

# ECON 1550

Spring 2026

# Problem Set 5

Due: March 11, 2026 at 11:59pm ET

Instructor: [Fernando Duarte](#)  
Head TA: [Leo Zucker](#)  
Undergraduate TAs: [Eric Kim](#), [Raisa Axenie](#), [Nathalie Peña](#)  
Submission: [Canvas](#) or [Gradescope](#)

## Instructions

- When submitting to Gradescope, indicate the page where each question is answered to avoid a 5-point deduction.
- Full credit is given for correct answers. If multiple steps are needed, you must show them to get full credit.
- Points are shown for each part. Partial credit is given for partially correct answers; show your work to maximize it.
- Late submissions receive a score of zero.
- If you have technical problems submitting, email your work to the Head TA before the deadline.
- Collaboration with classmates is encouraged; use of generative AI is permitted but discouraged.
- You must write, understand, and submit your solutions individually. Copying other students' or AI-generated answers, even fragments, is not allowed.

## 1. The Big Mac Index, Purchasing Power Parity, and the Exchange Rate (100 points)

The Big Mac index was invented by The Economist in 1986 as a lighthearted guide to whether currencies are at their “correct” level. Read the article about the Big Mac index (attached at the end of this problem set or online at <https://www.economist.com/interactive/big-mac-index>), and the box “Some Meaty Evidence on the Law of One Price” in Chapter 5 of the textbook, then please answer the following questions:

- (a) [10 points] How is Purchasing Power Parity (PPP) defined in the article from The Economist?
- (b) [10 points] How is Purchasing Power Parity (PPP) defined in Chapter 5 of the textbook (and in class)?
- (c) [10 points] Measures of exchange rates and PPP for many countries can be downloaded from the OECD at [this link](#). Observations are annual.

Data for the Big Mac index can be found at <https://github.com/TheEconomist/>

[big-mac-data](#). For this problem set, use the pinned file `big-mac-source-data-v2-pinned.csv`, which is based on [the corresponding Economist source file](#). For some years, observations are annual. For other years, observations are semi-annual. When comparing Big Mac index data to OECD data, transform semi-annual data to annual by taking the average of the two semi-annual observations.

Explain how the OECD PPP measure relates to our definition of PPP from the textbook (and from class).

Hint: The OECD database links to [this explanation](#) of how their measure of PPP is constructed.

- (d) [10 points] Pick any two countries that have data for 2024 or later in both the Big Mac index data and the OECD data. Using these two countries:  
For the latest year available, construct  $P/P^*$  using the Big Mac data and the OECD data. Which of the two is closest to  $E$ ? Do the two  $P/P^*$  measures agree on which of the two currencies is over/under-valued?
- (e) [10 points] Using all the years available, make a scatter plot of  $E$  against the Big Mac data's  $P/P^*$ . What should the scatter plot look like if PPP holds? What features of the scatter plot support the hypothesis that PPP holds? What features suggest the hypothesis that PPP holds is not true?
- (f) [10 points] Answer the last question once again, but using OECD data to construct  $P/P^*$ .
- (g) [10 points] Repeat parts (e) and (f) but now assess relative PPP rather than absolute PPP.
- (h) [10 points] In a single plot, show the time series of the growth rate of the two PPP measures and the growth rate of the exchange rate (that is, plot the year in the horizontal axis and the growth rates of the three variables on the vertical axis). Do the series move together over time? Describe one feature of the plot that provides evidence in favor and one feature that provides evidence against the hypothesis that relative PPP holds.
- (i) [10 points] Is the PPP implied by the Big Mac data close to the PPP from the OECD data? Give two reasons for why they are not supposed to perfectly agree.
- (j) [10 points] There are many criticisms of the Big Mac index as a measure of PPP. The Economist itself points out it is not meant to be a precise measure of PPP or currency valuation. On the other hand, there must be some advantages of the Big Mac index. List three advantages of the Big Mac index.

