Economics 134 L8. Climate Change II

Will Rafey

UCLA

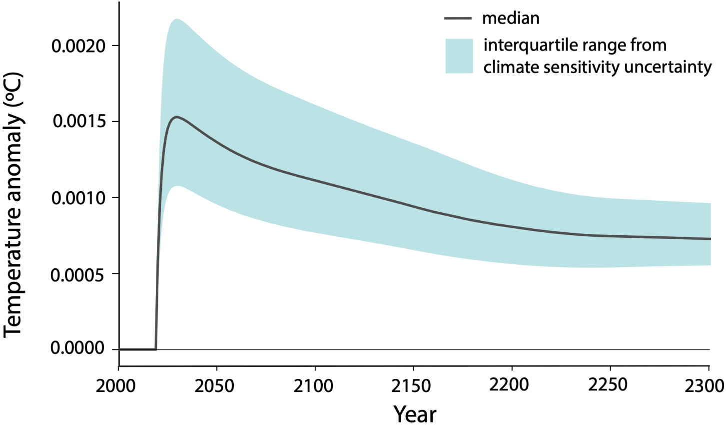
October 27, 2025

Climate change

Why study climate change?

1. One of the greatest challenges of our time
2. Raises new and interesting economic issues
    1. ~~balancing energy use with decarbonization (L7)~~
    2. discounting and long-run environmental policy (today)
    3. risk, uncertainty, and irreversibility (L9)
    4. international negotiation and cooperation (L10)

Emissions today influence the climate for hundreds of years



Long-run temperature change due to a 3.66Gt CO_2 emissions increase in 2020.

Plan

Introduction to discounting

The Stern v. Nordhaus debate

Ramsey's formula

1. Prescriptive approach

2. Descriptive approach

Implications for climate policy evaluation

Introduction to discounting

The Stern v. Nordhaus debate

Ramsey's formula

1. Prescriptive approach

2. Descriptive approach

Implications for climate policy evaluation

Introduction to discounting

Objective: compare economic outcomes occurring at different times

$\hookrightarrow$ vast number of public policies have varying time paths of costs and benefits

Idea: suppose that 1 today is worth $\frac{1}{1+r}$ tomorrow, given a discount rate, r.

Then, suppose that some environmental benefits B_t occur over some number of periods $t \in \{0, 1, 2, \ldots, T\}$.

At time zero, we can calculate the **net present discounted value** (NPDV) of this sequence of benefits as

$$V = \sum_{t=0}^{T} \frac{1}{(1+r)^t} B_t,$$

where r is the discount rate.

Remarks

The discount rate gives us a **relative price** of future consumption goods v. present consumption goods.

Note that

- the discount rate is generally positive
  - however, could be negative, in a situation of decline or depression...
- units of consumption goods, **not** utility
- **not** dollars: here, "discount rate" $\equiv$ **real** discount rate (i.e., net of inflation)
- imagine: rate of return on capital investment
  - e.g., suppose that trees grow at a rate 5% per year. From a valuation point of view, 105 trees a year from now is equivalent to 100 trees today
  - i.e., (100 trees today) = (105 trees next year, discounted by $1 + .05$)

Example

Suppose we could obtain \$1,000,000 in 200 years. How much is that worth today?

We know that $V = \frac{10^6}{(1+r)^T}$. Suppose \$$10^6$ in 200 years is worth \$$10^5$. Then the discount rate must be $(10^6/10^5)^{1/T} - 1 = 0.0116$.

More generally,

present value, V, of \$1,000,000 in 200 years	discount rate, r
100,000	1.16%
10,000	**2.33%**
1,000	3.51%
100	**4.71%**
10	5.93%
1	7.15%
.10	8.39%
.01	9.65%

✓ Choice of discount rate is **immensely important** for long horizons.

The Stern Review

We have already met Nordhaus, from last lecture, whose work won the 2018 Nobel Prize in Economics.

Another influential study was the 2006 **Stern Review** on the Economics of Climate Change, commissioned by the Government of the United Kingdom.

