Econ 110A: Lecture 15

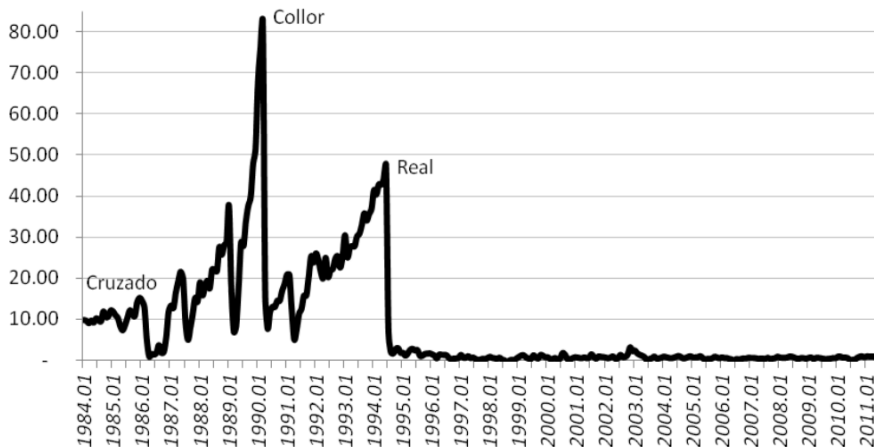Carlos Góes[1]

[1]UC San Diego

UCSD, Summer Session II

Inflation
percentage change in an economy's overall price level

$$\pi_t \equiv \frac{P_t - P_{t-1}}{P_{t-1}}$$

Brazilian hyperinflation

Graph 5 - Monthly inflation, in percentage points (1984-2012)

From Góes (2012) "A Beginner's Guide to Brazilian Economic Idiosyncracies" The SAIS Europe Journal of Global Affairs, Volume 15.

Stories of hyperinflation (i)

People had to rush to the supermarket as soon as they got their paychecks because prices increased twice a day!

Businessmen were buying whatever they could to "store value" even trucks… can you imagine… Typically cars and trucks are a horrible investment because they depreciate as they get out of the dealership lot.

Stories of hyperinflation (ii)

The government tried price controls... the predictable consequence was shortages in most supermarkets. My mom had to buy formula in the black market for premium (beyond price controls) in order to find the product. (The cute rabbit is me under hyperinflation).

Stories of hyperinflation (iii)

Then Treasury Secretary (and future President) Fernando Henrique Cardoso introduce a new currency, the Brazilian real. A team of U.S. trained economists, notably future Treasury Secretary Pedro Malan in the background.

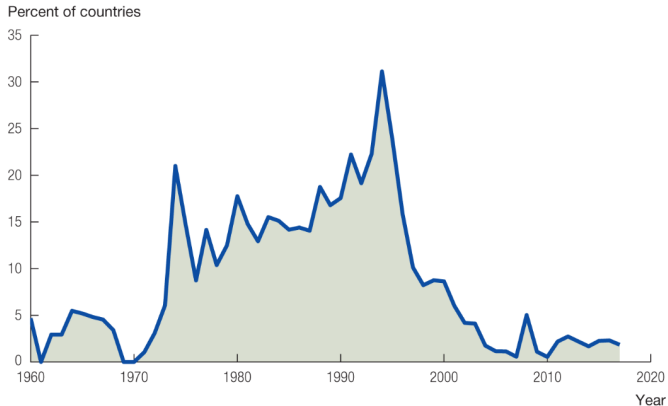# Brazil is obviously not the only country that went through a hyperinflation...

Germany, Hungary, Poland, Bolivia, Argentina, Somalia, Venezuela, Russia, and many others...

