Applications:

Real versus nominal prices.

Nominal price – actual selling price.
Real price – deflated for inflation price.

CONSUMER PRICE INDEX – SEPTEMBER 2019

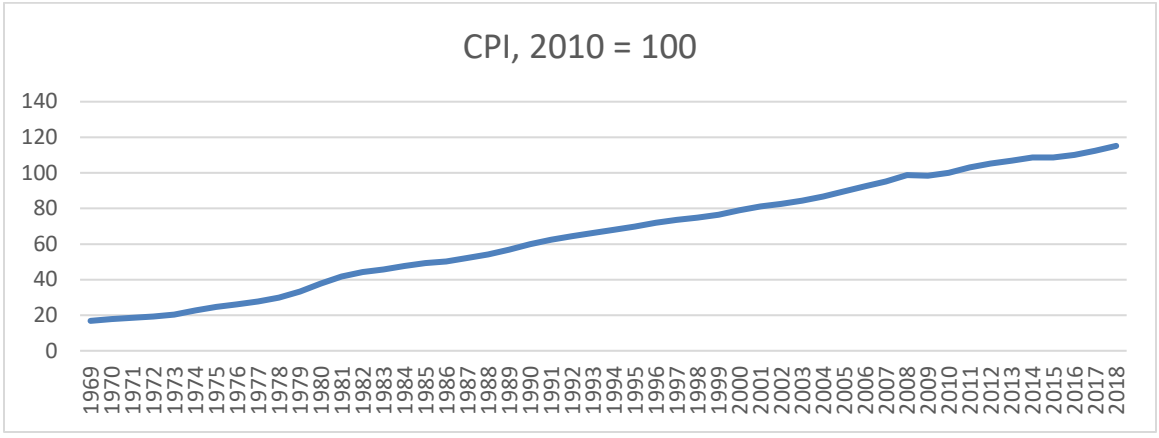
The Consumer Price Index for All Urban Consumers (CPI-U) was unchanged in September on a seasonally adjusted basis after rising 0.1 percent in August, the U.S. Bureau of Labor Statistics reported today. Over the last 12 months, the all items index increased 1.7 percent before seasonal adjustment.

Increases in the indexes for shelter and food were offset by declines in the indexes for energy and used cars and trucks to result in the seasonally adjusted all items index being flat. The energy index fell 1.4 percent as the gasoline index declined 2.4 percent. The food index increased 0.1 percent in September after being unchanged in each of the prior 3 months.

https://www.bls.gov/cpi/

Nominal price of a burger in 1955 is $0.15.
Nominal price of a burger in 2002 is $0.79.

Nominal in 2002 is more than nominal in 1955. Is a dollar in 1955 the same as a dollar in 2002?



Buying power differs. Consumer price index is one way to account for this – how much it takes to buy a given bundle of goods.

1) Define the bundle of goods.
2) Calculate the cost in each year of buying that exact same bundle of goods.
3) Pick base year and set this as the reference year (CPI is often with a footnote about the base year)

From the BLS:

How is the CPI market basket determined?

The CPI market basket is developed from detailed expenditure information provided by families and individuals on what they actually bought. For the current CPI, this information was collected from the Consumer Expenditure Surveys for 2013 and 2014. In each of those years, about 7,000 families from around the country provided information each quarter on their spending habits in the interview survey. To collect information on frequently purchased items, such as food and personal care products, another 7,000 families in each of these years kept diaries listing everything they bought during a 2-week period.

Over the 2 year period, then, expenditure information came from approximately 28,000 weekly diaries and 60,000 quarterly interviews used to determine the importance, or weight, of the more than 200 item categories in the CPI index structure.

What goods and services does the CPI cover?

The CPI represents all goods and services purchased for consumption by the reference population (U or W) BLS has classified all expenditure items into more than 200 categories, arranged into eight major groups. Major groups and examples of categories in each are as follows:

- FOOD AND BEVERAGES (breakfast cereal, milk, coffee, chicken, wine, full service meals, snacks)
- HOUSING (rent of primary residence, owners' equivalent rent, fuel oil, bedroom furniture)
- APPAREL (men's shirts and sweaters, women's dresses, jewelry)
- TRANSPORTATION (new vehicles, airline fares, gasoline, motor vehicle insurance)

- MEDICAL CARE (prescription drugs and medical supplies, physicians' services, eyeglasses and eye care, hospital services)
- RECREATION (televisions, toys, pets and pet products, sports equipment, admissions);
- EDUCATION AND COMMUNICATION (college tuition, postage, telephone services, computer software and accessories);
- OTHER GOODS AND SERVICES (tobacco and smoking products, haircuts and other personal services, funeral expenses).

