern likely reflects lock-in stemming from long-term contracts, process compatibility, and quality certification with contractors, as well as the large fixed costs involved in switching from a contract manufacturing model to localized production. In this specification, other firm attributes, including age, leverage, and the share of international division employees, do not have clear effects.

(Table 8. Adjustment choices and firm attributes (multinomial logit))

4. Conclusions

This study combines an original firm survey conducted in the context of Trump tariffs 2.0 with administrative firm data to document how tariff impacts and adjustments vary across firms with heterogeneous characteristics. Three patterns stand out. First, expected impacts largely reflect direct exposure: they are common among North American exporters and especially strong for firms involved in related-party (intrafirm) exports, consistent with the fixed nature of internal transactions and practical constraints related to rules of origin, pricing, and regulatory compliance. Moreover, interaction results suggest that upstreamness may strengthen impacts among firms with less direct export exposure to North America, pointing to supply-chain spillovers not captured by direct export measures alone. Second, adjustment strategies are more selective than impacts and are strongly influenced by firm size, while productivity does not exhibit a uniform effect; instead, adjustment appears more advanced among large, highly productive firms, consistent with complementarities between scale-based implementation capacity and execution ability. Third, adjustment choices vary by exposure type: intrafirm exporters to North America are more likely to favor localization through U.S.-oriented investment, arms-length exporters tend to rely more on price/cost adjustments and destination reoptimization, and firms exporting to China and Asia are more likely to rebalance their portfolios through third-country shifts (including deeper reorientation within the region).

These findings suggest that policy support should be targeted and build capacity: assistance for heavily exposed firm groups—especially those that depend on exports to U.S. affiliates—may focus on practical compliance and adjustment tasks. At the same time, efforts to enhance adaptive capacity should focus on lowering fixed costs and easing organizational constraints, particularly for smaller firms. A key limitation of our study is that it is descriptive and relies on self-reported outcomes. Future research using more detailed measures of import exposure and transaction networks could help clarify underlying mechanisms and causal pathways.

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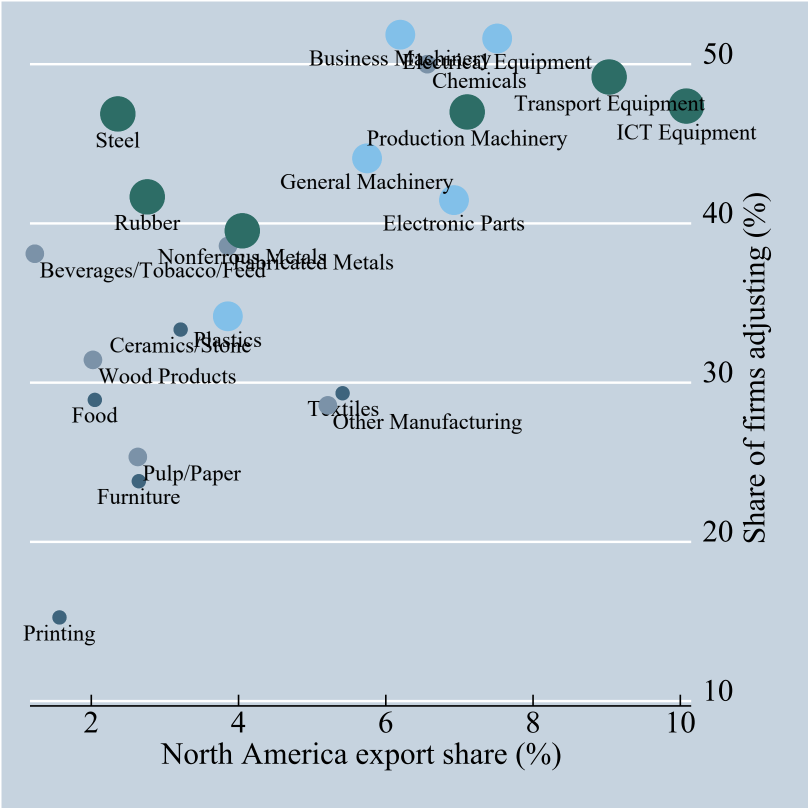

Figure 1. North America Export Share and Firms' Tariff Adjustments

Note: The vertical axis shows, for each industry, the share of firms reporting any adjustment (including actions under consideration). The horizontal axis shows the industry-average North America export share, defined as exports to North America divided by total exports (%).