- led by Nicholas Stern (London School of Economics)

Estimated much higher climate damages than previous studies:

> *Using the results from formal economic models, the Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing* **at least 5% of global GDP each year, now and forever**. *(p. vi)*

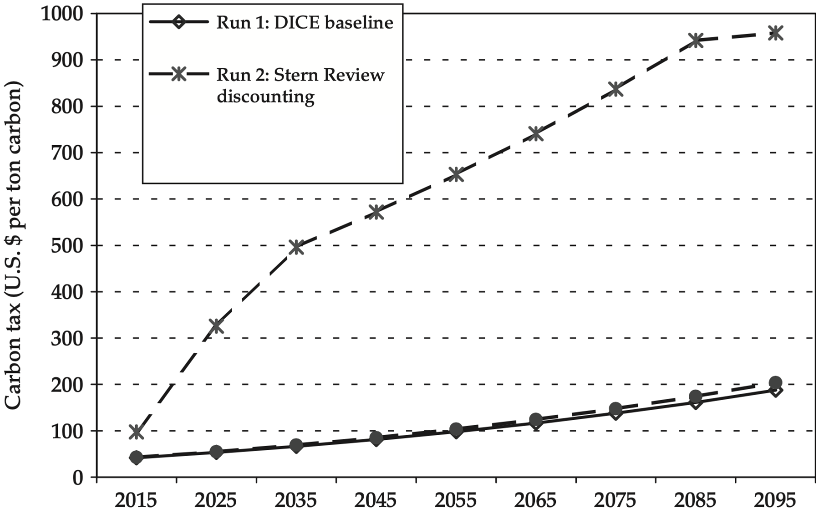
Implications for climate change damages

U.S. emissions per-capita: **13.7 tons CO_2** in 2020

- Nordhaus approach (4.25% discount rate): 1 $tCO_2 \approx$ **\$40** of damages
- Stern approach (1.4% discount rate): 1 $tCO_2 \approx$ **\$400** of damages.

Largely because these are very distant damages, discounted to the present. $\hookrightarrow$

Stern v. Nordhaus



Optimal carbon tax under alternative discount rates (Nordhaus 2008, Figure 9-1, p. 188).

A model of optimal savings

Frank Ramsey (1903–1930) developed a mathematical theory of optimal savings.

The theory can be understood with the following example. Consider two periods, t and $t+1$.

- In each period, we can produce output with $f(k)$ using capital k.
- In each period, output $f(k_t)$ can be used for **consumption** c_t and **investment** (or saving) i_t, so that $f(k_t) = c_t + i_t$.
- Investment becomes capital tomorrow, so that $k_{t+1} = \delta k_t + i_t$, with depreciation $\delta \in (0, 1)$.

At t, we choose investment i_t to maximize utility

$$u(c_t) + \frac{1}{1+\rho} u(c_{t+1})$$

where ρ is the rate of pure time preference: difference in importance of utility today versus utility in the future.

Solving for optimal investment

Optimal investment satisfies the first-order condition

$$\frac{\partial}{\partial i_t}\left[u\big(f(k_t) - i_t\big) + \frac{1}{1+\rho}u\big(f(\delta k_t + i_t) - i_{t+1}\big)\right] = 0$$

which is

$$-u'(c_t) + \frac{1}{1+\rho}u'(c_{t+1})f'(k_{t+1}) = 0.$$

Rearranging, and taking natural logs, we obtain

$$\ln f'(k_{t+1}) = \ln(1+\rho) + \ln\frac{u'(c_t)}{u'(c_{t+1})}.$$

Ramsey's formula

We have derived $\ln f'(k_{t+1}) = \ln(1+\rho) + \ln \frac{u'(c_t)}{u'(c_{t+1})}$.

Some definitions:

1. $\ln f'(k_{t+1})$ is ln of the marginal product of capital, or the real interest rate r
2. $\ln(1+\rho) \approx \rho$ is the rate of pure time preference
3. $\ln \frac{u'(c_t)}{u'(c_{t+1})} \equiv \theta g$, where θ is the elasticity of marginal utility and g is the growth rate of consumption

These definitions give us

$$r = \rho + \theta g,$$

which is **Ramsey's formula**!

