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Import Competition and Restructuring Strategies: Evidence from Japanese firm-level data◆

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Abstract

Using firm-level data from Japan, this study examines how firms restructure in response to import competition from China, with a focus on employment adjustments and industry switching. The results indicate that many firms reduced their workforce in response to rising imports, with production workers experiencing the most substantial job losses. An analysis of the time lag in the effects of import shocks suggests that while the number of production workers declines immediately following an increase in imports, broader employment adjustments and industry switching typically occur after a delay of two or more years. Moreover, a comparison between firms that switched industries and those that did not shows that non-switching firms faced more severe negative impacts from import competition. Offshoring plays a critical role in mitigating these adverse effects.

Keywords: Import Competition, Employment Adjustment, Product switching
JEL classification: D21, F15, F53

◆This study is conducted as a part of the project "Structural Changes in the World Economy and Responses from Japanese Firms and the Government" undertaken at the Research Institute of Economy, Trade and Industry (RIETI). This study uses data from the questionnaire information based on the "Basic Survey of Japanese Business Structures and Activities" (Ministry of Economy, Trade and Industry), "Census of Manufacture" (Ministry of Economy, Trade and Industry), and "Economic Census for Business Activity" (Ministry of Internal Affairs and Communications and Ministry of Economy, Trade and Industry). We also utilize the Census of Manufacture's plant-id converter, which is provided by RIETI. The author is grateful for the helpful comments and suggestions by Shujiro Urata (Waseda Univ.), Fukunari Kimura (Keio Univ.), Kazunobu Hayakawa (Institute for Developing Economies), Keiko Ito (Chiba University), and Discussion Paper seminar participants at RIETI. This project is financially supported by the Japan Society for Promotion of Science KAKENHI grant number 22H00063.

1. INTRODUCTION

In recent years, the anti-globalization movement has gained momentum, accompanied by increasing criticism of trade liberalization. Much of this criticism stems from the perception that imports from emerging economies, such as China, are displacing jobs in high-income countries. In response, some countries have begun implementing protectionist policies, including raising tariffs and safeguarding domestic industries. This trend has led to a substantial body of research examining the causal link between import competition and employment, using data at the regional, industrial, and firm levels. However, relatively little is known about the strategies firms use to cope with competitive import pressures. While heightened import competition often forces firms to reduce employment, some adopt innovation strategies—such as switching industries—to relieve this pressure, while others increase offshore intermediate input imports.

This study uses Japanese firm-level data from 1997 to 2014 to explore how firms reorganize their corporate structures in response to import competition. The dataset enables us to capture employment structures, intermediate input imports, and firm-product sales at the six-digit level. Using this data, we examine which firms adjust employment, which switch industries, and whether combining these strategies helps mitigate competitive pressures. We also investigate how, and to what extent, offshoring mitigates the negative effects of import competition. We focus on industry switching, employment adjustment, and offshoring, as industry switching is a key driver of structural transformation in the economy, alongside firm entry and exit. Another important feature of this study is the analysis of the time lag associated with corporate restructuring in response to import competition and offshoring. By leveraging 17 years of panel data, we assess whether different lag periods yield different results. Understanding these time lags is essential for determining the appropriate timeframe to evaluate the effects of import competition.

The key findings of this study are summarized as follows. First, many firms have reduced their workforce due to rising imports, with production workers experiencing the most significant job losses. An analysis of the time lag in the impact of import shocks reveals that while the number of production workers declines immediately in response to increased imports, it takes approximately two years or more for firms to adjust total employment and switch industries. Second, a comparison of job losses between firms that switched industries and those that did not shows that firms that did not switch industries faced more severe adverse effects from import competition. Third, offshoring plays a crucial role in mitigating the negative impacts of import competition.

This study builds on three strands of the literature. The first examines the impact of the competitive pressure from imports on employment, particularly in emerging markets such as China. For instance, Autor et al. (2013) and Acemoglu et al. (2016) show that an increase in Chinese imports to the U.S. has a significant negative impact on local labor markets.[1] By contrast, the empirical findings for Germany and Japan differ from those observed in the U.S. and other European countries. For example, Dauth et al. (2014) compare the impact of imports from Eastern Europe and China on Germany's regional labor markets. They found that the adverse effects of imports from Eastern Europe were more pronounced than those from China and that increased exports offset the negative impact of import exposure. Similarly, Taniguchi (2018) examines the impact of rising Chinese imports on Japan's labor market and finds that the effect is positive rather than negative, particularly in the case of intermediate goods imports.

The second strand of literature examines the effects of offshoring. The positive impact of intermediate goods imports mentioned earlier may be attributed to cost reductions achieved through offshoring. Using Japanese plant-level data, Hayakawa et al. (2021) found that while Chinese import competition negatively affects employment in directly competing industries, increased imports in upstream industries have a positive effect on employment in downstream sectors. Mion and Zhu (2013), using Belgian firm-level data, analyzed the impact of import competition and offshoring—defined as firm-level imports of intermediate goods—on employment. They reported positive coefficients for offshoring, though the magnitudes were small, suggesting a limited impact on overall employment.

The third strand explores how import competition influences firms' product restructuring or industry switching. Using U.S. census data at five-year intervals, Bernard et al. (2006) found that manufacturing plants exposed to greater competition from low-wage countries were more likely to switch industries. Iacovone et al. (2013), analyzing Mexican plant-product-level data from 1994 to 2004, showed that import competition from China prompted product restructuring and acted as a driver of creative destruction. Similarly, Miranda et al. (2011), using Estonian firm-level data from 1997 to 2005, examined the effects of international competition on firm dynamics, considering both firm closures and product switching. Their findings suggest that Estonian firms were more likely to switch industries in response to export opportunities rather

[1] Following these seminal studies, research on other advanced economies has emerged, including studies on France (Malgouyres, 2017), Norway (Balsvik et al., 2015), Spain (Donoso et al., 2015), and Portugal (Branstetter et al. 2019).

than import exposure. Unlike the U.S. and Mexico, neither import nor export competition significantly influenced firm exits in Estonia.[2]

These studies have employed a range of outcome variables and yielded valuable insights. However, they do not explore the time lag between firms' responses to shocks, partly because they use data at five-year intervals or over relatively short periods. Moreover, previous studies have not examined which types of firms adopt specific strategies to maintain employment. To address these gaps, this study employs a multinomial logit model and a switching regression model to analyze how firms respond to competitive pressure, identifying which firms adapt successfully and which succumb to pressure.

The remainder of this paper is organized as follows. Section 2 outlines the empirical framework and Section 3 describes the data. Section 4 presents the estimation results, and Section 5 concludes the paper.

2. EMPIRICAL FRAMEWORK

To examine China's import competition's impact on corporate restructuring, we estimate the following equation:

$$y_{ijt} = \beta_0 + \beta_1 Z_{it-s} + \beta_2 \Delta IMP_{it} + \beta_3 \Delta Offshore_{it} + \lambda_j + \mu_t + \varepsilon_{it}. \qquad (1)$$

The dependent variable y_{ijt} represents the growth rate in the number of workers for firm *i* in industry j in year *t*. In addition, we use a firm-level dummy variable to indicate whether the firm is engaged in industry switching. Z_i is a vector of firm characteristics in years *t-s*, comprising the logarithm of the number of employees (*Firm Size*), a dummy variable for multi-plant firms (*Multi-plant*), firm age (*Age*), the lagged capital-labor ratio (*K-L ratio*), the R&D to sales ratio (*R&D intensity*), and a dummy variable for multi-product firms (*Multi-product*). ΔIMP_{it} and $\Delta Offshore_{it}$ represent the import competition measure and offshore intensity,

[2] Several studies utilize other outcome variables or explore the heterogeneity in the impact of import competition. Mion and Zhu (2013) examine the impact on the skilled worker share as well as the employment growth ratio and explore the heterogeneity in terms of non-production worker ratio. Bloom et al. (2016), Yamashita and Yamauchi (2019), and Autor et al. (2020) examine the impact on firm-level patent application. Hombert and Matlay (2018) examine the role of R&D stock and report that R&D stock mitigates the negative impact of imports on sales and profit margins.

respectively. λ_j and μ_t are the industry and year fixed effects, respectively. ε_{ijt} is the error term.

