SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Cost spent to build variation point *i* at time τ

$$c_i(\tau)$$

i = index over variation points

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Cost spent to build variation point *i* at time τ

…adjusted by a factor to account for net present value of money

$$c_i(\tau)e^{-r(\tau-t)}$$

i = index over variation points

r = assumed interest rate

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Cost spent to build variation point *i* at time τ

Expected cost summed over all relevant time intervals

…adjusted by a factor to account for net present value of money

$$E\left[\sum_{\tau=t}^{T} c_i(\tau)e^{-r(\tau-t)}\right]$$

i = index over variation points

r = assumed interest rate

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Expected costs of building variation point *i* incurred from now until time T

$$E\left[\sum_{\tau=t}^{T} c_i(\tau)e^{-r(\tau-t)}\right]$$

i = index over variation points

r = assumed interest rate

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

$X_{i,k}(\tau)$ — value of variation point *i* in product *k* at time τ

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

$X_{i,k}(\tau)$

value of variation point *i* in product *k* at time τ = $VMP_{i,k}(\tau) - MC_{i,k}(\tau)$

marginal value of the i^{th} variation point in the k^{th} product at time τ.

marginal cost of tailoring variation point *i* for use in product *k*

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable
t = time now,
T = target date
T* = modeling limit (t=forever)

…adjusted by a factor to account for net present value of money

$$X_{i,k}(\tau)\, e^{-r(\tau - t)}$$

value of variation point *i* in product *k* at time τ = $VMP_{i,k}(\tau) - MC_{i,k}(\tau)$

marginal value of the i^th variation point in the k^th product at time τ.

marginal cost of tailoring variation point *i* for use in product *k*

i = index over variation points
r = assumed interest rate
k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

...adjusted by a factor to account for net present value of money

$$\sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}$$

summed over all time

value of variation point *i* in product *k* at time τ = $VMP_{i,k}(\tau) - MC_{i,k}(\tau)$

marginal value of the i[th] variation point in the k[th] product at time τ.

marginal cost of tailoring variation point *i* for use in product *k*

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

…adjusted by a factor to account for net present value of money

Value cannot be negative

summed over all time

$$\max\left(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}\right)$$

value of variation point *i* in product *k* at time τ = $VMP_{i,k}(\tau) - MC_{i,k}(\tau)$

marginal value of the i^th^ variation point in the k^th^ product at time τ.

marginal cost of tailoring variation point *i* for use in product *k*

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

$$\max\left(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}\right)$$

value of variation point *i* in product *k* over all time

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

$$E[\sum_{k} \max(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)})]$$

value of variation point *i* in product *k* over all time…

…and over all products

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

$$p_{i,T} E\left[\sum_{k} \max\left(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}\right)\right]$$

probability that variation point *i* will be ready for use by time T

value of variation point *i* in product *k* over all time…

…and over all products

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Expected costs of building variation point *i* incurred from now until time T

$$, -E\left[\sum_{\tau=t}^{T} c_i(\tau)e^{-r(\tau-t)}\right]$$

$$+ p_{i,T}E[\sum_{k} \max(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)})]$$

probability that variation point *i* will be ready for use by time T

value of variation point *i* in product *k* over all time…

…and over all products

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Value cannot be negative

Expected costs of building variation point *i* incurred from now until time T

$$\max\left(0, -E\left[\sum_{\tau=t}^{T} c_i(\tau) e^{-r(\tau-t)}\right]\right.$$

$$\left. + \, p_{i,T} E\left[\sum_{k} \max\left(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}\right)\right]\right)$$

probability that variation point *i* will be ready for use by time T

value of variation point *i* in product *k* over all time…

…and over all products

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Value of variation point *i* over the time interval (t,T)

Value cannot be negative

Expected costs of building variation point *i* incurred from now until time T

$$v_i(t,T) = \max\left(0, -E\left[\sum_{\tau=t}^{T} c_i(\tau)e^{-r(\tau-t)}\right]\right.$$

$$\left. + p_{i,T}E\left[\sum_{k}\max\left(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}\right)\right]\right)$$

probability that variation point *i* will be ready for use by time T

value of variation point *i* in product *k* over all time…

…and over all products

i = index over variation points

r = assumed interest rate

k = index over products

SYMBOLS FOR TIME

τ = time variable

t = time now,

T = target date

T* = modeling limit (t=forever)

Cost spent to build a variation point at time τ

Expected cost summed over all relevant time intervals

...adjusted by a factor to account for net present value of money

Value of variation point *i* over the time interval (t,T)

Value cannot be negative

$$v_i(t,T) = \max\left(0, -E\left[\sum_{\tau=t}^{T} c_i(\tau) e^{-r(\tau-t)}\right]\right.$$

$$\left. + p_{i,T} E\left[\sum_k \max\left(0, \sum_{\tau=T}^{T^*} X_{i,k}(\tau)\, e^{-r(\tau-t)}\right)\right]\right)$$

Value cannot be negative

summed over all time

probability that variation point *i* will be ready for use by time T

expected value over all products

value of variation point *i* in product *k* at time τ = $VMP_{i,k}(\tau) - MC_{i,k}(\tau)$

marginal value of the ith variation point in the kth product at time τ.

marginal cost of tailoring variation point *i* for use in product *k*

i = index over variation points

r = assumed interest rate

k = index over products