Say CPI in 1955 is 26.8, CPI in 2002 is 181.3

(meaning that 26.8 cents in 1955 bought what 100 cents bought in the base year (1984) and you needed 181.3 cents to buy in 2002)

To express the 1955 price in 2002 dollars, we can convert using the CPI ratio:

$$\frac{CPI_{2002}}{CPI_{1955}} * p_{1955} = \frac{181.3}{26.8} * 0.15 = \$1.01$$

In real terms, the burger was more expensive in 1955.

[Try the other way, and you can find the 2002 price in 1955 dollars is around 12 1955 cents.]

Say the world only has food and clothing. Years are years one (1) and two (2).

$$y_1 = p_1^c * c_1 + p_1^f * f_1$$

$$y_2 = p_2^c * c_1 + p_2^f * f_1$$

y_2 is defined as the income that it takes to buy the same bundle of food and clothing as you bought in year one at prices in year two. (y_2/ y_1) is the 1+ the rate of inflation.

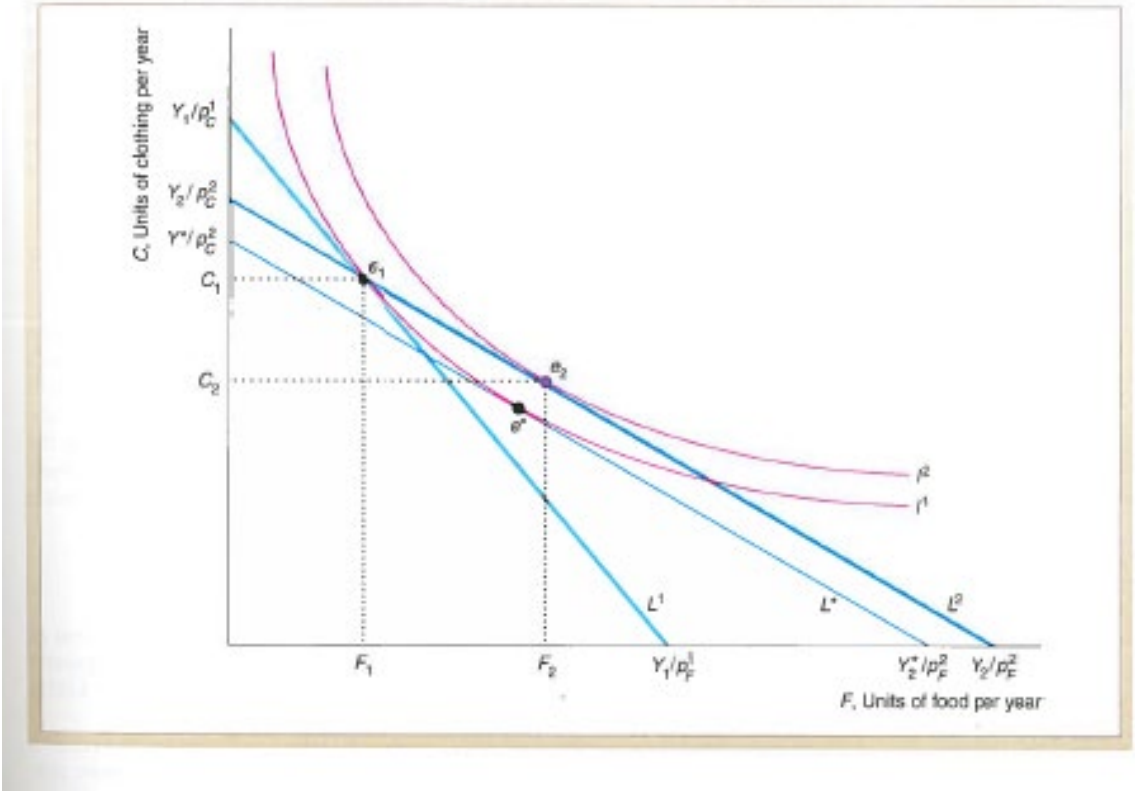
CPI is calculated based on a weighted average of price changes for given budget shares.

CPI overcompensates unless prices of all components go up by the same rate.

Substitution bias: CPI assumes people do not substitute commodities based on changes in relative commodities. It assumes the goal is to consume the same bundle over time.

Figure 5.7 The Consumer Price Index.

In the first year, when Klaas has an income of Y_1, his optimal bundle is e_1, where indifference curve I^1 is tangent to his budget constraint, L^1. In the second year, the price of clothing rises more than the price of food. Because his salary increases in proportion to the CPI, his second-year budget constraint, L^2, goes through e_1, so he can buy the same bundle as in the first year. His new optimal bundle, however, is e_2, where I^2 is tangent to L^2. The CPI adjustment overcompensates him for the increase in prices: Klaas is better off in the second year because his utility is greater on I^2 than on I^1. With a smaller true cost-of-living adjustment, Klaas' budget constraint, L^*, is tangent to I^1 at e^*.