ΔIMP_{it} is the import competition measure, calculated as the changes in the Chinese import ratio weighted by firm-product level shipment values:

$$\Delta IMP_{it} = \sum_p w_{ipt-s} \frac{\Delta M_{pt}^{CH}}{Q_{pt-s} + M_{pt-s}}$$

where w_{ipt-s} is the share of the shipment value for firm i and product p in year t-s; M_{pt}^{CH} is the value of imports from China for product p in year t and Q_{pt-s} and M_{pt-s} denote denote domestic production and total imports for product p in year t, respectively. Because ΔIMP may be affected by a potential demand shock in Japan, we use the identification strategy proposed by Autor et al. (2013). Specifically, we use as an instrumental variable the changes in the import ratio from China to seven high-income trading partners in China, except for Japan. The set of countries follows Autor et al. (2013) and includes Australia, Denmark, Finland, Germany, New Zealand, Spain and Switzerland.

$$\Delta IMP_{it}^{OTH} = \sum_p w_{ipt-s} \frac{\Delta M_{pt}^{OTH}}{Q_{pt-s} + M_{pt-s}}$$

Because the product-level import ratio from China to other high-income countries is aggregated with the firm-level product sales share in t-s, this variable varies by firm and year. The identification strategy behind this specification is that import demand in other high-income countries is correlated with Chinese supply shocks but import demand shocks are not correlated across high-income countries.

The offshore intensity, $\Delta Offshore_{it}$, is defined as the change in the ratio of firm-level imports from Asia to the total costs for firm i in year t.[3] As this variable may be endogenous, we employ two instrumental variables: (1) the average import ratio from Asian countries to other firms in the same industry and (2) the lagged value of offshoring intensity, $Offshore_{it-s}$. The identification strategy assumes that the firms within an industry share similar technological structures. Therefore, the peer firms' import behaviour is likely to correlate with that of the focal firm, satisfying the relevance condition. Simultaneously, peer firms' offshoring decisions are not expected to directly affect the focal firm's employment outcomes, thus satisfying the exclusion restriction. This approach follows the instrumental

[3] Ideally, we should use firm-level imports from China. Unfortunately, in our data, only the value of firms' imports by region is available; it is not possible to identify the country of origin of the imports. Imports from Asia include imports from China, and it is used as an indicator of offshoring in previous studies, such as Endoh (2021).

variable strategies used in previous studies, including Endoh (2021) and Fritsch and Görg (2015).

To examine firms' reaction patterns to import competition, we employ the multinomial logit model specified in the following equation:

$$\Pr(Y_i = k) = \exp(\beta_j X_i) / \left(1 + \sum_{l=1}^{m} \exp(\beta_l X_i)\right) \tag{2}$$

where firm i chooses the response category k based on covariate X_i. For firms' reaction k, treating "No adjustment" as base category, we define the following three firm response categories; 1) "Employment Adjustment only," 2) "Product switching only," and 3) "Both employment adjustment and product switching." Detailed definitions of these categories are provided in Section 3.2. The covariate vector X_i includes the change in import penetration, offshoring measures, and other firm characteristics.

While the multinomial logit model examines firms' choices of corporate restructuring strategies in response to import competition, it does not provide a quantitative assessment of outcomes, such as the extent to which employment reduction differs between firms that switch industries and those that do not. To address this issue, we employed a switching regression model. In the first stage, we estimated the probability of industry switching. In the second stage, we separately examine the extent to which import competition influences the rate of employment change for firms that switch industries and those that do not. The model is estimated using the maximum likelihood method based on the following specifications: We estimated a switching regression model in two stages. The first stage is the selection equation, estimating the probability of a firm switching its main product.

$$I_{it} = \phi(X_i + \eta_{it}), \tag{3}$$

where I_{it} is a binary indicator equal to 1 if firm *i* switches its main product between year *t-s* and year *t,* and 0 otherwise.

In the second stage, we estimate separate outcome equations for firms that do and do not switch between industries. For switchers ($I_{it} = 1$),

$$y_{it} = \beta_0^{I=1} + \beta^{I=1}{}_1 Z_{it-s} + \beta_2^{I=1} \Delta IMP_{it} + \beta_3^{I=1} \Delta Offshore_{it} + \varepsilon_{it}^{I=1}, \tag{4}$$

For non-switchers ($I_{it} = 0$):

$$y_{it} = \beta_0^{I=0} + \beta^{I=0}{}_1 Z_{it-s} + \beta_2^{I=0} \Delta IMP_{it} + \beta_3^{I=0} \Delta Offshore_{it} + \varepsilon_{it}^{I=0}. \tag{5}$$

When estimating equations (3), (4), and (5), to satisfy the exclusion restriction, at least one variable must be included that affects the selection decision in equation (3) but does not affect the outcome variable in equations (4) and (5). We introduced the Herfindahl index, which is the sum of the squares of firm-product-level sales shares. Controlling for firm size and multi-product firm status, this variable is expected to affect industry switching, but not the rate of employment change or other factors.

To address endogeneity in the multinomial logit estimation and switching regression, we employ the control function approach (Wooldridge, 2015), which is widely used to address endogeneity. The advantage of the control function approach is that it can be applied to nonlinear equations, which makes it suitable for our models. The specific procedure of the control function approach is to first estimate a regression equation with endogenous variables as dependent variables and independent variables as instrumental variables. The residuals of this regression equation are added as independent variables in a multinomial logit model and switching regression.

3. DATA AND DESCRIPTIVE ANALYSIS

3.1. *Data Source*

Our primary firm-level data set is the *Basic Survey of Japanese Business Structure and Activities (BSJBSA)* conducted by the Ministry of Economy, Trade and Industry (*METI*). This survey was administered to quantitatively assess the diversification and internationalization of Japanese enterprises. It covers firms with at least 50 employees and a paid-up capital or investment fund exceeding 30 million yen, operating in the mining, manufacturing, wholesale, retail trade, and selected service sectors. The dataset contains detailed information on key firm-level variables such as sales, costs, debt, assets, profits, employment, trade, and R&D activities. A notable limitation of this survey is the absence of information regarding the specific products exported or imported, as well as the destination and source countries of these trade flows.

The second dataset used in our study is the *Census of Manufacture (COM)*, which is also conducted by *METI*. This dataset provides plant-level information, including geographic location, workforce size, material input costs, and the shipment value of products classified at the six-digit industry classification level. For our analysis, we aggregate plant-product-level data from the *COM* to the firm level and subsequently merge it with the *BSJBSA* dataset. Because no official concordance exists between the *COM* and *BSJBSA*, we link the two datasets using firm identifiers such as company name, telephone number, postal code, and address. We define "industry switch" as a switch from one industry to another. The industry classification of firms is based on the product with the largest sales at the six-digit level.[4] Our study uses data from 1997 to 2014. While more recent data are available, we exclude post-2015 data because the list of headquarters' names and locations for multiplant firms in the *COM* became unavailable after 2015, thus precluding plant-level data aggregation at the firm level.

