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The Impact of Municipal One-Stop Consultation Centers (OSCs) for Foreign Residents on Firms and Workers in Japan.*

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Abstract

This paper examines how municipal one-stop consultation centers (OSCs) for foreign residents affect firms' employment structures and working conditions for both foreign and Japanese employees. Using an unbalanced panel of 437 foreign-employing establishments observed from FY2019 to FY2023 (1,716 establishment-year observations) merged with municipality-level data on OSC establishment and subsidy allocations, we estimate two-way fixed-effects and staggered difference-in-differences models robust to heterogeneous treatment timing. The results show that OSC establishment substantially expands both the intensive and extensive margins of foreign employment—by roughly six workers on average—while reducing annual overtime and total working hours by about 33 and 69 hours, respectively. These effects are more pronounced in municipalities receiving above-median allocations under the Foreign Resident Environment Improvement Subsidy, underscoring the importance of sufficient financial and administrative capacity. Spillover effects on Japanese employees are modestly positive: regular and non-regular employment increase, while regular working hours decline slightly, indicating complementarities rather than substitution between domestic and foreign labor. Overall, the findings suggest that OSCs enhance coordination, retention, and work–life balance across firms, functioning as institutional infrastructures that promote both efficiency and inclusion in local labor markets.

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1 Introduction

Japan's rapid population aging and decline have tightened the labor market, leading both firms and policymakers to increasingly rely on foreign workers. According to the Ministry of Health, Labor and Welfare's Report on the Employment Status of Foreign Workers, the number of foreign employees reached a record 2,302,587 and the number of employing establishments 342,087 as of October 2024¹. Foreign workers are integral to regional production networks. However, persistent differences in language, legal systems, and workplace practices between Japan and migrants' home countries continue to impede retention, productivity, and long-term integration.

Local governments aimed to address these challenges by creating consultation desks for foreign residents. These offices provide guidance on residence status, labor conditions, housing, access to medical and welfare services, Japanese-language education, and children's schooling. However, despite their broad scope, they are rather fragmented and limited. For example, consultations on specific issues—such as visa renewals or employment disputes—are often referred to external agencies; interpreter coverage is frequently inadequate; and administrative responsibilities are divided across multiple municipal departments. Consequently, foreign residents must navigate several offices, incurring both time and monetary costs.

To overcome these frictions, municipalities have established comprehensive one-stop consultation centers (OSCs) that integrate services and coordinate closely with specialized agencies². Specifically, OSCs provide a single venue for multi-domain consultations, including residence procedures, employment support, language education, housing assistance, and access to medical and welfare services. Regular participation or the periodic dispatch of specialized agencies ensures expert advice and accurate guidance. Expanded multilingual services, such as telephone interpretation and online translation, enable the delivery of information in residents' native or other comprehensible languages. By streamlining service provision, OSCs aim not only to disseminate information but also to facilitate long-term settlement, career development, workplace improvements, and harmonious coexistence within local communities.

Despite their rapid diffusion, municipal evaluations typically rely on input-type metrics—most notably, number of consultations—rather than on downstream outcomes such as retention, hours, or firm-level performance³. As such, little is known about whether the presence of an OSC affects foreign workers' job retention, working hours, or the perfor-

¹Source: https://www.mhlw.go.jp/stf/newpage_50256.html

²The locations of all comprehensive consultation centers across Japan are compiled in detail by CINGA (Citizen's Network for Global Activities), a non-profit organization focused on international citizen activities. (Source: [CINGA website](#))

³Source: [Gyosei Online website](#)

mance of the firms that employ them. It is also unclear how OSCs influence Japanese employees, who may experience shifts in workload, task allocation, or employment opportunities when foreign employment expands.

This study empirically examines how municipal OSCs affect the business performance of firms that employ foreign workers, improve their retention and working conditions, and reduce the workload of Japanese employees. To this end, we use an unbalanced panel drawn from the National Survey on the Actual Employment of Foreign Workers conducted online from February 19 to 25, 2025, targeting managers across Japan registered with a commercial panel. Of the 4,105 valid responses, we extracted only those firms that employed foreign workers between fiscal years (FY) 2019 and 2023. Firms that did not continuously employ foreign workers or employed them only in certain years were excluded, leaving a final sample of 437 firms with a maximum of 1,716 establishment-year observations. Our estimation strategy employs two-way fixed-effects (TWFE) models with establishment and year effects. The key explanatory variables include a dummy indicating the presence of an OSC in the firm's municipality and a high-subsidy dummy capturing whether cumulative allocations of the Foreign Resident Environment Improvement Subsidy exceed the sample median.

The results, based on staggered difference-in-differences estimates, show that the establishment of an OSC substantially expanded both the intensive and extensive margins of foreign employment by roughly six workers on average while reducing annual overtime and total working hours by approximately 33 and 69 hours, respectively. These effects are stronger in municipalities with above-median subsidy allocations, underscoring the importance of adequate financial and administrative capacities. The Spillover effects on Japanese employees were modestly positive: both regular and non-regular employment increased, while regular working hours declined slightly. These patterns suggest complementarities rather than substitutions between domestic and foreign labor. Overall, OSCs appear to have enhanced retention, coordination, and work–life balance across firms, functioning as an institutional infrastructure that promotes efficiency and inclusion in local labor markets.

The remainder of the paper is organized as follows: Section 2 reviews related literature. Section 3 describes the institutional backgrounds of foreign-resident consultation offices, OSCs, and subsidy programs. Section 4 presents the data and key variables. Section 5 describes the estimation method and reports the results. Section 6 discusses the effect on the demand side and presents the robustness checks. Finally, Section 7 concludes the paper and discusses policy implications.

2 Literature Review

In Japan, foreign workers are viewed as a means of alleviating labor shortages caused by population aging and decline, and the Japanese government began accepting foreign workers as early as the 1980s. The 1989 amendment to the Immigration Control and Refugee Recognition Act changed the residence qualifications for foreign workers. In 2012, the conditions for highly skilled foreign professionals to obtain permanent residency were relaxed, further accelerating the acceptance of foreign workers in recent years (Liu-Farrer 2020). In the 2020s, discussions increasingly focused on how Japan should attract and retain foreign human resources and improve its working environment (Japan Federation of Economic Organizations 2020).

Against this backdrop, empirical analyses of how the acceptance of foreign workers affects Japan's labor market are needed. However, the surveys targeting foreign residents remain insufficient, and rigorous empirical verification is lacking. Related studies have shown that the inflow of foreign workers reduced the unemployment rate of Japanese workers as the former compensate for the shortage of domestic labor (Tomohara 2022). Conversely, this study uses industries as the unit of observation and does not analyze the regional characteristics or policy effects that might influence the Japanese labor market based on the inflow of foreign workers. Therefore, it analyzes the impact of municipal comprehensive consultation centers on firms employing foreign workers, clarifying how regional policy interventions alter the effects of foreign workers on the labor market.

This study focuses on two key areas. The first concerns the mismatch between foreign workers and employers. Comprehensive consultation centers may help resolve such mismatches. Theoretical analyses employing search models that assume heterogeneous domestic and foreign labor suggest that mismatches can arise between firms and foreign workers (Weiss et al. 2003). For instance, in the United States, a policy change allowing foreign workers to obtain driver's licenses reduced geographic mismatches and improved labor outcomes (Cho 2022). By addressing issues between firms and foreign workers, comprehensive consultation centers are expected to reduce mismatches and improve labor outcomes for foreign workers. This study empirically tests this effect. Moreover, foreign workers face labor-market discrimination (Oreopoulos 2011). Comprehensive consultation centers may help mitigate such discrimination. We analyze whether the presence of a center changes firms' hiring policies toward foreign workers and the reasons for not hiring them.

The second area concerns the complementarity or substitutability between Japanese and foreign workers. As suggested by related research, if complementarity exists, improvements in foreign workers' productivity brought about by a comprehensive consultation center should also enhance Japanese workers' outcomes (Tomohara 2022). Conversely, if

Japanese and foreign workers are substitutes, foreign workers' productivity improvements may reduce Japanese workers' outcomes (Borjas 2003, 2017; Dustmann et al. 2017) . By analyzing how comprehensive consultation centers affect the labor outcomes of Japanese workers, this study discusses the degree of complementarity or substitutability between the two groups.

3 Institutional Background

3.1 Foreign Resident Consultation Offices

Triggered by the 1989 amendment to the Immigration Control Act, the number of foreign workers increased rapidly, especially in regions with a concentration of manufacturing companies that support the Japanese industries, while simultaneously exposing various clashes in daily life and education between Japanese residents and foreign workers (Tanno 2007). During the transition from short-term migrant work to long-term settlement, problems such as isolation caused by language and institutional barriers and issues in education, welfare, and housing became increasingly evident. Since the 1990s, local governments, international exchange associations, and non-profit organizations (NPOs) have progressively established foreign resident consultation offices. Initially, many operated on an irregular basis with limited language support, however, following the promotion of multicultural coexistence policies after 2006, permanent offices and multilingual services expanded.

According to the Multicultural Coexistence Portal Site of the Council of Local Authorities for International Relations (CLAIR), eight offices were established before the 1988 immigration law amendment, 99 between 1989 and 1999, 84 between 2000 and 2009, 141 between 2010 and 2019, and 107 after 2020 (with 64 undated cases). These figures illustrate a trajectory that began with the early development of the 1980s and 1990s, followed by institutional enhancement in the 2000s and, most recently, an expansion driven by strengthened multicultural coexistence policies.

The forms of these offices varies widely: operating bodies (municipalities, international exchange associations, bar associations, NGOs, etc.), target users (foreign nationals, people with limited Japanese proficiency), consultation topics (legal issues, medical care, education, daily-life concerns), staff composition (consultants capable of speaking foreign languages, interpreters, specialists), and setup (permanent or temporary) differ by municipality. Foreign resident consultants, in particular, have drawn on their multilingual abilities and cultural backgrounds not only to interpret and provide consultation but also to serve as intermediaries for government agencies and specialist organizations, thereby easing cultural friction and building trust. However, challenges remain, including unclear

job roles, insufficient training opportunities, and limitations in information sharing owing to municipal staff transfers and siloed administrative structures.

The experience and operational know-how of these consultation offices have been utilized nationwide for establishing “comprehensive consultation centers,” which were institutionalized following the December 2018 amendment to the Immigration Control Act.

3.2 Comprehensive Consultation Centers

Comprehensive consultation centers are multilingual one-stop consultation services established by local governments to comprehensively address the diverse challenges faced by foreign residents in Japan (Immigration Services Agency, 2025). Against the backdrop of a growing foreign workforce and the introduction of the Specified Skilled Worker system(SSW), the Japanese government adopted in December 2018 the Comprehensive Response Measures for the Acceptance and Coexistence of Foreign Human Resources. This national framework aims to promote the acceptance of foreign talent and multicultural coexistence by providing institutional and financial support for local governments to establish integrated consultation systems.

Under this initiative, the Immigration Services Agency created the Foreign Resident Environment Improvement Subsidy for the establishment and operation of OSCs. The subsidies initially targeted prefectures and large municipalities with substantial foreign populations, but were expanded in 2019 to include all local governments. From FY 2020 onward, joint establishment by multiple municipalities became possible, and subsequent policy revisions in 2022 relaxed the restrictions on outreach activities, enhancing administrative flexibility.

In contrast to the earlier fragmented consultation systems, where residence, employment, and welfare issues were handled separately by immigration offices, Hello Work, and public health centers, OSCs integrate these services within a single venue. They provide coordinated guidance on residential procedures, labor issues, education, welfare, and daily-life concerns, supported by interpreters and multilingual materials. Cooperation with specialized agencies enables the faster and more accurate resolution of individual cases. These institutional features allow foreign residents to access comprehensive assistance in one place and help local governments promote community integration.