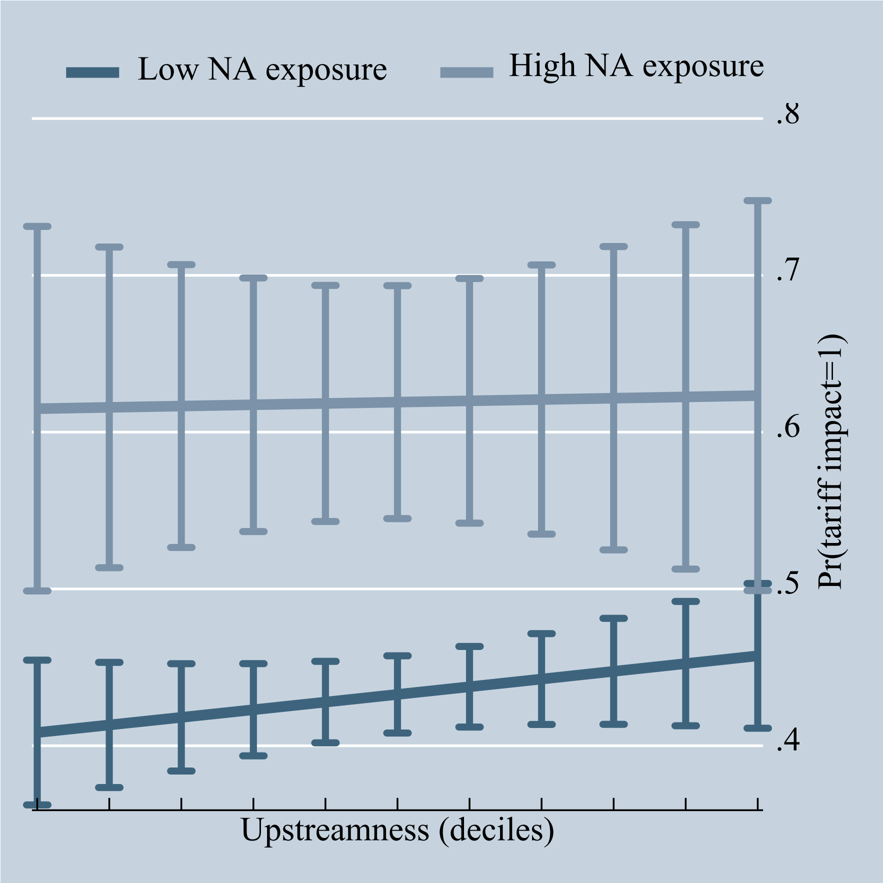

Figure 2. Predicted probability of reporting an impact by upstreamness and North America export exposure

Note: The figure plots predicted probabilities of reporting Tariff impact = 1 (defined as answering “moderate impact” or “significant impact”) from the baseline logit model. The horizontal axis shows firm-level upstreamness evaluated over the 0^{th}–100^{th} percentiles in deciles (10-percentile increments). “Low NA exposure” and “High NA exposure” fix the North America export share at its 25^{th} and 75^{th} percentiles, respectively. Vertical bars denote 95% confidence intervals.