Applying Ramsey's formula

We have $r = \rho + \theta g$.

Ramsey's formula gives us two separate reasons for discounting consumption:

- caring less about tomorrow than today (ρ)
- believing tomorrow's consumer will be better off than today's (θg)

Question: how should we estimate ρ, θ, and g?

Two economic approaches to discounting

Two ways to take Ramsey's equation to the data:

1. Prescriptive—use ethical arguments to determine ρ
2. Descriptive—use market data on investment returns for r (to learn about ρ)

Continued debate over which approach is correct (and what parameters/data to use in each case).

1. Prescriptive approach

Question: How (ethically) should impacts on future generations be valued?

Ramsey argues that $\rho = 0$:

> *"to discount later enjoyments in comparison with earlier ones... is ethically indefensible and arises merely from the weakness of the imagination" (1928, p. 543)*

Remark 1. The view that $\rho = 0$ does **not** imply that $r = 0$ (unless $\theta g = 0$).

Stern sets $\rho = 0.1$ (nonzero due to extinction risk).

Critiques of the prescriptive approach

Arbitrariness—many different ethical approaches; not obvious which one to pick:

> *To begin with, there is a major issue concerning the views that are embodied in the social welfare function adopted by the Stern Review. It takes the* **lofty vantage point of the world social planner**, *perhaps stoking the dying embers of the British Empire, in determining the way in which the world should combat the dangers of global warming. The world, according to Government House utilitarianism, should use the combination of time discounting and consumption elasticity that the Stern Review's authors find persuasive from their ethical vantage point (Nordhaus 2008, p. 174).*

Calibrating θg

Two questions:

1. What are reasonable expectations of increases in per-capita income, g?
   - estimates of long-run economic growth rates typically 1–3%

2. How rapidly should marginal utility from an additional unit of consumption fall as consumption rises, i.e., how large is θ?
   - e.g., if $\theta = 1$ (utility is logarithmic), then if income rises by 1%, marginal utility of consumption falls by 1%
   - revealed preference studies, from behavior towards risk and towards consumption bundles over time, give estimates typically in $\theta \in [1, 2]$.

Example calculation

Example. Suppose $\rho = 0$.

- Suppose $g = 1.5\%$ and $\theta = 2$. Then $r = 3\%$!
- Alternatively, suppose $g = 0.5\%$ and $\theta = 1$; then $r = 0.5\%$.

2. Descriptive approach to discounting

Alternatively, we could try to measure r directly.

Questions:

- what choices involving tradeoffs across time do people (firms) actually make?
- to what extent will green investments displace investments elsewhere?

Opportunity cost of capital argument:

- If investing in climate protection today is less valuable than investing in some other productive sector of the economy, then we are better off investing in the productive sector.
  - **Example**. Invest in education, health technology now if $\implies$ more productive, healthier workforce $\implies$ more wealth, innovation (that is worth more than the additional climate damage incurred)

$\hookrightarrow$ by this logic, a green project should be discounted at the expected rate of return of a traded asset with the same risk

Measured rates of return

Nordhaus (2008, p. 58)

Table 3-2. Estimated Real Returns to Capital from IPCC Second Assessment, Various Periods and Sources

Asset	Period	Real Return (Percent)
High-income industrial countries		
Equities	1960–1984 (a)	5.4
Bonds	1960–1984 (a)	1.6
Nonresidential capital	1975–1990 (b)	15.1
Govt. short-term bonds	1960–1990 (c)	0.3
United States		
Equities	1925–1992 (a)	6.5
All private capital, pretax	1963–1985 (d)	5.7
Corporate capital, posttax	1963–1985 (e)	5.7
Real estate	1960–1984 (a)	5.5
Farmland	1947–1984 (a)	5.5
Treasury bills	1926–1986 (c)	0.3
Developing countries		
Primary education	various (f)	26
Higher education	various (f)	13

Source: Arrow et al. 1996. The letters refer to the sources provided in the background document.