More importantly, the establishment of OSCs follows a standardized administrative process defined by the Immigration Services Agency⁴. In each fiscal year, the Ministry

⁴In each fiscal year, the Ministry of Justice issues a public call for proposals under the Foreign Resident Environment Improvement Subsidy. Municipalities prepare implementation plans that describe service organization, coordination mechanisms, and multilingual support systems. Applications are typically due by mid-May, following a public notice in late March or early April, and approved projects are notified by early summer. Establishing a new center generally requires three to six months of preparation, including coordi-

of Justice publicly invites applications for subsidies, evaluates the submitted plans, and approves the selected municipalities. Once approved, municipalities receive fixed national subsidies, typically covering up to 100 % of the development and 50 % of the operational costs¹—and are required to submit annual operational reports. Because approval depends primarily on the administrative capacity and fiscal conditions at the municipal level rather than on firm-level characteristics, the timing of OSC introduction can be regarded as an exogenous policy shock to the firms located in those municipalities. This institutional setting provides a quasi-experimental framework for analyzing the impact of OSCs on employment and firm outcomes.

Since the program’s inception, the number of centers has grown steadily—from 176 in FY2019 to 315 in FY2023, and usage has expanded accordingly. Nationwide consultations increased from approximately 270,000 to more than 520,000 during the same period, covering topics such as residence (34 %), employment (27 %), daily life (22 %), and education or welfare (17 %). Yet awareness remains limited: government surveys indicate that only approximately 40 % of foreign residents and 30 % of firms are aware of their nearest OSC. These figures suggest that, although OSCs have become a significant component of Japan’s local integration infrastructure, substantial informational barriers remain.

3.3 Foreign Resident Environment Improvement Subsidy

The Foreign Resident Environment Improvement Subsidy was created in December 2018 as part of the Comprehensive Response Measures for the Acceptance and Coexistence of Foreign Human Resources. The national subsidy program provides financial support to local governments that establish and operate comprehensive consultation centers, thus enabling foreign residents to promptly and reliably obtain necessary information and consultation services promptly and reliably.

The program covers a wide range of information and consultation areas, including residential procedures, employment, medical care, welfare, childbirth and child-rearing, and education, and aims to promote a multicultural society by facilitating multilingual service provision.

All prefectures and municipalities (including special wards) are eligible, and the Minister of Justice approves subsidies based on applications. In addition to single-municipality projects, joint projects between prefectures and municipalities or between multiple municipalities are permitted, allowing for the development of wide-area consultation systems beyond densely populated foreign resident regions.

The eligible projects are divided into “development projects,” which involve new es-

nation among departments and staffing arrangements. Approved projects receive subsidies covering up to 100 % of development and 50 % of operational costs.

tablishments or capacity expansion, and “operation projects,” which cover the maintenance and management of existing centers. Development projects are subsidized at 100 % of the necessary expenses, whereas operational projects are subsidized at 50 %, with the maximum subsidy amounts determined according to the number of foreign residents. For municipalities, the upper limit is 10 million yen if the foreign resident population is 5,000 or more and 2 million yen if it is less than 500. Development projects cannot merely replace existing offices; they must add new functions or strengthen systems.

The Total subsidies amounted to approximately 2.025 billion yen in the first fiscal year (2019). Thereafter, they remained stable at approximately 2 billion yen through FY 2021 (approximately 1.907 billion yen in 2020 and 2.009 billion yen in 2021). However, they declined sharply to approximately 1.042 billion yen in 2022 and remained at approximately 1.090 billion yen in 2023. The average subsidies followed a similar trend, decreasing from about 13.41 million yen in 2019 to about 9.17 million yen in 2021 and then stabilizing in the 4.5 million yen range from 2022 onward.

The subsidy allocated to each municipality is determined through administrative screening based on project proposals, population size, and fiscal capacity, rather than based on firm-level economic conditions. Consequently, variation in cumulative subsidy allocations can be interpreted as reflecting the exogenous differences in administrative capacity and policy prioritization, rather than the local labor-market demand. This feature motivated us to conduct robustness analysis in policy intensity across municipalities.

4 Data

4.1 Overview of the Survey

The data used in this study were obtained from the National Survey on the Actual Employment of Foreign Workers, conducted over seven days from February 19 to 25, 2025. The survey was designed in relation to the “Training Employment System” scheduled for full-scale introduction in 2027. Its objectives are to obtain a nuanced understanding—by region, firm size, and industry—of the employment and living environments of foreign workers; to document firms’ use of various consultation services, including comprehensive one-stop consultation centers for foreign residents; and to evaluate the effects of these services.

The target population comprised corporate owners and executives nationwide. In addition to firms that already employ foreign workers, the sample also includes firms that consider future employment. After stratification based on age–sex composition by prefecture, respondents were selected via random sampling. If the targeted number of responses

could not be achieved in certain prefectures, the samples were supplemented with observations from other regions.

A survey was administered online to a panel maintained by a commercial company. Respondents with extremely short completion times (approximately 3 percent) were excluded, leaving 4,105 valid responses. The questionnaire consisted of 33 items (three screening questions and 30 main questions). The respondents received point-based incentives proportional to the number of questions. As a quality control measure, responses containing meaningless strings (e.g., “aaa”) in free-text boxes were excluded from the tabulations.

4.2 Sample Restrictions and Key Variables

For each fiscal year from 2019 to 2024, the survey retrospectively inquires about firm performance and the working conditions of Japanese and foreign employees. Even among firms that employ foreign workers, there are years in which they do not employ such workers; as such, foreign worker variables are missing for those years. We restrict the analysis to establishment–year observations with a positive number of foreign employees, yielding an unbalanced panel. Because information on comprehensive consultation centers was missing for FY2024, that year was excluded from analysis. The final analytical sample comprises 437 unique establishments with a maximum of 1,716 observations. In addition, establishments that did not continuously employ foreign workers or did so only in specific years were excluded. Accordingly, our analysis focuses on the intensive margin of foreign employment.

Industry categories are used to capture where the acceptance of foreign workers is active and whether consultation-desk usage differs by industry. The prefecture indicators control for regional characteristics of firm locations. The years since founding were converted from categorical responses to medians and used to assess whether firm age was associated with the use of consultation services.

The use of foreign-resident consultation services was coded as a binary variable indicating whether a firm uses a comprehensive one-stop consultation center or other consultation desks, thus allowing us to examine the differences in employment environments and working conditions by usage. The number of regular foreign employees has been recorded annually from FY2019 to FY2024 and converted from categories to medians. Scheduled (regular) and overtime working hours for foreign employees are quantified by assigning representative values to each categorical range; these variables are used to calculate annual hours and assess workload. The Foreign employee turnover rate was defined as a percentage and converted to the midpoints of the categorical ranges.

To capture overall firm size and composition, we included sales revenue, average age

of male regular Japanese employees, average age of female regular Japanese employees, number of regular Japanese employees, number of non-regular Japanese employees, scheduled working hours for Japanese employees, overtime hours for Japanese employees, and the turnover rate among Japanese employees. These were converted to medians or representative values from the categorical responses.

As a policy variable, we constructed a comprehensive consultation center dummy, equal to 1 if the firm's municipality has a foreign-resident one-stop consultation center and 0 otherwise. We also develop multiple improvement and deterioration indicators covering labor, skills, management, productivity, culture, Japanese language, legal knowledge, norms, interpersonal relations, and ties with the surrounding community. Each indicator equals 1 if the respondent reports improvement (or deterioration) in the relevant item, and 0 otherwise.

Finally, to capture strategic hiring decisions regarding foreign workers, we constructed hiring-policy variables—binary as indicators corresponding to eight conditions: Japanese proficiency, technical skills, overseas business alignment, tightness in the domestic labor market, specific occupations, long-term employment, new graduates, and SSW status.

(Table 1 here)

4.3 Descriptive Statistics

The descriptive statistics are presented in Table 2. In the analytical sample, the average number of regular foreign employees was 10 (min = 2, max = 110). The average foreign employee turnover rate was 6.3% (min = 2.5%, max = 35%). The scheduled working hours for foreign employees averaged 719 hours annually (min = 400, max = 1,100), whereas overtime hours averaged 129 hours (min = 50, max = 450). The total working hours averaged 847 hours (min = 450, max = 1,550).

(Table 2 around here)

The average number of regular Japanese employees was 5 (min = 1, max = 11), and the average number of non-regular Japanese employees was 4 (min = 1, max = 11). The turnover rate among the Japanese employees was 7.9% (min = 2.5%, max = 35%). The scheduled working hours for Japanese employees averaged 1,201 hours (min = 650, max = 3,000), overtime hours 157 (min = 50, max = 450), and total working hours 1,354 (min = 700, max = 3,450).

Regarding comprehensive consultation centers, 55.4% of the foreign-employing firms in our sample were located in municipalities with a center. Among them, 30.2% were in

high-subsidy municipalities, defined as those at or above the sample median in the cumulative Foreign Resident Environment Improvement Subsidy amounts during FY2019–FY2023.

Among post-hire improvement indicators for foreign workers, “Culture” showed the highest share (55.7%), followed by “Labor” (47.0%) and “Skills” (33.9%). For post-hire deterioration indicators, “Culture” was again the highest (28.6%), followed by “Labor” (15.9%).

With respect to hiring policies, “Japanese proficiency” was emphasized most (63.8%), followed by “Technical skills” (52.4%), “Overseas business alignment” (17.4%), and “Specific occupations” (20.2%). The shares of “New graduates” (7.0%) and “Specified Skilled Worker, etc.” (11.1%) were relatively low.

5 Estimation Method and Results

5.1 Methods

To estimate the effects of OSCs on foreign-worker outcomes, we employ an event study specification. The estimating equation is expressed as

$$y_{emt} = \sum \beta_{osc} D_{mt}^{osc} + \delta_e + \delta_t + \epsilon_{emt}, \quad (1)$$

where y_{emt} denotes an outcome variable for establishment e , located in municipality m , in fiscal year t . The indicator D_{mt}^{osc} takes 1 if an OSC exists in municipality m in year t and 0 otherwise. β_{osc} captures the net association between OSC presence and establishment-level outcomes. Establishment fixed effects (δ_e) absorb time-invariant characteristics such as firm management style, industry-specific labor demand, and local network effects, while year fixed effects (δ_t) control for aggregate shocks including macroeconomic fluctuations and nationwide policy changes.

A key empirical advantage of this setting is that the timing of OSC establishment is primarily determined by administrative and institutional factors rather than firm-level conditions. In each fiscal year, municipalities submit applications for subsidy funding in early spring, and successful projects are publicly announced around June or July following a centralized screening process by the Ministry of Justice. Therefore, the establishment of a center depends on the outcome of this bureaucratic review and annual fiscal allocations, rather than on contemporaneous changes in local labor demand or firm performance. Similarly, the differences in cumulative subsidy amounts across municipalities reflect variations in fiscal capacity and policy prioritization by local governments rather

than responses to private-sector shocks. These institutional characteristics render OSC establishment plausibly exogenous to individual firms, creating a quasi-experimental environment that enables credible identification of β_{osc}

Despite these favorable conditions, several potential sources of endogeneity must be acknowledged. Municipalities with a larger pre-existing stock of foreign workers may have been more motivated to apply for OSC funding, thereby introducing a possible selection bias. Moreover, because OSC adoption occurs at different points in time across municipalities, conventional TWFE estimators may yield biased results if the treatment effects vary across cohorts or over time, which is a well-known issue in staggered-adoption settings. To address this concern, the analysis complements the TWFE specification with the robust difference-in-differences estimator developed by [Roth and Sant’Anna \(2023\)](#), which corrects for negative weighting and provides unbiased estimates of average treatment effects under staggered policy implementation. In this framework, OSC establishment is treated as the treatment variable, and group–time average treatment effects are reweighted to ensure internal validity in the presence of heterogeneous adoption timing.