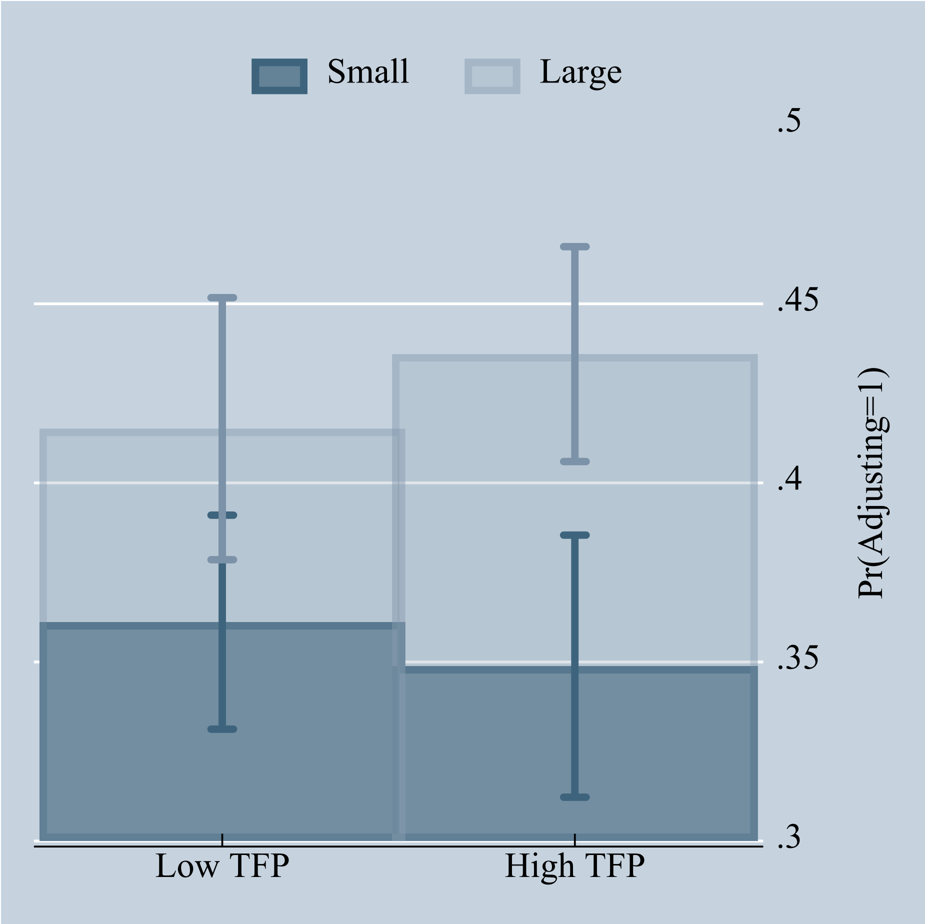

Figure 3. Size–productivity interaction in firms' adjustment probability

Note: The figure plots predicted probabilities of Adjusting = 1 (including actions under consideration) from the logit model. "Small" and "Large" fix firm size (log sales) at the 25th and 75th percentiles, respectively, while "Low TFP" and "High TFP" fix TFP at the 25th and 75th percentiles, respectively. Vertical bars denote 95% confidence intervals.

Table 1. Distribution of Anticipated Impacts of Trump Tariffs 2.0

	Total	No impact at all	Minor impact	Neutral	Moderate impact	Significant impact
Number of responses	1836	141	310	615	550	220
Share of responses (%)	100.0	7.7	16.9	33.5	30.0	12.0
Total sales (¥100 mil.)	273000	5800	26200	35400	109000	96800
Share of sales (%)	100.0%	2.1%	9.6%	13.0%	39.9%	35.5%
Number of employees	465873	16374	53255	96782	180267	119195
Share of employees (%)	100.0%	3.5%	11.4%	20.8%	38.7%	25.6%

Table 2. Distribution of Firms' Adjustment Status to Trump Tariffs 2.0

Total	No action taken	Minimal action (primarily under consideration)	Some measures implemented	Mostly implemented	Fully implemented
1824	1106	587	114	17	0
100%	60.60%	32.20%	6.30%	0.90%	0%
Average sales per employee (thousand yen)	36849	39810	62133	50570	-