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

10-Year Real Interest Rate (REAINTRATREARAT10Y)

Observations
Oct 2025: **1.56911**
Updated: Oct 24, 2025 2:34 PM CDT
Next Release Date: Not Available

Units:
Percent,
Not Seasonally Adjusted

Frequency:
Monthly

1Y | 5Y | 10Y | Max

1982-01-01 to 2025-10-01

Edit Graph

Download

Source: Federal Reserve Bank of Cleveland via FRED®
Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

Fullscreen

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

Historical context

https://scholar.google.com/citations?user=1-lLvOQAAAAJ&hl=en

William Nordhaus

FOLLOW

Yale University
Verified email at yale.edu - Homepage
macroeconomics environmental economics

TITLE	CITED BY	YEAR
Economía PA Samuelson, WD Nordhaus AMGH Editora	22208 *	2012
The political business cycle WD Nordhaus The review of economic studies 42 (2), 169-190	7313	1975
What is the value of scientific knowledge? An application to global warming using the PRICE model WD Nordhaus, D Popp The Energy Journal 18 (1), 1-45	3380	1997
The impact of global warming on agriculture: a Ricardian analysis R Mendelsohn, WD Nordhaus, D Shaw The American economic review, 753-771	3231	1994
A question of balance: Weighing the options on global warming policies	3087	2008

Historical context

https://scholar.google.com/citations?user=1-lLvOQAAAAJ&hl=en

William Nordhaus

FOLLOW

Yale University
Verified email at yale.edu - Homepage

macroeconomics environmental economics

TITLE	CITED BY	YEAR
Economía PA Samuelson, WD Nordhaus AMGH Editora	22208 *	2012
The political business cycle WD Nordhaus The review of economic studies 42 (2), 169-190	7313	1975
What is the value of scientific knowledge? An application to global warming using the PRICE model WD Nordhaus, D Popp The Energy Journal 18 (1), 1-45	3380	1997
The impact of global warming on agriculture: a Ricardian analysis R Mendelsohn, WD Nordhaus, D Shaw The American economic review, 753-771	3231	$\boxed{1994}$
A question of balance: Weighing the options on global warming policies	3087	2008

Example of descriptive approach

Nordhaus tries to match $r = 4.25$.

So, he sets $\rho = 1.5\%$ (with $\theta = 1.45$ and $g = 1.9\%$).

Note that, could attain same result if $\theta = 2.13$ and $\rho = 0.1\%$!

Implication: ρ and θ must be determined jointly!

Critiques of the descriptive approach

Critiques:

- asset prices may reflect a variety of concerns
  - not obvious which rate of return to use
- efficiency issues
  - future generations cannot trade
  - competitive equilibrium may not be efficient
  - e.g., impatience may drive markets' collective attitude towards the future
- equity concerns
  - even if efficient, the equilibrium may be socially undesirable because of large intergenerational inequalities
  - cuts both ways: e.g., higher $\theta \implies$ more aversion to intertemporal inequality

Discussion

Prescriptive approach tends towards:

- somewhat lower discount rates
- relatively higher spending today on climate mitigation

Descriptive approach:

- somewhat higher discount rates
- relatively lower spending today on climate mitigation

Economists' discount rates

Weitzman (2001) surveyed the opinions of 2,160 economists about r:

> *Dear XXX:*
>
> *I would very much appreciate enlisting a few moments of your time in the cause of introducing some economic analysis into the current policy debates about global warming.*
>
> *As part of an empirical study, I need your best point estimate of the appropriate real discount rate to be used for evaluating environmental projects over a long time horizon. (What I am after here is the relevant interest rate for discounting real-dollar changes in future goods and services—as opposed to the rate of pure time preference on utility.)*