Overestimating the rate of inflation has important implications for U.S. society because Social Security, various retirement plans, welfare, and many other programs include CPI-based cost-of-living adjustments. According to one estimate, the bias in the CPI alone makes it the fourth-largest "federal program" after Social Security, health care, and defense. For example, the U.S. Postal Service (USPS) has

From Perloff

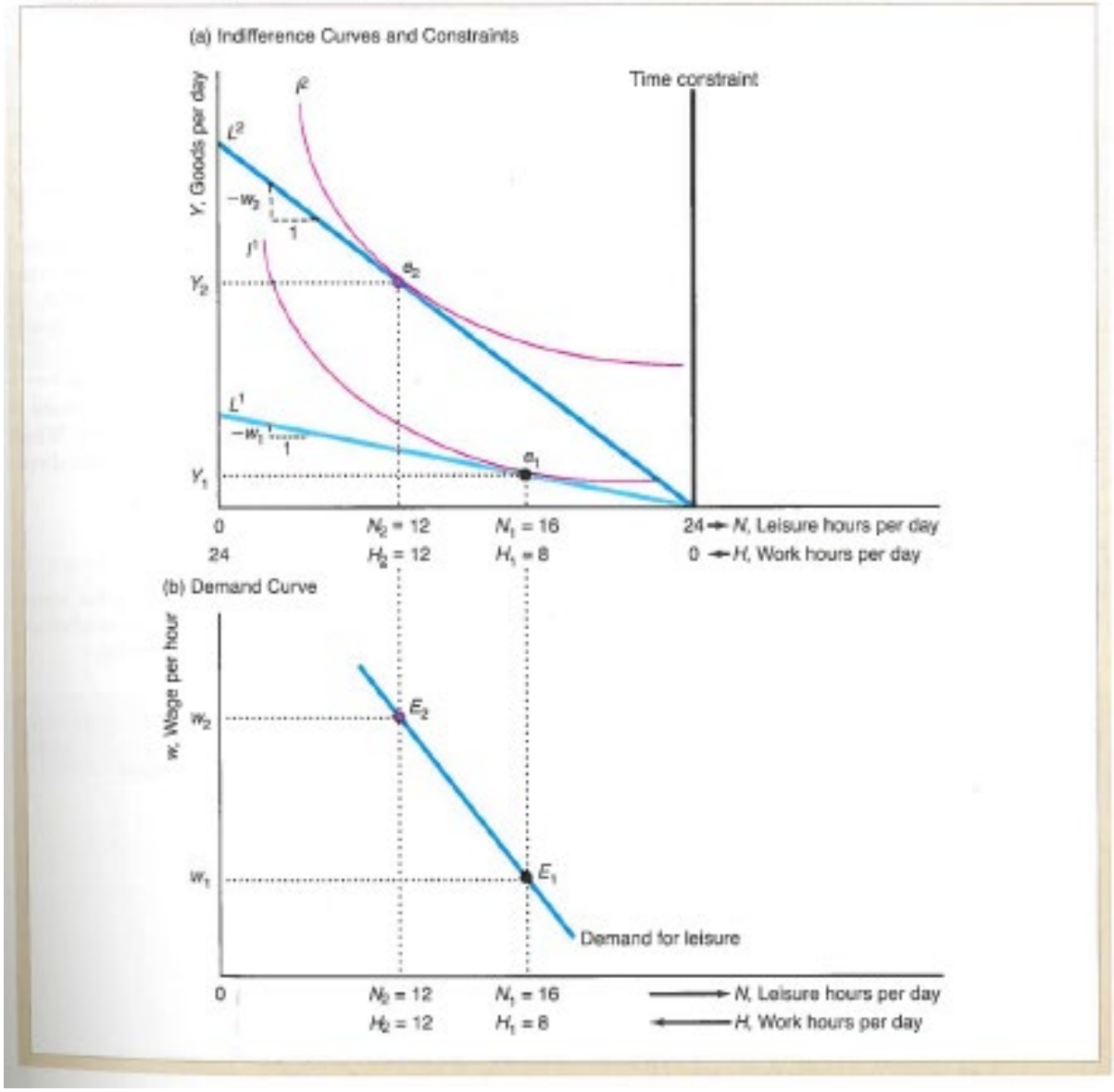
Labor supply example.

Y is income, w_1 is the hourly wage. There are 24 hours in a day, and the person can allocate them across work (H for hours worked, each hour paid w_1) and N (non-work, or leisure). Then $Y = w_1 * H$ and $H = 24 - N$ (from $H + N = 24$).