...but the quality of central banks improved and the share of countries with high inflation decreased
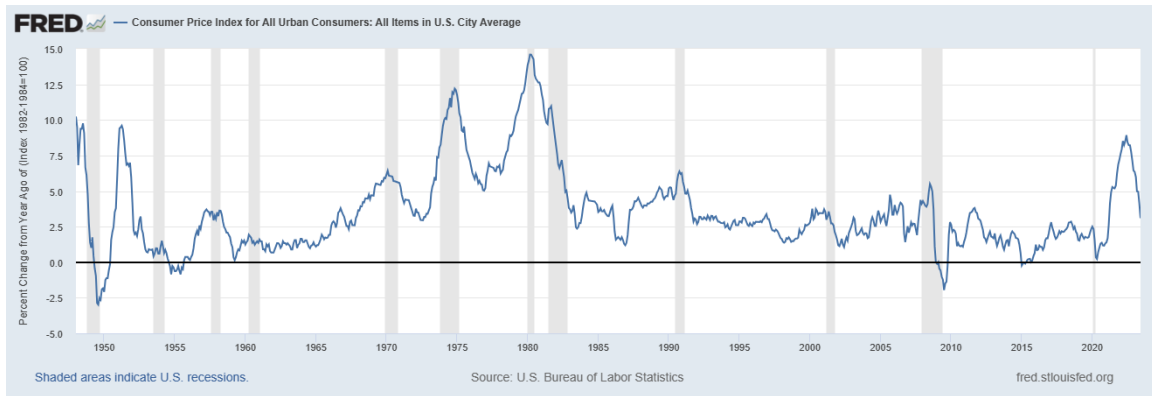
FIGURE 8.2

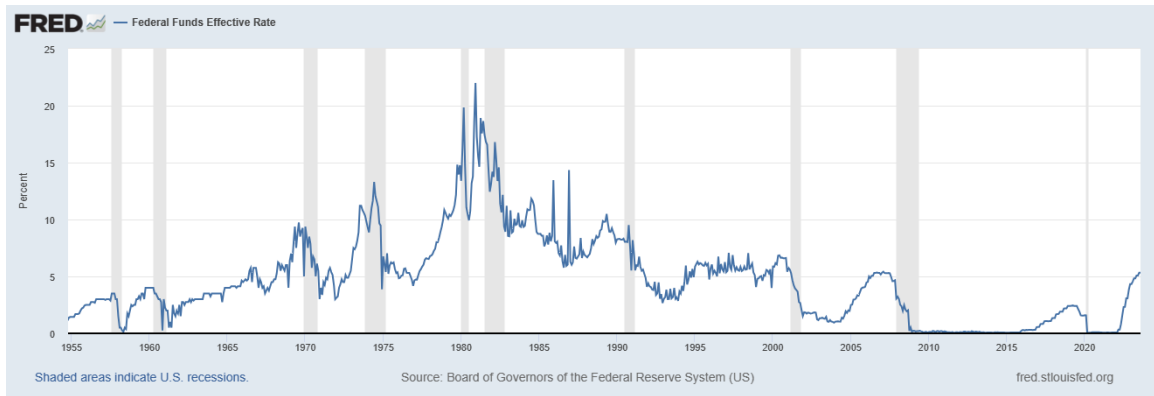The Percent of Countries Experiencing High Inflation

Percent of countries

Source: FRED.

Percent of Countries Experiencing High Inflation (Figure 8.3 of your textbook)
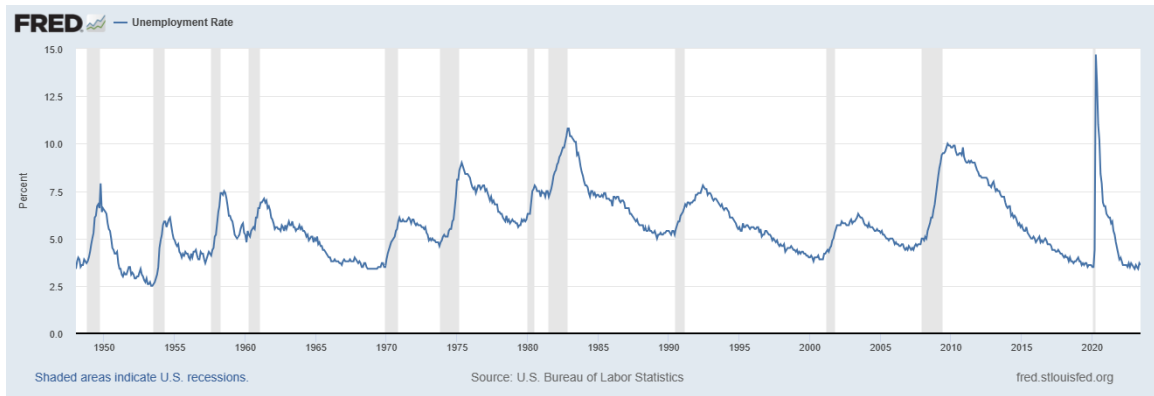
The great inflation in the U.S. (and then again)