To compute the import penetration ratio, we use nine-digit *Harmonized System (HS)* import data sourced from Japan's trade statistics compiled by the Ministry of Finance. The *HS* nine-digit import data for 1997–2014 were harmonized using the concordance table developed by Ito and Aoyagi (2019). These harmonized import data were subsequently linked to a six-digit *COM* product classification using the concordance framework constructed by Baek et al. (2021). Additionally, data on product-level exports to other high-income countries are extracted from the *CEPII BACI* database. The summary statistics of the variables are presented in Appendix Table A1.

3.2. ***Descriptive analyses***

Figure 1 shows import penetration from China from 1995 to 2015.China's import share has been rising since the late 1990s and has continued to rise since then, despite a temporary drop during the Global Financial Crisis of 2008-2009. Parallel to rising import competition, Japan's manufacturing employment has experienced a substantial decline. Figure 2 shows the share of employment of manufacturing sector. It increased slightly around 2007, but has gradually declined, falling from 20.8% in 1995 to 15.3% in 2015.

== Figures 1 and 2 ==

Table 1 presents changes in Chinese import penetration by industry. There is large heterogeneity across industries. The top five industries in terms of changes in import penetration were information and communication electronics equipment, Textiles, Furniture and fixtures, leather tanning, and miscellaneous manufacturing. In contrast, the bottom five industries include printing, iron and steel, beverages and tobacco, transport equipment, and food manufacturing.

== Table 1 ==

Table 2 presents the number of employees per firm and the corresponding growth rates for our sample. Panel (a) reports the total number of employees, the number of production

[4] Although a 3-digit industry classification is available in BSJBSA, a more detailed classification is available in COM, so the COM industry classification was used in this study.

workers, and the percentage of production workers for the years 1997, 2006, and 2014. Since the dataset includes only firms with 50 or more employees, the mean and median total number of employees in 1997 were 480 and 157, respectively. Both the mean and median values for total employees and production workers declined between 1997 and 2006. From 2006 to 2014, these figures show only modest changes, with a slight rebound. The share of production workers remained relatively stable over the period, with little variation in either the mean or median.

Panel (b) shows the average employment growth rates over five years and the share of firms that changed industries. First, the employment growth rates for total and production employees are -0.4% and -0.7%, respectively, indicating a significant decline in production workers. Industry switching is defined by whether the industry of the firm, as defined by the sector classification of the products with largest sales, has changed. We look at the sector classifications of products at the 4-digit, 3-digit, and 2-digit levels; 6% of firms at the 4-digit level and 4% at the 2-digit level change industry classifications each year. The second and third rows compare employment growth rates and industry-switching rates for the Top five and Bottom five industries, respectively, in terms of changes in import penetration from China.[5] In both cases, employment reduction and industry switch rates appear to be larger in industries with significant changes in import penetration from China. By comparison, employment reduction and industry-switching rates are lower in the bottom five industries.

Panel (c) of Table 2 presents the proportion of firms engaging in offshoring and the average offshore ratio, both of which increased substantially from 1997 to 2014. Although the number of offshoring firms remains relatively limited, their share gradually increased from 16.6% in 1997 to 29.5% in 2014. The offshore ratio also increases. For the mean value, conditional on offshoring firms, it has increased from 6.3% to 10.1%.

== Table 2 ==

How do firms respond to intensifying import competition from China? Table 3 presents the distribution of firms according to their response patterns. Firms are categorized into four groups based on their reactions. The first group consists of firms that neither reduce employment nor switch industries, labeled "*NoAdjust*." The second group includes firms that adjust employment only (*EmplAdjustOnly*), while the third group comprises firms that switch industries only (*IndSwitchOnly*). The fourth group consists of firms that adopt both strategies—employment adjustment and industry switching—labeled "*BothEmplSwitch*." Employment

[5] Top five industries include Information and communication electronics equipment, Textiles, Furniture and fixtures, Leather tanning and Miscellaneous manufacturing industries. Bottom 5 industries are Printing, Iron and Steel, Beverages and Tabaco, Transport equipment and Food manufacturing.

adjustment is defined as a reduction of 10% or more in the number of production workers over the previous five years. Industry switching refers to a change in a firm's primary four-digit industry classification. To assess the impact of Chinese import competition, we compare firms operating in the top and bottom five industries based on the extent of change in Chinese import penetration.

Among all firms shown in column (1), 54% made no adjustments (*NoAdjust*), 30.5% implemented only employment reductions (*EmplAdjustOnly*), 9.2% switched industries without adjusting employment (*IndSwitchOnly*), and 6.3% pursued both strategies (*BothEmplSwitch*). Columns (2) and (3) present firms in the bottom five and top five industries, respectively, based on the degree of change in Chinese import penetration. In the bottom five industries, shown in column (2), 58% of firms did not undertake any adjustment (*NoAdjust*). While the shares of firms engaging in industry switching—either alone or in combination with employment reductions—were low, the proportion of firms implementing only employment adjustment was similar to that observed for all firms. By contrast, in the top five industries, presented in column (3), the share of firms that made no adjustments was lower at 48%. The proportion of firms that engaged in industry switching alone or in combination with employment reduction was notably higher at 11% and 9.7%, respectively. These patterns suggest that firms exposed to greater import competition from China are more likely to respond with a combination of employment adjustment and industry switching.[6]

== Table 3 ==

4. ESTIMATION RESULTS

Table 4 presents the estimation results for Equation (1). The dependent variable is the change in total employment with varying time lags. The Kleibergen-Paap Wald statistics for the first-stage weak instrument generally exceeded the threshold of 10, and the Hansen J-test failed to reject the null hypothesis in most specifications, indicating that the instruments were valid and not weak. In column (1), where the lag is one year, the sign of the coefficient of import penetration is negative but not significant. However, in columns (2)–(5), the import penetration rate becomes significant when the lag is two years or longer. Furthermore, the magnitude of the coefficient increases as the lag extends from two to five years. The coefficient of offshoring is

[6] In Panel (b) of Appendix A6, we use alternative definition of the employment adjustment; a decrease of 5% or more in the number of production workers. We confirm the pattern of corporate restructuring does not change much.

positive but statistically significant only when a five-year lag is used. This suggests that offshoring offsets the negative impact of import competition. Previous studies, such as Hijzen et al. (2010), show that offshoring increases firms' productivity. Our results may indicate that productivity enhancement through offshoring helps maintain employment.

We calculate the economic significance of the impacts of import competition and offshoring. According to Table 1, the change in import penetration from China between 1997 and 2014 for the top five industries with the largest increase was 15.7 percentage points. Since the five-year average change in import penetration is 4.6 (=15.7/17×5) percentage points with a coefficient of –0.106, an increase in imports reduces the growth rate of employment by 0.5 (=4.6×–0.106) percentage points. Given that the average change in employment over five years was –1.9 percentage points (Table A1), the change in import penetration explains about one-quarter of the decline in employment. On the other hand, the (unconditional) change in the offshoring indicator over the 1997–2014 period was 1.9%, as indicated in Panel (c) of Table 2, which translates to a five-year average of 0.57 (=1.9/17×5) percentage points. Given the offshoring coefficient of 0.728, the effect of offshoring is 0.41 (=0.57×0.728) percentage points, which offsets the impact of increased import penetration. These results highlight the significant heterogeneity in the impact of import competition and offshoring across sectors and firms. For industries competing with Chinese imports, firms that do not offshore are forced to reduce their employment, while firms in other industries or those actively engaging in offshoring are not.