# Our Big Mac index shows how burger prices differ across borders

Using patty-power parity to think about exchange rates

Last updated on January 29th 2026

## Raw index (January 2026)

Base currency: US dollar

Country	Currency	% Under/Over valued
Switzerland	Franc	+48.4
Uruguay	Peso	+43.1
Norway	Krone	+22.8
Sweden	Krona	+18.6
Denmark	Krone	+16.7
Britain	Pound	+15.7
Euro area	Euro	+15.3
Israel	Shekel	+4.0
Poland	Zloty	+2.2
Colombia	Peso	+1.5
Mexico	Peso	+0.8
United States	US\$	<i>BASE</i>
Costa Rica	Colón	-1.3
Turkey	Lira	-3.5
Singapore	S\$	-5.5
Australia	A\$	-7.0

<b>Country</b>	<b>Currency</b>	<b>% Under/Over valued</b>
Canada	C\$	-9.4
Argentina	Peso	-9.6
Czech Rep.	Koruna	-10.2
Chile	Peso	-11.4
Lebanon	Pound	-12.4
UAE	Dirham	-15.5
Saudi Arabia	Riyal	-17.2
Honduras	Lempira	-17.3
Peru	Sol	-17.8
Hungary	Forint	-18.4
New Zealand	NZ\$	-19.3
Bahrain	Dinar	-22.0
Nicaragua	Córdoba	-22.4
Qatar	Riyal	-23.7
Kuwait	Dinar	-25.8
Brazil	Real	-27.3
Guatemala	Quetzal	-29.7
Thailand	Baht	-29.7
Moldova	Leu	-33.2
Venezuela	Bolívar	-33.9
Romania	Leu	-35.0
Oman	Rial	-35.1
Azerbaijan	Manat	-36.2
Pakistan	Rupee	-36.9
South Korea	Won	-38.9
China	Yuan	-40.2
Jordan	Dinar	-42.3

Country	Currency	% Under/Over valued
Malaysia	Ringgit	-44.6
South Africa	Rand	-45.1
Hong Kong	HK\$	-47.6
Ukraine	Hryvnia	-47.8
Japan	Yen	-50.5
Vietnam	Dong	-52.7
Philippines	Peso	-53.6
Egypt	Pound	-56.8
Indonesia	Rupiah	-58.9
India	Rupee	-58.9
Taiwan	NT\$	-59.6

### **Example: The British pound is 15.7% overvalued against the US dollar**

A Big Mac costs £5.29 in Britain and US\$6.12 in the United States. The implied exchange rate is 0.86. The difference between this and the actual exchange rate, 0.75, suggests the British pound is 15.7% overvalued.

## **About the Big Mac index**

The Big Mac index was invented by *The Economist* in 1986 as a lighthearted guide to whether currencies are at their “correct” level. It is based on the theory of purchasing-power parity (PPP), the notion that in the long run exchange rates should move towards the rate that would equalise the prices of an identical basket of goods and services (in this case, a burger) in any two countries.

Burgernomics was never intended as a precise gauge of currency misalignment, merely a tool to make exchange-rate theory more digestible. Yet the Big Mac index has become a global standard, included in several economic textbooks and the subject of dozens of academic studies.

## **GDP-adjusted index**

The GDP-adjusted index addresses the criticism that you would expect average burger prices to be cheaper in poor countries than in rich ones because labour costs are lower. PPP signals where exchange rates should be heading in the long run, as a country like China gets richer, but it says little about today's equilibrium rate. The relationship between prices and GDP per person may be a better guide to the current fair value of a currency.

## Methodology note

In July 2022 we updated the Big Mac index to use a McDonald's-provided price for the United States. We also changed our methodology for how we calculate the GDP-adjusted index, the full history of which will now be adjusted whenever the IMF's historical GDP series are updated. The previously published versions of both indices are available in our archive.

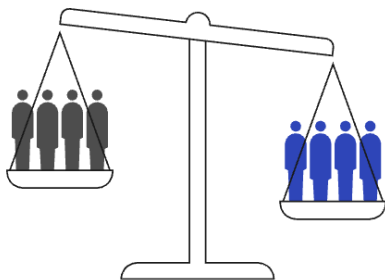
Note: All prices include tax.

Sources: McDonald's; LSEG Workspace; IMF; Eurostat; LebaneseLira.org; Banque du Liban; *The Economist*.

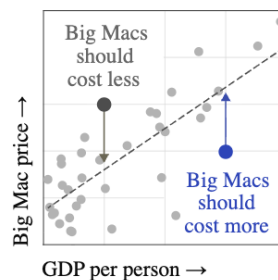
© The Economist Newspaper Limited 2026

### How it works

Varying labour costs and barriers to migration and trade may undermine purchasing-power parity



To control for this, our adjusted index predicts what Big Mac prices should be given a country's GDP per person



The difference between the predicted and the market price is an alternative measure of currency valuation