Furthermore, to evaluate whether the treatment timing was plausibly exogenous, we conducted additional robustness analyses. These exercises examine whether municipalities with higher pre-treatment ratios of foreign workers are systematically more likely to establish OSCs in later periods. The results show that the correlation between pre-existing foreign-worker share and subsequent OSC adoption is small and statistically insignificant. We also estimated placebo regressions using lagged treatment indicators and found no evidence of pre-trends in the key outcome variables. Finally, a shift-share instrumental-variable approach using historical foreign-worker distribution as the exposure measure yielded consistent results, reinforcing the interpretation of OSC introduction as an administratively driven, quasi-exogenous policy shock.

Collectively, these institutional features and empirical checks indicate that the variation in OSC establishment across municipalities can be interpreted as a plausibly exogenous treatment, allowing for a credible estimation of its effects on firms’ employment composition, working conditions, and productivity outcomes.

5.2 Assumption Test

A threat to our estimation results is endogeneity in the introduction of OSCs. For example, if a municipality experiencing an influx of immigrants introduces the OSCs, the results may be biased by immigrant-preference characteristics, such as the high demand for immigrant workers. If the treatment timing is not random, the result represents the violation of the assumption of [Roth and Sant’Anna \(2023\)](#) and the estimation result of staggered DiD. To examine this threat, we estimate the correlation between the long-term trend in

the influx of immigrants and the characteristics of OSCs using the following estimation equation:

Table 3 represents the OSCs characteristics of municipality: the dummy for the OSC is introduced in 2024; the year gap between the introduction and 2019; the cumulative OSCs funds in 2024; the dummy for OSC is introduced in 2019; and the administrative rank for the municipality.⁸ Represents the rate of foreign residents of the municipality and calendar year standardized by the foreign rate in 2018, and the estimated parameter can be interpreted as the long-term trend of the relationship between the situation of foreign residents and the characteristics of the OSCs. If the estimated parameters are positive or negative, the municipality's long-term situation may affect the characteristics of the OSCs. Table 3 shows the validity test.

(Table 3 around here)

The estimated parameters of the standardized immigrant rate in the estimation for the OSC introduction dummy (column 1), and the amount of funds are not significant, and parameters for the timing of the OSC introduction (column 2), the 2019 dummy, and the rank for the municipality are significant, but the signs are cyclic. Therefore, no strong positive or negative relationship between the long-term trend and the characteristics of the OSCs is observed.

5.3 Main Results

Table 4 and Figure 1 present a comparison between the conventional TWFE estimator and the staggered difference-in-differences estimator of Roth and Sant'Anna (2023) for immigrant-worker outcomes. The dependent variables are, in turn, the number of foreign employees, the number of foreign employees and the sample that does not employ foreign employees, the turnover rate of foreign workers, scheduled (regular) working hours, overtime hours, and total working hours. All specifications include establishment and year fixed effects, and standard errors are clustered at the municipality level.

The TWFE estimates are generally small and statistically insignificant across specifications, while the staggered DiD estimates reveal clearer post-treatment effects. After the establishment of an OSC, both the intensive and extensive margins of immigrant employment rise significantly, whereas separation rates, regular working hours, and overtime hours decline. These patterns indicate that the introduction of OSCs not only expands the scale of foreign employment but also stabilizes retention and reduces working hours, consistent with improved matching and workplace coordination.

(Table 4 around here)

(Figure 1 around here)

Next, we examine how OSC establishments affect Japanese employees. In the literature, the direction of spillover effects depends on whether Japanese and foreign labor are complements or substitutes. Table 5 and Figure 2 present the corresponding estimates for the Japanese employees.

(Table 5 around here)

(Figure 2 around here)

For the total working hours, the results mirror those for foreign workers. Although OSC availability generally reduces Japanese employees' working hours. Taken together, these results provide further evidence of complementarity between Japanese and foreign workers, indicating that the benefits of OSCs extend beyond foreign employees to also shape outcomes for Japanese workers. The stronger response among regular employees is consistent with the argument of [Ottaviano and Peri \(2012\)](#), who emphasize that differences in skill composition reduce substitutability between domestic and foreign workers. Regarding total working hours, the availability of an OSC alone slightly reduces the working hours of Japanese employees. Taken together, these results imply that OSCs improve employment conditions for both groups of workers and strengthen complementarities within local labor markets.

Overall, the staggered DiD results provide two central insights. First, the effectiveness of OSCs depends not only on their establishment but also on sufficient financial and administrative capacity to sustain their operation. Municipalities with larger subsidy allocations exhibited stronger positive effects, confirming that well-resourced centers are crucial for improving foreign-worker outcomes. Second, the introduction of OSCs increased both the intensive and extensive margins of foreign employment while reducing turnover and working hours, suggesting improved retention and work–life balance. Spillover effects on Japanese employees are also evident: regular and non-regular employment rose moderately, while regular working hours declined slightly. These patterns imply that OSCs do not induce substitution between foreign and Japanese labor but rather foster complementarity through better task coordination, communication, and redistribution of workloads, thereby contributing to more sustainable and inclusive workplace environments.

5.4 Demand Side Analysis

To better understand the behavior of the labor demand side through which OSCs affect firm and worker outcomes, we examine how the establishment of OSCs is affected. Specifically,

we focused on four sets of outcome variables: (i) labor skills or social assimilation of foreign workers reported by firms, (ii) hiring policy indicators reflecting firms' priorities when recruiting foreign workers, and (iii) facing challenges when they employ foreign workers.

The improvement indicators capture firms' retrospective evaluations of whether particular aspects of foreign employees' conditions, such as labor skills, productivity, legal knowledge, moral awareness, and relationships with the local community, have improved over the past fiscal year. For each item, we construct a binary variable that equals 1 if a firm reports improvement and 0 otherwise. Similarly, the deterioration indicators equal 1 if a firm reports worsening in the corresponding dimension. By examining these outcomes, we can identify whether OSCs contribute to qualitative changes in the employment environment beyond quantitative adjustments in workforce size or hours worked.

Table 3 and Figure 3, which report the staggered DiD results, provide stronger evidence of such dynamic improvements of labor indicators, and Table 3 and Figure 4 report those of cultural indicators. Across all qualitative dimensions, such as labor, skills, management, and productivity, the coefficients on the OSC dummy are generally not statistically significant. This suggests that the mere presence of an OSC does not immediately translate into measurable improvements in workplace quality or employee outcomes. When heterogeneous treatment timing is accounted for, statistically significant positive effects emerge in several domains—notably productivity, legal awareness, moral values, and relationships with the surrounding community. These effects tend to appear two to three years after the establishment of an OSC, consistent with a gradual adaptation process. The patterns imply that OSCs enhance firms' access to accurate legal and administrative information, promote compliance, and facilitate coordination among workers, firms, and local institutions. In short, OSCs reduce informational and institutional frictions that previously hindered effective labor matching and retention, leading to gradual improvements in both productivity and social cohesion.

(Table 3 around here)

(Figure 3 around here)

(Figure 3 around here)

(Figure 4 around here)

Table 8 and 9, Figure 5, and 6 present the estimation results for the deterioration indicators. These estimates indicate that establishing an OSC does not produce unintended adverse consequences, such as declines in motivation or performance. The absence of

negative effects further supports the interpretation that OSCs operate as stabilizing institutional platforms rather than sources of disruption. Likely reflects compositional adjustments in hiring rather than genuine organizational decline. Overall, these results suggest that OSCs can improve workplace stability and community relations without generating offsetting costs or negative spillovers.

(Table 9 around here)

(Table 8 around here)

(Table 9 around here)

(Figure 5 around here)

(Figure 6 around here)

Moreover, regarding the skill of the Japanese language, we had prepared more detailed questions. So, we evaluate the impact of the OSCs on the language skills of immigrant workers, and Table 10 and Figure 7 show the result. It is well known that immigrants do not transfer their productivity without the language skills of the destination country. The OSCs may introduce public language classes for immigrant workers, thereby improving their language skills. To investigate the impact, we use the question for the language skills, and the respondent answers the average language skill of their employee by four scales: 1. equivalent to natives; 2. fluent speaking; 3. speaking a little; 4. Not much speaking. We estimate the DiD strategy using an indicator variable that takes 1 when the respondent answers 1 or 2, and 0 otherwise.

Table 10 and Figure 7 show that OSC improves language skills in the short term, with an effect size of approximately 15 percentage points. The result suggests that OSCs improve the language skills of foreign workers, thereby increasing labor demand for the establishment in such a municipality.

(Table 10 around here)

(Figure 7 around here)

Table 11 and Figure 8 reveal emerging patterns once treatment heterogeneity is considered. The staggered DiD estimates indicate a gradual and statistically significant increase in firms' propensity to recruit newly graduated foreign workers and SSWs approximately three years after OSC establishment. This delayed response suggests that OSCs encourage firms to shift from short-term or transactional hiring toward more structured and skill-based employment strategies. By reducing information asymmetries and administrative burdens, OSCs enable firms to invest in human capital accumulation through on-the-job training and retention initiatives, fostering more sustainable labor integration.

(Table 11 around here)

(Figure 8 around here)

Altogether, these results underscore that OSCs primarily enhance firm outcomes through institutional and informational channels rather than through direct financial incentives. By coordinating with immigration, labor, and welfare offices, OSCs improve access to accurate guidance, compliance support, and interorganizational communication. Consequently, firms gain greater confidence in expanding and retaining their foreign workforce, while both foreign and Japanese employees benefit from improved communication, job stability, and workplace quality. These findings align closely with the main results, reinforcing the interpretation of OSCs as an institutional infrastructure that promotes both economic efficiency and social inclusion in the local labor markets.

Finally, we estimate the impact on the recruitment challenge for immigrant workers. The OSCs may address some challenges in employing immigrant workers, such as language and cultural barriers, the need for a mentoring supervisor, and the process, and thus the resolution of these difficulties may increase the number of immigrant workers. Table 12 and Figure 9 show the estimation results for the difficulty.

(Tab 12 around here)

(Figure 9 around here)

These results show no significant results of the challenge except for the difficulty of culture. Employers report cultural difficulties with a slight lag following the introduction of the OSC in the municipality, suggesting that the increase in recruitment drives changes in the composition of immigrant workers rather than that cultural difficulties affect the number of immigrant workers. The tendency is consistent with Figure 3, which shows the decline in the skill indicator.

Summing up the demand-side estimation results, these findings suggest that OSCs improve average language skills and productivity, as well as social assimilation, such as knowledge of law and morals, and communicative engagement among foreign workers. Therefore, these improvements reinforce SSW's recruitment plan and increase the employment of foreign workers. However, the increase in foreign workers also leads to the employment of low-skilled workers and workers from culturally distant backgrounds.

6 Concluding Remarks

This study provides the first nationwide, establishment-level evidence on how municipal OSCs for foreign residents influence firms' employment structures, working condi-

tions, and organizational adaptation in Japan. Using an unbalanced panel of 437 foreign-employing establishments from FY2019 to FY2023, we estimated two-way fixed-effects models with establishment and year effects and employed staggered-adoption estimators robust to heterogeneous treatment timing.

Our findings provide several insights into the literature as follows. First, the establishment of an OSC significantly increases the number of foreign employees by approximately six on average while reducing both overtime and total working hours. Second, the spillover effects on Japanese workers are positive: the number of regular employees and total working hours increase moderately, whereas separation rates remain unchanged. These results point to complementarities rather than substitution between foreign and domestic labor, consistent with theories of skill heterogeneity and task complementarity (Ottaviano and Peri 2012). OSCs thus appear to improve coordination, workplace communication, and overall efficiency across mixed workforces.

