inflateR

Historical currency adjustment in R

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The question

What is an amount in one year's money worth in another year's money?

Thirteen currencies, two inflation measures, one tidy interface.

Why it matters

- **Journalism**: what is that 1970 salary worth in today's money?
- **Economic history**: deflating nineteenth- and twentieth-century wages to a common unit
- **Accounting and compliance**: revaluing historical assets, legacy contracts, and long-dated liabilities
- **Public policy**: comparing government spending, wages, and benefits across decades

What is already out there

- **`priceR`**: pricing-related toolkit with some inflation helpers, broader scope[1]
- **`quantmod`**: pulls CPI series from FRED but leaves adjustment to the user
- **`WDI`**: fetches World Bank series but does not adjust values directly
- **Bespoke spreadsheets**: ad hoc, single-currency, hard to audit

The gap: **no purpose-built tool that bundles the canonical indices and exposes a symmetric pair of adjustment functions**.

[1] Condamin (2022), *priceR: Economics and Pricing Tools*, R package on CRAN.

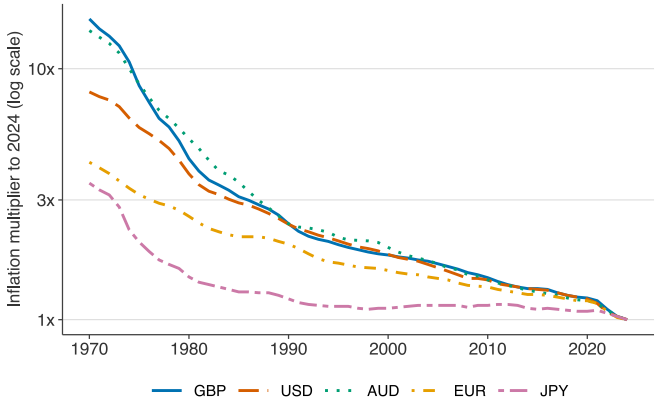
What inflateR offers

1. **Coverage**: thirteen currencies (GBP, USD, AUD, EUR, CAD, JPY, CNY, CHF, NZD, INR, KRW, BRL, NOK), 1960 to 2024
2. **Interface**: four adjustment functions in two symmetric pairs, one cumulative/annualised rate helper, one metadata helper
3. **Provenance**: zero runtime dependencies, no API key, no network access, World Bank WDI data bundled

On CRAN since March 2026. CPI and GDP deflator both exposed[2].

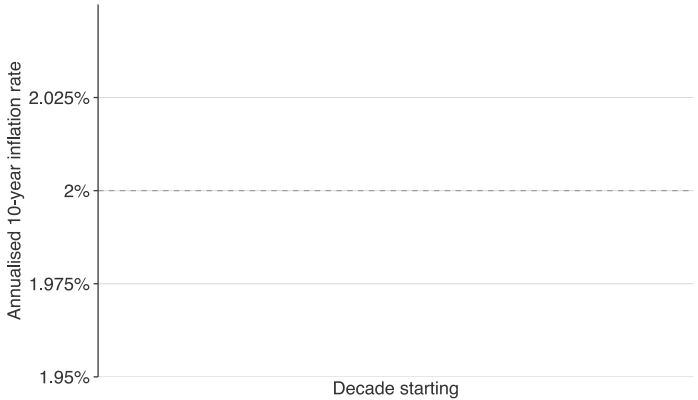
[2] World Bank Development Indicators, series `FP.CPI.TOTL` and `NY.GDP.DEFL.ZS`, rescaled to 2020 = 100.

Multipliers: GBP, USD, AUD, EUR, JPY to 2024



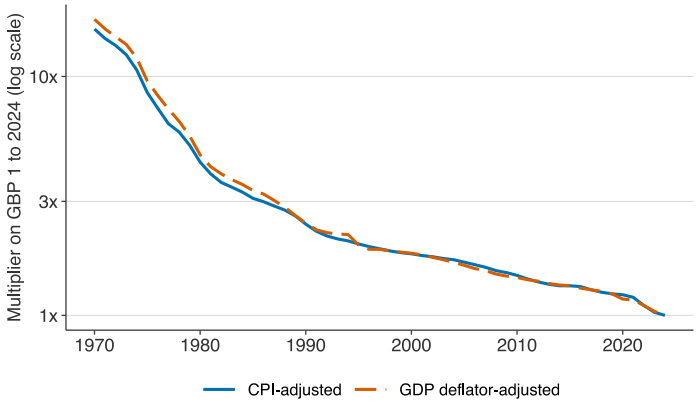
Multiplier to convert one unit of historical currency into 2024 money, five currencies, 1960 to 2024. Exports: `adjust_inflation()`, `adjust_real()`.

Rolling 10-year annualised inflation



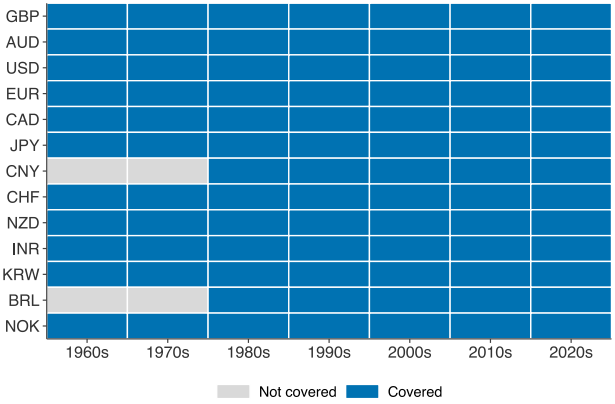
Rolling 10-year annualised CPI inflation, five currencies, 1970 to 2024. Exports: `inflation_rate()`.

