Foreign Exchange Intervention at Turning Points: Case of Japan

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Foreign Exchange Intervention at Turning Points: Case of Japan

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Abstract

Using daily USD/JPY quotes and Japanese intervention records from 1991 through 2026, I estimate local projections around intervention dates. I find that JPY appreciates after buying-JPY interventions, and the appreciation lasts for more than two years. This is robust with lagged returns, episode onsets, a fixed sample, and leave-one-episode specifications. Buying-USD dates show no persistent post-intervention movement in USD/JPY, while pre-trends of JPY appreciation exist and disappear after buying-USD interventions.

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1 Introduction

This paper studies whether foreign exchange intervention can be turning points in USD/JPY. I combine daily USD/JPY quotes with operation-level records from April 1991 through June 2026. For each horizon, I regress the change in log USD/JPY from the day before intervention on an intervention-day indicator, following the local-projection approach of Jordà (2005).

I find that JPY appreciates against USD after buying-JPY interventions, and that post-intervention appreciation is persistent over 2 years. JPY appreciates by −1.42 log points after 20 trading days, −12.57 after 250 days, and −19.36 after 500 days. This qualitative and quantitative finding is robust after controlling for five lagged daily returns. It is also present when treatment is the onset of an intervention episode, when the sample is fixed from 500 trading days before through 1,000 days after intervention, and when inference leaves one intervention episode out at a time. Buying-USD dates show no persistent post-intervention movement in USD/JPY, although significant JPY appreciation pre-trends exist before the buying-USD intervention.

Intervention may operate through portfolio balance, signaling, or coordination (Sarno and Taylor, 2001). Event studies group nearby operations and measure short-window exchange-rate movements (Fatum and Hutchison, 2003). For Japan, Fatum and Hutchison (2006) find movements in the intended direction over short business-day windows, and Guyot and Montgomery (2025) relate intraday exchange-rate dynamics to daily intervention outcomes. I use the same episode logic as a robustness exercise and report the two-sided daily path around intervention.

Japanese reaction-function estimates relate intervention to recent exchange-rate movements and previous operations (Ito and Yabu, 2007, 2020). This work motivates reporting negative horizons, adding lagged returns, and grouping consecutive operations into episodes.