https://fred.stlouisfed.org/graph/?g=17wAB
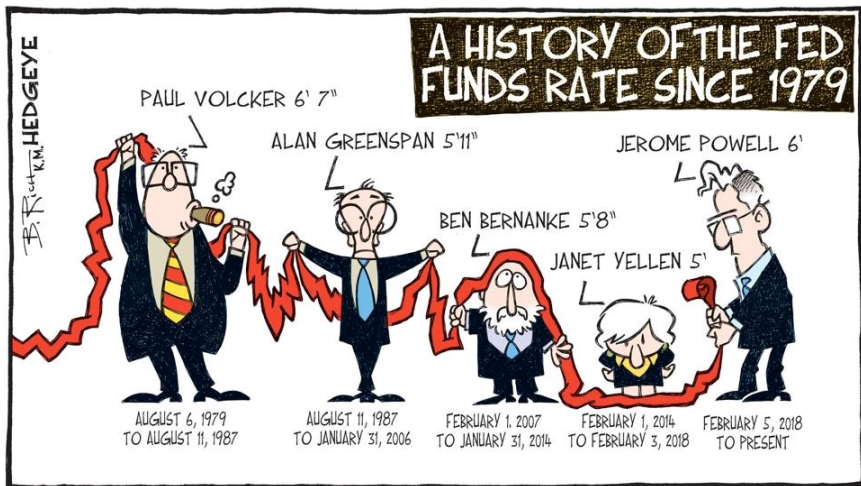
The great disinflation in the U.S.

https://fred.stlouisfed.org/graph/?g=17wAP

The great disinflation in the U.S.... also caused a recession

https://fred.stlouisfed.org/series/UNRATE

Correlation is not causation but...

How to measure prices over time?

- One way to compare prices across time is to adjust for average changes in prices across times using some price index.

- For instance, if we want to know the price of some good i in 1950 and want to know what is the equivalent price of that good in 2018 prices, we can adjust for the *average change in prices between those years*:

$$\underbrace{P_{i,2018}}_{\substack{\text{price of } i \\ \text{in 2018}}} = \underbrace{P_{i,1950}}_{\substack{\text{price of } i \\ \text{in 1950}}} \times \underbrace{\frac{P_{2018}}{P_{1950}}}_{\substack{\text{ratio of price} \\ \text{prices between 2018} \\ \text{and 195}}}$$

How to measure prices over time?

- Suppose you know 1 gallon of gas was $0.29 in 1950

- You also know that the consumer price index for 2018 is $P_{2018} = 100$ and for 1950 is $P_{1950} = 9.59$.
    - This means that, on average, prices grew $\frac{P_{2018} - P_{1950}}{P_{1950}} = 942\%$ between those years!

- This is enough information to calculate the price of gasoline in 2018 dollars:

$$P_{gasoline,2018} = P_{gasoline,1950} \frac{P_{2018}}{P_{1950}} = \$_{1950}0.29 \times \frac{\$_{2018}100}{\$_{1950}9.59} = \$_{2018}2.82$$

What is money?

Three traditional functions

1. medium of exchange
2. unit of account
3. storage of value
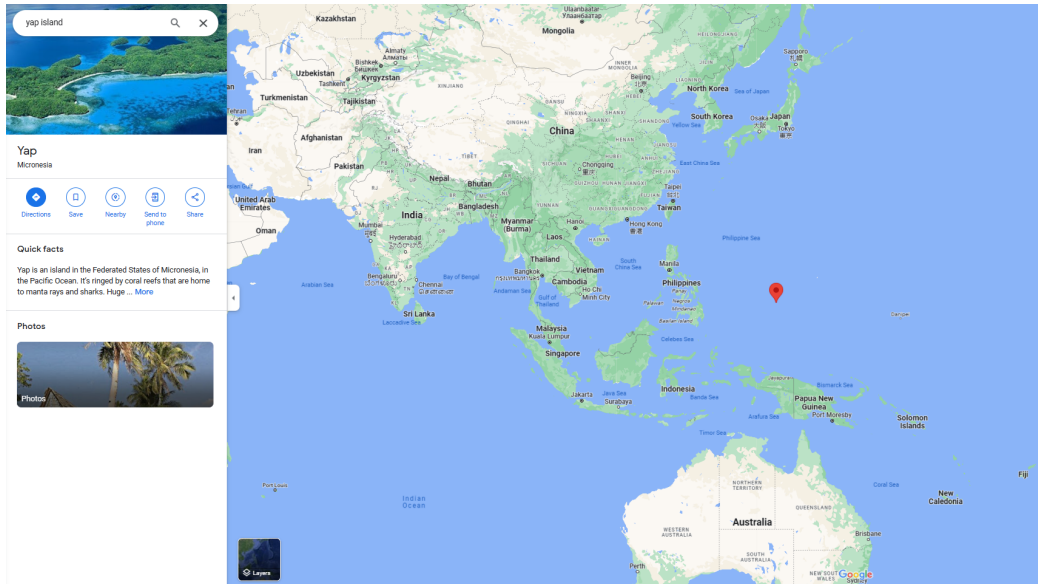
What is money?

