

Firms as Risk Absorbers: A Source of Resilience in Japan's Labor Market*

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Abstract

This report studies how Japanese manufacturing establishments adjust to exchange rate shocks. The results show that yen appreciation reduces profits, wages, and labor productivity, while total employment responds only modestly. This pattern suggests that Japanese firms absorb external shocks internally, cushioning employment through adjustments in profits, compensation, and labor composition.

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Introduction

This report examines how Japanese manufacturing firms adjust labor and other margins after exchange rate shocks. Exchange rate movements can reduce export competitiveness and weaken firm performance, especially for industries that rely heavily on destination markets where the yen appreciates. A central question is whether firms respond to these shocks by reducing employment or by adjusting other margins, such as profits, wages, labor productivity, and the composition of employment.

We begin with a description of the data sources and variable construction. Our primary data source is Japan’s Census of Manufacturing, which provides annual establishment-level information. The Census covers manufacturing establishments with more than four employees and reports employment, wages, sales, costs, and value added. A useful feature of the Census is that it separately reports regular and part-time employment, which allows us to examine both changes in total employment and adjustments in the composition of labor. Total wage payments are available for all establishments, while wage payments by worker type are available only for establishments with more than 30 employees.

We measure profits as operating surplus, defined as sales net of total wage payments and intermediate input costs. The average wage rate is measured as total wage payments divided by total employment, and labor productivity is measured as value added per worker.

To address revisions to the Japanese Industry Classification (JIC) codes in 1984, 1993, 2001, 2007, and 2013, we construct a consistent industry classification over the full sample period. Specifically, we harmonize establishments into a stable set of Japanese manufacturing industries and use this classification throughout the analysis.

We measure industries’ exposure to exchange rate movements using bilateral industry-level trade data from the NBER–UN Trade Database and exchange rate data from Penn World Table 10.0. The trade data provide Japanese exports by destination country and product category, while the exchange rate data measure bilateral currency movements against the yen.

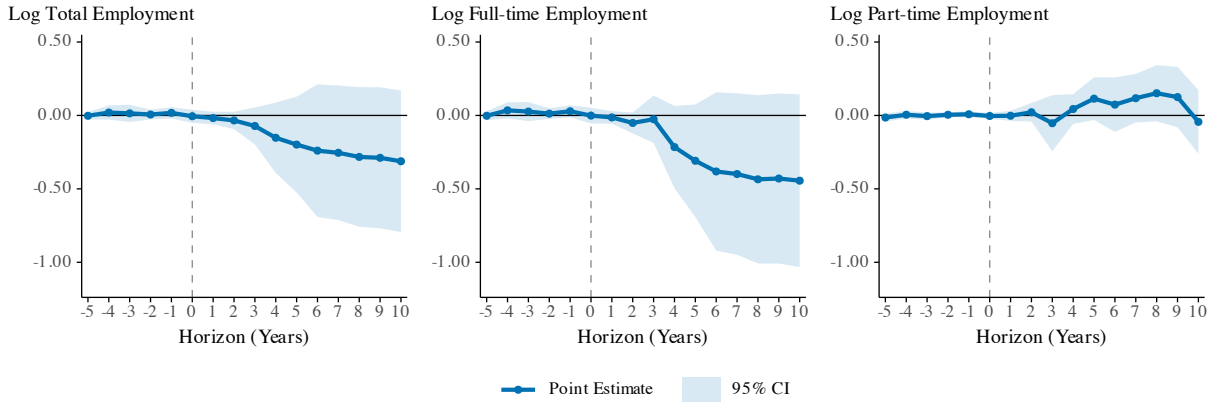
Empirical Results

We begin by estimating baseline impulse responses of establishment outcomes to exchange rate shocks. The figures report responses from five years before to ten years after the shock, with 95 percent confidence intervals. Pre-shock coefficients provide a check on differential pre-trends across industries with different exchange rate exposure.