Table 3. Distribution of Reported Adjustment Measures to Trump Tariffs 2.0

Total	Price reductions / cost-cutting for U.S.-bound products	Establish/expand production in the U.S. (localization)	Partnership with / acquisition of U.S. firms	Expand exports to third-country markets (non-U.S.)	Lobby the U.S. government to mitigate impacts (incl. via industry associations)	Shift from goods exports to services exports	Other
541	237	46	17	130	36	11	172
-	43.8%	8.5%	3.1%	24.0%	6.7%	2.0%	31.8%
Average sales per employee (thousand yen)	42186	103618	163146	59340	46294	38072	38544

Table 4. Impacts (binary) and firm attributes

	[1]	[2]	[3]	[4]	[5]	[6]
TFP	-0.0289	-0.0257	-0.0158	-0.0258	-0.0256	-0.0124
	[0.0226]	[0.0225]	[0.0236]	[0.0227]	[0.0227]	[0.0237]
Log sales	0.0492***	0.0423***	0.0372***	0.0623***	0.0616***	0.0451***
	[0.0117]	[0.0120]	[0.0130]	[0.0111]	[0.0113]	[0.0128]
Exporter				-0.0251	-0.025	-0.0342
				[0.0526]	[0.0526]	[0.0538]
Exports to North America	0.195***					
	[0.0477]					
Exports to China	0.0739*					
	[0.0379]					
Intra-firm exports to North America		0.294***	0.286***			
		[0.0636]	[0.0658]			
Arm's-length exports to North America		0.133***	0.124**			
		[0.0487]	[0.0495]			
Intra-firm exports to China		0.106**	0.103*			
		[0.0492]	[0.0559]			
Arm's-length exports to China		0.0525	0.0404			
		[0.0430]	[0.0442]			
Exports to Asia	0.0429	0.0378	0.0293			
	[0.0395]	[0.0396]	[0.0410]			
Exports to Europe	-0.00101	0.0126	0.0205			
	[0.0501]	[0.0504]	[0.0519]			
Exports to Middle East	-0.0407	-0.0563	-0.0669			
	[0.0613]	[0.0613]	[0.0627]			
Exports to Other regions	-0.0292	-0.019	-0.0153			
	[0.0467]	[0.0468]	[0.0475]			
North America export share				0.00349***		
				[0.000706]		
China export share				0.000841*		
				[0.000463]		
Intra-firm export share (N. America)					0.00416***	0.00303**
					[0.00128]	[0.00128]
Arm's-length export share (N. America)					0.00317***	0.00283***
					[0.000849]	[0.000875]
Intra-firm export share (China)					0.000665	1.64E-04
					[0.000755]	[0.000800]
Arm's-length export share (China)					0.000937*	0.000635
					[0.000569]	[0.000587]
Upstreamness			0.069			0.064
			[0.0574]			[0.0574]
Intl. division employment share			-0.000474			0.000998
			[0.00433]			[0.00441]
Firm age			0.000146			0.000248
			[0.000650]			[0.000649]
Debt ratio			0.000207			0.000222
			[0.000387]			[0.000391]
MNE			0.00501			0.0629*
			[0.0376]			[0.0367]
Technology exporter			0.123			0.125
			[0.134]			[0.134]
Service exporter			0.0522			0.0940*
			[0.0508]			[0.0499]
Domestic outsourcing			0.0512*			0.0497*
			[0.0275]			[0.0277]
Offshore outsourcing			-0.113			-0.0643
			[0.143]			[0.157]
Domestic & offshore outsourcing			0.0237			0.0256
			[0.0514]			[0.0511]
Obs.	1,602	1,602	1,602	1,602	1,602	1,602

Note: Reported coefficients are average marginal effects from logit models. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5. Impact intensity and firm attributes (ordered logit)