== Table 4 ==

Panel (a) in Table 5 presents the estimation results for the rate of change in production workers, while panels (b) and (c) report the results for industry switching, captured by a binary variable equal to one if a firm changes its main product between period *t–s* and *t*. The effect of import competition on the change in production workers is statistically significant, with a negative coefficient in column (1), which uses a one-year lag. Unlike the results for changes in total firm employment shown in Table 4, this finding indicates that import competition has an immediate impact on production workers. As with Table 4, the coefficient increases as the lag lengthens, and the effect of offshoring becomes significant when the lag exceeds four years. When comparing the magnitudes of the coefficients to those in Table 4, the coefficient for the rate of change in production workers is larger for both import competition and offshoring.

Regarding industry switching, import competition is not statistically significant at the three-digit level in panel (b), but becomes significant at the four-digit level in panel (c) when the lag is four years or longer. This finding suggests that firms' responses involving industry switching occur more slowly and gradually than employment adjustments. Meanwhile, the coefficient for offshoring is statistically significant and negative only when the lag is four years or more, indicating that firms outsourcing intermediate goods offshore are more likely to continue producing their existing products. Appendix Table A4 presents results for industry switching at the two-digit level, which are nearly identical to those for the three-digit level reported in panel (b) of Table 5.

== Table 5 ==

Table 6 presents the results of the multinomial logit regression in equation (2). The results of the first-stage estimation of the control function approach are presented in Appendix Table A5, where the coefficients of the instrument variables exhibit statistically significant estimates. In the second stage, we control for the residuals obtained in the first stage of the estimation. We use "*NO adjustment*" as the reference category. For the remaining three categories, namely BothEmplSwitch, EmplAdjustOnly, and ProdSwitchOnly, China's import penetration has a positive coefficient and is statistically significant. Looking at the size of marginal effect, the one for "*EmplAdjustOnly*" is the highest, indicating that more firms respond to fierce import competition with "*EmplAdjustOnly*." The coefficients for offshoring are negative and significant for *BothEmplSwitch*, and *BothEmplSwitch*, and this result, as in Table 4, indicates that firms with more offshoring tend not to make employment adjustments. Turning to the other variables, the results indicate that *EmplAdjustOnly* and *BothEmplSwitch* are chosen by large firms with a high firm age, whereas firms that choose only product switching are younger and smaller.[7]

== Table 6 ==

Table 7 presents the estimation results of the switching regression model specified in Equations (3) to (5). As in Equation (2), endogeneity is addressed by controlling for the residuals obtained from the first-stage estimation. Columns (1)–(3) report the results as follows: column (1) represents the selection equation that determines whether a firm engages in industry switching, column (2) examines the determinants of employment growth for firms that do not switch industries, and column (3) focuses on firms that do. In the selection equation in column (1), the coefficient of import penetration is positive and statistically significant, indicating that heightened import competition increases the probability of industry switching. Consistent with the findings in Table 6, younger and smaller firms are more likely to switch industries.

[7] Appendix A6 presents the estimation results using an alternative definition of the employment adjustment: a decrease of 5% or more in the number of production workers. The coefficients of import competition for *EmplAdjustOnly* and *ProdSwitchOnly* are still positive but become insignificant.

Column (2), which analyzes firms that do not engage in industry switching, shows that an increase in import penetration leads to employment reductions. However, in column (3), which examines firms that switched products, the coefficient on import penetration is not statistically significant. As shown in Table 5, offshoring positively affects employment growth. Columns (4) to (6) use the growth rate of production workers as the dependent variable instead of total employment growth. Although the signs of the coefficients remain consistent, the absolute value of the import penetration coefficient for firms that do not switch industries (column (5)) is larger.

== Table 7 ==

In summary, firms that switch industries in response to intense import competition tend to experience smaller employment reductions. By contrast, firms that do not switch industries tend to significantly reduce employment. This effect is particularly pronounced when production workers' adjustments are examined. In addition, our results suggest that younger and smaller firms are more likely to switch industries, helping them escape import competition. Several studies report that the impact of import competition is less significant for relatively large firms with a higher share of non-production workers or larger R&D stocks (Mion and Zhu, 2013; Hombert and Matlay, 2018). Our results indicate that industry switching is an effective strategy for both smaller and younger firms.

5. CONCLUDING REMARKS

The growing influx of inexpensive products from low-wage countries has raised concerns about the competitiveness of domestic industries and the loss of jobs in high-income countries, fuelling anti-globalization sentiment and increasing criticism of trade liberalization. Using firm-level data from Japan, this study examines firms' restructuring in response to import competition from China, focusing on employment reduction and industry switching. We also compared these responses with the effects of offshoring.

Our findings reveal that rising imports have led many firms to reduce their workforce, with production workers experiencing significant losses. Time-lag analysis shows that import competition has an immediate effect on the employment of production workers, whereas overall firm-level employment adjustment and product switching tend to occur with a delay of two to three years. Importantly, firms that engaged in product switching experienced less severe employment losses than those that did not, suggesting that product switching could be an effective coping strategy. Offshoring also plays a crucial role in mitigating the adverse effects of import competition. These findings highlight the importance of offshoring in sustaining employment and suggest that globalization should not simply be regarded as a factor that reduces job opportunities.

Although this study presents interesting findings, it also offers various avenues for future research. First, we focus on employment adjustment and industry switching as forms of corporate restructuring strategy; however, in practice, some firms choose alternative options such as plant closures, mergers, or divestitures. To achieve a comprehensive understanding of restructuring behavior, it is essential to link data on mergers and acquisitions (M&A), firm closures, and related activities. This remains an important avenue for future research aimed at uncovering the complete picture of corporate restructuring strategies. Second, the relationship between restructuring and innovation strategies, such as R&D investment and patent applications, is crucial. While previous studies examined R&D and patents individually, a more comprehensive analysis that includes industry switching and explores the interconnections among these strategies is necessary.

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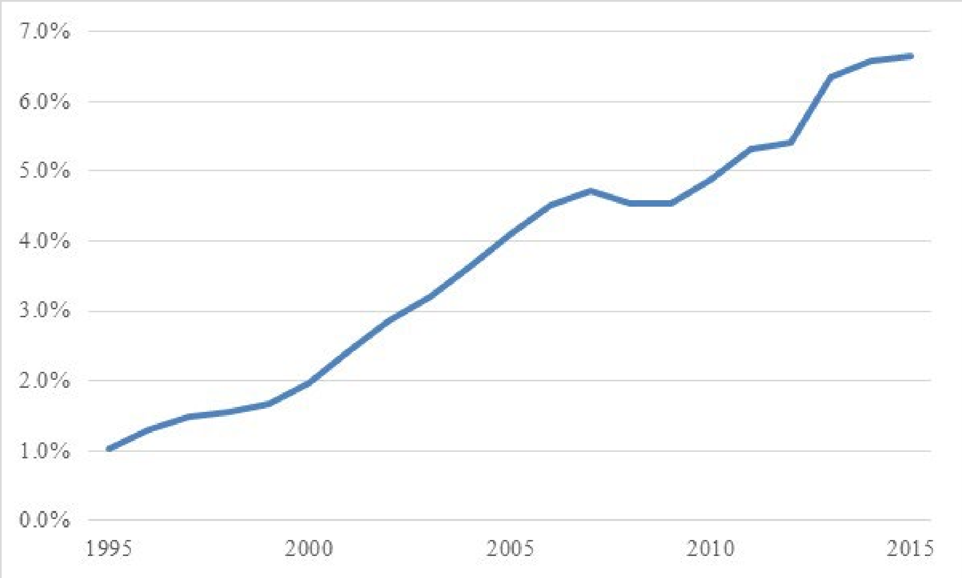
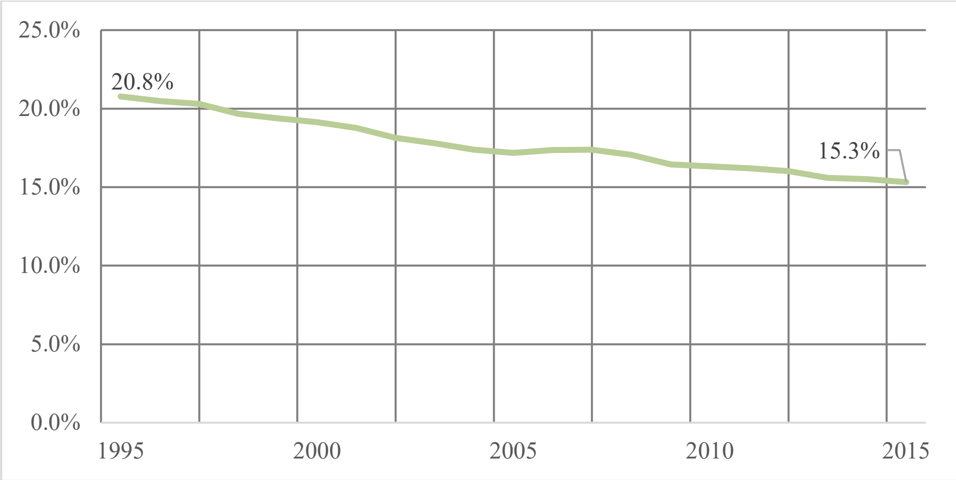
Figure 1: Import Penetration Ratio from China