Employment. Figure 1 reports the response of employment to yen appreciation. The three panels show total employment, full-time employment, and part-time employment. Total

employment responds little to exchange rate shocks. Full-time employment declines gradually in the medium run, while part-time employment increases modestly. Both responses are small in magnitude, and the aggregate employment response remains limited. The pre-shock coefficients are close to zero, suggesting no sharp differential pre-trends across industries with different subsequent exposure. These results indicate that employment is not the main margin of adjustment.

Figure 1: Dynamic Employment Responses to Yen Appreciation



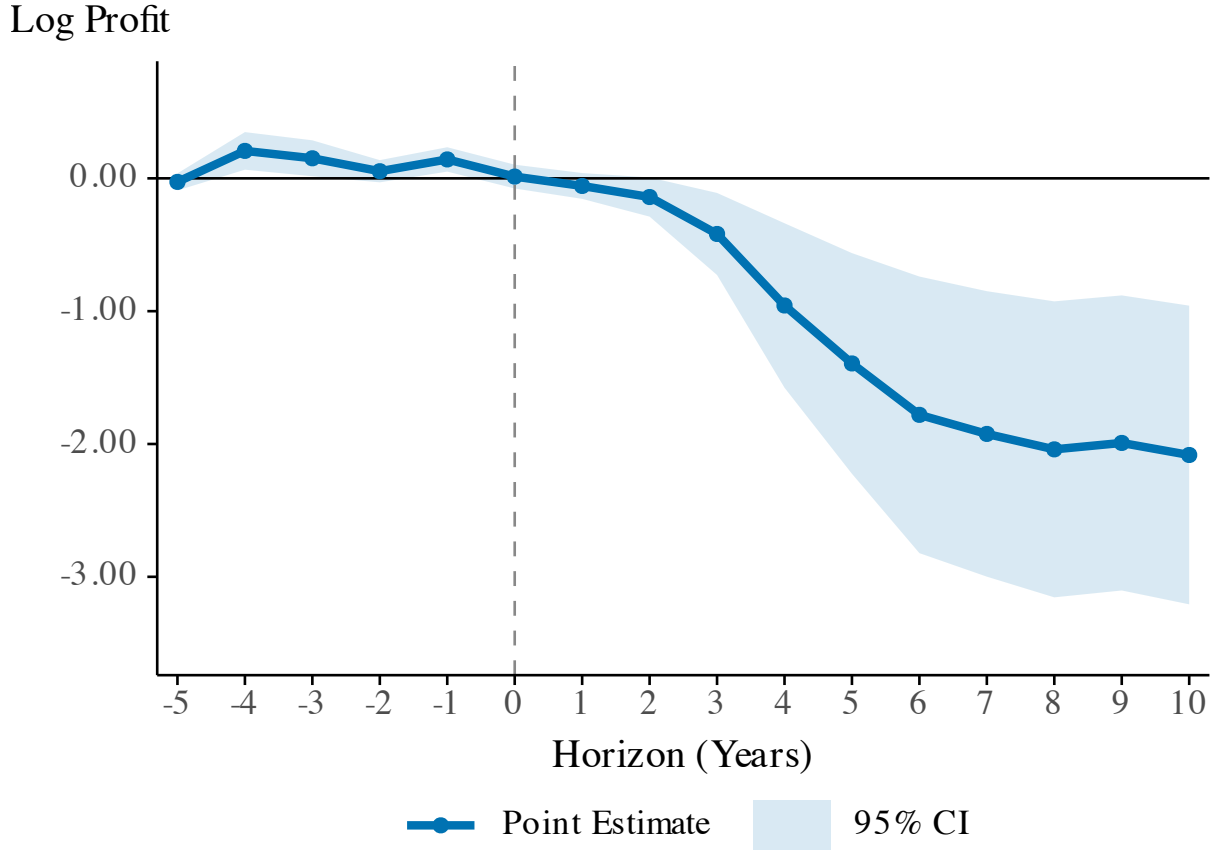
Notes: This figure reports impulse responses of establishment employment to exchange rate shocks. The left panel shows log total employment, the middle panel shows log full-time employment, and the right panel shows log part-time employment. Each point plots the estimated impulse response at horizon h from the baseline local-projection specification in equation (??). The shaded areas denote 95 percent confidence intervals. The vertical dashed line marks the year of the shock.