The demand side analysis, based on both survey-based qualitative indicators and staggered DiD estimates, offers further insights. The results indicate that OSCs operate primarily by reducing informational and institutional frictions—through multilingual guidance, legal mediation, and inter-agency coordination—leading to measurable improvements in productivity, legal awareness, moral values, and community relations. These positive effects emerge gradually, typically two to three years after OSC establishment, consistent with an adjustment process in which firms and workers learn to utilize the new institutional infrastructure. At the same time, no evidence of deterioration in morale or productivity was found, suggesting that OSCs improve organizational outcomes without imposing unintended costs. Moreover, firms located in municipalities with OSCs increasingly tend to hire newly graduated foreign workers and SSWs, indicating a shift toward long-term, skill-based employment strategies supported by in-house training and retention investment. Overall, these findings imply that OSCs enhance both efficiency and inclusiveness by fostering more stable, knowledge-intensive, and cooperative employment relationships.

Two limitations of this study should be acknowledged. Although the administrative approval process for OSCs offers plausibly exogenous timing, our analysis remains observational and cannot fully control for the unobserved heterogeneity in municipal governance capacity or the intensity of OSC utilization. Moreover, while we examine both the extensive and intensive margins of employment, precise causal pathways, such as changes in task allocation, technology adoption, and client composition, remain to be disentangled.

Future studies should extend this analysis in several directions. For instance, exploring industry-level heterogeneity could clarify whether OSCs' effects differ between labor-intensive manufacturing sectors and service- or communication-oriented industries. Furthermore, examining the lag structure of subsidy allocations and OSC establishment may

reveal the delayed or cumulative impacts of administrative support. Finally, distinguishing between worker nationalities and visa categories—such as technical intern trainees, SSWs, and highly skilled professionals can help identify heterogeneous policy effects across migrant groups and employment trajectories.

From a policy perspective, the results underscore the fact that OSCs generate positive and durable impacts when they are adequately funded and professionally managed. Sustained financial support, continuous staff training in multilingual mediation, and strong interdepartmental coordination are essential to realize their full potential. The observed complementarity between foreign and Japanese labor further suggests that OSCs can support Japan’s ongoing transition from a temporary, low-skilled labor system to a more sustainable model of human-capital-based integration.

In summary, when properly resourced and institutionally embedded, OSCs are more than administrative service counters. Instead, they serve as a foundational infrastructure that enhances economic efficiency, strengthens social cohesion, and promotes the creation of inclusive and cooperative labor markets in Japan.

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7 Tables and Figures

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Table 1: Variable Definitions

Variable	Definition
Industry	Industry to which the firm belongs (e.g., manufacturing, services). Used to analyze differences in acceptance of foreign workers and in consultation-desk usage across industries.
Prefecture	Respondent's prefecture. Used to control for firm characteristics in regression analyses.
Years since founding	Years since establishment. Used to examine whether use of comprehensive consultation centers varies by firm age. Categorical responses (e.g., "less than 1 year," "1 year") are converted to medians (0.5, 1, etc.).
Number of regular foreign employees (FY2019–FY2023)	Annual number of regular foreign employees (FY2019–FY2024 in the questionnaire). Categories (e.g., 1–5, 6–9) are converted to medians (e.g., 2, 7) for analysis.
Scheduled working hours of foreign employees (FY2019–FY2023)	Annual scheduled (regular) hours. Representative values (e.g., 400, 600) are assigned to categorical ranges (e.g., <500, 500–700). Used to compare working conditions by consultation-center usage.
Overtime hours of foreign employees (FY2019–FY2023)	Annual overtime hours. Representative values (e.g., 50, 150) are assigned to categorical ranges (e.g., <100, 100–200). Combined with scheduled hours to estimate total working hours and assess workload.
Turnover rate of foreign employees (FY2019–FY2023)	Annual turnover rate for foreign employees. Percentage categories (e.g., <5%, 5–10%) are converted to midpoints (e.g., 2.5%, 7.5%). Used to analyze retention by consultation-center usage.
Sales (10,000 yen units) (FY2019–FY2023)	Annual sales revenue (units of 10,000 yen). Categorical ranges (e.g., ≤5,000; >5,000–10,000) are converted to medians (e.g., 2,500; 7,500). Used as a control for firm size in regressions.
Average age of male regular Japanese employees (FY2019–FY2023)	Converted to median years (e.g., 27, 37) from categories (e.g., <35, 35–40). Used as a firm-characteristics control.
Average age of female regular Japanese employees (FY2019–FY2023)	Converted to median years from categorical ranges, analogous to the male average age.
Number of regular Japanese employees (FY2019–FY2023)	Number of regular Japanese employees. Categories (e.g., 0, 1–9) are converted to medians (e.g., 0, 5). Used to compare conditions by consultation-center usage.
Number of non-regular Japanese employees (FY2019–FY2023)	Number of non-regular Japanese employees. Categories converted to medians. Used to compare conditions by consultation-center usage.

Variable	Definition
Scheduled working hours of Japanese employees (FY2019–FY2023)	Annual scheduled (regular) hours. Representative values (e.g., 750, 800) are assigned to categorical ranges (e.g., <700, 700–899).
Overtime hours of Japanese employees (FY2019–FY2023)	Annual overtime hours. Representative values are assigned to categorical ranges, used with scheduled hours to estimate total hours and assess workload.
Turnover rate of Japanese employees (FY2019–FY2023)	Annual turnover rate for Japanese employees. Percentage categories converted to midpoints (e.g., 2.5%, 7.5%).
Comprehensive consultation center dummy (FY2019–FY2024)	Equals 1 if a foreign-resident one-stop consultation center exists in the firm’s municipality, 0 otherwise. Used as a proxy for potential access to the center.
High-subsidy region dummy (FY2019–FY2024)	For municipalities hosting the relevant comprehensive consultation center, equals 1 if the cumulative Foreign Resident Environment Improvement Subsidy amount (FY2019–FY2023) is at or above the sample median; 0 otherwise.
Improvement indicator: Labor (FY2019–FY2024)	Equals 1 if any of the following improved: (1) foreign workers’ technical skills, (2) management skills, or (3) productivity; 0 otherwise.
Improvement indicator: Skills (FY2019–FY2024)	Equals 1 if “foreign workers’ technical skills improved”; 0 otherwise.
Improvement indicator: Management (FY2019–FY2024)	Equals 1 if “foreign workers’ management skills improved”; 0 otherwise.
Improvement indicator: Productivity (FY2019–FY2024)	Equals 1 if “foreign workers’ productivity improved”; 0 otherwise.
Improvement indicator: Culture (FY2019–FY2024)	Equals 1 if any of the following improved: (1) Japanese-language ability, (2) legal knowledge, (3) moral values, (4) close relationships with Japanese coworkers, or (5) interaction with the local community.
Improvement indicator: Japanese language (FY2019–FY2024)	Equals 1 if “foreign workers’ Japanese-language ability improved”; 0 otherwise.
Improvement indicator: Legal (FY2019–FY2024)	Equals 1 if “foreign workers’ knowledge of laws and regulations improved”; 0 otherwise.
Improvement indicator: Norms (FY2019–FY2024)	Equals 1 if “foreign workers’ moral values improved”; 0 otherwise.
Improvement indicator: Relationships (FY2019–FY2024)	Equals 1 if “close relationships with Japanese coworkers improved”; 0 otherwise.

Variable	Definition
Improvement indicator: Community ties (FY2019–FY2024)	Equals 1 if “interaction with the local community improved”; 0 otherwise.
Deterioration indicator: Labor (FY2019–FY2024)	Equals 1 if any of the following deteriorated: (1) foreign workers’ technical skills, (2) management skills, or (3) productivity; 0 otherwise.
Deterioration indicator: Skills (FY2019–FY2024)	Equals 1 if “foreign workers’ technical skills deteriorated”; 0 otherwise.
Deterioration indicator: Management (FY2019–FY2024)	Equals 1 if “foreign workers’ management skills deteriorated”; 0 otherwise.
Deterioration indicator: Productivity (FY2019–FY2024)	Equals 1 if “foreign workers’ productivity deteriorated”; 0 otherwise.
Deterioration indicator: Culture (FY2019–FY2024)	Equals 1 if any of the following deteriorated: (1) Japanese-language ability, (2) legal knowledge, (3) moral values, (4) close relationships with Japanese coworkers, or (5) interaction with the local community.
Deterioration indicator: Japanese language (FY2019–FY2024)	Equals 1 if “foreign workers’ Japanese-language ability deteriorated”; 0 otherwise.
Deterioration indicator: Legal (FY2019–FY2024)	Equals 1 if “foreign workers’ knowledge of laws and regulations deteriorated”; 0 otherwise.
Deterioration indicator: Norms (FY2019–FY2024)	Equals 1 if “foreign workers’ moral values deteriorated”; 0 otherwise.
Deterioration indicator: Relationships (FY2019–FY2024)	Equals 1 if “close relationships with Japanese coworkers deteriorated”; 0 otherwise.
Deterioration indicator: Community ties (FY2019–FY2024)	Equals 1 if “interaction with the local community deteriorated”; 0 otherwise.
Hiring policy: Japanese proficiency (FY2019–FY2024)	Equals 1 if the firm would hire foreign workers provided they meet the required level of Japanese proficiency; 0 otherwise.
Hiring policy: Technical skills (FY2019–FY2024)	Equals 1 if the firm would hire provided they meet the required technical skill level; 0 otherwise.
Hiring policy: Overseas business alignment (FY2019–FY2024)	Equals 1 if the firm would hire when aligned with countries/regions of its overseas operations; 0 otherwise.

Table 2: Descriptive Statistics

	N	Mean	SD	Median	Min	Max
The number of immigrant workers	1702	10.2474	20.4477	2.0000	2.0000	110.0000
The separate rate of immigrant workers	1576	6.3008	7.3472	2.5000	2.5000	35.0000
The regular working hours of immigrant workers	1409	719.8013	238.3545	800.0000	400.0000	1100.0000
The non-regular working hours of immigrant workers	1422	129.6062	111.0648	50.0000	50.0000	450.0000
The total working hours of immigrant workers	1391	848.6700	304.0968	850.0000	450.0000	1550.0000
The number of regular japanese workers	1702	5.3884	3.2092	5.0000	1.0000	11.0000
The number of non-regular japanese workers	1702	4.2056	3.0958	3.0000	1.0000	11.0000
The separate rate of regular japanese workers	1520	7.8914	7.8589	7.5000	2.5000	35.0000
The regular working hours of japanese workers	1395	1198.2437	686.4743	950.0000	650.0000	3000.0000
The non-regular working hours of japanese workers	1429	157.7677	124.3577	150.0000	50.0000	450.0000
The total working hours of japanese workers	1367	1352.0117	748.0071	1100.0000	700.0000	3450.0000
The dummy of the One-stop center	1702	0.5505	0.4976	1.0000	0.0000	1.0000
The dummy of high funds	1702	0.3584	0.4797	0.0000	0.0000	1.0000

Variable	Definition
Hiring policy: Few Japanese applicants (FY2019–FY2024)	Equals 1 if the firm would hire when there are no (or few) Japanese applicants; 0 otherwise.