Three traditional functions

1. medium of exchange
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Many different items have served that role over history:

- gold, silver, copper;
- grains;
- paper currency;
- digital bits (that's us!);
- shells;
- rocks in the ocean.

Stone money in the Yap Islands

Stone money in the Yap Islands

Money as a good may not have a use or an end itself...

... but it facilitates economic transactions becoming the reference price in the economy.

The fancy word for that is that money is the numéraire good in the economy.

The Quantity Theory of Money

An introduction to Monetary Economics

Milton Friedman
1912-2006

Nobel Prize in Economics, 1976

Measures of Money Supply

Different Measures of Money Supply in January 2019 (billions of dollars)

C	Currency	1,710
MB	Monetary Base (currency + reserves)	3,350
M1	Currency + demand deposits (e.g. checkings accounts)	3,740
M2	M1 + savings accounts + individual money mkts accounts	14,470

The Quantity Equation

This is an accounting identity, always holds true!

$$\underbrace{M_t}_{\text{money supply}} \cdot \underbrace{V_t}_{\text{velocity}} = \underbrace{P_t}_{\text{price level}} \cdot \underbrace{Y_t}_{\text{real GDP}}$$

The Quantity Equation (in growth rates)

This is (still) an accounting identity, always holds true!

$$g_{P_t} \equiv \pi_t = g_{M_t} + g_{V_t} - g_{Y_t}$$

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The Quantity Equation (in growth rates)

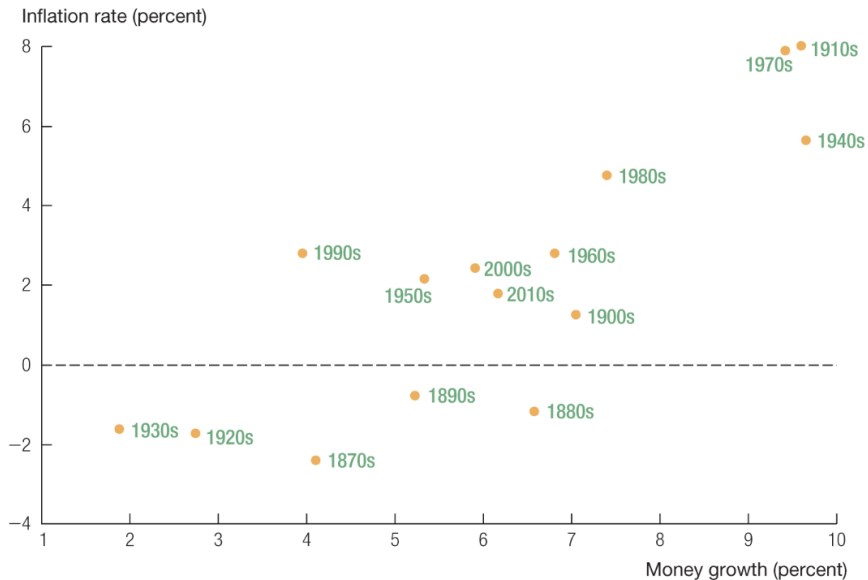This is (still) an accounting identity, always holds true!

