



# Foreign direct investment and temporary workers in Japan

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## ABSTRACT

The rapid growth in the number of temporary workers in Japan during the 2000s generated greater income inequality and greater job insecurity because temporary workers' wages are lower and their jobs are more tenuous than those of permanent workers. However, little is established about the relation between globalization and domestic growth in the temporary workforce. This study examines that relationship. It investigates whether the initiation of foreign direct investment (FDI) into Asia increased temporary workers' share of total wages and employment. This study employs a first-differenced difference-in-difference estimation with propensity score matching to examine how the initiation of FDI among Japanese manufacturers during 2003–2004 affected domestic employment. Firm-level data cover the period following the 2004 deregulation, which accelerated increases in the number of temporary workers by allowing manufacturers to employ such workers indirectly through employment agencies. Positive effects of vertical FDI are observed on the temporary worker ratio one year after starting FDI, but vanish in subsequent years. Therefore, this study concludes that the relationship between temporary workers and offshoring is complementary in the early stage of FDI and that no persistent effect of offshoring occurs that results in greater income inequality and greater job insecurity through an increase in the number of temporary workers.

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## 1. Introduction

Temporary workers have become increasingly important in developed economies such as Germany, Spain, France, and Japan. Facing global competition from low-wage countries, firms in developed economies seek to reduce costs, including labor costs. Hiring temporary workers is one strategy for reducing labor costs. Another strategy is offshoring, i.e., relocating business processes to other countries.

The hypothesis that hiring temporary workers is a substitute for offshoring is examined in a previous study (Presbitero, Richiardi, & Amighini, 2015). In practice, however, firms can employ both strategies simultaneously because offshoring might not prevent firms from hiring temporary domestic workers. Therefore, this study re-examines this hypothesis using Japanese firm-level data. In particular, this study investigates whether firms that initiate vertical foreign direct investment (FDI) tend to increase the employment and wage share of temporary workers. To address potential endogeneity issues, this

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**Table 1**  
Wage share of temporary workers in Japanese machinery industry (2001–2013).

Year	WB (trillion)	PERMS (%)	TEMPS (%)	DISPS (%)	PARTS (%)
2001	17.6	97.6	2.4	1.7	0.7
2002	16.8	96.9	3.1	2.3	0.8
2003	17.7	96.4	3.6	2.8	0.8
2004	18.0	95.4	4.6	3.8	0.8
2005	17.6	94.2	5.8	4.9	0.9
2006	16.8	92.0	8.0	6.9	1.1
2007	18.1	91.3	8.7	7.7	1.0
2008	16.3	94.6	5.4	4.4	1.0
2009	15.2	95.3	4.7	3.7	1.1
2010	15.6	95.2	4.8	3.6	1.2
2011	15.9	95.0	5.0	3.8	1.3
2012	16.0	95.7	4.3	3.2	1.1
2013	16.1	95.6	4.4	3.4	1.1

Notes: Calculations are from the panel data of Japanese firms for 2001–2013 constructed from the *Basic Survey of Japanese Business Structure and Activities* by the Japanese Ministry of Economy, Trade and Industry. WB denotes total wages in trillion yen in Japan's machinery industry. PERMS denotes permanent workers' share of total wages. TEMPS denotes temporary workers' share of total wages. DISPS and PARTS are the wage shares of dispatched and part-time workers, respectively.

study employs first-differenced difference-in-difference (DID) estimators. In addition, this study conducts DID estimation using a matched sample. The matching is conducted using the propensity score matching (PSM) technique.<sup>1</sup>

The estimation results indicate that one year after starting FDI, vertical FDI raises the share of temporary workers in the total wage bill and in total employment. These results suggest that vertical FDI and temporary workers are complements rather than substitutes during the early stages of FDI. However, the results show that the complementary relationship between temporary workers and vertical FDI is not persistent because the positive effects on the temporary worker ratio vanish two years after starting FDI.

This study is divided into eight sections, including this section. Section 2 explains the background. Section 3 describes the data, variables, and descriptive statistics of the data. Section 4 introduces the empirical strategy. Section 5 reports benchmark results of the simple DID estimation using the unmatched sample. Section 6 presents the estimation results of firms' decisions to initiate vertical FDI and the results of DID using the matched sample. Section 7 provides the robustness checks. Section 8 summarizes and concludes the study.

## 2. Background

Employing temporary workers<sup>2</sup> is one of the major strategies used by firms to reduce labor costs because wages and hiring and firing costs for temporary workers are lower than those for permanent workers. Temporary workers receive lower average wages and benefits than permanent workers and enjoy less stable employment (Esteban-Pretel, Nakajima, & Tanaka, 2011). They are widely denied access to training, possibility for promotion, and eligibility to unionize.

In Japan, the share of temporary workers<sup>3</sup> rose during the 2000s. In 2004, deregulation accelerated their rising numbers by enabling manufacturers to employ temporary workers indirectly through employment services ("dispatched workers").<sup>4</sup> Tables 1 and 2 indicate the wages and employment of temporary workers in Japan's machinery industry during 2001–2013. The former shows their share of wages as a percentage of total wages paid (wage share); the latter shows their employment as a percentage of total employment (employment share). The wage share (TEMPS) is defined as

$$TEMPS = \frac{\text{Wage cost for temporary workers}}{\text{Total wage bill}} \times 100 \quad (1)$$

where the wage cost for temporary workers includes both part-time and dispatched workers,<sup>5</sup> and total wage bill includes both temporary and permanent workers.

<sup>1</sup> Crinò (2010) also employed the PSM technique to examine the effects of offshoring on the skill composition of employment.

<sup>2</sup> The distinction between temporary and permanent workers resembles the traditional distinction between unskilled and skilled workers because temporary workers are generally less skilled than permanent workers. College-educated workers are less likely to work as temporary workers (Asano, Ito, & Kawaguchi, 2013), indicating that temporary workers are less educated than permanent workers.

<sup>3</sup> Temporary workers are called "non-standard workers" in Japan.

<sup>4</sup> The Japanese government permitted worker dispatching only in very limited cases until 1999 but it gradually removed the restrictions on worker dispatching from the late 1990s to the early 2000s (Okudaira, Ohtake, Kume, & Tsuru, 2013). The 2004 deregulation is important since it allowed worker dispatching in manufacturing industries.

<sup>5</sup> Wage cost for day laborers is unavailable and therefore excluded.

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