Finds **considerable disagreement** $\hookrightarrow$

No consensus among economists

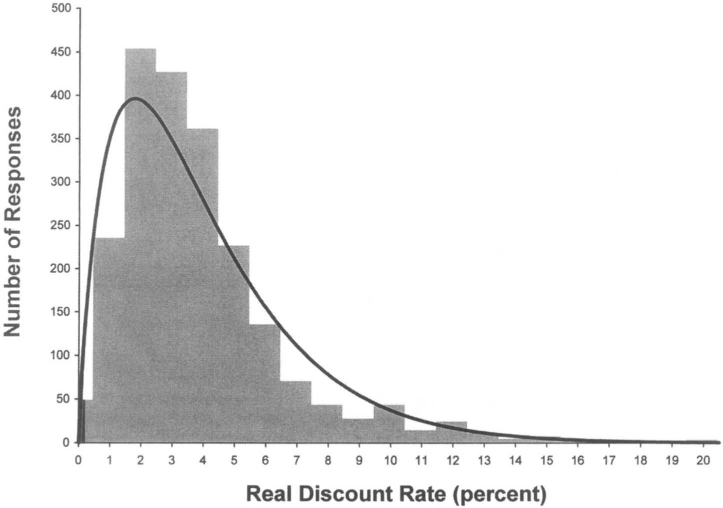


FIGURE 1. ACTUAL (HISTOGRAM) AND FITTED (CURVE) FREQUENCY DISTIRBUTIONS

Mean: $r = 3.96\%$ (s.d. 2.94%). **Source**. Weitzman (2001, p. 263).

Nordhaus' IAM

	Social Cost of Carbon			
	[2018 $ per ton of CO2]			
Discount rate	2015	2020	2050	2100
0.1%	970	966	917	665
1.0%	497	515	614	657
2.0%	219	236	349	544
3.0%	93	104	179	361
4.0%	44	49	93	207
5.0%	23	27	55	126
DICE- opt	36	43	105	295

Social cost of carbon under alternative discount rates (Nordhaus 2018, Figure 2).

Nordhaus' IAM

Discount rate	Social Cost of Carbon [2018 $ per ton of CO2]			
	2015	2020	2050	2100
0.1%	970	966	917	665
1.0%	497	515	614	657
2.0%	219	236	349	544
3.0%	93	104	179	361
4.0%	44	49	93	207
5.0%	23	27	55	126
DICE- opt	36	43	105	295

Social cost of carbon under alternative discount rates (Nordhaus 2018, Figure 2).

Nordhaus' IAM

	Social Cost of Carbon			
	[2018 $ per ton of CO2]			
Discount rate	2015	2020	2050	2100
0.1%	970	966	917	665
1.0%	497	515	614	657
2.0%	219	236	349	544
3.0%	93	104	179	361
4.0%	44	49	93	207
5.0%	23	27	55	126
DICE- opt	36	43	105	295

Social cost of carbon under alternative discount rates (Nordhaus 2018, Figure 2).

Governments' discount rates

Real discount rates for public investment: US (OMB)

- 1972–1992, 10%
- 1992–2003, 7%
- 2003–2022, 7% (and 3% "as sensitivity")
- 2023 (proposed), 1.7%

France

- 1985–2005, 8%
- 2005–2011, $r_f = 4\%$ (and $r_f = 2\%$ for >30 years)
- 2011–present, $r_f + (\beta \times 3\%)$

Obama's social cost of carbon

Table ES-1: Social Cost of CO_2, 2020 – 2050 (in 2020 dollars per metric ton of CO_2)

	Discount Rate and Statistic		
Emissions Year	5% Average	3% Average	2.5% Average
2020	14	51	76
2025	17	56	83
2030	19	62	89
2035	22	67	96
2040	25	73	103
2045	28	79	110
2050	32	85	116

Source. Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," February 2021.

Obama's social cost of carbon

Table ES-1: Social Cost of CO_2, 2020 – 2050 (in 2020 dollars per metric ton of CO_2)

	Discount Rate and Statistic		
Emissions Year	5% Average	3% Average	2.5% Average
2020	14	51	76
2025	17	56	83
2030	19	62	89
2035	22	67	96
2040	25	73	103
2045	28	79	110
2050	32	85	116

Source. Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," February 2021.

Obama's social cost of carbon

Table ES-1: Social Cost of CO_2, 2020 – 2050 (in 2020 dollars per metric ton of CO_2)

	Discount Rate and Statistic		
Emissions Year	5% Average	3% Average	2.5% Average
2020	14	51	76
2025	17	56	83
2030	19	62	89
2035	22	67	96
2040	25	73	103
2045	28	79	110
2050	$\boxed{32}$	$\boxed{85}$	$\boxed{116}$

Source. Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," February 2021.