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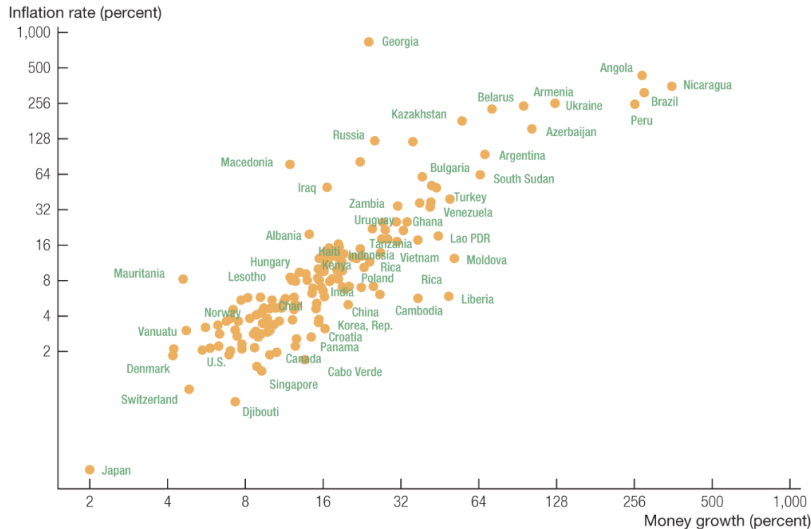
$$g_{P_t} \equiv \pi_t = g_{M_t} - g_{Y_t}$$

Inflation is always and everywhere a monetary phenomenon
– Milton Friedman

QTM works well over the long run...

Inflation rate (percent) vs Money growth (percent)

QTM works well over the long run...

Money Growth and Inflation around the World, 1990–2017

…and it also seems to hold in simple economies…

The Economic Organisation of a P.O.W. Camp

By R. A. RADFORD

INTRODUCTION

AFTER allowance has been made for abnormal circumstances, the social institutions, ideas and habits of groups in the outside world are to be found reflected in a Prisoner of War Camp. It is an unusual but a vital society. Camp organisation and politics are matters of real concern to the inmates, as affecting their present and perhaps their future existences. Nor does this indicate any loss of proportion. No one pretends that camp matters are of any but local importance or of more than transient interest, but their importance there is great. They bulk large in a world of narrow horizons and it is suggested that any distortion of values lies rather in the minimisation than in the exaggeration of their importance. Human affairs are essentially practical matters and the measure of immediate effect on the lives of those directly concerned in them is to a large extent the criterion of their importance at that time and place. A prisoner can hold strong views on such subjects as whether or not all tinned meats shall be issued to individuals cold or be centrally cooked, without losing sight of the significance of the Atlantic Charter.

One aspect of social organisation is to be found in economic activity, and this, along with other manifestations of a group existence, is to be found in any P.O.W. camp. True, a prisoner is not dependent on his exertions for the provision of the necessaries, or even the luxuries of life, but through his economic activity, the exchange of goods and services, his standard of material comfort is considerably enhanced. And this is a serious matter to the prisoner: he is not "playing at shops" even though the small scale of the transactions and the simple expression of comfort and wants in terms of cigarettes and jam, razor blades and writing paper, make the urgency of those needs difficult to appreciate, even by an ex-prisoner of some three months' standing.

Nevertheless, it cannot be too strongly emphasised that economic activities do not bulk so large in prison society as they do in the larger world. There can be little production; as has been said the prisoner is independent of his exertions for the provision of the necessities and luxuries of life; the emphasis lies in exchange and the media of exchange. A prison camp is not to be compared with the seething crowd of higglers in a street market, any more than it is to be com-

…and it also seems to hold in simple economies…

ones were rejected, or extra demanded as a make-weight.   For a time we suffered all the inconveniences of a debased currency.

Machine-made cigarettes were always universally acceptable, both for what they would buy and for themselves.   It was this intrinsic value which gave rise to their principal disadvantage as currency, a disadvantage which exists, but to a far smaller extent, in the case of metallic currency;—that is, a strong demand for non-monetary purposes. Consequently our economy was repeatedly subject to deflation and to periods of monetary stringency.   While the Red Cross issue of 50 or 25 cigarettes per man per week came in regularly, and while there were fair stocks held, the cigarette currency suited its purpose admirably. But when the issue was interrupted, stocks soon ran out, prices fell, trading declined in volume and became increasingly a matter of barter.   This deflationary tendency was periodically offset by the sudden injection of new currency.   Private cigarette parcels arrived in a trickle throughout the year, but the big numbers came in quarterly when the Red Cross received its allocation of transport.   Several hundred thousand cigarettes might arrive in the space of a fortnight. Prices soared, and then began to fall, slowly at first but with increasing rapidity as stocks ran out, until the next big delivery.   Most of our economic troubles could be attributed to this fundamental instability.