Note: Chinese import penetration is computed as Import from China / Domestic demand, where Domestic demand = Domestic production + imports from the world–exports to the world

Source: Authors' calculation based on System of National Accounts (Cabinet Office) and JIP database (RIETI).

Figure 2: Share of manufacturing employment in Japan



Source: Authors’ computation from the System of National Accounts (Cabinet Office of Japan).

Table 1: Changes in Chinese import penetration

Industry code (2-digit)	Industry Description	Improt penetration from China 1997	2006	2014
9	Food	4.0%	6.2%	5.8%
10	Beverages, Tobacco and Feed	0.6%	1.2%	1.8%
11	Textile products	14.0%	27.1%	31.5%
12	Lumber and Wood products, except Furniture	2.3%	5.2%	5.9%
13	Furniture and Fixtures	2.2%	11.1%	20.3%
14	Pulp, Paper and Paper products	0.3%	1.1%	2.3%
15	Printing and allied industries	0.1%	0.2%	0.5%
16	Chemical and allied products	1.1%	3.8%	6.9%
17	Petroleum and Coal products	2.4%	4.4%	5.7%
18	Plastic products, except otherwise classified	0.6%	1.9%	3.4%
19	Rubber products	1.8%	4.6%	6.2%
20	Leather tanning, Leather products and Fur skins	7.0%	12.7%	21.4%
21	Ceramic, Stone and Clay products	0.7%	2.7%	4.2%
22	Iron and Steel	0.8%	1.4%	1.6%
23	Non-ferrous Metals and products	1.3%	4.8%	5.6%
24	Fabricated metal products	0.5%	2.9%	4.8%
25	General-purpose machinery	0.5%	3.0%	6.0%
26	Production machinery	0.4%	2.0%	4.3%
27	Business oriented machinery	1.3%	4.4%	7.1%
28	Electronic parts, devices and Electronic circuits	0.9%	4.0%	9.4%
29	Electrical machinery, equipment and supplies	1.7%	6.1%	9.1%
30	Information and Communication electronics equipment	2.3%	11.6%	22.2%
31	Transportation equipment	0.4%	1.1%	2.0%
32	Miscellaneous manufacturing industries	2.7%	8.2%	11.3%
Total		1.8%	4.5%	6.4%

Note: Indicators of Chinese import penetration is defined in equation (1)

Source: Authors' computation from BSJBSA and COM data. (METI)

Table 2: Number of employees and the ratio of industry switching firms

Panel (a) Number of worker and ratio of production worker

	Total employees		Production worker		Ratio of production worker	
	Mean	Median	Mean	Median	Mean	Median
1997	479.7	157	292.3	99	65.0%	70%
2006	431.8	149	248.5	93	64.6%	69%
2014	449.8	150	255.0	94	64.9%	70%

Panel (b) Growth rate of employment and share of firm that switch industries

	Groth rate of employment		Industry switching		
	Total	Production	4-digit	3-digit	2-digit
All firms	-0.4%	-0.7%	5.8%	5.1%	4.3%
Top 5	-0.5%	-1.3%	7.0%	6.2%	5.5%
Bottom 5	-0.3%	-0.4%	5.1%	4.1%	3.5%

Panel (c) Ratio of firms that engage in Offshoring and and average value of offshoring ratio

	Ratio of firms engaging in *Offshore*	*Offshore ratio*	
		Unconditional mean	Conditional mean
1997	16.6%	1.04%	6.3%
2006	25.6%	1.99%	7.8%
2014	29.5%	2.97%	10.1%

Note: Offshore ratio is defined as the share of import from Asia in total costs

Source: Authors' computation from BSJBSA and COM data. (METI)

Table 3: Firm's reaction patterns

	(1) All firms	(2) Bottom 5	(3) Top 5
NoAdjust	54.0	58.0	48.0
EmplAdjustOnly	30.5	31.5	31.3
IndSwitchOnly	9.2	6.5	11.0
BothEmplSwitch	6.3	4.0	9.7

Source: Authors' computation from BSJBSA and COM data.(METI)

Table 4: Impact of Import competition on changes in the number of employees (all workers)

	(1)	(2)	(3)	(4)	(5)
Length of time lag	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CHN}	-0.00378	-0.0503**	-0.0674**	-0.0724***	-0.106***
	(0.0199)	(0.0239)	(0.0269)	(0.0251)	(0.0341)
Δ Offshore	0.00882	0.0146	0.0170	0.472***	0.728***
	(0.00883)	(0.0148)	(0.0174)	(0.119)	(0.181)
Firm Size	-0.00575***	-0.0107***	-0.0152***	-0.0158***	-0.0232***
	(0.000380)	(0.000726)	(0.00108)	(0.00116)	(0.00185)
Multi-plant	0.00105	0.000616	6.55e-05	-0.000772	-0.00316
	(0.000646)	(0.00118)	(0.00173)	(0.00186)	(0.00284)
ln(Age)	-0.0102***	-0.0192***	-0.0286***	-0.0299***	-0.0480***
	(0.000743)	(0.00137)	(0.00205)	(0.00220)	(0.00353)
ln(K-L ratio)	0.00725***	0.0122***	0.0162***	0.0158***	0.0246***
	(0.000388)	(0.000704)	(0.00103)	(0.00111)	(0.00170)
R&D intensity	0.0157	0.0379	0.120***	0.177***	0.294***
	(0.0135)	(0.0270)	(0.0462)	(0.0383)	(0.0590)
Multi-product	-0.00302***	-0.00599***	-0.00942***	-0.00955***	-0.0147***
	(0.000624)	(0.00116)	(0.00172)	(0.00185)	(0.00295)
First stage					
ΔIMP^{oth}	0.458***	-0.805***	0.485***	-0.143***	0.470***
	(0.0168)	(0.154)	(0.0160)	(0.0139)	(0.0169)
$\Delta\ Offshore^{oth}$	0.0246***	0.460***	0.0400***	0.477***	0.00939
	(0.00698)	(0.0140)	(0.0101)	(0.0177)	(0.0127)
$Offshore_{t-s}$	-0.775***	0.0324***	-0.828***	0.00714	-0.157***
	(0.173)	(0.00641)	(0.139)	(0.0133)	(0.0159)
Observations	192,776	172,687	155,241	133,757	125,893
Hansen J	0.229	0.578	0.0912	0.294	0.652
Kleibergen-Paap	249.3	366.1	321.2	38.31	33.59
F test for ΔIMP^{CHN}	255	376.9	326.6	251.8	262.5
F test for Δ*Offshore*	7.665	12.78	12.37	40.86	35.58