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

10-Year Real Interest Rate (REAINTRATREARAT10Y)

Observations
Oct 2025: **1.56911**
Updated: Oct 24, 2025 2:34 PM CDT
Next Release Date: Not Available

Units:
Percent,
Not Seasonally Adjusted

Frequency:
Monthly

1Y | 5Y | 10Y | Max

1982-01-01 to 2025-10-01

Edit Graph

Download

Source: Federal Reserve Bank of Cleveland via FRED®
Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

Fullscreen

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

10-Year Real Interest Rate (REAINTRATREARAT10Y)

Observations
Oct 2025: **1.56911**
Updated: Oct 24, 2025 2:34 PM CDT
Next Release Date: Not Available

Units:
Percent,
Not Seasonally Adjusted

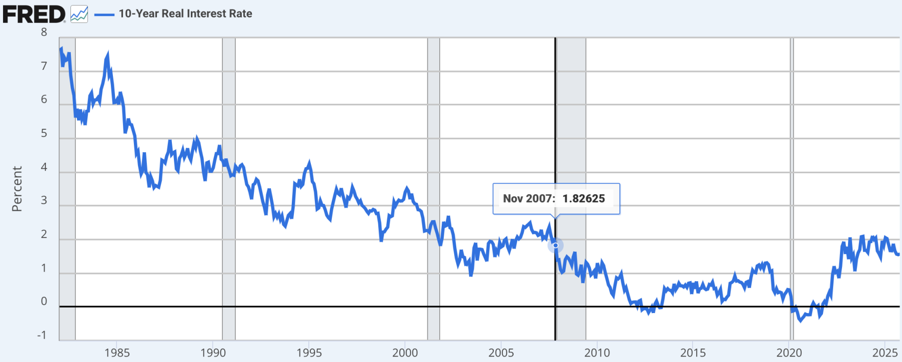
Frequency:
Monthly

1Y | 5Y | 10Y | Max

1982-01-01 to 2025-10-01

Edit Graph

Download



Source: Federal Reserve Bank of Cleveland via FRED®

Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

Fullscreen

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

10-Year Real Interest Rate (REAINTRATREARAT10Y)

Observations
Oct 2025: **1.56911**
Updated: Oct 24, 2025 2:34 PM CDT
Next Release Date: Not Available

Units:
Percent,
Not Seasonally Adjusted

Frequency:
Monthly

1Y | 5Y | 10Y | Max

1982-01-01 to 2025-10-01

Edit Graph

Download

Source: Federal Reserve Bank of Cleveland via FRED®

Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

Fullscreen

US EPA's social cost of carbon

Table 2.4.1: Average Real Return on 10-Year Treasury Securities Based on Inflation Measure

	Time Period	
Inflation Measure	1991-2020	1973-2020
Consumer Price Index (CPI)	1.55%	2.12%
Livingston Survey	1.62%	2.48%
Perceived Inflation Target Rate (PTR)	1.98%	2.80%

Table 2.4.2: Calibrated Ramsey Formula Parameters

Near-Term Target Certainty-Equivalent Rate	ρ	η
1.5%	0.01%	1.02
2.0%	0.20%	1.24
2.5%	0.46%	1.42

Source: Rennert et al. (2022b)

Source. United States Environmental Protection Agency, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," November 2023.

US EPA's social cost of carbon

Table 2.4.1: Average Real Return on 10-Year Treasury Securities Based on Inflation Measure

	Time Period	
Inflation Measure	1991-2020	1973-2020
Consumer Price Index (CPI)	1.55%	2.12%
Livingston Survey	1.62%	2.48%
Perceived Inflation Target Rate (PTR)	1.98%	2.80%

Table 2.4.2: Calibrated Ramsey Formula Parameters

Near-Term Target Certainty-Equivalent Rate	ρ	η
1.5%	0.01%	1.02
2.0%	0.20%	1.24
2.5%	0.46%	1.42

Source: Rennert et al. (2022b)

Source. United States Environmental Protection Agency, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," November 2023.