Table 3: The validity test for the OSC introduction

	The dummy for the OSC is introduced	The timing of the OSC introduce	The amount of fund for the OSC in 2023	The dummy for the OSC is introduced in 2019
Constant	0.789*** (0.117)	0.592 (1.316)	-14.786 (86.504)	0.651 (0.645)
The standarized immigrant rate in 2013	-0.594 (0.611)	2.351 (2.423)	11.555 (159.346)	-1.494 (1.187)
The standarized immigrant rate in 2014	1.212 (1.250)	-6.940+ (3.928)	266.917 (258.628)	4.206* (1.925)
The standarized immigrant rate in 2015	-0.387 (1.335)	6.130+ (3.520)	-201.404 (231.751)	-3.128+ (1.725)
The standarized immigrant rate in 2016	0.771 (1.078)	-7.959** (2.902)	-9.189 (190.122)	2.885* (1.422)
The standarized immigrant rate in 2017	-1.093 (0.849)	5.636+ (2.890)	29.578 (189.148)	-2.064 (1.416)
Num.Obs.	255	156	154	156
R2	0.021	0.146	0.060	0.125
R2 Adj.	0.001	0.117	0.029	0.095
RMSE	0.48	0.70	45.80	0.34

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001

Table 4: Estimated results for immigrant workers

	Number		Number(Extensive margin)		Separate rate		Regular working hours		Extra working hours		Total working hours	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	-0.468 (3.661)		1.667 (2.578)		0.030 (1.956)		-47.538 (36.679)		-36.590* (16.531)		-88.678+ (45.268)	
$t - G = -4$	-1.472 (2.340)	0.124 (0.290)	0.330 (1.293)	0.350+ (0.186)	1.028 (1.280)	0.047 (0.094)	-21.387 (33.858)	-0.684 (3.466)	-4.894 (10.944)	0.561 (1.656)	-27.949 (38.742)	0.211 (3.604)
$t - G = -3$	1.520 (1.977)	0.194 (0.234)	1.444 (1.737)	0.402* (0.189)	0.206 (1.309)	0.251** (0.085)	-4.471 (18.939)	-2.782 (3.948)	-9.314 (9.939)	-0.117 (1.671)	-15.134 (22.022)	-2.872 (4.564)
$t - G = -2$	-1.648 (1.131)	0.113 (0.203)	-0.746 (0.610)	0.297* (0.129)	-0.210 (0.787)	0.100 (0.065)	22.197 (28.164)	3.908 (4.612)	-22.912 (19.562)	2.072 (1.409)	-11.267 (24.552)	4.752 (5.405)
$t - G = 0$	-1.782 (1.324)	3.946+ (2.328)	-0.915 (0.766)	2.602* (1.278)	0.130 (0.527)	-0.975 (0.697)	-7.268 (27.212)	-38.935 (30.125)	-1.294 (4.790)	-26.975+ (14.253)	-9.372 (31.402)	-68.149+ (39.896)
$t - G = 1$	-0.348 (1.376)	5.481* (2.438)	-0.027 (0.781)	3.546** (1.358)	-0.173 (0.564)	-1.101 (0.763)	11.328 (25.526)	-34.990 (32.267)	2.617 (5.298)	-26.252+ (15.169)	13.251 (29.029)	-65.509 (42.759)
$t - G = 2$	-0.796 (1.576)	4.601+ (2.618)	-0.335 (0.872)	3.347* (1.406)	-0.212 (0.866)	-1.005 (0.792)	14.979 (23.917)	-31.130 (31.932)	9.821 (6.789)	-19.109 (15.111)	24.316 (28.241)	-52.852 (42.193)
$t - G = 3$	-0.852 (1.629)	4.461 (2.821)	-0.388 (0.948)	3.310* (1.544)	-0.275 (0.861)	-0.828 (0.711)	11.637 (26.005)	-23.105 (32.802)	10.444 (7.618)	-24.720 (15.818)	21.301 (30.568)	-48.492 (42.495)
$t - G = 4$	0.938 (1.650)	7.800** (2.670)	0.715 (0.974)	5.122*** (1.504)	-0.513 (0.869)	-1.189 (0.847)	10.086 (24.074)	-42.311 (32.941)	8.833 (8.245)	-29.334+ (16.763)	18.648 (28.305)	-77.548+ (43.804)
$t - G = 5$	-0.254 (1.800)	6.869* (2.855)	-0.259 (1.067)	4.410** (1.654)	0.020 (0.895)	-0.782 (0.870)	8.319 (30.690)	-33.940 (36.578)	5.085 (9.412)	-24.760 (18.501)	12.835 (36.247)	-60.127 (48.213)

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 5: Estimated results for japanese workers

	Number		Number(Non-regular)		Separate rate		Regular working hours		Extra working hours		Total working hours	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	0.798 (0.736)		-0.240 (0.271)		-2.812 (2.015)		-98.177+ (59.401)		-11.825 (19.472)		-122.528+ (69.189)	
$t - G = -4$	0.323 (0.442)	0.107*** (0.025)	-0.044 (0.214)	0.070* (0.031)	-0.227 (1.064)	0.011 (0.072)	-10.643 (59.864)	-12.687* (5.351)	17.478 (30.369)	-1.339 (0.869)	8.340 (89.282)	-9.393+ (5.188)
$t - G = -3$	-0.140 (0.244)	0.076** (0.030)	-0.109 (0.185)	0.063+ (0.033)	0.710 (1.664)	-0.078 (0.071)	-33.611 (71.678)	-20.210*** (6.076)	-21.760+ (12.193)	-3.421** (1.239)	-63.787 (87.063)	-19.945** (6.266)
$t - G = -2$	0.005 (0.231)	0.075* (0.038)	-0.281 (0.250)	0.015 (0.033)	-1.056+ (0.566)	-0.073 (0.068)	95.638 (141.323)	-1.393 (12.338)	-19.966+ (10.524)	-0.104 (1.642)	79.976 (148.752)	0.246 (13.968)
$t - G = 0$	-0.404+ (0.209)	0.781* (0.356)	-0.198 (0.194)	0.730* (0.347)	-0.909 (0.876)	-0.666 (0.844)	-73.928 (49.956)	-221.509* (98.568)	-19.527* (9.865)	-6.004 (15.889)	-94.854+ (55.637)	-230.822* (106.793)
$t - G = 1$	-0.368+ (0.223)	0.827* (0.371)	-0.275 (0.229)	0.585 (0.357)	-0.793 (0.981)	0.291 (0.960)	-23.714 (44.752)	-162.432+ (98.713)	-5.820 (10.053)	4.432 (16.782)	-30.365 (50.554)	-157.678 (106.131)
$t - G = 2$	-0.330 (0.238)	0.972** (0.371)	-0.237 (0.246)	0.654+ (0.378)	-0.564 (0.968)	0.512 (0.925)	-17.542 (46.889)	-168.942+ (96.508)	-9.332 (11.205)	-1.162 (16.681)	-28.733 (53.220)	-171.466 (104.580)
$t - G = 3$	-0.312 (0.248)	0.939* (0.376)	-0.302 (0.256)	0.758* (0.380)	-0.824 (1.038)	-0.097 (0.960)	-38.981 (54.941)	-186.429+ (104.679)	-2.030 (11.797)	2.482 (17.750)	-42.726 (62.518)	-186.182 (114.510)
$t - G = 4$	-0.272 (0.258)	1.133** (0.394)	-0.298 (0.265)	0.936* (0.394)	-0.980 (1.074)	-1.021 (0.984)	-60.156 (62.218)	-195.421+ (103.762)	-8.203 (12.486)	-11.744 (18.467)	-63.897 (69.334)	-198.966+ (113.283)
$t - G = 5$	-0.179 (0.238)	1.436*** (0.422)	-0.176 (0.247)	0.998* (0.425)	-0.634 (1.150)	-1.060 (1.026)	-84.280 (69.767)	-270.902* (119.333)	-7.521 (13.554)	-20.490 (21.017)	-85.259 (77.776)	-273.303* (128.574)

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 6: Estimated results for improve indicator of labor

	Labor		Skill		Manegement		Productivity	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	-0.228*		-0.152		-0.268*		0.018	
	(0.108)		(0.124)		(0.130)		(0.027)	
$t - G = -4$	-0.152+	-0.003	-0.106	0.003	-0.249*	-0.010***	0.038+	0.001*
	(0.091)	(0.008)	(0.105)	(0.006)	(0.113)	(0.002)	(0.021)	(0.001)
$t - G = -3$	-0.118	-0.003	-0.103	-0.002	-0.204	-0.006	0.018	0.001
	(0.104)	(0.007)	(0.080)	(0.006)	(0.125)	(0.006)	(0.014)	(0.001)
$t - G = -2$	0.027	-0.009	-0.042	-0.011+	-0.022	-0.005	0.019+	0.001*
	(0.054)	(0.007)	(0.059)	(0.006)	(0.070)	(0.007)	(0.010)	(0.001)
$t - G = 0$	-0.045	-0.051	-0.016	0.006	-0.034	-0.017	-0.038***	0.073**
	(0.078)	(0.057)	(0.081)	(0.056)	(0.061)	(0.049)	(0.011)	(0.024)
$t - G = 1$	-0.008	-0.008	0.006	0.011	-0.053	-0.037	-0.002	0.112***
	(0.082)	(0.061)	(0.077)	(0.056)	(0.062)	(0.051)	(0.018)	(0.026)
$t - G = 2$	-0.021	-0.056	-0.029	-0.019	-0.004	-0.014	-0.016	0.070*
	(0.086)	(0.061)	(0.080)	(0.058)	(0.074)	(0.049)	(0.025)	(0.031)
$t - G = 3$	0.047	0.001	0.005	-0.001	-0.005	-0.025	-0.001	0.091**
	(0.087)	(0.063)	(0.085)	(0.060)	(0.067)	(0.049)	(0.027)	(0.033)
$t - G = 4$	0.066	0.057	0.011	0.006	-0.031	-0.017	-0.030	0.063
	(0.090)	(0.065)	(0.089)	(0.063)	(0.066)	(0.051)	(0.034)	(0.041)
$t - G = 5$	0.011	0.048	0.011	0.040	-0.046	-0.008	-0.029	-0.009
	(0.095)	(0.067)	(0.088)	(0.065)	(0.082)	(0.055)	(0.040)	(0.049)

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Estimated results for improved indicator of culture

	Culture		Language		Law		Moral		Relationship		Neighborhood	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	-0.006 (0.130)		0.194 (0.127)		-0.005 (0.163)		-0.146 (0.128)		-0.184 (0.134)		-0.052 (0.098)	
$t - G = -4$	0.109** (0.042)	0.010 (0.007)	0.172 (0.109)	0.008 (0.006)	0.010 (0.135)	-0.002 (0.006)	0.088 (0.070)	0.017** (0.005)	-0.045 (0.066)	-0.002 (0.006)	-0.043 (0.087)	-0.003*** (0.001)
$t - G = -3$	0.175+ (0.089)	0.010 (0.006)	0.138 (0.095)	0.002 (0.006)	-0.044 (0.056)	0.013*** (0.002)	0.043 (0.042)	0.016*** (0.002)	0.057 (0.038)	0.007 (0.005)	-0.105 (0.086)	-0.004*** (0.001)
$t - G = -2$	0.069+ (0.039)	-0.004 (0.006)	0.010 (0.035)	-0.006 (0.006)	0.017 (0.081)	0.013* (0.006)	0.140+ (0.074)	0.015** (0.005)	-0.014 (0.049)	-0.004 (0.006)	-0.046 (0.057)	-0.008*** (0.002)
$t - G = 0$	0.068 (0.048)	0.055 (0.056)	0.015 (0.044)	0.053 (0.054)	0.063 (0.057)	0.074 (0.045)	0.086+ (0.048)	0.054 (0.046)	-0.014 (0.039)	-0.007 (0.043)	0.000 (0.031)	0.002 (0.029)
$t - G = 1$	0.076 (0.059)	0.052 (0.059)	0.028 (0.055)	0.079 (0.056)	0.081 (0.057)	0.057 (0.048)	0.060 (0.049)	0.024 (0.046)	0.011 (0.048)	0.019 (0.046)	0.014 (0.046)	0.087** (0.027)
$t - G = 2$	0.080 (0.060)	0.059 (0.061)	-0.026 (0.054)	0.017 (0.059)	0.104+ (0.059)	0.066 (0.047)	0.110+ (0.057)	0.070 (0.051)	0.012 (0.047)	0.001 (0.048)	0.040 (0.052)	0.120*** (0.032)
$t - G = 3$	0.041 (0.056)	0.005 (0.061)	-0.018 (0.057)	0.030 (0.060)	0.093 (0.063)	0.169*** (0.048)	0.069 (0.056)	0.153*** (0.045)	0.023 (0.048)	0.016 (0.049)	0.016 (0.049)	0.062+ (0.038)
$t - G = 4$	0.031 (0.065)	-0.048 (0.063)	-0.066 (0.060)	-0.070 (0.062)	0.080 (0.068)	0.158*** (0.046)	0.086 (0.058)	0.103+ (0.054)	0.017 (0.050)	-0.022 (0.053)	0.007 (0.047)	0.061 (0.043)
$t - G = 5$	0.060 (0.068)	-0.014 (0.067)	-0.045 (0.067)	-0.003 (0.065)	0.100 (0.068)	0.014 (0.059)	0.076 (0.064)	0.011 (0.058)	0.012 (0.056)	-0.038 (0.056)	0.011 (0.056)	-0.003 (0.052)