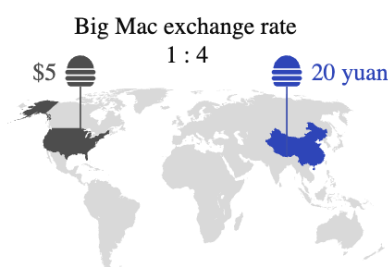


### How it works

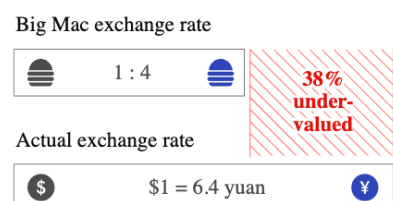
Purchasing-power parity implies that exchange rates are determined by the value of goods that currencies can buy



Differences in local prices – in our case, for Big Macs – can suggest what the exchange rate should be



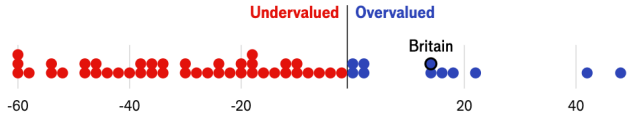
Using burgeronomics, we can estimate how much one currency is under- or over-valued relative to another



ADJUST TO ACCOUNT FOR GDP PER PERSON

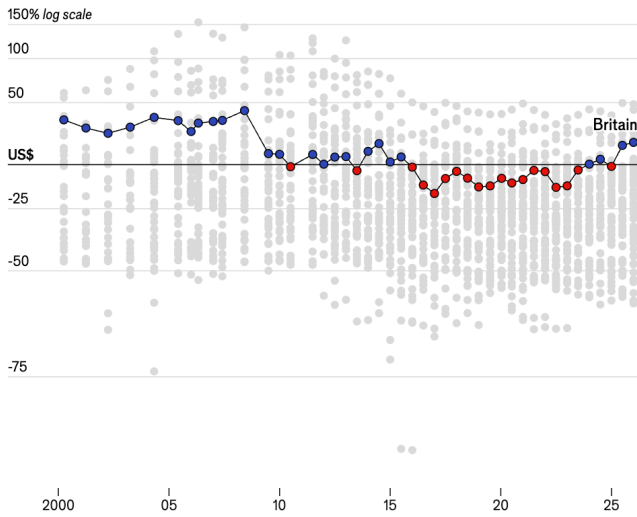
Raw index	GDP-adjusted
-----------	--------------

Jan 2026 | The British pound is 15.7% overvalued against the US dollar



A Big Mac costs **£5.29** in Britain and **US\$6.12** in the United States. The implied exchange rate is **0.86**. The difference between this and the actual exchange rate, **0.75**, suggests the British pound is **15.7% overvalued**.

**2000-2025**

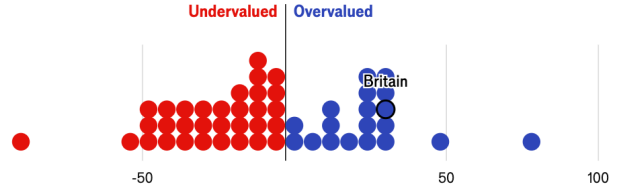


Sources: McDonald's; LSEG Workspace; IMF; Eurostat; LebaneseLira.org; Banque du Liban; The Economist

ADJUST TO ACCOUNT FOR GDP PER PERSON

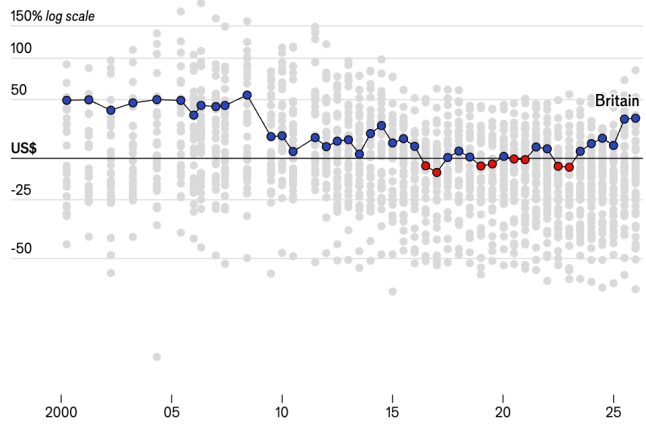
Raw index	GDP-adjusted
-----------	--------------

Jan 2026 | The British pound is 31.9% overvalued against the US dollar



A Big Mac costs **15.7% more** in Britain (**US\$7.08**) than in the United States (**US\$6.12**) at market exchange rates. Based on differences in GDP per person, a Big Mac should cost **12.3% less**. This suggests the British pound is **31.9% overvalued**.

**2000-2025**



Sources: McDonald's; LSEG Workspace; IMF; Eurostat; LebaneseLira.org; Banque du Liban; The Economist