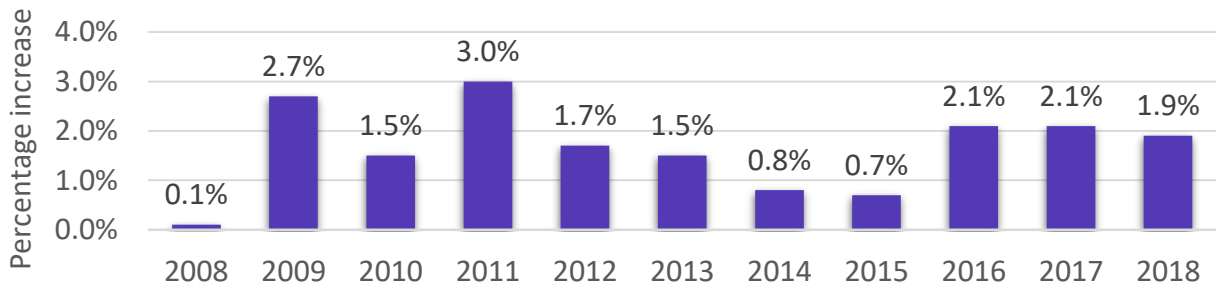## Over time inflation reduces purchasing power

Average Inflation Rates 2008-2018[1]

- Inflation rose by 1.9% last year; on average everything now costs 1.9% more than last year

- Rates can be negative, indicating deflation

- Between 1914 – 2018 **average inflation was 3.2%**[2]

- Between 2000 – 2018 average inflation was 2.1%

- Inflation is measured from the Consumer Price Index (CPI), a measure of price changes of consumer goods and services[3]

The Federal Reserve's role in managing inflation

- According to the Federal Reserve, the **ideal inflation rate is 2%**[4]
    - Higher inflation would make it more difficult for long term financial goal planning, such as for retirement
    - Lower inflation would risk deflation, where prices, but also wages, fall

- To maintain this ideal rate, the Federal Reserve exercises monetary policy and raises (or lowers) interest rates[5]

- **Raising interest rates** make it more difficult for consumers and businesses to borrow money. Consumers buy less, and businesses expand less. Demand for goods and services goes down, but so does inflation.

- **Lowering interest rates** result in better borrowing power for both consumers and business. Both spend more. Businesses hire more, generating even more income for consumers to spend. The economy is stimulated. Demand, and inflation, go up.

Long term financial planning

- When determining how much to save for a long-term financial goal, such as retirement, inflation adds an extra challenge

- Perhaps you estimate you'll need $50,000 per year in today's dollars to live on in retirement. But how much will that be 10 years from now? 20 years? 30 years?

Calculating compounded growth[6]

$$FV = PV(1 + r)^t$$

FV = future value
PV = present value
r = rate
t = time (years)

- Assuming 3% average inflation, in 20 years, how much will be needed to pay for what $50,000 pays for today?
    - $50,000 x $(1+.03)^{20}$ = $90,000

- Same equation can determine the growth of your savings. If investments earn 5%, how much will $10,000 be worth in 10 years?
    - $10,000 x $(1+.05)^{10}$ = $16,000

Calculating inflation-adjusted return[7]

$$\frac{(1 + Return)}{(1 + Inflation\ rate)} - 1$$

- But with inflation that $16,000 won't have as much purchasing power as it does today. To calculate the effects of inflation, first calculate the inflation adjusted return
    - $((1+.05) / (1+.03))$ – 1 = .0194

- With inflation a 5% return is reduced to 1.9%!! In ten years your savings (in today's dollars) is only worth:
    - $10,000 x $(1+.0194)^{10}$ = $12,118

References

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