



HM Treasury

Discounting

**Green Book supplementary
guidance**

October 2026

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Green Book supplementary guidance



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ISBN: 978-1-918417-98-2

PU: 3687

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Chapter 1

Introduction

1.1 The Green Book is the UK government’s guidance on appraisal, the process of assessing the costs, benefits and risks of different options for achieving government objectives.¹

1.2 The Green Book recommends using discounting to compare social costs and social benefits occurring over different time periods on a consistent basis. Discounting enables profiles of social costs and social benefits stretching over many years to be expressed in ‘present value’ terms.

1.3 This document supplements the Green Book by providing further guidance on discounting. Annex A sets out the standard discount factors for appraisal. Practitioners should multiply these by the expected social costs and social benefits in the relevant years of an appraisal.

¹ [‘The Green Book’](#), HM Treasury, October 2026

Chapter 2

Derivation of the discount rate

Introduction

2.1 The discount rate that is used in the Green Book is known formally as the Social Time Preference Rate (STPR). The STPR is currently set at 3.00% in real terms for the first 30 years of a proposal.

2.2 The STPR is named as such because it is primarily derived using a social time preference approach. This is one of the two broad approaches that can be used to derive the discount rate, which are:

- **Social time preference (STP):** The discount rate reflects the rate at which society is willing to trade off consumption today for consumption tomorrow.
- **Social opportunity cost of capital (SOC):** The discount rate reflects the cost of capital, derived from the different sources of government funding, as well as the return on the private investment that it displaces.

The Ramsey formula

2.3 The STPR is primarily derived using a formula known as the Ramsey formula. The Ramsey formula is made up of two components that are added together. These are the:

- **Risk-free discount rate (r_f):** Society's preference for social benefits now, rather than later. This is denoted by r_f .
- **Systematic risk premium (L):** The premium that society demands in compensation for the riskiness of government proposals, and which arises from the fact that the social benefits of government proposals generally correlate with the wider economy. This is denoted by the letter L .

2.4 The risk-free discount rate is made up of three components:

- **Pure time preference (δ):** The social time preference that is solely due to social benefits occurring later in time. This is denoted by the Greek letter δ (delta).
- **Wealth effect:** The social time preference that arises because society gets richer over time.

- **Rare disaster risk (R):** The social time preference that arises because of the risk of a severe, but low-probability, negative shock to aggregate consumption. This is denoted by the letter R .

2.5 The wealth effect is made up of two components:

- **Elasticity of marginal utility of consumption (μ):** An indicator of how an average person's wellbeing changes as their consumption changes. This is denoted by the Greek letter μ (mu).
- **Expected annual growth rate of future real per capita consumption (g):** A forecast of how the average person's consumption of goods and services is projected to change over time. This is denoted by the letter g .

2.6 Under the Ramsey formula, the risk-free discount rate is expressed mathematically as:

$$r_f = \delta + \mu g + R$$

2.7 The STPR is calculated by adding the systematic risk premium to the risk-free discount rate:

$$STPR = r_f + L$$

2.8 Table 2.A shows the values that HM Treasury uses in the calculation of the STPR. The rationale behind each of these values is discussed in the technical annexes of the Green Book Discount Rate Review 2026.²

Table 2.A Assumed values for the parameters in the STPR

Parameter	Assumed value
Pure time preference (δ)	0.50%
Elasticity of marginal utility of consumption (μ)	1.25
Expected annual growth rate of future real per capita consumption (g)	1.50%
Rare disaster risk (R)	-0.50%
Systematic risk premium (L)	1.00%

Source: HM Treasury

The risk-free discount rate

2.9 The first step in calculating the risk-free discount rate is to calculate the wealth effect. This involves multiplying together the values for the elasticity of marginal utility of consumption (μ) and expected annual growth rate of future real per capita consumption (g):

² ['Green Book Discount Rate Review: Technical Annexes'](#), Mark C. Freeman and Ben Groom, June 2026

$$\mu g = 1.25 \times 1.50\%$$

$$\mu g = 1.875\%$$

2.10 The second step is to add the value for the wealth effect to the values for rare disaster risk (R) and pure time preference (δ). This gives an estimate for the risk-free discount rate:

$$\delta + \mu g + R = 0.50\% + 1.875\% - 0.50\%$$

$$\delta + \mu g + R = 1.875\%$$

2.11 HM Treasury's estimate of the risk-free discount rate is primarily founded on the Ramsey formula. However, it triangulates this estimate with other evidence, including expert survey data, international comparisons and the SOC approach. For the SOC approach, HM Treasury takes into account the inflation-adjusted yields on government bonds. In June 2026, real yields on 10-year, 20-year and 40-year gilts were around 2%.³