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Estimated results for deteriorated indicator of labor

	Labor		Skill		Manegement		Productivity	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	0.192 (0.144)		0.019 (0.020)		0.203 (0.133)		-0.027 (0.054)	
$t - G = -4$	0.257* (0.125)	0.013 (0.009)	0.009 (0.012)	0.000 (0.000)	0.172+ (0.102)	0.012* (0.006)	0.086 (0.088)	0.003 (0.006)
$t - G = -3$	0.285* (0.131)	0.012 (0.009)	0.012 (0.011)	0.000 (0.000)	0.191 (0.116)	0.011+ (0.006)	0.088 (0.083)	0.003 (0.006)
$t - G = -2$	0.079 (0.074)	0.003 (0.006)	0.005 (0.009)	0.000 (0.000)	0.014 (0.028)	0.003*** (0.000)	0.064 (0.071)	0.002 (0.006)
$t - G = 0$	0.076 (0.070)	0.010 (0.042)	0.008 (0.019)	0.038* (0.016)	0.010 (0.038)	-0.041 (0.029)	0.047 (0.067)	0.025 (0.030)
$t - G = 1$	0.091 (0.068)	0.012 (0.041)	-0.005 (0.017)	0.026+ (0.014)	0.051 (0.037)	0.074** (0.023)	0.049 (0.063)	0.007 (0.033)
$t - G = 2$	0.094 (0.076)	0.024 (0.046)	0.008 (0.021)	0.018 (0.016)	0.022 (0.043)	0.040 (0.028)	0.053 (0.067)	0.042 (0.030)
$t - G = 3$	0.096 (0.077)	0.031 (0.045)	0.018 (0.028)	0.033+ (0.018)	0.025 (0.042)	0.039 (0.029)	0.054 (0.067)	0.036 (0.029)
$t - G = 4$	0.094 (0.083)	-0.001 (0.049)	-0.006 (0.025)	0.014 (0.017)	0.017 (0.042)	-0.007 (0.034)	0.065 (0.073)	0.026 (0.033)
$t - G = 5$	0.075 (0.081)	-0.020 (0.049)	-0.030 (0.031)	-0.032 (0.031)	0.021 (0.048)	-0.062 (0.038)	0.056 (0.073)	0.044 (0.029)

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: Estimated results for deteriorated indicator of culture

	Culture		Language		Law		Moral		Relationship		Neighborhood	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	-0.167 (0.129)		-0.015 (0.072)		-0.158 (0.124)		-0.046 (0.039)		0.091 (0.091)		-0.066 (0.041)	
$t - G = -4$	-0.132 (0.109)	-0.008 (0.006)	-0.017 (0.069)	-0.002*** (0.001)	-0.010 (0.026)	0.001 (0.004)	-0.052 (0.037)	-0.004*** (0.001)	0.025 (0.098)	-0.004*** (0.001)	-0.106 (0.067)	-0.004*** (0.001)
$t - G = -3$	-0.076 (0.088)	-0.007 (0.007)	-0.053 (0.096)	-0.003*** (0.001)	0.003 (0.027)	0.000 (0.004)	-0.081* (0.038)	-0.007*** (0.001)	0.076 (0.070)	0.001 (0.006)	-0.077 (0.063)	-0.005*** (0.001)
$t - G = -2$	0.011 (0.039)	-0.009 (0.006)	0.047 (0.088)	0.002 (0.006)	0.059 (0.062)	-0.001 (0.004)	-0.081* (0.041)	-0.008*** (0.002)	-0.045 (0.050)	-0.007*** (0.002)	-0.015 (0.039)	-0.003 (0.004)
$t - G = 0$	0.038 (0.066)	-0.085 (0.052)	0.056 (0.058)	-0.001 (0.028)	-0.011 (0.027)	0.005 (0.028)	-0.041 (0.054)	-0.042 (0.033)	0.063 (0.068)	-0.008 (0.028)	-0.027 (0.051)	-0.036 (0.030)
$t - G = 1$	0.037 (0.073)	-0.073 (0.056)	0.032 (0.064)	0.000 (0.025)	-0.007 (0.032)	-0.003 (0.027)	-0.054 (0.061)	-0.043 (0.033)	0.058 (0.078)	-0.042 (0.034)	-0.033 (0.066)	-0.016 (0.032)
$t - G = 2$	0.050 (0.074)	-0.085 (0.055)	0.032 (0.067)	0.007 (0.025)	-0.042 (0.044)	-0.029 (0.032)	-0.061 (0.064)	-0.082* (0.038)	0.053 (0.076)	-0.033 (0.033)	0.015 (0.068)	0.004 (0.035)
$t - G = 3$	0.084 (0.077)	-0.056 (0.059)	0.044 (0.065)	0.015 (0.029)	-0.005 (0.045)	0.015 (0.033)	-0.038 (0.060)	-0.027 (0.033)	0.065 (0.079)	-0.033 (0.038)	0.008 (0.068)	-0.025 (0.035)
$t - G = 4$	0.103 (0.079)	-0.019 (0.057)	0.061 (0.068)	0.009 (0.034)	-0.046 (0.042)	-0.035 (0.031)	-0.001 (0.061)	0.030 (0.035)	0.089 (0.078)	0.029 (0.033)	0.016 (0.067)	0.014 (0.031)
$t - G = 5$	0.059 (0.079)	-0.059 (0.061)	0.051 (0.069)	0.007 (0.032)	-0.037 (0.048)	-0.022 (0.034)	-0.023 (0.071)	-0.013 (0.042)	0.048 (0.079)	-0.025 (0.031)	0.018 (0.066)	0.003 (0.034)

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 10: Estimated results for language skills

	Language Skill	
	TWFE	RS
$t - G = -5$	0.000 (0.000)	
$t - G = -4$	0.000 (0.000)	0.004 (0.006)
$t - G = -3$	0.000 (0.000)	-0.004 (0.006)
$t - G = -2$	0.000 (0.000)	-0.006 (0.006)
$t - G = 0$	0.000 (0.000)	0.127* (0.053)
$t - G = 1$	0.000 (0.000)	0.153** (0.054)
$t - G = 2$	0.000 (0.000)	0.143** (0.055)
$t - G = 3$	0.000 (0.000)	0.121* (0.056)
$t - G = 4$	0.000 (0.000)	0.101+ (0.059)
$t - G = 5$	0.000 (0.000)	0.098 (0.064)

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11: Estimated results for recruit plan

	Language		Skill		Scarcity		Occupation		SSW		Tenure		New entrance	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)	
$t - G = -4$	0.000 (0.000)	-0.005 (0.007)	0.000 (0.000)	-0.003 (0.006)	0.000 (0.000)	-0.004*** (0.001)	0.000 (0.000)	-0.008*** (0.001)	0.000 (0.000)	-0.005*** (0.001)	0.000 (0.000)	0.004 (0.006)	0.000 (0.000)	-0.001* (0.000)
$t - G = -3$	0.000 (0.000)	-0.006 (0.007)	0.000 (0.000)	-0.010+ (0.006)	0.000 (0.000)	-0.005*** (0.001)	0.000 (0.000)	-0.002 (0.005)	0.000 (0.000)	-0.006*** (0.002)	0.000 (0.000)	0.001 (0.006)	0.000 (0.000)	-0.001* (0.001)
$t - G = -2$	0.000 (0.000)	-0.002 (0.007)	0.000 (0.000)	0.002 (0.006)	0.000 (0.000)	-0.007*** (0.002)	0.000 (0.000)	-0.007 (0.005)	0.000 (0.000)	0.005*** (0.000)	0.000 (0.000)	0.002 (0.005)	0.000 (0.000)	-0.002* (0.001)
$t - G = 0$	0.000 (0.000)	0.059 (0.054)	0.000 (0.000)	0.032 (0.055)	0.000 (0.000)	0.000 (0.032)	0.000 (0.000)	0.028 (0.046)	0.000 (0.000)	0.022 (0.036)	0.000 (0.000)	0.019 (0.046)	0.000 (0.000)	0.083** (0.027)
$t - G = 1$	0.000 (0.000)	0.064 (0.057)	0.000 (0.000)	0.021 (0.057)	0.000 (0.000)	0.008 (0.032)	0.000 (0.000)	0.035 (0.047)	0.000 (0.000)	0.009 (0.039)	0.000 (0.000)	0.022 (0.048)	0.000 (0.000)	0.089** (0.028)
$t - G = 2$	0.000 (0.000)	0.068 (0.058)	0.000 (0.000)	0.040 (0.057)	0.000 (0.000)	0.004 (0.033)	0.000 (0.000)	0.027 (0.049)	0.000 (0.000)	0.016 (0.038)	0.000 (0.000)	0.024 (0.048)	0.000 (0.000)	0.089** (0.028)
$t - G = 3$	0.000 (0.000)	0.063 (0.058)	0.000 (0.000)	0.018 (0.059)	0.000 (0.000)	0.003 (0.034)	0.000 (0.000)	0.035 (0.048)	0.000 (0.000)	0.011 (0.040)	0.000 (0.000)	0.017 (0.049)	0.000 (0.000)	0.090** (0.029)
$t - G = 4$	0.000 (0.000)	0.067 (0.060)	0.000 (0.000)	0.039 (0.062)	0.000 (0.000)	0.002 (0.036)	0.000 (0.000)	0.028 (0.051)	0.000 (0.000)	0.128*** (0.027)	0.000 (0.000)	0.015 (0.052)	0.000 (0.000)	0.093** (0.030)
$t - G = 5$	0.000 (0.000)	0.059 (0.064)	0.000 (0.000)	0.012 (0.067)	0.000 (0.000)	0.002 (0.039)	0.000 (0.000)	0.024 (0.055)	0.000 (0.000)	0.000 (0.046)	0.000 (0.000)	0.024 (0.055)	0.000 (0.000)	0.097** (0.031)

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 12: Estimated results for the challenge of immigrant recruitment