	[1] No impact at all	[2] Little impact	[3] Neither / unsure	[4] Some impact	[5] Very large impact
TFP	0.00853	0.0134	0.00657	-0.0157	-0.0128
	[0.00615]	[0.00958]	[0.00475]	[0.0112]	[0.00919]
Log sales	-0.00820**	-0.0129**	-0.00632**	0.0151**	0.0123**
	[0.00338]	[0.00519]	[0.00263]	[0.00608]	[0.00499]
Intra-firm exports to North America	-0.0524***	-0.106***	-0.128***	0.103***	0.183***
	[0.00740]	[0.0159]	[0.0318]	[0.0101]	[0.0480]
Arm's-length exports to North Americ	-0.0290***	-0.0514***	-0.0381**	0.0596***	0.0588**
	[0.00913]	[0.0177]	[0.0178]	[0.0199]	[0.0244]
Intra-firm exports to China	-0.0127	-0.021	-0.0126	0.0246	0.0216
	[0.0116]	[0.0202]	[0.0144]	[0.0238]	[0.0224]
Arm's-length exports to China	-0.00919	-0.0149	-0.00833	0.0175	0.015
	[0.0103]	[0.0174]	[0.0109]	[0.0203]	[0.0183]
Exports to Asia	-0.00864	-0.014	-0.00777	0.0164	0.014
	[0.00990]	[0.0166]	[0.0103]	[0.0193]	[0.0174]
Exports to Europe	-0.00304	-0.00482	-0.00248	0.00566	0.00468
	[0.0128]	[0.0206]	[0.0111]	[0.0242]	[0.0203]
Exports to Middle East	0.0109	0.0163	0.00664	-0.0191	-0.0148
	[0.0188]	[0.0267]	[0.00871]	[0.0313]	[0.0229]
Exports to Other regions	0.00725	0.0117	0.00645	-0.0137	-0.0117
	[0.0109]	[0.0181]	[0.0111]	[0.0212]	[0.0189]
Upstreamness	-0.0193	-0.0302	-0.0148	0.0354	0.0289
	[0.0147]	[0.0230]	[0.0114]	[0.0269]	[0.0221]
Intl. division employment share	2.35E-04	0.000368	1.81E-04	-0.000432	-0.000353
	[0.00101]	[0.00158]	[0.000776]	[0.00185]	[0.00151]
Firm age	-6.94E-06	-0.0000109	-5.35E-06	0.0000127	0.0000104
	[0.000166]	[0.000261]	[0.000128]	[0.000305]	[0.000250]
Debt ratio	-7.89E-05	-0.000124	-6.08E-05	0.000145	0.000118
	[9.91e-05]	[0.000155]	[7.65e-05]	[0.000182]	[0.000149]
MNE	-0.009	-0.0146	-0.00805	0.0172	0.0144
	[0.00902]	[0.0151]	[0.00922]	[0.0179]	[0.0154]
Technology exporter	-0.0335**	-0.0616*	-0.0539	0.0681**	0.0808
	[0.0158]	[0.0335]	[0.0438]	[0.0323]	[0.0606]
Service exporter	-0.00707	-0.0114	-0.0063	0.0134	0.0114
	[0.0118]	[0.0197]	[0.0120]	[0.0231]	[0.0204]
Domestic outsourcing	-0.0121	-0.0187*	-0.00857*	0.0220*	0.0173*
	[0.00741]	[0.0113]	[0.00490]	[0.0133]	[0.0101]
Offshore outsourcing	-0.0167	-0.0265	-0.0133	0.0311	0.0254
	[0.0345]	[0.0587]	[0.0380]	[0.0682]	[0.0629]
Domestic & offshore outsourcing	-0.00641	-0.00969	-0.00396	0.0114	0.00863
	[0.0135]	[0.0208]	[0.00921]	[0.0245]	[0.0189]
Obs.	1,594	1,594	1,594	1,594	1,594

Note: Reported coefficients are average marginal effects from ordered logit models. Robust standard errors are in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Table 6. Firm attributes and the likelihood of adjustment