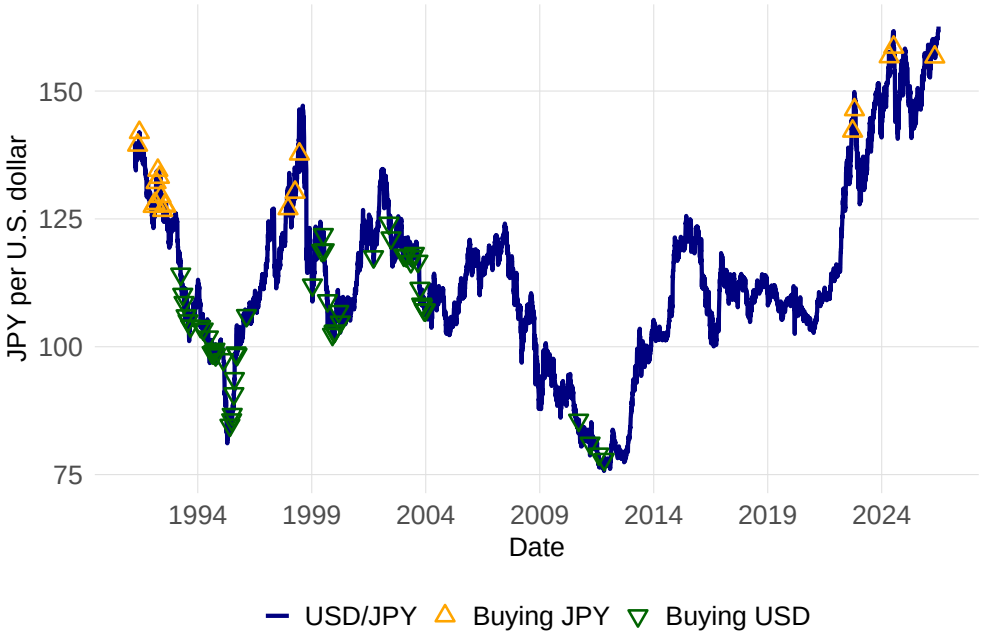
2 Analysis

2.1 Data

The exchange rate is the Federal Reserve's DEXJPUS series, measured in Japanese yen per U.S. dollar (Board of Governors of the Federal Reserve System, 2026). An increase denotes JPY depreciation. I use non-missing quotes as the trading-day calendar. The sample runs from April 1, 1991, through June 30, 2026, and contains 8,846 quotes. Earlier observations are used to construct negative (pre-intervention) horizons.

Intervention records come from Japan's Ministry of Finance (Ministry of Finance Japan, 2026). I use only direct USD/JPY operations and exclude operations which involve other

Figure 1: USD/JPY and Japanese Intervention Episodes



Notes: This figure shows the USD/JPY exchange rate and the Japanese intervention episodes. The line is DEXJPUS in yen per U.S. dollar. Markers show the onset of five-quiet-trading-day intervention episodes. Operations without a DEXJPUS quote move to the next available quote date. Sources: FRED and Japan's Ministry of Finance.

currencies, which are rare. Buying JPY denotes dollars sold and yen bought; Buying USD denotes dollars bought and yen sold. An operation without a DEXJPUS quote moves to the next available quote date. The data contain 42 Buying-JPY operations and 319 Buying-USD operations. This sample alignment leaves 42 Buying-JPY and 316 Buying-USD intervention dates because three pairs of Buying-USD operations map to the same trading day.

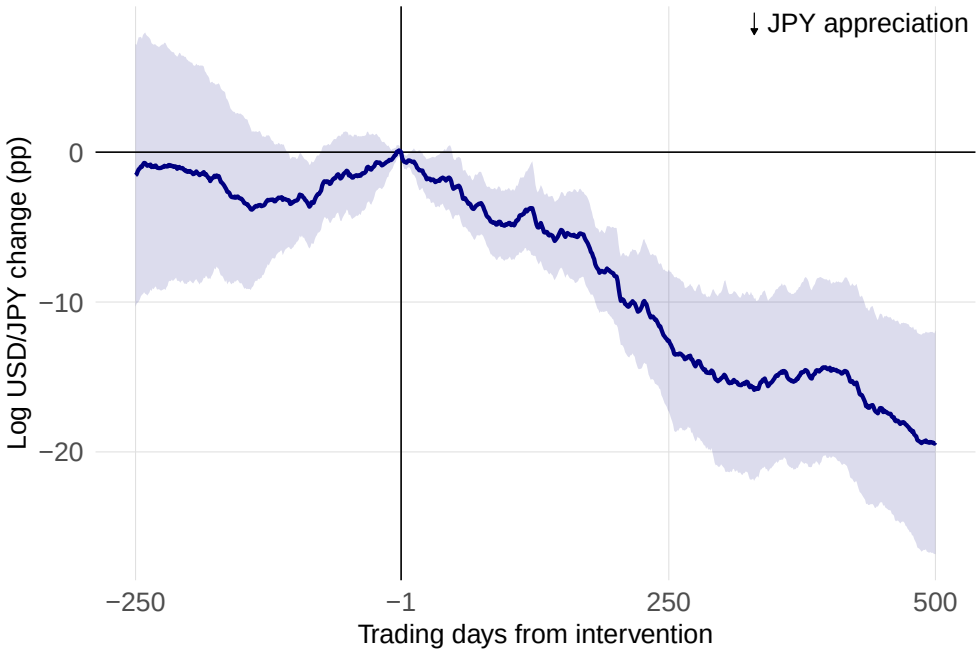
I group same-direction operations into episodes. A new episode begins when at least five intervening trading days contain no same-direction operation. This rule produces 19 Buying-JPY and 51 Buying-USD episodes. Figure 1 plots USD/JPY and the episode onsets. The markers show that consecutive operations cluster into distinct episodes.