CPI versus GDP deflator for GBP



Two measures of GBP inflation, 1970 to 2024, rebased to 2020 = 100. Exports: `adjust_inflation()`, `adjust_real()`.

Coverage: thirteen currencies, six decades



Data availability heatmap, thirteen currencies, 1960s to 2020s. Exports: `list_currencies()`.

Central formulas

Forward adjustment (historical to present):

$$\text{adjust\_inflation}(a,\ s \to t) = a \cdot \frac{I_t}{I_s} \tag{1}$$

Cumulative inflation rate between years s and t:

$$\pi_{s \to t} = \frac{I_t}{I_s} - 1 \tag{2}$$

Annualised inflation rate for $n = t - s$ years:

$$\pi_{\text{ann}} = \left(\frac{I_t}{I_s}\right)^{1/n} - 1 \tag{3}$$

Package at a glance

Function families:

- **CPI adjustment**: `adjust_inflation()`, `historical_value()`
- **GDP deflator adjustment**: `adjust_real()`, `historical_real()`
- **Rates**: `inflation_rate()` (cumulative or annualised)
- **Metadata**: `list_currencies()`

Deps: base R only. R $\geq$ 3.5.0. No API key, no network.

Direction-measure matrix

Two directions (forward and reverse) times two measures (CPI and deflator) = four core functions. Every function accepts ISO code or country name.

Minimal working example

```r
library(inflateR)

# Forward: 1990 GBP 30,000 salary in today's money
adjust_inflation(30000, from_year = 1990, currency = "GBP")

# Reverse: today's GBP 50,000 in 1990 equivalent
historical_value(50000, to_year = 1990, currency = "GBP")

# Rate: annualised CPI inflation for GBP, 1970 to 2024
inflation_rate("GBP", from_year = 1970, to_year = 2024,
               annualised = TRUE)
```

Every function is vectorised over `amount`, so bulk conversion of a column of historical prices requires no loop.

UK real median weekly earnings, 1980 to 2024

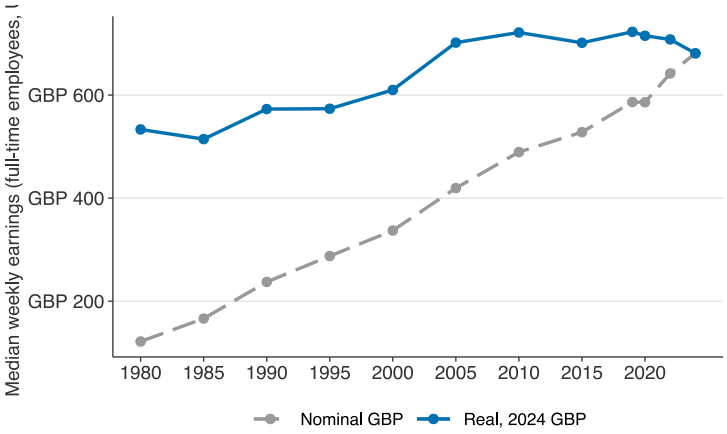
Data. ONS Annual Survey of Hours and Earnings (ASHE). Median gross weekly pay for full-time employees, 1980 to 2024 as published.

Question. *Have UK real wages stagnated since the 2010 peak?*

Why this case. Canonical UK applied-labour question over the past fifteen years[3]. Nominal series hides the phenomenon entirely; CPI deflation via a single function call reveals it. Reproducible with one line of `adjust_inflation()`.

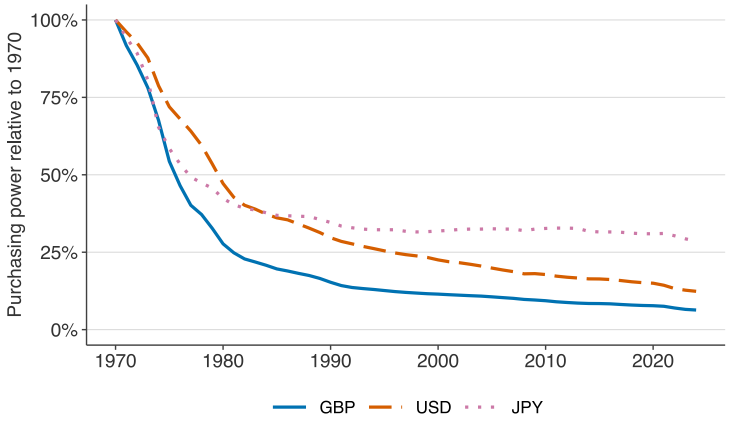
[3] Blundell, Joyce, Keiller & Ziliak (2023), *The dynamics of real wages in the UK*, and Giupponi & Machin (2023) on wage stagnation.

UK real wages peaked in 2010, down 5.6 per cent since



UK median weekly earnings, nominal (grey dashed) and real 2024 GBP (blue solid), 1980 to 2024. Source: ONS ASHE, deflated via `adjust_inflation()`.

Purchasing power has collapsed for GBP, USD, and JPY



Purchasing power of 1 unit of currency relative to 1970, 1970 to 2024. GBP 7 per cent, USD 13 per cent, JPY 30 per cent. Computed via inverse `adjust_inflation()`.

What inflateR does not yet do

- **World Bank WDI only**: native methodologies (ONS RPI, BLS chained CPI) differ modestly
- **No PPP conversion**: cross-country comparisons at a point in time need a separate step
- **Annual data only**: no monthly or quarterly adjustment out of the box
- **1960 start**: pre-1960 history requires users to supply an alternative series

v0.2.0 roadmap: expanded currency coverage, optional PPP-adjusted cross-country conversion, higher-frequency data, and an `inflation_chart()` helper for plot output.

Contact, code, paper

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