	[1]	[2]	[3]	[4]	[5]	[6]
TFP	0.00401	0.00563	0.00727	0.00853	0.00902	0.0141
	[0.0223]	[0.0223]	[0.0235]	[0.0227]	[0.0227]	[0.0238]
Log sales	0.0741***	0.0703***	0.0591***	0.0905***	0.0887***	0.0648***
	[0.0115]	[0.0117]	[0.0126]	[0.0110]	[0.0111]	[0.0126]
Exporter				0.0425	0.0428	0.0562
				[0.0516]	[0.0515]	[0.0528]
Exports to North America	0.254***					
	[0.0483]					
Exports to China	0.122***					
	[0.0380]					
Intra-firm exports to North America		0.294***	0.299***			
		[0.0658]	[0.0682]			
Arm's-length exports to North America		0.197***	0.195***			
		[0.0490]	[0.0500]			
Intra-firm exports to China		0.119**	0.0971*			
		[0.0489]	[0.0551]			
Arm's-length exports to China		0.0689	0.0641			
		[0.0424]	[0.0437]			
Exports to Asia	0.0831**	0.0731*	0.0582			
	[0.0388]	[0.0390]	[0.0404]			
Exports to Europe	0.0024	0.0114	0.0087			
	[0.0486]	[0.0488]	[0.0498]			
Exports to Middle East	-0.0207	-0.0345	-0.0666			
	[0.0624]	[0.0620]	[0.0606]			
Exports to Other regions	-0.00882	0.00348	0.00772			
	[0.0454]	[0.0454]	[0.0461]			
North America export share				0.00358***		
				[0.000683]		
China export share				0.000917**		
				[0.000447]		
Intra-firm export share (N. America)					0.00450***	0.00316**
					[0.00127]	[0.00127]
Arm's-length export share (N. America)					0.00317***	0.00286***
					[0.000818]	[0.000837]
Intra-firm export share (China)					0.00139*	0.000637
					[0.000735]	[0.000768]
Arm's-length export share (China)					0.000654	0.00051
					[0.000550]	[0.000567]
Upstreamness			0.0428			0.0377
			[0.0559]			[0.0563]
Intl. division employment share			0.0101**			0.0130**
			[0.00506]			[0.00511]
Firm age			-1.32E-04			0.0000217
			[0.000635]			[0.000638]
Debt ratio			-0.000296			-0.000225
			[0.000408]			[0.000407]
MNE			0.0385			0.0911**
			[0.0373]			[0.0367]
Technology exporter			0.0799			0.0964
			[0.137]			[0.138]
Service exporter			-0.00712			0.0338
			[0.0471]			[0.0477]
Domestic outsourcing			0.03			0.0301
			[0.0268]			[0.0271]
Offshore outsourcing			-0.0985			-0.0599
			[0.125]			[0.138]
Domestic & offshore outsourcing			0.077			0.0859
			[0.0526]			[0.0525]
Obs.	1,606	1,606	1,606	1,606	1,606	1,606

Note: Reported coefficients are average marginal effects from logit models. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. Adjustment progress and firm attributes (ordered logit)