2.2 Baseline Specification

Let S_t denote USD/JPY on trading day t. For direction d and horizon $h \in \{-250, \ldots, 500\}$, define

$$y_{t,h} = 100 \left[\log S_{t+h} - \log S_{t-1}\right]. \tag{1}$$

Figure 2: USD/JPY around Buying-JPY Intervention Dates



Notes: This figure shows the results for the local projection around buying-JPY interventions. The line shows $\widehat{\beta}_h^{\mathrm{JPY}}$ from equation (2). The band is a pointwise 95 percent Bartlett Newey–West interval with bandwidth $|h+1|$. Each horizon uses all feasible observations. Horizon -1 is zero by construction.

The baseline local projection is

$$y_{t,h} = \alpha_h^d + \beta_h^d D_t^d + \varepsilon_{t,h}^d, \tag{2}$$

where D_t^d equals one on a same-direction intervention date. The coefficient β_h^d is the difference in the mean cumulative exchange-rate change between intervention dates and dates without a same-direction intervention. This comparison describes paths around selected intervention dates; it does not identify a causal policy effect. Each horizon uses all feasible origins. I set $\widehat{\beta}_{-1}^d = 0$, while $\widehat{\beta}_0^d$ includes the intervention-day movement. Pointwise 95 percent intervals use Bartlett Newey–West standard errors with bandwidth $|h+1|$ and a finite-sample correction.

Figure 2 reports the Buying-JPY estimates. Before intervention, the coefficient reaches -3.84 near horizon -141 and then moves toward zero as the intervention date approaches. It falls to -0.40 on the intervention day, with a 95 percent interval of $[-0.74, -0.05]$, and reaches -1.42 after 20 trading days, -3.20 after 60 days, -12.57 after 250 days, and -19.36 after 500 days. The estimated path therefore changes direction around buying-JPY intervention.

2.3 Robustness

Five return lags. I add five lagged daily returns to account for short-run exchange-rate dynamics:

$$y_{t,h} = \alpha_h + \beta_h D_t^{\text{JPY}} + \sum_{j=1}^{5} \gamma_{h,j}\, 100\Delta \log S_{t-j} + \varepsilon_{t,h}. \tag{3}$$

Panel (a) of Figure 3 reports the result. The coefficient is -1.43 at 20 days, -12.63 at 250 days, and -19.43 at 500 days, all within 0.1 log points of the baseline.

Episode onsets. Consecutive intervention dates may belong to one policy episode. Let E_t^{JPY} equal one at the onset of a five-quiet-day Buying-JPY episode. I estimate

$$y_{t,h} = \alpha_h + \beta_h^E E_t^{\text{JPY}} + \varepsilon_{t,h}. \tag{4}$$

Continuation Buying-JPY dates are excluded as origins; later operations remain in the outcome path. Panel (b) uses all 19 episodes through horizon 58 and 18 thereafter. The coefficient is -1.20 at 20 days, -3.77 at 60 days, -11.10 at 250 days, and -18.79 at 500 days. At horizon -60, the coefficient is -2.76 and then moves toward zero before the onset. Consolidating consecutive operations makes the change in direction clearer.