2.12 Based on this triangulation, HM Treasury adjusts the risk-free discount rate upwards by 0.125 percentage points, giving a value of 2.00%:

$$r_f = 1.875\% + 0.125\%$$

$$r_f = 2.00\%$$

The systematic risk premium

2.13 The STPR approach implies a value for the systematic risk premium (L) that is around 0.50%.

2.14 As with the risk-free discount rate, HM Treasury informs its estimate of the systematic risk premium with a triangulation approach. It corroborates its estimate of L with evidence from expert surveys, international comparisons and the SOC approach. This triangulation implies a value of 1.00% for the systematic risk premium. The rationale for this judgment is discussed further in the technical annexes of the Green Book Discount Rate Review 2026.⁴

The Social Time Preference Rate

2.15 The estimate for the risk-free discount rate is added to the systematic risk premium. This implies a value of 3.00% for the STPR:

$$STPR = 2.00\% + 1.00\%$$

$$STPR = 3.00\%$$

³ ['Green Book Discount Rate Review: Summary of Findings and Recommendations'](#), Mark C. Freeman and Ben Groom, June 2026

⁴ ['Green Book Discount Rate Review: Technical Annexes'](#), Mark C. Freeman and Ben Groom, June 2026

2.16 The discount factor for a given year is calculated as follows:

$$\text{Discount factor in year } t = \left(\frac{1}{1 + 3.00\%} \right)^t$$

for years 1 to 30

Chapter 3

Discounting in appraisal

Using the discount rate

3.1 Practitioners should use the headline STPR to discount all proposals. The exception is Official Development Assistance (ODA) proposals, discussed in Paragraph 3.11.

3.2 Practitioners should not use different discount rates for different types of proposals. This is because the social value of a proposal should be reflected in the expected social costs and social benefits, rather than in its discount rate.

3.3 For example, environmental impacts should generally be appraised using the STPR. If environmental goods and services are expected to become scarcer, less substitutable, or more highly valued over time, then these effects should be reflected through estimates of future environmental values, rather than through a lower discount rate. Practitioners should therefore account for such effects through appropriate relative price adjustments and forecasts of environmental values, consistent with the relevant Green Book supplementary guidance.⁵

Discounting and risk

3.4 The future outcomes of any proposal are uncertain. Practitioners should generally reflect the possible outcomes in the expected social costs and social benefits, rather than by varying the discount rate.

3.5 Practitioners should note that the systematic risk premium (L) does not reflect any obsolescence risk that might be associated with a proposal. This is the risk that technological advances cause a proposal to become obsolete and to provide fewer social benefits than expected over the course of its time horizon. Obsolescence risk should be reflected in the proposal's expected social benefits.

3.6 Different proposals may theoretically have different systematic risk premiums. In other words, their social benefits may have different degrees of correlation with the overall economy. This means that different proposals may theoretically have different estimates for the L term in the STPR formula. Despite this, in government appraisals, practitioners should not deviate from the systematic risk premium of 1.00% and hence the STPR of 3.00%.

⁵ ['Enabling a Natural Capital Approach'](#), Department for Environment, Food & Rural Affairs, February 2026

Proposals with time horizons beyond 30 years

3.7 The standard discount rate of 3.00% declines over time. This is because there is uncertainty around the future values of the annual growth rate of real per capita consumption (g) and long-term real gilt yields, both of which are used in informing the discount rate.

3.8 When conducting an appraisal, practitioners should use a discount rate of:

- 3.00% for years 1 to 30
- 2.50% for years 31 to 75
- 2.25% for years 76 to 125

3.9 The Green Book discount rate profile is expressed in terms of forward rates, not spot rates. For example, for an appraisal with a time horizon ending in year 40, practitioners should use 3.00% as the discount rate until year 30, then 2.50% from year 31 to year 40. They should not use 2.50% as the discount rate in each year until year 40.

3.10 Many proposals have social costs and social benefits beyond 125 years. These should be taken into account in appraisal. However, discounting is not an analytically meaningful technique for social costs and social benefits that take place after year 125. Practitioners should therefore use standard social cost-benefit analysis, and the relevant discount rates, only for monetisable impacts that occur within the first 125 years of an appraisal. For social costs and social benefits that take place after year 125, practitioners should consider alternative analytical methods and discuss their approach with HM Treasury.

Official Development Assistance (ODA) proposals

3.11 The Green Book guidance on discounting may not be suitable for appraising ODA proposals. Factors such as long-term growth rates can differ significantly across countries. Consequently, for ODA proposals where social costs and social benefits primarily affect people in other countries, alternative discount rates may be appropriate. Practitioners should contact the Foreign, Commonwealth & Development Office (FCDO) for further guidance.