	[1] No response (no plans)	[2] Under consideration	[3] Partially implemented	[4] Mostly implemented
TFP	-0.0132	0.00944	0.00318	0.000562
	[0.0226]	[0.0162]	[0.00546]	[0.000972]
Log sales	-0.0623***	0.0446***	0.0151***	0.00266***
	[0.0115]	[0.00837]	[0.00303]	[0.000837]
Intra-firm exports to North America	-0.260***	0.160***	0.0846***	0.0151**
	[0.0585]	[0.0287]	[0.0268]	[0.00623]
Arm's-length exports to North America	-0.179***	0.121***	0.0487***	0.00922**
	[0.0460]	[0.0289]	[0.0151]	[0.00373]
Intra-firm exports to China	-0.0667	0.0469	0.0169	0.00289
	[0.0503]	[0.0347]	[0.0135]	[0.00237]
Arm's-length exports to China	-0.0744*	0.0522*	0.0188*	0.00342
	[0.0416]	[0.0284]	[0.0113]	[0.00225]
Exports to Asia	-0.0362	0.0256	0.009	0.00162
	[0.0388]	[0.0270]	[0.00998]	[0.00188]
Exports to Europe	-0.00478	0.00342	0.00116	0.000204
	[0.0444]	[0.0317]	[0.0108]	[0.00189]
Exports to Middle East	0.0173	-0.0124	-0.00411	-0.000729
	[0.0548]	[0.0396]	[0.0129]	[0.00230]
Exports to Other regions	0.00689	-0.00492	-0.00167	-0.000296
	[0.0425]	[0.0302]	[0.0104]	[0.00184]
Upstreamness	-0.0557	0.0398	0.0134	0.00237
	[0.0528]	[0.0378]	[0.0128]	[0.00233]
Intl. division employment share	-0.00582	0.00417	0.00141	0.000248
	[0.00357]	[0.00256]	[0.000867]	[0.000167]
Firm age	2.49E-04	-1.78E-04	-6.01E-05	-1.06E-05
	[0.000608]	[0.000436]	[0.000147]	[2.61e-05]
Debt ratio	0.0000375	-0.0000268	-9.05E-06	-1.60E-06
	[0.000380]	[0.000272]	[9.18e-05]	[1.62e-05]
MNE	-0.0588	0.042	0.0144	0.00243
	[0.0362]	[0.0257]	[0.00913]	[0.00159]
Technology exporter	-0.0692	0.0477	0.0181	0.00327
	[0.0942]	[0.0626]	[0.0268]	[0.00500]
Service exporter	0.0242	-0.0175	-5.75E-03	-1.03E-03
	[0.0415]	[0.0301]	[0.00970]	[0.00177]
Domestic outsourcing	-0.0202	0.0146	0.0048	0.00083
	[0.0261]	[0.0189]	[0.00616]	[0.00108]
Offshore outsourcing	0.0769	-0.0579	-0.0164	-0.00268
	[0.129]	[0.0996]	[0.0253]	[0.00402]
Domestic & offshore outsourcing	-0.0436	0.031	0.0106	0.00187
	[0.0463]	[0.0327]	[0.0116]	[0.00209]
Obs.	1,585	1,585	1,585	1,585

Note: Reported coefficients are average marginal effects from ordered logit models. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8. Adjustment choices and firm attributes (multinomial logit)

	[1]	[2]	[3]	[4]	[5]
	No response	Other response	price/cost adjustments	Third-country shift	U.S. investment
TFP	-0.0109	0.0052	-0.016	0.00104	0.0207**
	[0.0216]	[0.0148]	[0.0155]	[0.0126]	[0.00967]
Log sales	-0.0425***	0.0183**	0.00513	0.0091	0.00990***
	[0.0113]	[0.00774]	[0.00771]	[0.00579]	[0.00351]
Intra-firm exports to North America	-0.178***	-0.00925	0.0652	0.0206	0.102**
	[0.0651]	[0.0374]	[0.0458]	[0.0304]	[0.0456]
Arm's-length exports to North America	-0.158***	0.0113	0.0555*	0.0376	0.0532*
	[0.0471]	[0.0322]	[0.0329]	[0.0240]	[0.0288]
Intra-firm exports to China	-0.115**	-0.0164	0.00794	0.125***	-0.0019
	[0.0519]	[0.0290]	[0.0319]	[0.0441]	[0.0147]
Arm's-length exports to China	-0.0874**	-0.0244	0.0307	0.0941***	-0.0131
	[0.0410]	[0.0233]	[0.0299]	[0.0333]	[0.0124]
Exports to Asia	-0.0643*	-0.00644	0.0278	0.0669**	-0.0240**
	[0.0375]	[0.0234]	[0.0280]	[0.0313]	[0.00942]
Exports to Europe	-0.00783	-0.00148	0.0148	0.00168	-0.00715
	[0.0428]	[0.0313]	[0.0279]	[0.0186]	[0.0121]
Exports to Middle East	-0.0252	0.00198	0.0436	-0.00924	-0.0112
	[0.0592]	[0.0423]	[0.0410]	[0.0199]	[0.0119]
Exports to Other regions	0.0415	-0.00107	-0.0458	0.00182	0.00358
	[0.0426]	[0.0294]	[0.0318]	[0.0195]	[0.0125]
Upstreamness	-0.00436	0.00812	0.000465	0.000312	-0.00454
	[0.0504]	[0.0357]	[0.0363]	[0.0258]	[0.0191]
Intl. division employment share	-0.0039	0.00146	0.000826	0.00147	0.000147
	[0.00361]	[0.00254]	[0.00206]	[0.00128]	[0.000800]
Firm age	0.000429	-2.09E-04	-0.000405	-4.21E-05	0.000227
	[0.000570]	[0.000396]	[0.000405]	[0.000310]	[0.000208]
Debt ratio	0.0000634	1.50E-04	-0.000262	0.000127	-7.78E-05
	[0.000365]	[0.000204]	[0.000310]	[0.000217]	[0.000212]
MNE	-0.102***	0.0236	0.0549**	0.00949	0.0144
	[0.0360]	[0.0255]	[0.0257]	[0.0171]	[0.0127]
Technology exporter	0.135**	-0.0661**	-0.0104	-0.0453***	-0.0131
	[0.0605]	[0.0291]	[0.0493]	[0.0148]	[0.0119]
Service exporter	0.0252	-0.00716	-0.0342	0.00933	0.00682
	[0.0379]	[0.0271]	[0.0213]	[0.0188]	[0.0127]
Domestic outsourcing	-0.0402*	0.0266	0.0265	-0.00564	-0.00717
	[0.0242]	[0.0166]	[0.0168]	[0.0143]	[0.0108]
Offshore outsourcing	0.0277	0.0859	-0.00859	-0.0645***	-0.0404***
	[0.124]	[0.110]	[0.0699]	[0.0121]	[0.00910]
Domestic & offshore outsourcing	0.0303	-0.0292	0.0192	-0.00129	-0.0191
	[0.0386]	[0.0230]	[0.0270]	[0.0214]	[0.0121]
Obs.	1,606	1,606	1,606	1,606	1,606

