

WHY IS INFLATION IN THE U.S. HIGHER THAN IN OTHER COUNTRIES?

EXPLANATION OF THE METHODOLOGY

BY

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Methods

- The identification strategy stands on three pillars: (1) a Phillips curve type specification based on a Real Personal Disposable Income per capita gap (x); (2) a difference-in-differences approach based on sorting countries into two bins, those that pursued similarly aggressive measures to the U.S. (“active” group), versus those that did not (“passive” group); and (3) a local projections approach (Jordà, 2005) to evaluate the effects of fiscal support during the pandemic on inflation over time.
- Specifically, let π_{it} denote core CPI inflation at annual rate (we use CPI since PCE data is not available in the OECD database), let π_{it+1}^e denote one-year-ahead inflation expectations (whose construction we detail below), let x_{it} denote the Real Personal Disposable Income gap (whose construction we detail below), let α_i denote country-fixed effects and δ_t time-fixed effects. Finally, define $A_i = 1$ if country i belongs in the “active group” and is 0 otherwise. Similarly, denote $P_t = 1$ for the pandemic period, 0 otherwise. Hence define the dummy variable $D_{it} = A_i \times P_t$. With these definitions, the typical equation that we estimate is:

$$\pi_{it+h} = \alpha_i^h + \delta_t^h + \gamma_h^e \pi_{it+1}^e + \gamma_h \pi_{it-1} + \theta_h x_{it} + D_{it}[\phi_h^e \pi_{it+1}^e + \phi_h \pi_{it-1} + \beta_h x_{it}] + \epsilon_{it+h}; \quad h = 0, 1, \dots, 3 \quad (1)$$

- Several observations deserve comment:
 1. we do not impose the restriction $\gamma_h^e + \gamma_h = 1$ since it is unclear that it should hold for $h \neq 0$. We also do not impose a similar restriction $\phi_h^e + \phi_h = 1$ since this refers to the “treatment effect” coefficients.
 2. the coefficient of interest is β_h , which captures the effect of belonging to the “active” group on inflation or in policy evaluation parlance, the average treatment effect on the treated. Note that this coefficient is interacted with x_{it} so that countries with programs of different magnitudes are properly accommodated.

3. the regressions contain a full set of country- and time-fixed effects to account for heterogeneity across countries and common trends in inflation. Specifically, time-fixed effects would control for natural variation in global inflation due to the common pandemic shock and its downstream effects from lockdowns, supply chain disruptions, as well as other policies and factors.
 4. we also allow the coefficients on expected and past inflation to possibly vary in the “active” group in the pandemic period.
 5. standard errors are clustered around countries to allow for non-parametric unstructured time series features in the covariance matrix of the residuals.
- **Construction of π_{it+1}^e :** we construct one-period-ahead inflation expectations for each country by predicting future core CPI from a history of 20 years of inflation data as in Hamilton et al. (2016). More specifically, we estimate for each country i using rolling windows of 20 years of quarterly data:

$$\pi_{it} = \gamma_i + \gamma_{is} \sum_{s=1}^4 \pi_{it-s} + v_{it}, \quad (2)$$

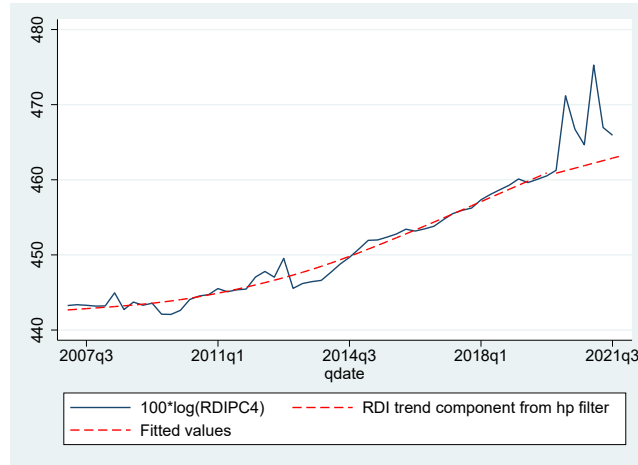
and obtain $\pi_{it+1}^e = \hat{\pi}_{it}$.

- **Construction of x_{it} :** we use the HP filter with parameter $\lambda = 1600$ on data for the log of the Real Personal Disposable Income index up to the pandemic (2019Q4). In order to avoid over-smoothing the pandemic period (since the HP-filter would want to bring the RDPI trend up during that period and hence minimize the gap), we compute a linear trend using data on log RDI from 2015 to 2019 and then use that trend from 2020 to the end of the sample. As figure [Figure 1](#) shows, the HP trend is nearly linear over that estimation period. Thus, by taking the log, x_{it} can be read as the approximate percent deviation from trend. Finally, we take a four-quarter rolling average (one year) of this gap since a boost in income does not immediately turn into increased consumption, but rather that it can get smoothed over the year.