Profits. In contrast, Figure 2 shows that profits respond strongly to yen appreciation. Following yen appreciation, profits decline gradually and persistently over time, and the effect becomes economically meaningful in the medium run. This contrast between profits and employment suggests that exchange rate shocks weaken firm performance but do not translate into large employment reductions.

Part-Time Employment. Figure 3 examines whether establishments adjust the composition of employment. The probability of employing part-time workers rises after yen appreciation and increases over the post-shock horizon. This pattern suggests that establishments adjust by shifting toward more flexible labor arrangements rather than reducing employment levels.

Wages. Figure 4 reports the response of the average wage rate. Wages decline gradually

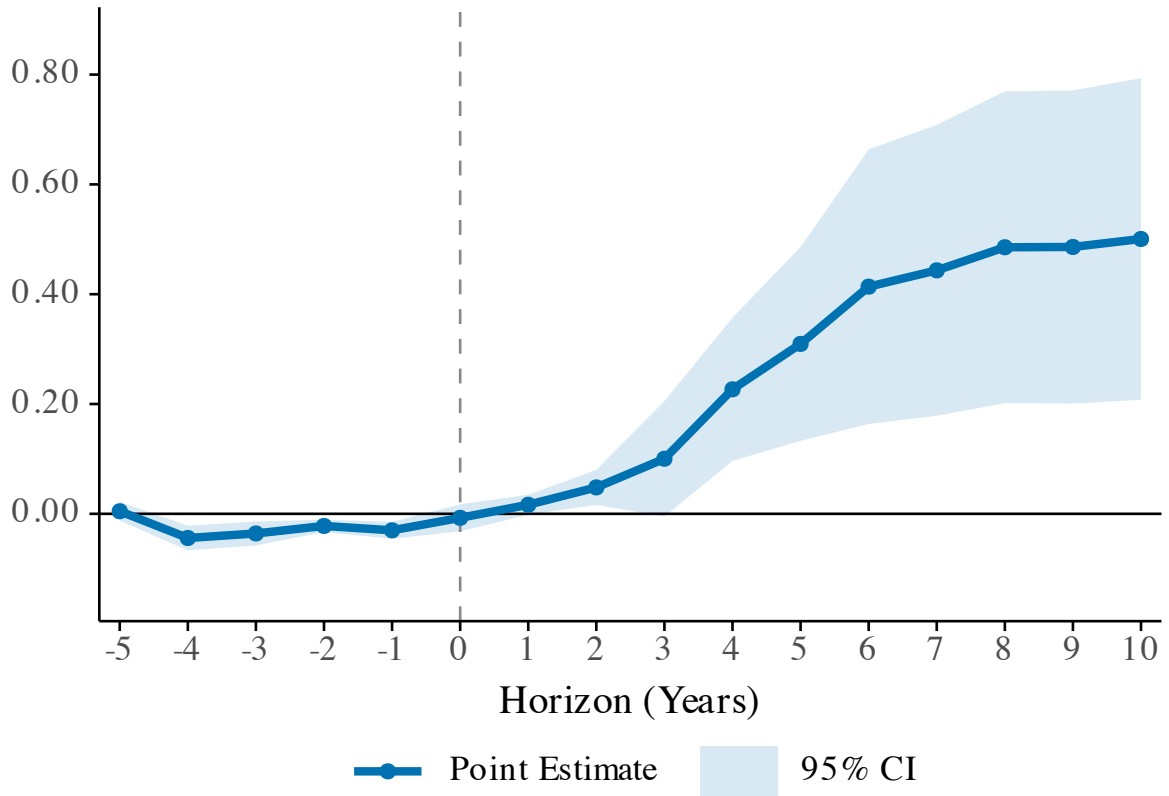
Figure 2: Dynamic Profit Responses to Yen Appreciation



Notes: This figure reports impulse responses of establishment profits to exchange rate shocks. Each point plots the estimated impulse response at horizon h from the baseline local-projection specification. The shaded areas denote 95 percent confidence intervals. The vertical dashed line marks the year of the shock.