Note: Reported coefficients are average marginal effects from multinomial logit models. Robust standard errors are in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Appendix Table A1. Descriptive statistics

	Mean	Std. dev.	Min	Max
Impact = 1 (moderate/very high)	0.427	0.495	0	1
Impact (5-point scale)	3.244	1.093	1	5
Response = 1 (any action)	0.404	0.491	0	1
Response progress (scale)	1.476	0.656	1	4
Response type	1.603	1.092	1	5
Total factor productivity (TFP)	1.402	0.571	-3.4	4.0
Log sales	8.243	1.214	4.6	14.9
Exporter	0.948	0.223	0	1
Exports to North America	0.166	0.373	0	1
Intra-firm exports to North America	0.063	0.243	0	1
Arm's-length exports to North America	0.112	0.316	0	1
Exports to China	0.238	0.426	0	1
Intra-firm exports to China	0.115	0.320	0	1
Arm's-length exports to China	0.123	0.328	0	1
Exports to Asia	0.111	0.314	0	1
Exports to Europe	0.142	0.349	0	1
Exports to Middle East	0.061	0.239	0	1
Exports to Other regions	0.920	0.271	0	1
North America export share	5.611	17.821	0	100
China export share	10.240	25.151	0	100
Intra-firm export share (N. America)	2.203	11.397	0	100
Arm's-length export share (N. America)	3.409	14.065	0	100
Intra-firm export share (China)	3.795	15.485	0	100
Arm's-length export share (China)	6.445	20.126	0	100
Upstreamness	1.897	0.555	1	3.6
Intl. division employment share	0.661	3.081	0	63.6
Firm age	57.559	19.446	2	178
Debt ratio	30.319	31.826	0	665.9
MNE	0.230	0.421	0	1
Technology exporter	0.015	0.121	0	1
Service exporter	0.104	0.305	0	1
No outsourcing	0.292	0.455	0	1
Domestic outsourcing	0.623	0.485	0	1
Offshore outsourcing	0.006	0.076	0	1
Domestic & offshore outsourcing	0.079	0.270	0	1