	Language		Culture		Mentor		Procedure	
	TWFE	RS	TWFE	RS	TWFE	RS	TWFE	RS
$t - G = -5$	-0.064 (0.054)		-0.016 (0.050)		0.079 (0.088)		0.014 (0.030)	
$t - G = -4$	-0.053 (0.048)	-0.014* (0.005)	0.081 (0.092)	0.008 (0.006)	-0.077 (0.091)	0.004 (0.005)	0.004 (0.027)	0.004 (0.006)
$t - G = -3$	-0.036 (0.043)	-0.014* (0.006)	0.089 (0.103)	0.018* (0.008)	-0.076 (0.091)	-0.012*** (0.002)	-0.031 (0.055)	0.002 (0.006)
$t - G = -2$	-0.003 (0.042)	-0.014* (0.005)	0.041 (0.092)	0.003 (0.005)	-0.009 (0.083)	0.001 (0.007)	-0.014 (0.020)	0.002 (0.005)
$t - G = 0$	-0.107+ (0.059)	-0.045 (0.056)	0.077 (0.055)	0.055 (0.052)	0.044 (0.041)	0.012 (0.047)	-0.001 (0.025)	0.014 (0.047)
$t - G = 1$	-0.099 (0.064)	-0.009 (0.058)	0.062 (0.069)	0.029 (0.057)	0.083 (0.051)	0.030 (0.045)	-0.003 (0.031)	0.028 (0.050)
$t - G = 2$	-0.091 (0.067)	-0.006 (0.059)	0.102 (0.067)	0.076 (0.057)	0.046 (0.056)	-0.010 (0.049)	-0.011 (0.039)	0.024 (0.049)
$t - G = 3$	-0.069 (0.062)	-0.004 (0.058)	0.017 (0.069)	0.001 (0.058)	0.085 (0.061)	0.027 (0.052)	-0.068 (0.043)	-0.049 (0.054)
$t - G = 4$	-0.092 (0.070)	-0.002 (0.060)	0.050 (0.073)	0.214*** (0.051)	0.067 (0.064)	0.001 (0.052)	-0.038 (0.046)	-0.048 (0.057)
$t - G = 5$	-0.065 (0.071)	0.013 (0.063)	0.087 (0.076)	0.083 (0.062)	0.063 (0.063)	-0.021 (0.057)	-0.026 (0.049)	-0.047 (0.059)