Discounting and inflation

3.12 Discounting is distinct from adjusting for inflation. The STPR is a real discount rate and must be applied only to values expressed in real terms, meaning that the effects of general inflation have already been removed. Practitioners should first convert social costs and social benefits into real terms and then discount them using the STPR. The inflation rate and discount rate should not be added together and applied to social costs and social benefits because this will produce a mathematically incorrect result.

Discounting historical costs and benefits

3.13 Discounting should not be applied retrospectively to costs and benefits that have already occurred. The values of social costs and social benefits do not increase simply because activities took place in the past.

Annex A

Discount factors

Table A.1 Standard discount rates and discount factors

Year	Discount rate	Discount factor	Year	Discount rate	Discount factor
0	–	1.0000	30	3.00%	0.4120
1	3.00%	0.9709	31	2.50%	0.4019
2	3.00%	0.9426	32	2.50%	0.3921
3	3.00%	0.9151	33	2.50%	0.3826
4	3.00%	0.8885	34	2.50%	0.3732
5	3.00%	0.8626	35	2.50%	0.3641
6	3.00%	0.8375	36	2.50%	0.3553
7	3.00%	0.8131	37	2.50%	0.3466
8	3.00%	0.7894	38	2.50%	0.3381
9	3.00%	0.7664	39	2.50%	0.3299
10	3.00%	0.7441	40	2.50%	0.3218
11	3.00%	0.7224	41	2.50%	0.3140
12	3.00%	0.7014	42	2.50%	0.3063
13	3.00%	0.6810	43	2.50%	0.2989
14	3.00%	0.6611	44	2.50%	0.2916
15	3.00%	0.6419	45	2.50%	0.2845
16	3.00%	0.6232	46	2.50%	0.2775
17	3.00%	0.6050	47	2.50%	0.2708
18	3.00%	0.5874	48	2.50%	0.2642
19	3.00%	0.5703	49	2.50%	0.2577
20	3.00%	0.5537	50	2.50%	0.2514
21	3.00%	0.5375	51	2.50%	0.2453
22	3.00%	0.5219	52	2.50%	0.2393
23	3.00%	0.5067	53	2.50%	0.2335
24	3.00%	0.4919	54	2.50%	0.2278
25	3.00%	0.4776	55	2.50%	0.2222
26	3.00%	0.4637	56	2.50%	0.2168
27	3.00%	0.4502	57	2.50%	0.2115
28	3.00%	0.4371	58	2.50%	0.2064
29	3.00%	0.4243	59	2.50%	0.2013

Year	Discount rate	Discount factor	Year	Discount rate	Discount factor
60	2.50%	0.1964	93	2.25%	0.0909
61	2.50%	0.1916	94	2.25%	0.0889
62	2.50%	0.1869	95	2.25%	0.0869
63	2.50%	0.1824	96	2.25%	0.0850
64	2.50%	0.1779	97	2.25%	0.0831
65	2.50%	0.1736	98	2.25%	0.0813
66	2.50%	0.1694	99	2.25%	0.0795
67	2.50%	0.1652	100	2.25%	0.0778
68	2.50%	0.1612	101	2.25%	0.0760
69	2.50%	0.1573	102	2.25%	0.0744
70	2.50%	0.1534	103	2.25%	0.0727
71	2.50%	0.1497	104	2.25%	0.0711
72	2.50%	0.1460	105	2.25%	0.0696
73	2.50%	0.1425	106	2.25%	0.0680
74	2.50%	0.1390	107	2.25%	0.0665
75	2.50%	0.1356	108	2.25%	0.0651
76	2.25%	0.1326	109	2.25%	0.0636
77	2.25%	0.1297	110	2.25%	0.0622
78	2.25%	0.1269	111	2.25%	0.0609
79	2.25%	0.1241	112	2.25%	0.0595
80	2.25%	0.1213	113	2.25%	0.0582
81	2.25%	0.1187	114	2.25%	0.0569
82	2.25%	0.1161	115	2.25%	0.0557
83	2.25%	0.1135	116	2.25%	0.0545
84	2.25%	0.1110	117	2.25%	0.0533
85	2.25%	0.1086	118	2.25%	0.0521
86	2.25%	0.1062	119	2.25%	0.0509
87	2.25%	0.1038	120	2.25%	0.0498
88	2.25%	0.1016	121	2.25%	0.0487
89	2.25%	0.0993	122	2.25%	0.0477
90	2.25%	0.0971	123	2.25%	0.0466
91	2.25%	0.0950	124	2.25%	0.0456
92	2.25%	0.0929	125	2.25%	0.0446

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HM Treasury contacts

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If you require this information in an alternative format or have general enquiries about HM Treasury and its work, contact:

Correspondence Team
HM Treasury
1 Horse Guards Road
London
SW1A 2HQ

Tel: 020 7270 5000

Email: public.enquiries@hmtreasury.gov.uk