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table 5: Impact of Import competition on change in the number of production workers and industry switching at the 3 and 4-digit level

Growth rate of the number of product workers					
	(1)	(2)	(3)	(4)	(5)
Length of time lag	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CHN}	-0.0774*	-0.108**	-0.186***	-0.205***	-0.280***
	(0.0409)	(0.0485)	(0.0530)	(0.0484)	(0.0626)
Δ *Offshore*	0.0206	0.0379	0.0440	1.234***	1.780***
	(0.0205)	(0.0362)	(0.0423)	(0.235)	(0.346)
Observations	190,166	169,417	151,747	130,782	122,231
Hansen J	0.0297	0.407	0.219	0.780	0.504
Kleibergen-Paap	241.5	364.3	327.7	37.71	31.83
F test for ΔIMP^{CHN}	249.5	373.8	333.2	260	278.1
F test for Δ*Offshore*	7.840	12.82	12.86	40.35	34.41
Industry switching: Changes in industry classification at 3 digit-level					
	(6)	(7)	(8)	(9)	(10)
Length of time lag	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CHN}	0.00904	0.0261	0.0401	0.0546	0.0578
	(0.0382)	(0.0422)	(0.0362)	(0.0371)	(0.0420)
Δ *Offshore*	-0.0121	-0.0219	-0.0231	-0.605***	-0.741***
	(0.00985)	(0.0185)	(0.0196)	(0.170)	(0.214)
Observations	192,776	148,569	155,241	140,206	125,893
Hansen J	0.411	0.643	0.116	0.680	0.901
Kleibergen-Paap	249.3	380.4	321.2	42.68	33.59
F test for ΔIMP^{CHN}	255	392.2	326.6	270.5	262.5
F test for Δ*Offshore*	7.665	17.69	12.37	45.12	35.58
Industry switching: Changes in industry classification at 4 digit-level					
	(11)	(12)	(13)	(14)	(15)
Length of time lag	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CHN}	-0.00781	0.0518	0.0700*	0.0790*	0.101**
	(0.0420)	(0.0483)	(0.0407)	(0.0405)	(0.0468)
Δ *Offshore*	-0.0117	-0.0212	-0.0228	-0.574***	-0.677***
	(0.00915)	(0.0173)	(0.0188)	(0.182)	(0.227)
Observations	192,776	148,569	155,241	140,206	125,893
Hansen J	0.617	0.460	0.0886	0.624	0.664
Kleibergen-Paap	249.3	380.4	321.2	42.68	33.59
F test for ΔIMP^{CHN}	255	392.2	326.6	270.5	262.5
F test for Δ*Offshore*	7.665	17.69	12.37	45.12	35.58

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and* indicate statistically significant at 1%, 5%, and 10%. Firm controls, industry FE, and year FE were included. The full results are presented in Tables A3 and A4 in the Appendix.

Table 6: Multinomial logit estimation for firm's reaction in response to import competition (marginal effect)

	(1) No reaction	(2) BothEmplSwitch	(3) EmplAdjustOnly	(4) ProdSwitchOnly
ΔIMP^{CHN}	-0.212***	0.0654***	0.0894*	0.0575*
	(0.0561)	(0.0231)	(0.0534)	(0.0296)
ΔOffshore	0.920***	-0.215**	-0.808***	0.104
	(0.207)	(0.0903)	(0.187)	(0.123)
Firm Size	-0.0146***	0.00372***	0.0227***	-0.0117***
	(0.00270)	(0.00120)	(0.00241)	(0.00179)
Multi-plant	-0.0174***	0.00500**	0.0172***	-0.00480*
	(0.00501)	(0.00234)	(0.00458)	(0.00288)
ln(Age)	-0.0204***	0.000858	0.0387***	-0.0192***
	(0.00508)	(0.00229)	(0.00477)	(0.00257)
ln(K-L ratio)	0.0241***	-0.00569***	-0.0203***	0.00194
	(0.00247)	(0.00112)	(0.00216)	(0.00146)
R&D intensity	0.242**	-0.0848	-0.135	-0.0220
	(0.107)	(0.0546)	(0.101)	(0.0557)
Multi-product	-0.101***	0.0591***	-0.0319***	0.0735***
	(0.00518)	(0.00290)	(0.00459)	(0.00342)
residual ΔIMP^{CHN}	0.199***	-0.0525*	-0.141**	-0.00579
	(0.0697)	(0.0270)	(0.0643)	(0.0378)
residual ΔOffshore	-1.133***	0.246***	1.001***	-0.114
	(0.214)	(0.0922)	(0.192)	(0.128)
Observations	118,780			
log likelyhood	-122975			

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table 7: Switching regression for industry switching and changes in number of employments

	(1)	(2)	(3)	(4)	(5)	(6)
	selection (ind switch)	Growth rate of # of workers		selection (ind switch)	Growth rate of # of production workers	
VARIABLES	Z={0,1}	Z=0	Z=1	Z={0,1}	Z=0	Z=1
ΔIMP^{CHN}	0.704***	-0.0538**	-0.0925	0.752***	-0.154***	-0.154
	(0.123)	(0.0228)	(0.0582)	(0.126)	(0.0380)	(0.0988)
Δ Offshore	-0.362	0.250***	0.455**	-0.506	1.095***	0.718**
	(0.463)	(0.0847)	(0.208)	(0.471)	(0.139)	(0.352)
Firm Size	-0.105***	-0.0188***	-0.0350***	-0.114***	-0.0261***	-0.0448***
	(0.00548)	(0.000922)	(0.00255)	(0.00560)	(0.00152)	(0.00437)
Multi-plant	-0.0290***	-0.00489***	-0.00535	-0.0197*	-0.0204***	-0.0314***
	(0.0109)	(0.00185)	(0.00522)	(0.0110)	(0.00304)	(0.00886)
ln(Age)	-0.115***	-0.0467***	-0.0509***	-0.120***	-0.0443***	-0.0563***
	(0.0101)	(0.00174)	(0.00517)	(0.0103)	(0.00287)	(0.00876)
ln(K-L ratio)	-0.0248***	0.0207***	0.0223***	-0.0237***	0.0204***	0.0269***
	(0.00519)	(0.000897)	(0.00252)	(0.00529)	(0.00148)	(0.00426)
R&D intensity	-0.430*	0.353***	0.473***	-0.376	0.0838	-0.297
	(0.240)	(0.0360)	(0.115)	(0.241)	(0.0588)	(0.196)
Multi-product	-0.208***	-0.0119***	-0.0255***	-0.211***	-0.00631*	-0.0450***
	(0.0173)	(0.00200)	(0.00820)	(0.0176)	(0.00340)	(0.0139)
hh_index	-1.816***			-1.831***		
	(0.0287)			(0.0292)		
residual ΔIMP^{CHN}	-0.514***	0.0766***	0.300***	-0.542***	0.189***	0.450***
	(0.159)	(0.0284)	(0.0801)	(0.163)	(0.0472)	(0.136)
residual Δ Offshore	0.472	-0.309***	-0.465**	0.621	-1.300***	-0.933***
	(0.470)	(0.0863)	(0.210)	(0.478)	(0.142)	(0.356)
Observations	110,223			107,084		
log likelyhood	-50040			-100297		