The data

- We obtain cross-country data on real household gross disposable income per capita from the OECD’s “Household Dashboard: cross country comparisons.” Our sample includes quarterly data from 2007Q1 to 2021Q4 for Canada, Denmark, Finland, France, Germany, Netherlands, Norway, Sweden, the United Kingdom, and the United States.

Figure 1: Calculating the RDI gap



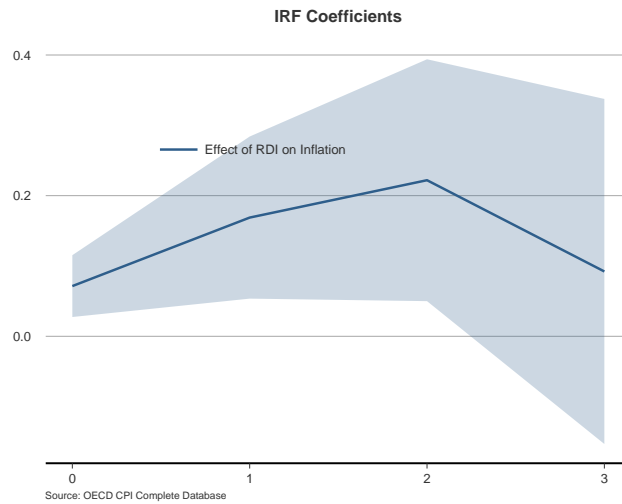
Notes: HP filter used until 2019. Linear extrapolation from then to the end of the sample. See text.

- We rely on core CPI (Consumer Price Inflation) indices to measure inflation stripped from the effect of food and energy prices, which tend to be volatile. Our data are also sourced from OECD, which unfortunately does not report PCEPI for the countries in our sample.

Results

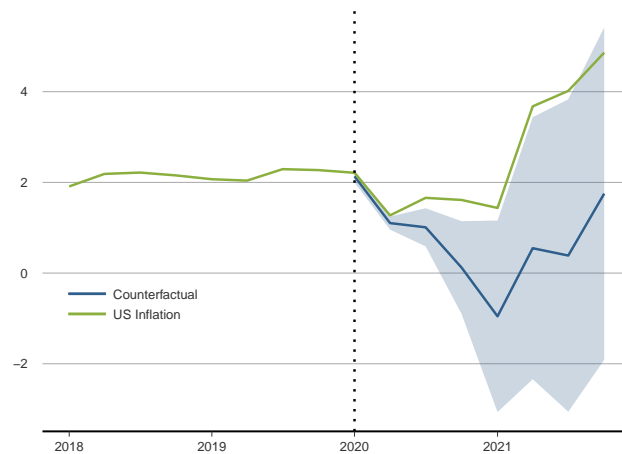
- Our list of “active” countries, *i.e.*, $A_i = 1$, include Canada, Denmark, Netherlands, Norway and the United States. The “passive” list of countries, *i.e.*, $A_i = 0$, include Finland, France, Germany, Sweden, and the United Kingdom. That is, there is an equal number of countries (5) in each group. The dividing line is based on whether the cumulative RDI gap approximately exceeded 1%. For example, this number was 35% for Canada and 38% for the U.S., but essentially 0 for Finland, France, and the United Kingdom.
- A plot of the average treatment effect on the treated, β_h , or if you like, the impulse response of a one percentage change in the RPDG gap on inflation, is displayed in [Figure 2](#).
- We use these coefficient estimates to construct a counterfactual path for inflation based on this channel alone. To do this, we ask what would the path of inflation have been had the U.S. followed a “passive” fiscal response during the pandemic, which we subtract from realized U.S. core CPI to obtain the counterfactual path. This is shown in [Figure 3](#), which replicates Figure 3 in the Economic Letter.

Figure 2: *Local Projections – DiD impulse response*



Notes: Impulse response from LP-DiD procedure in Equation 1. See text.

Figure 3: *The counterfactual path of inflation*



Notes: Actual and counterfactual path of core CPI inflation for the U.S. based on Equation 1. Error bands shown. See text.

- The figure indicates that inflation might have turned negative absent the support received from the government during the pandemic. However, it now seems that accumulating all the effects, inflation would have followed a shallower path than it actually did, at the end of our sample, the difference is close to 3 percentage points.

References

Hamilton, James D., Ethan S. Harris, Jan Hatzius, and Kenneth D. West. 2016. "The Equilibrium Real Funds Rate: Past, Present, and Future." *IMF Economic Review* 64(4, November), pp. 660–707.

Jordà, Òscar. 2005. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review*, 95(1, March): 161–182.