...but breaks down over the short run (monthly vs 5-year)

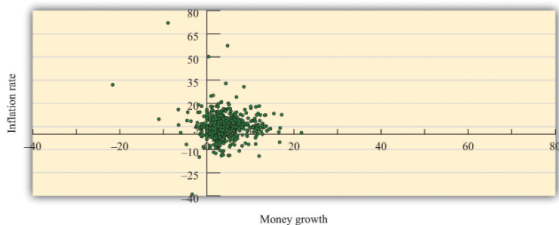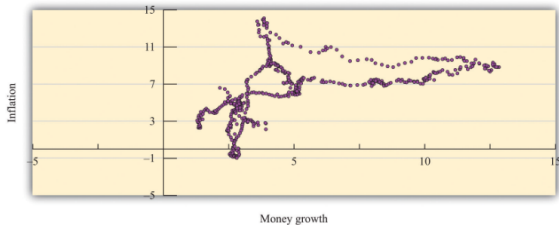Figure 11.4 *Inflation and Money Growth in the Short Run*

Figure 11.5 *Inflation and Money Growth in the Long Run*

Why would the Central Bank "print too much money"?

- Government budget constraint:

$$\underbrace{G}_{\text{uses}} = \underbrace{T}_{\text{taxes}} + \underbrace{\Delta B}_{\text{bonds}} + \underbrace{\Delta M}_{\text{money}}$$

- Printing money to finance fiscal expenditures is called seigniorage or the inflation tax...

- Historical origins is literally making gold coins smaller...

What happened when the Somali government collapsed and the market was flooded with banknotes? A natural experiment

CrossMark

The monetary mechanism of stateless Somalia
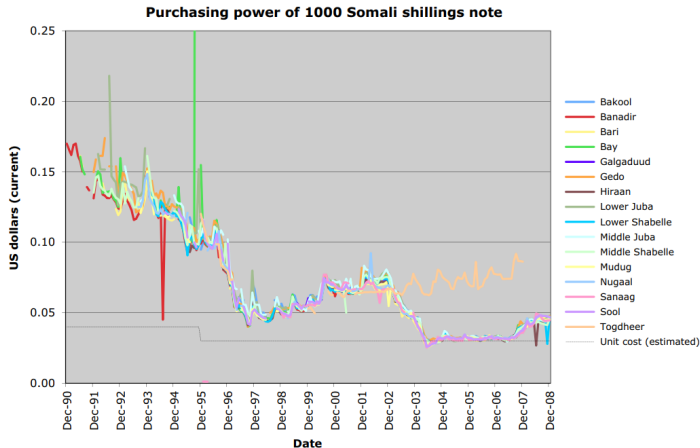
William J. Luther[1]

Abstract A peculiar monetary institution emerged during the period of interregnum in Somalia from January 1991 to August 2012. Without a functioning government to restrict the supply of notes in circulation, Somalis found it profitable to contract with foreign printers and import forgeries. The exchange value of the largest denomination Somali shillings note fell from US $0.30 in 1991 to US $0.03 in 2008. However, the purchasing power eventually stabilized at the cost of producing additional notes.

...the exchange rate of shillings converged to the marginal cost of printing another banknote! Inflation kicked in and seigniorage gains eventually disappeared!

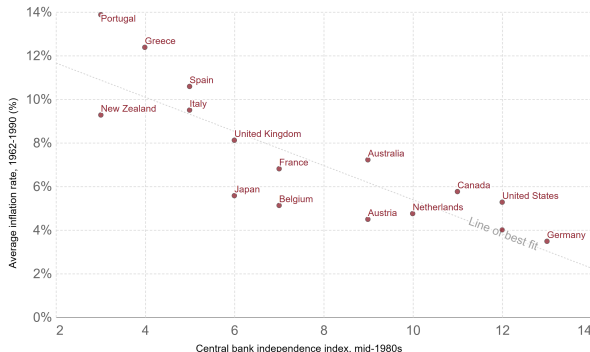Purchasing power of 1000 Somali shillings note

How do governments constrain this fiscal inflationary impulse?

Persistent high inflation is always and everywhere a fiscal phenomenon
– Thomas Sargent, Nobel Prize in Economics (2011)

Inflation and central bank independence: OECD countries

Unit 15 'Inflation, unemployment, and monetary policy' Section 15.11 'Macroeconomic policy before the global financial crisis: Inflation-targeting policy' in The CORE Team, The Economy. Available at: https://tinyco.re/15112000 [Figure 15.20]

Source: OECD (2015), Grilli et al. (1991)
Note: Central bank independence index is displayed on the 'MAP' tab. CC-BY-ND-NC

tinyco.re/15112000 • Powered by ourworldindata.org