Illustrate using a graph of other goods, leisure.

Figure 5.8 Demand for Leisure.

(a) Jackie chooses between leisure, N, and other goods, Y, subject to a time constraint (vertical line at 24 hours) and a budget constraint, L^1, which is $Y = w_1 H = w_1(24 - N)$, with a slope of $-w_1$. The tangency of her indifference curve, I^1, with her budget constraint, L^1, determines her optimal bundle, e_1, where she has $N_1 = 16$ hours of leisure and works $H_1 = 24 - N_1 = 8$ hours. If her wage rises from w_1 to w_2, Jackie shifts from optimal bundle e_1 to e_2. (b) Bundles e_1 and e_2 correspond to E_1 and E_2 on her leisure demand curve.



Illustrate using a graph of other goods, leisure. Leisure normal.

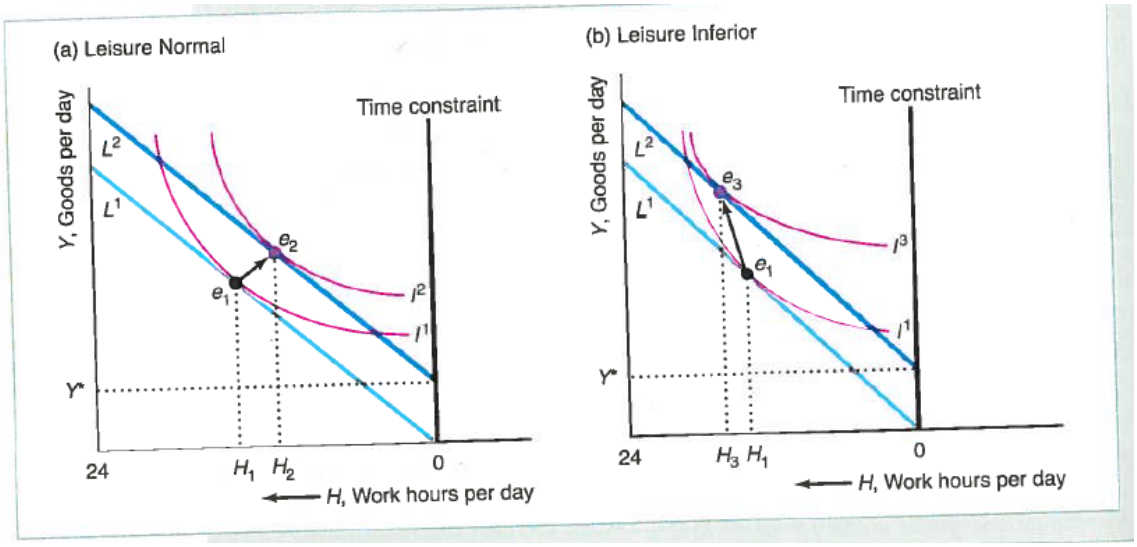
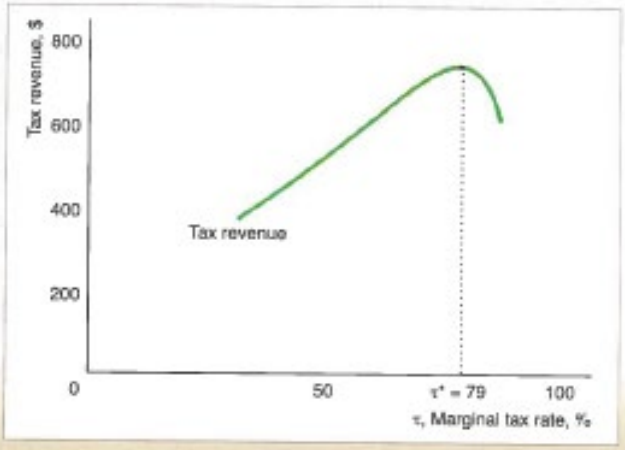


Figure 5.12 Relationship of Tax Revenue to Tax Rates.

At marginal tax rates below τ^*, an increase in the rate leads to larger tax collections. At rates above τ^*, however, an increase in the marginal rate decreases tax revenue. These calculations (Fullerton, 1982, Table 1, p. 15) are based on the assumption that the labor supply elasticity with respect to the after-tax wage is 0.15 and that the labor demand curve is horizontal.



	Sweden	France	Ireland	Spain	Switzerland	U.K.	Japan
Marginal tax rate, τ	65	47	41	37	35	26	24
Optimal tax rate, τ^*	58	59	57	59	58	54	54

Implication for tax rate / hours worked / tax revenue. Will decreasing tax rates increase hours worked, thus boosting incomes and production?