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table A1 Summary Statistics

	N	Mean	SD	p10	p90
s=1					
Growth rate of # of worker	192776	-0.008	0.128	-0.105	0.088
Growth rate of # of production worker	190167	-0.009	0.255	-0.172	0.147
changes in # of products	192776	-0.021	0.725	0.000	0.000
Industry switching dummy 2digit	192776	0.030	0.170	0.000	0.000
Industry switching dummy 3digit	192776	0.050	0.217	0.000	0.000
Industry switching dummy 4digit	192776	0.067	0.251	0.000	0.000
ΔIMP^{CHN}	192776	0.004	0.025	-0.002	0.013
ΔOffshore	192776	0.001	0.161	-0.001	0.004
Firm Size	192776	5.246	1.011	4.190	6.612
Multi-plant	192776	0.640	0.480	0.000	1.000
ln(Age)	192776	3.740	0.520	3.135	4.205
ln(K-L ratio)	192776	1.855	1.126	0.576	3.027
R&D intensity	192776	0.010	0.029	0.000	0.032
Multi-product	192776	0.612	0.487	0.000	1.000
s=3					
Growth rate of # of worker	155241	-0.016	0.214	-0.221	0.180
Growth rate of # of production worker	151748	-0.025	0.365	-0.328	0.269
changes in # of products	155241	-0.072	1.111	-1.000	1.000
Industry switching dummy 2digit	155241	0.056	0.229	0.000	0.000
Industry switching dummy 3digit	155241	0.091	0.288	0.000	0.000
Industry switching dummy 4digit	155241	0.124	0.329	0.000	1.000
ΔIMP^{CHN}	155241	0.011	0.048	-0.002	0.031
ΔOffshore	155241	0.004	0.180	-0.001	0.013
s=5					
Growth rate of # of worker	125893	-0.019	0.272	-0.300	0.256
Growth rate of # of production worker	122232	-0.035	0.437	-0.432	0.352
changes in # of products	125893	-0.135	1.383	-1.000	1.000
Industry switching dummy 2digit	125893	0.074	0.262	0.000	0.000
Industry switching dummy 3digit	125893	0.119	0.323	0.000	1.000
Industry switching dummy 4digit	125893	0.160	0.367	0.000	1.000
ΔIMP^{CHN}	125893	0.017	0.062	-0.001	0.047
ΔOffshore	125893	0.006	0.147	-0.001	0.021

Table A2: Full results of Panel (a) of Table 5: Impact of Import competition on changes in production worker employment and number of products when s=2 and s=4

	(1)	(2)	(3)	(4)	(5)
Length of time lag	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CHN}	-0.0774*	-0.108**	-0.186***	-0.205***	-0.280***
	(0.0409)	(0.0485)	(0.0530)	(0.0484)	(0.0626)
Δ Offshore	0.0206	0.0379	0.0440	1.234***	1.780***
	(0.0205)	(0.0362)	(0.0423)	(0.235)	(0.346)
Firm Size	-0.00700***	-0.0132***	-0.0200***	-0.0202***	-0.0320***
	(0.000605)	(0.00106)	(0.00155)	(0.00186)	(0.00292)
Multi-plant	-0.00241**	-0.00613***	-0.00890***	-0.0103***	-0.0170***
	(0.00122)	(0.00204)	(0.00280)	(0.00309)	(0.00442)
ln(Age)	-0.00954***	-0.0185***	-0.0279***	-0.0300***	-0.0467***
	(0.00107)	(0.00185)	(0.00270)	(0.00302)	(0.00465)
ln(K-L ratio)	0.00715***	0.0117***	0.0160***	0.0150***	0.0241***
	(0.000628)	(0.00102)	(0.00143)	(0.00160)	(0.00233)
R&D intensity	-0.0359	-0.0545	-0.0810	-0.0392	-0.0632
	(0.0286)	(0.0337)	(0.0564)	(0.0728)	(0.102)
Multi-product	-0.00389***	-0.00733***	-0.00906***	-0.00891***	-0.0136***
	(0.00104)	(0.00177)	(0.00251)	(0.00281)	(0.00432)
First stage					
ΔIMP^{oth}	0.457***	-0.808***	0.487***	-0.144***	0.476***
	(0.0170)	(0.153)	(0.0159)	(0.0140)	(0.0167)
$\Delta\ Offshore^{oth}$	0.0243***	0.461***	0.0397***	0.481***	0.00779
	(0.00697)	(0.0141)	(0.0102)	(0.0176)	(0.0136)
$Offshore_{t-s}$	-0.777***	0.0321***	-0.831***	0.00694	-0.155***
	(0.171)	(0.00647)	(0.137)	(0.0136)	(0.0162)
Observations	190,166	169,417	151,747	130,782	122,231
Hansen J	0.0297	0.407	0.219	0.780	0.504
Kleibergen-Paap	241.5	364.3	327.7	37.71	31.83
F test for ΔIMP^{CHN}	249.5	373.8	333.2	260	278.1
F test for $\Delta Offshore$	7.840	12.82	12.86	40.35	34.41

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table A3: Full results of Panel (b) and (c) of Table 5: Impact of Import competition on industry switching

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	3 ditig level of Industry switching					4 ditig level of Industry switching				
Length of time lag	s=1	s=2	s=3	s=4	s=5	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CHN}	0.00904	0.0261	0.0401	0.0546	0.0578	-0.00781	0.0518	0.0700*	0.0790*	0.101**
	(0.0382)	(0.0422)	(0.0362)	(0.0371)	(0.0420)	(0.0420)	(0.0483)	(0.0407)	(0.0405)	(0.0468)
Δ Offshore	-0.0121	-0.0219	-0.0231	-0.605***	-0.741***	-0.0117	-0.0212	-0.0228	-0.574***	-0.677***
	(0.00985)	(0.0185)	(0.0196)	(0.170)	(0.214)	(0.00915)	(0.0173)	(0.0188)	(0.182)	(0.227)
Firm Size	-0.00494***	-0.00817***	-0.00855***	-0.00832***	-0.0108***	-0.00444***	-0.00669***	-0.00727***	-0.00683***	-0.00910***
	(0.000912)	(0.00151)	(0.00149)	(0.00161)	(0.00209)	(0.000996)	(0.00176)	(0.00172)	(0.00183)	(0.00235)
Multi-plant	0.00111	0.000223	0.000638	-0.000505	0.00212	0.00125	-2.48e-05	0.000365	-0.00101	0.000756
	(0.00150)	(0.00260)	(0.00255)	(0.00270)	(0.00343)	(0.00170)	(0.00295)	(0.00289)	(0.00304)	(0.00386)
ln(Age)	-0.00238*	-0.00751***	-0.00780***	-0.00817***	-0.00883**	-0.00526***	-0.0138***	-0.0141***	-0.0143***	-0.0167***
	(0.00138)	(0.00257)	(0.00254)	(0.00270)	(0.00348)	(0.00158)	(0.00293)	(0.00289)	(0.00305)	(0.00395)
ln(K-L ratio)	-0.00273***	-0.00549***	-0.00589***	-0.00647***	-0.00730***	-0.00348***	-0.00655***	-0.00702***	-0.00710***	-0.00781***
	(0.000673)	(0.00128)	(0.00126)	(0.00134)	(0.00174)	(0.000786)	(0.00148)	(0.00146)	(0.00153)	(0.00199)
R&D intensity	0.0463	0.130**	0.150***	0.108*	0.0729	0.0264	0.0937*	0.115**	0.0641	0.0497
	(0.0283)	(0.0524)	(0.0522)	(0.0599)	(0.0708)	(0.0299)	(0.0559)	(0.0553)	(0.0619)	(0.0746)
Multi-product	0.0502***	0.0783***	0.0779***	0.0736***	0.0903***	0.0668***	0.103***	0.103***	0.0990***	0.122***
	(0.00132)	(0.00242)	(0.00237)	(0.00253)	(0.00334)	(0.00151)	(0.00278)	(0.00273)	(0.00289)	(0.00381)
First stage										
ΔIMP^{oth}	-0.775***	-0.837***	-0.828***	-0.147***	-0.157***	-0.775***	-0.837***	-0.828***	-0.147***	-0.157***
	(0.173)	(0.136)	(0.139)	(0.0134)	(0.0159)	(0.173)	(0.136)	(0.139)	(0.0134)	(0.0159)
Δ *Offshore* ^{oth}	0.458***	0.482***	0.485***	0.476***	0.470***	0.458***	0.482***	0.485***	0.476***	0.470***
	(0.0168)	(0.0144)	(0.0160)	(0.0170)	(0.0169)	(0.0168)	(0.0144)	(0.0160)	(0.0170)	(0.0169)
Offshore $_{t-s}$	0.0246***	0.0322***	0.0400***	0.00598	0.00939	0.0246***	0.0322***	0.0400***	0.00598	0.00939
	(0.00698)	(0.00608)	(0.0101)	(0.0127)	(0.0127)	(0.00698)	(0.00608)	(0.0101)	(0.0127)	(0.0127)
Observations	192,776	148,569	155,241	140,206	125,893	192,776	148,569	155,241	140,206	125,893
Hansen J	0.311	0.431	0.0256	0.425	0.616	0.617	0.460	0.0886	0.624	0.664
Kleibergen-Paap	249.3	380.4	321.2	42.68	33.59	249.3	380.4	321.2	42.68	33.59
F test for ΔIMP^{CHN}	255	392.2	326.6	270.5	262.5	255	392.2	326.6	270.5	262.5
F test for Δ*Offshore*	7.665	17.69	12.37	45.12	35.58	7.665	17.69	12.37	45.12	35.58