Figure 3: Dynamic Response of Part-Time Employment Use to Yen Appreciation

Part-time Employment (Dummy)

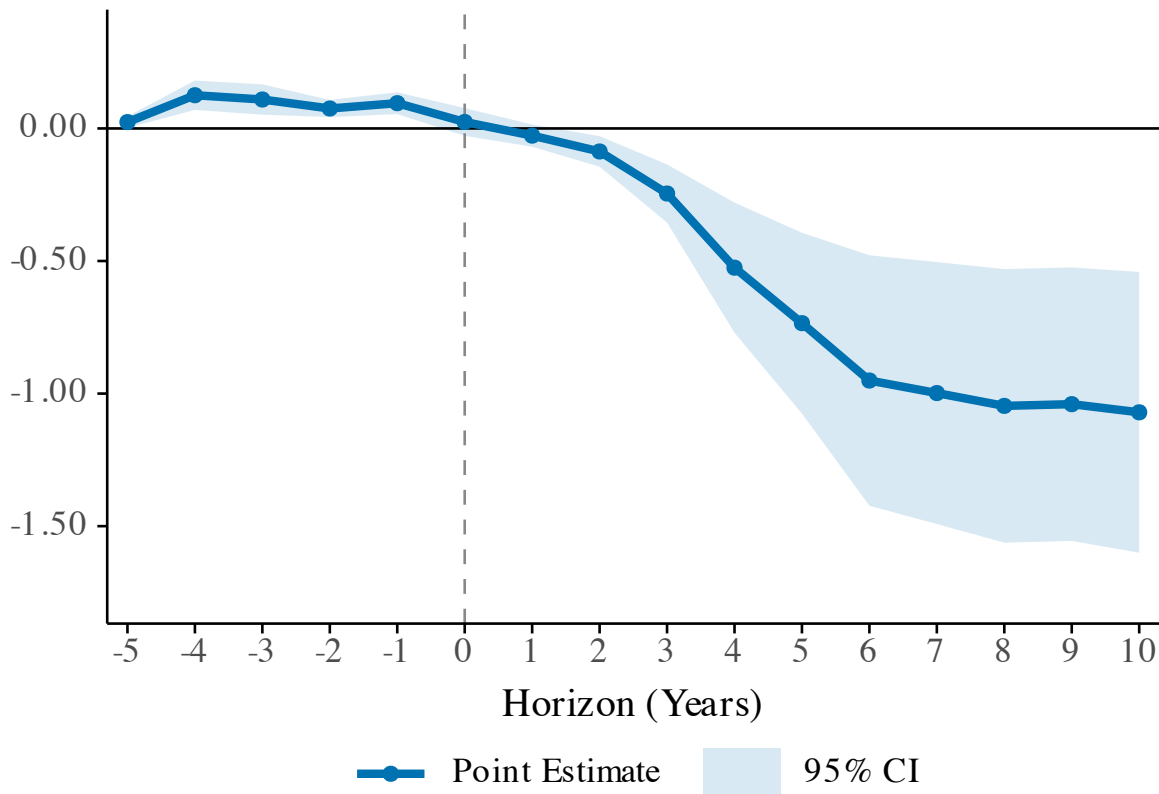


Notes: This figure reports impulse responses of the probability of employing part-time workers to exchange rate shocks. Each point plots the estimated impulse response at horizon h from the baseline local-projection specification. The shaded areas denote 95 percent confidence intervals. The vertical dashed line marks the year of the shock.

after yen appreciation, with the response becoming more pronounced several years after the shock. Wage adjustment therefore appears to be another margin through which establishments respond to exchange rate shocks.