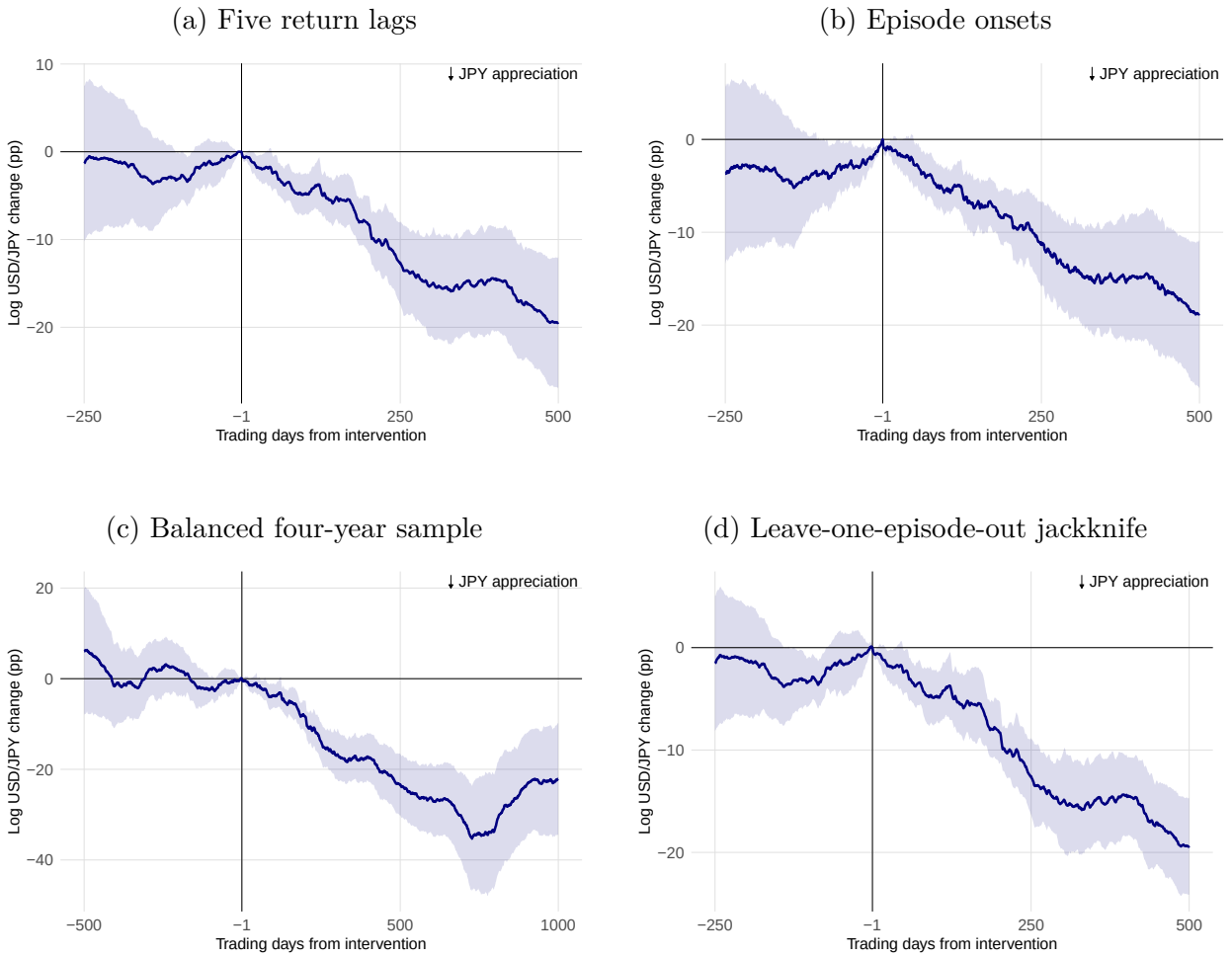
Balanced four-year sample. The baseline sample changes with the horizon. Panel (c) requires complete observations from 500 trading days before through 1,000 days after each origin. The fixed sample contains 7,863 dates and 32 Buying-JPY intervention dates. The coefficient is -1.09 at 20 days, -13.94 at 250 days, -23.34 at 500 days, and -22.14 at 1,000 days.

Leave-one-episode-out inference. For each episode g, I omit its Buying-JPY operation origins and re-estimate equation (2). If $\widehat{\beta}_{h,(-g)}$ is the resulting coefficient and G_h is the number of contributing episodes, the jackknife standard error is

$$\widehat{\text{SE}}_{JK,h} = \left[\frac{G_h - 1}{G_h} \sum_{g=1}^{G_h} \left(\widehat{\beta}_{h,(-g)} - \overline{\beta}_{h,(-)} \right)^2 \right]^{1/2}. \tag{5}$$

Panel (d) centers the pointwise t_{G_h-1} interval on the full daily estimate. The interval is $[-2.75, -0.10]$ at 20 days, $[-16.33, -8.81]$ at 250 days, and $[-24.11, -14.61]$ at 500 days.