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table A4: Industry switching: Changes in industry classification at 2 digit-level

	(1)	(2)	(3)	(4)	(5)
Length of time lag	*s=1*	*s=2*	*s=3*	*s=4*	*s=5*
ΔIMP^{CH}	0.0154	0.0415	0.0506	0.0498	0.0463
	(0.0332)	(0.0375)	(0.0316)	(0.0318)	(0.0355)
Δ Offshore	-0.0111	-0.0192	-0.0200	-0.550***	-0.649***
	(0.00961)	(0.0169)	(0.0176)	(0.150)	(0.188)
Firm Size	-0.00389***	-0.00648***	-0.00676***	-0.00659***	-0.00866***
	(0.000660)	(0.00114)	(0.00112)	(0.00123)	(0.00163)
Multi-plant	0.000206	-0.000608	-0.000379	-0.00198	0.00111
	(0.00116)	(0.00211)	(0.00207)	(0.00225)	(0.00282)
ln(Age)	-0.000562	-0.00199	-0.00231	-0.00249	-0.00130
	(0.00106)	(0.00198)	(0.00196)	(0.00213)	(0.00273)
ln(K-L ratio)	-0.00227***	-0.00488***	-0.00510***	-0.00579***	-0.00608***
	(0.000525)	(0.00102)	(0.00100)	(0.00108)	(0.00142)
R&D intensity	0.0251	0.0673	0.0792*	0.0219	-0.0241
	(0.0263)	(0.0482)	(0.0474)	(0.0475)	(0.0584)
Multi-product	0.0299***	0.0470***	0.0466***	0.0429***	0.0548***
	(0.00103)	(0.00192)	(0.00189)	(0.00205)	(0.00273)
First stage					
ΔIMP^{oth}	-0.775***	-0.837***	-0.828***	-0.147***	-0.157***
	(0.173)	(0.136)	(0.139)	(0.0134)	(0.0159)
$\Delta \text{Offshore}^{oth}$	0.458***	0.482***	0.485***	0.476***	0.470***
	(0.0168)	(0.0144)	(0.0160)	(0.0170)	(0.0169)
Offshore_{t-s}	0.0246***	0.0322***	0.0400***	0.00598	0.00939
	(0.00698)	(0.00608)	(0.0101)	(0.0127)	(0.0127)
Observations	192,776	148,569	155,241	140,206	125,893
Hansen J	0.411	0.643	0.116	0.680	0.901
Kleibergen-Paap test	249.3	380.4	321.2	42.68	33.59
F test for ΔIMP^{oth}	255	392.2	326.6	270.5	262.5
F test for Δ Offshore	7.665	17.69	12.37	45.12	35.58

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table A5: First stage estimation for Control Function Estimation

	(1)	(2)
	ΔIMP^{CHN}	Δ *Offshore*
ΔIMP^{oth}	0.472***	
	(0.00178)	
Δ *Offshore*^{oth}		0.0152**
		(0.00603)
Offshore$_{t-s}$		-0.153***
		(0.00267)
Observations	118,548	110,750
R-squared	0.420	0.040

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.

Table A6: Robustness check: different definition of employment adjustment

***Employ Adjustment*: A decrease in employment of 5% or more**

Panel (a) Firm's reaction patterns

	(1) All firms	(2) Bottom 5	(3) Top 5
NoAdjust	47.33	50.78	41.97
EmplAdjust	37.23	38.73	37.31
ProdSwitch	8.09	5.73	9.65
BothEmplS	7.35	4.76	11.07

Panel (b) Estimation results for multinomial logit model (marginal effect)

	(1) No reaction	(2) BothEmplSwitch	(3) EmplAdjustOnly	(4) ProdSwitchOnly
ΔIMP^{CHN}	-0.172***	0.0786***	0.0498	0.0432
	(0.0564)	(0.0260)	(0.0561)	(0.0282)
ΔOffshore	0.738***	-0.190*	-0.627***	0.0789
	(0.204)	(0.0996)	(0.196)	(0.116)
Firm Size	-0.0151***	0.00247*	0.0229***	-0.0103***
	(0.00267)	(0.00134)	(0.00259)	(0.00165)
Multi-plant	-0.0150***	0.00457*	0.0147***	-0.00431
	(0.00497)	(0.00255)	(0.00481)	(0.00264)
ln(Age)	-0.0291***	0.00152	0.0472***	-0.0196***
	(0.00502)	(0.00251)	(0.00499)	(0.00235)
ln(K-L ratio)	0.0252***	-0.00542***	-0.0214***	0.00165
	(0.00249)	(0.00124)	(0.00234)	(0.00135)
R&D intensity	0.235**	-0.122**	-0.122	0.00984
	(0.107)	(0.0603)	(0.109)	(0.0478)
Multi-product	-0.0922***	0.0694***	-0.0405***	0.0632***
	(0.00507)	(0.00315)	(0.00488)	(0.00315)
residual ΔIMP^{CHN}	0.180***	-0.0630**	-0.124*	0.00665
	(0.0698)	(0.0298)	(0.0671)	(0.0365)
residual ΔOffshore	-0.937***	0.222**	0.807***	-0.0920
	(0.211)	(0.102)	(0.201)	(0.120)
Observations	118,780			
log likelyhood	-126680			

Figures in parentheses are robust standard errors clustered at the firm level. ***, **, and * indicate statistically significant at 1%, 5%, and 10%. Industry and year FE were included in this study.