US EPA's social cost of carbon

Table ES.1: Estimates of the Social Cost of Greenhouse Gases (SC-GHG), 2020-2080 (2020 dollars)

	SC-GHG and Near-term Ramsey Discount Rate		
	$SC\text{-}CO_2$ *(2020 dollars per metric ton of CO_2)*		
	Near-term rate		
Emission Year	2.5%	2.0%	1.5%
2020	120	190	340
2030	140	230	380
2040	170	270	430
2050	200	310	480
2060	230	350	530
2070	260	380	570
2080	280	410	600

Values of $SC\text{-}CO_2$, $SC\text{-}CH_4$, and $SC\text{-}N_2O$ are rounded to two significant figures. The annual unrounded estimates are available in Appendix A.5 and at: https://www.epa.gov/environmental-economics/scghg.

Source. United States Environmental Protection Agency, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," November 2023.

US EPA's social cost of carbon

Table ES.1: Estimates of the Social Cost of Greenhouse Gases (SC-GHG), 2020-2080 (2020 dollars)

SC-GHG and Near-term Ramsey Discount Rate

	SC-CO_2 (2020 dollars per metric ton of CO_2)		
Emission	Near-term rate		
Year	2.5%	2.0%	1.5%
2020	120	190	340
2030	140	230	380
2040	170	270	430
2050	200	310	480
2060	230	350	530
2070	260	380	570
2080	280	410	600

Values of SC-CO_2, SC-CH_4, and SC-N_2O are rounded to two significant figures. The annual unrounded estimates are available in Appendix A.5 and at: https://www.epa.gov/environmental-economics/scghg.

Source. United States Environmental Protection Agency, "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," November 2023.

Current USFG social cost of carbon

whitehouse.gov

Sec. 6. Prioritizing Accuracy in Environmental Analyses. (a) In all Federal permitting adjudications or regulatory processes, all agencies shall adhere to only the relevant legislated requirements for environmental considerations and any considerations beyond these requirements are eliminated. In fulfilling all such requirements, agencies shall strictly use the most robust methodologies of assessment at their disposal and shall not use methodologies that are arbitrary or ideologically motivated.

(b) The Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), which was established pursuant to Executive Order 13990, is hereby disbanded, and any guidance, instruction, recommendation, or document issued by the IWG is withdrawn as no longer representative of governmental policy including:

Source: `https://www.whitehouse.gov/presidential-actions/2025/01/unleashing-american-energy/`

Current USFG social cost of carbon (cont'd)

(b) The Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), which was established pursuant to Executive Order 13990, is hereby disbanded, and any guidance, instruction, recommendation, or document issued by the IWG is withdrawn as no longer representative of governmental policy including:

[. . .]

(ii) the Report of the Greenhouse Gas Monitoring and Measurement Interagency Working Group of November 2023 (National Strategy to Advance an Integrated U.S. Greenhouse Gas Measurement, Monitoring, and Information System);

(iii) the Technical Support Document of February 2021 (Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990); and

Source: `https://www.whitehouse.gov/presidential-actions/2025/01/unleashing-american-energy/`

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

☆ 10-Year Real Interest Rate (REAINTRATREARAT10Y)

Observations

Oct 2025: **1.56911**

Updated: Oct 24, 2025 2:34 PM CDT

Next Release Date: Not Available

Units:

Percent,

Not Seasonally Adjusted

Frequency:

Monthly

1Y | 5Y | 10Y | Max

1982-01-01 to 2025-10-01

Edit Graph

Download

Source: Federal Reserve Bank of Cleveland via FRED®

Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

Fullscreen

Measured rates of return

https://fred.stlouisfed.org/series/REAINTRATREARAT10Y

10-Year Real Interest Rate (REAINTRATREARAT10Y)

Observations
Oct 2025: **1.56911**
Updated: Oct 24, 2025 2:34 PM CDT
Next Release Date: Not Available

Units:
Percent,
Not Seasonally Adjusted

Frequency:
Monthly

1Y | 5Y | 10Y | Max

1982-01-01 to 2025-10-01

Edit Graph

Download

Source: Federal Reserve Bank of Cleveland via FRED®

Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

Fullscreen

Next time

We will discuss **uncertainty**.