Figure 4: Dynamic Wage Responses to Yen Appreciation

Log Wage Rate (Total)

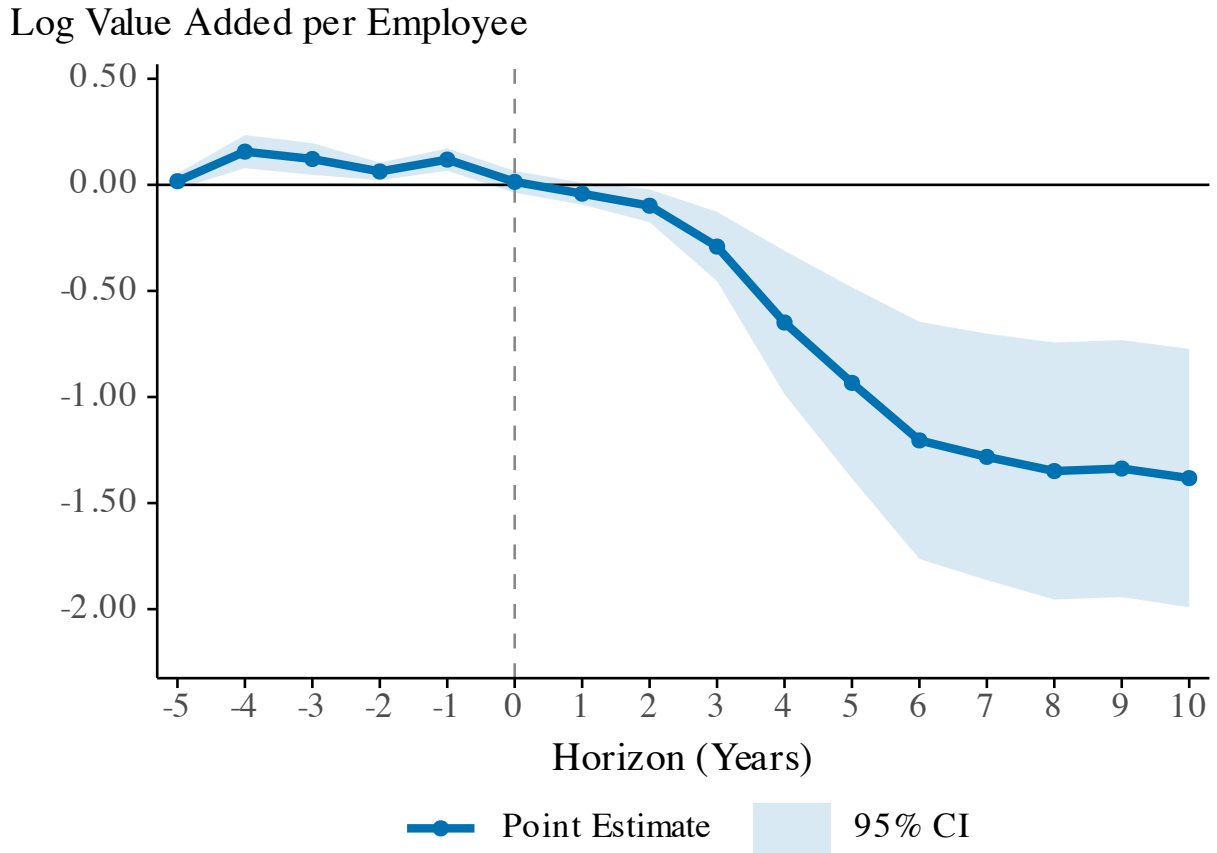


Notes: This figure reports impulse responses of establishment wage rate to exchange rate shocks. Each point plots the estimated impulse response at horizon h from the baseline local-projection specification. The shaded areas denote 95 percent confidence intervals. The vertical dashed line marks the year of the shock.

Labor Productivity. Finally, Figure 5 reports labor productivity, measured as value added per employee. Labor productivity declines after yen appreciation, with the decline becoming larger in the medium run and remaining negative over longer horizons.

Overall, the baseline results support the view that Japanese firms act as risk absorbers in response to exchange rate shocks. Yen appreciation significantly reduces profits and labor productivity, and firms adjust partly through wages and the use of part-time labor. Total employment, however, responds little. This pattern suggests that firms shield employment from adverse shocks by adjusting through profits, compensation, and labor composition

Figure 5: Dynamic Labor Productivity Responses to Yen Appreciation



Notes: This figure reports impulse responses of establishment labor productivity to exchange rate shocks. Each point plots the estimated impulse response at horizon h from the baseline local-projection specification. The shaded areas denote 95 percent confidence intervals. The vertical dashed line marks the year of the shock.

rather than through large employment reductions.