Figure 3: Buying-JPY Robustness



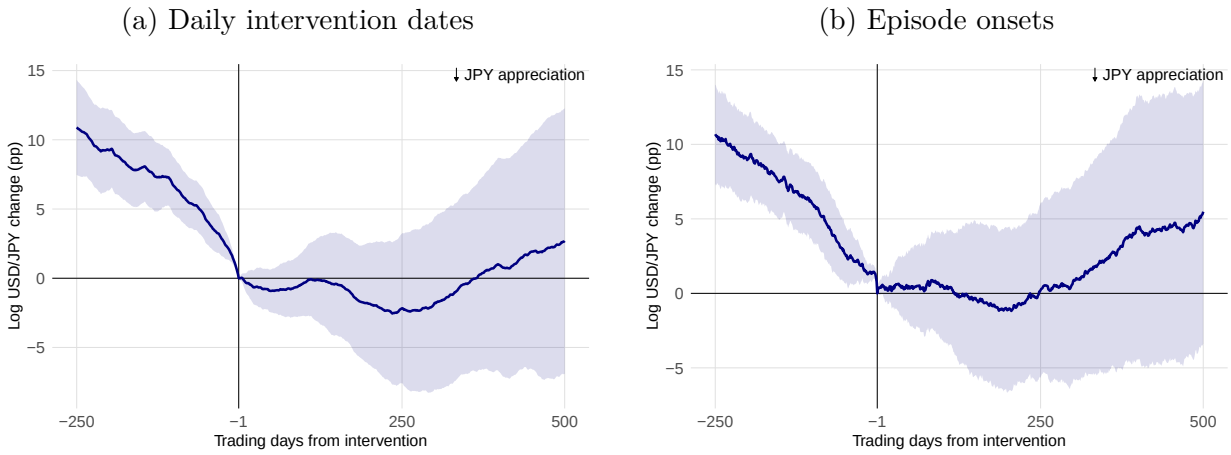
Notes: This figure shows the local projection estimates around buying-JPY interventions under different specifications. Panels (a)–(c) report pointwise 95 percent Bartlett Newey–West intervals. Panel (d) reports pointwise 95 percent delete-one-episode jackknife intervals. Horizon −1 is zero.

2.4 Buying USD Treatments

Figure 4 reports the Buying-USD results. Panel (a) uses 316 intervention dates. USD/JPY falls before intervention: the coefficient is 4.94 log points at horizon −60 and 10.90 at −250. After intervention, the coefficients are −0.56 at 20 days, −0.88 at 60 days, −2.17 at 250 days, and 2.69 at 500 days. Each interval contains zero.

Panel (b) uses 51 Buying-USD episode onsets and excludes continuation dates as origins. The coefficient is 0.39 on the onset day, 0.46 at 20 days, 0.50 at 60 days, and 0.22 at 250 days. The intervals contain zero from day one onward.

Figure 4: USD/JPY around Buying-USD Intervention



Notes: This figure shows the local projection estimates around buying-USD interventions. Panel (a) uses intervention dates. Panel (b) uses five-quiet-day episode onsets and excludes continuation dates as origins. Bands are pointwise 95 percent Bartlett Newey–West intervals.

3 Conclusion

Buying-JPY intervention dates coincide with a turning point in the estimated USD/JPY path. The coefficient moves toward zero before intervention and becomes more negative afterward. It is −1.42 log points at 20 trading days, −12.57 at 250 days, and −19.36 at 500 days. Estimates with lagged returns, episode onsets, a fixed sample, and episode-level jackknife inference show the same pattern.

The Buying-USD daily and episode coefficients show no persistent post-intervention movement in USD/JPY, while a clear pre-trend of JPY appreciation exists before the buying-USD interventions and disappears afterwards.

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