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

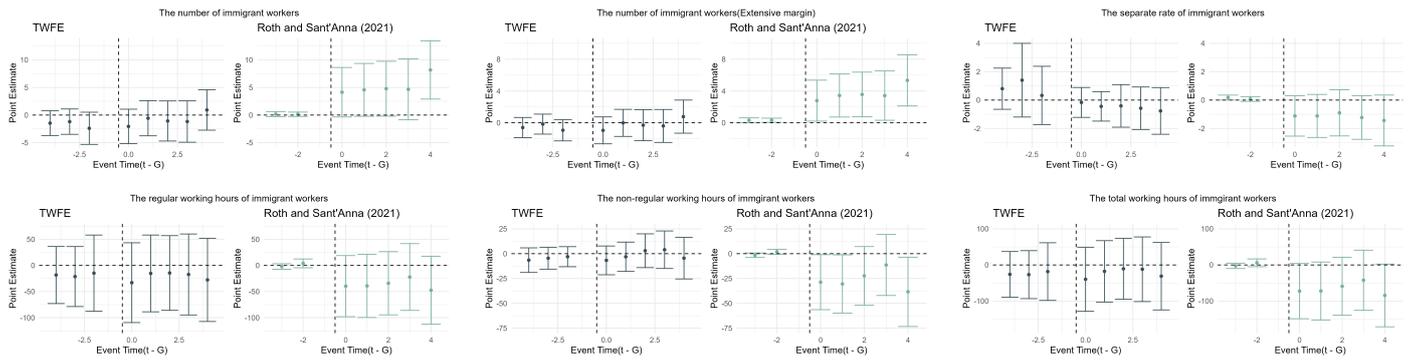


Figure 1: Staggered DiD estimation results for Immigrant workers

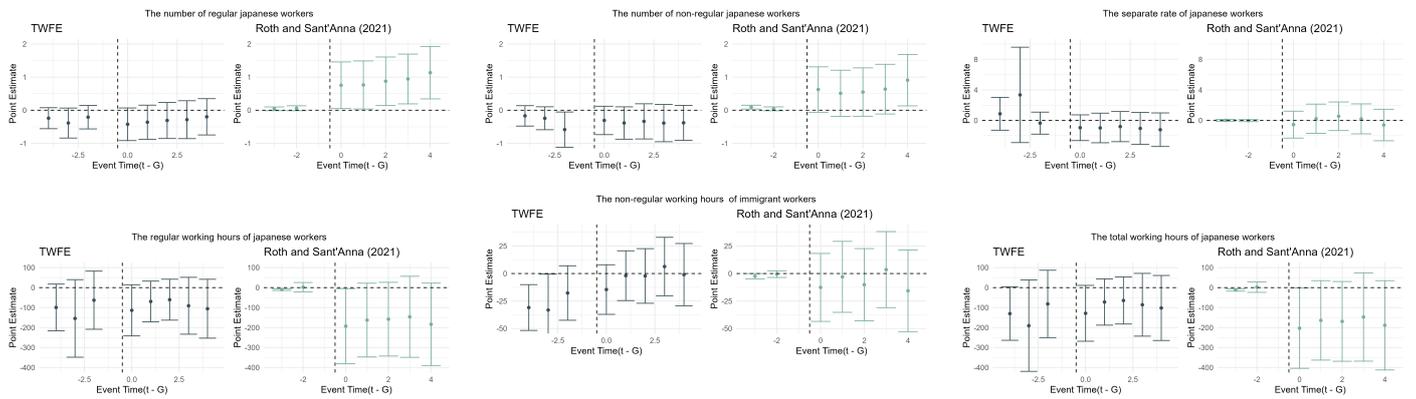


Figure 2: Staggered DiD estimation results for Japanese workers

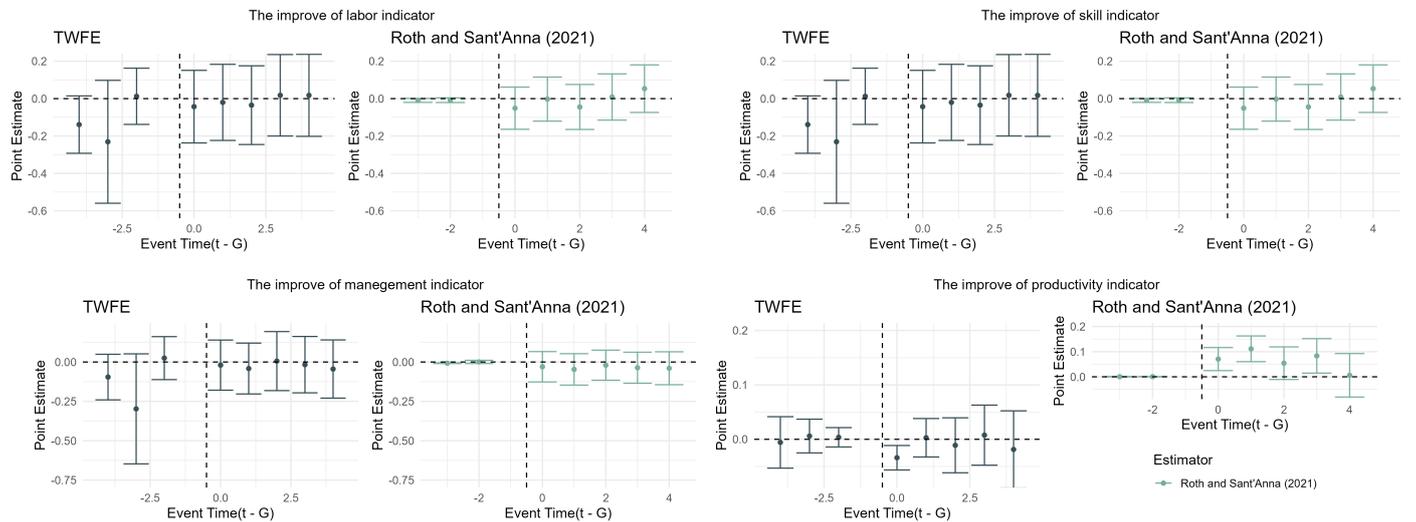


Figure 3: Staggered DiD estimation results for improved indicator of labor

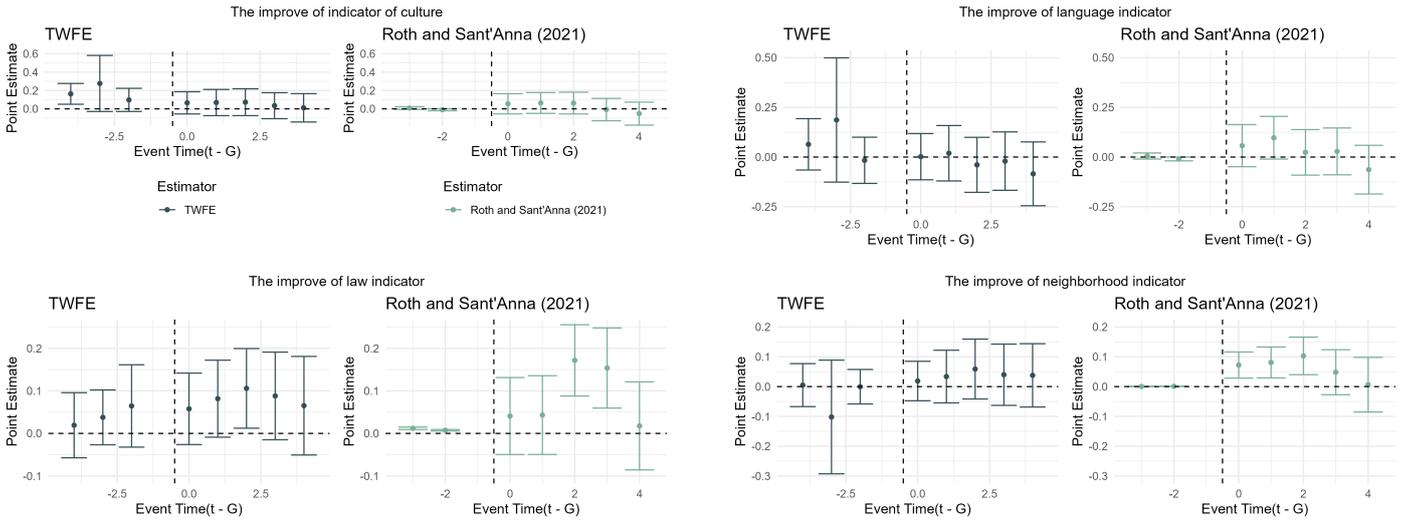


Figure 4: Staggered DiD estimation results for improved indicator of culture

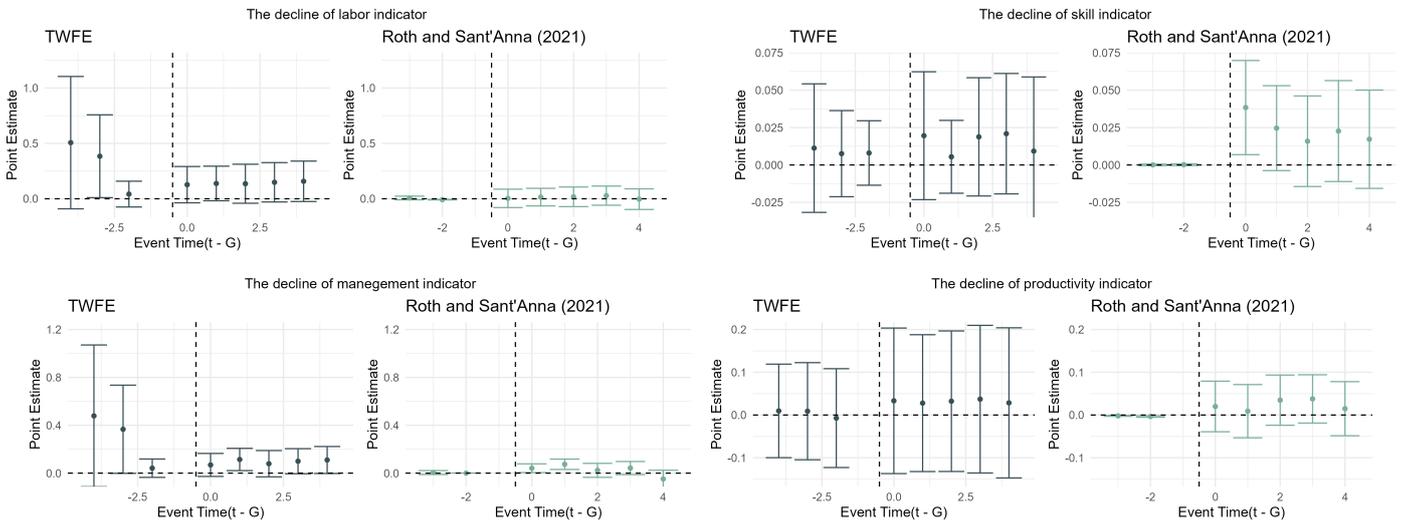


Figure 5: Staggered DiD estimation results for deteriorated indicator of labor

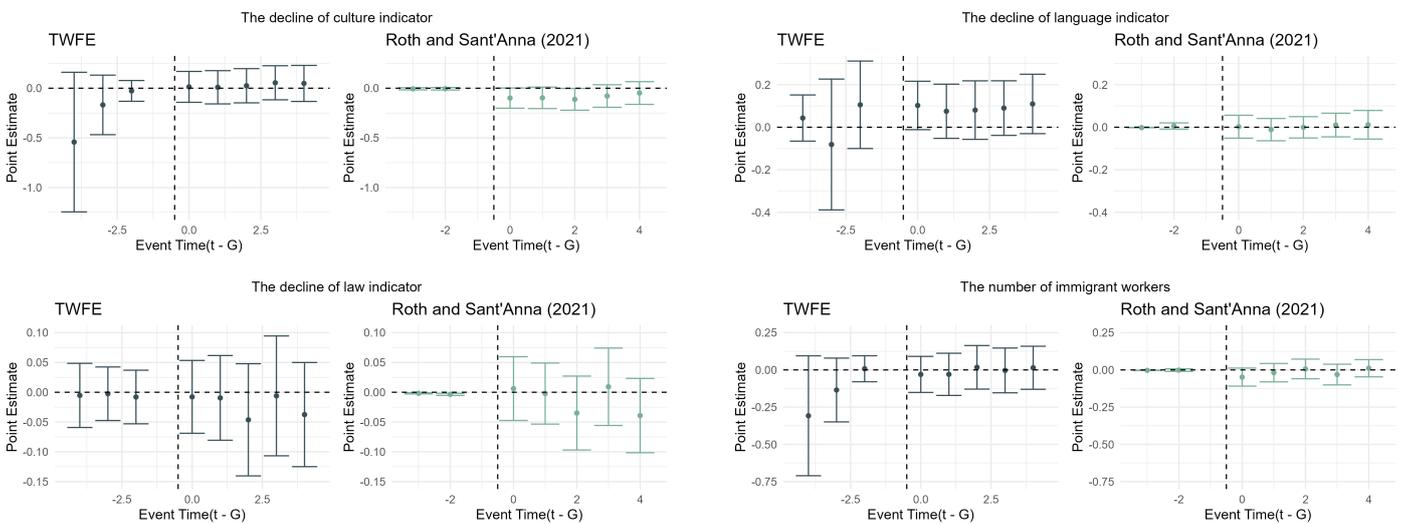


Figure 6: Staggered DiD estimation results for deteriorated indicator of culture

The language skill of immigrant workers

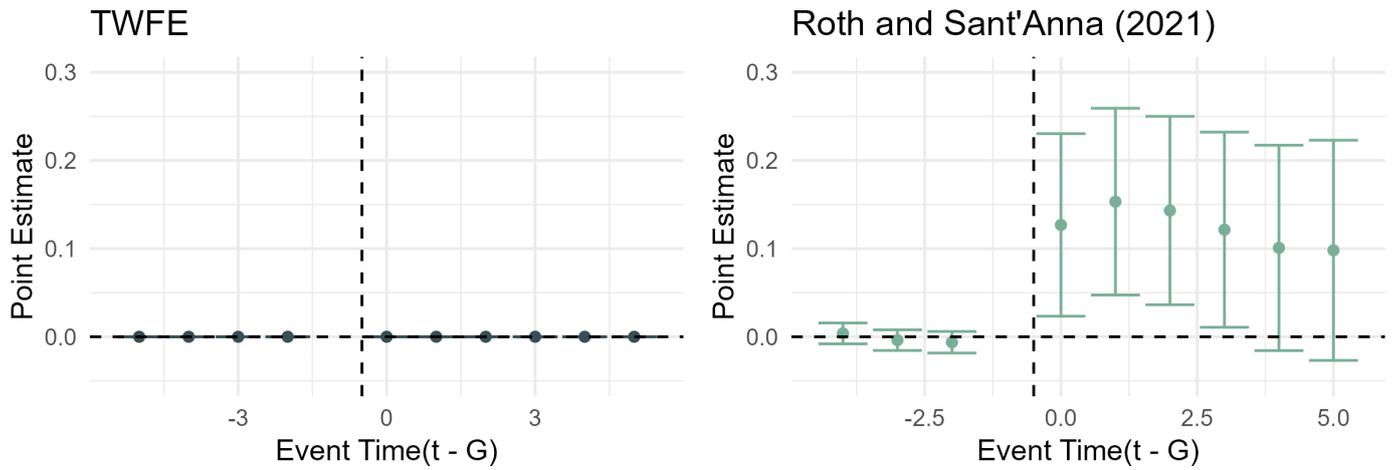


Figure 7: Staggered DiD estimation results for language skills

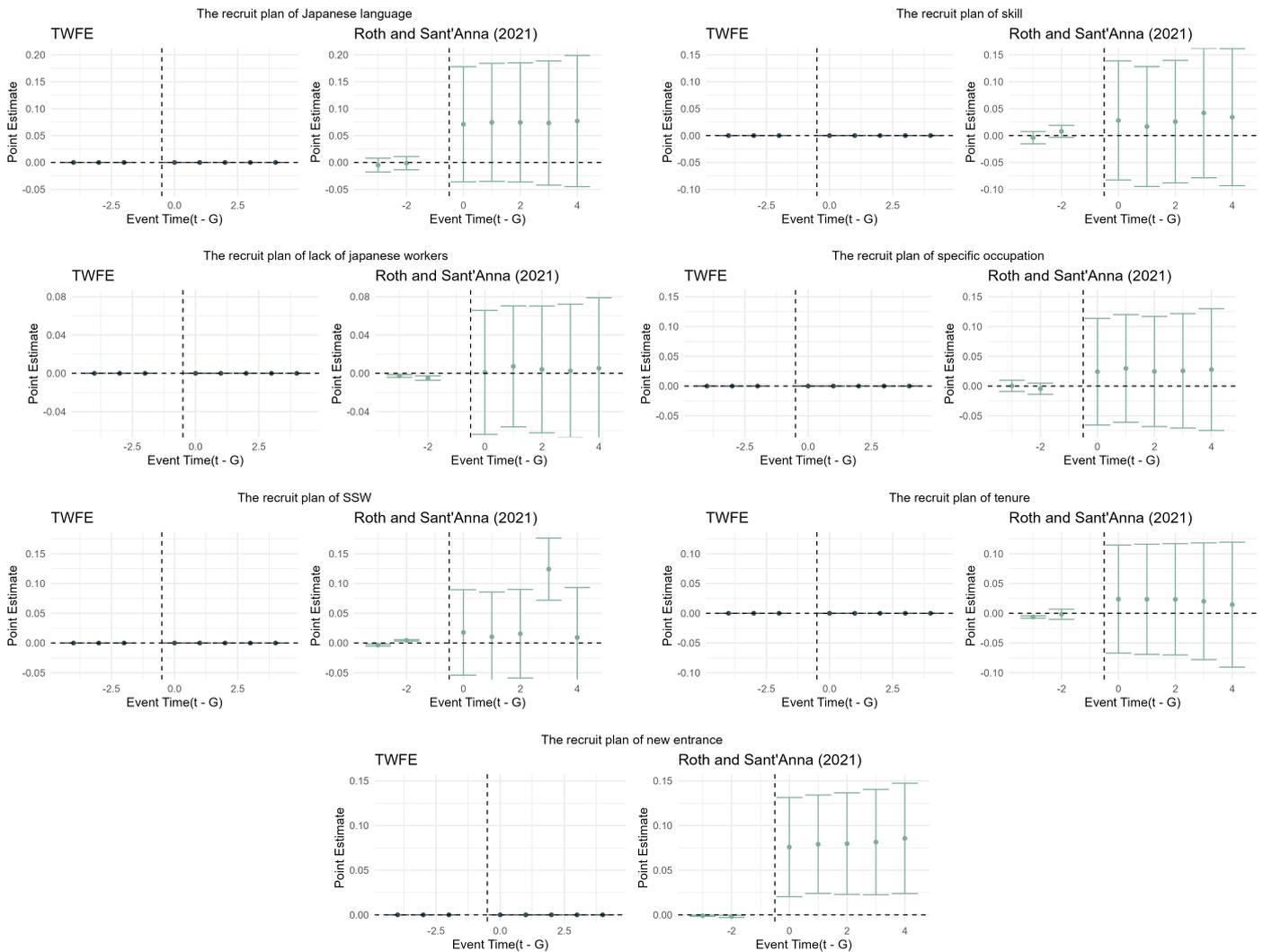


Figure 8: Staggered DiD estimation results for recruitment plans

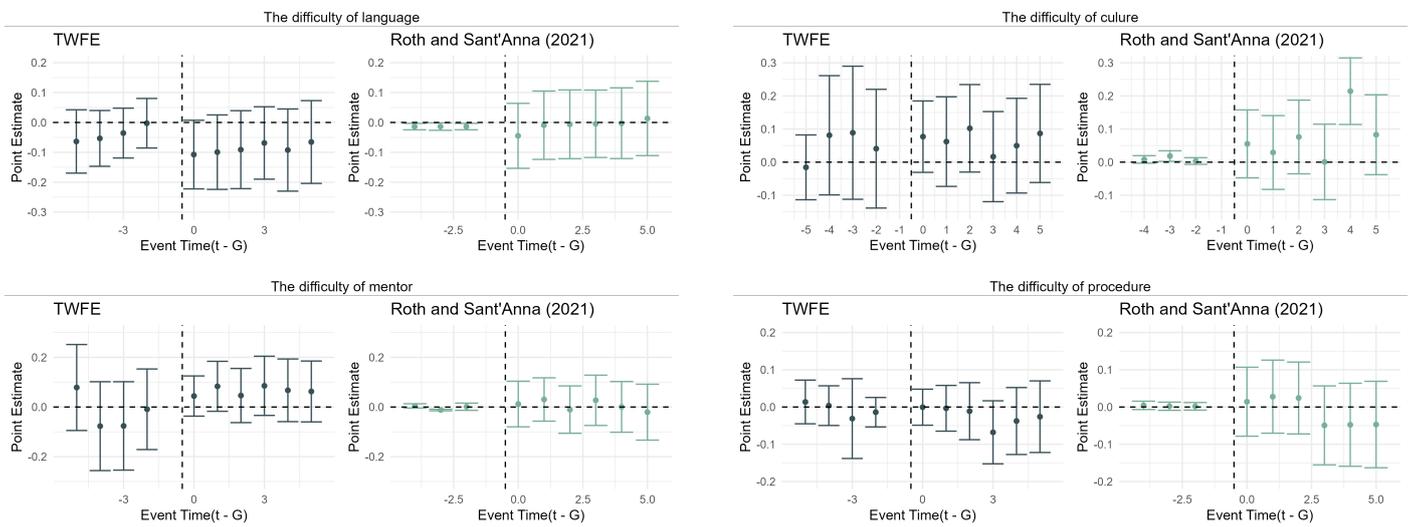


Figure 9: Staggered DiD estimation results for the challenge of immigrant recruitment