Details on the bequeathing versus gifting calculator

This calculator was inspired by a reading by Stephen Horan which was part of the CFA Institute level III program [1]. Horan has provided expressions for the relative value of gifting versus bequeathing using rules regarding estate planning and gifting in the global context. His generally applicable expressions are provided towards the end of the document a calculator for those expressions are in the second tab our excel web application. Our calculator for the US specializes these general rules to estate planning regulations in the United States and is in the first tab of the excel web application.

Non-charitable Gifting in the US

Consistent with the reference cited, we use the following notation

> T_e is the estate tax if the asset is bequeathed at death; r_g and r_e are pretax returns to the gift recipient and the estate making the gift; t_{ig} and t_{ie} are the effective tax rates on investment returns on both the gift recipient and the estate making the gift; and n is the expected time until the donor's death at which point the asset would transfer and be subject to estate tax if it had not been gifted.

Further let g be the amount of the gift, let X be the estate tax exemption limit, let Y be the anticipated estate size at bequest in the absence of gifting, let A be the annual gifting limit, let I_g and I_e be the future value of the gift amount to the recipient and to the estate (if not gifted) respectively right before the donors death.

Where I_g is given by

$$I_g = g\left(1 + r_g\left(1 - t_{ig}\right)\right)^n$$

And I_e is given by

$$I_e = g\left(1 + r_e\left(1 - t_{ie}\right)\right)^n$$

If z is the value of an estate at bequest above the estate tax exemption limit then the following function provides the total amount of estate tax due

$$F(z) = \begin{Bmatrix} T_e z, z > 0 \\ 0, z \le 0 \end{Bmatrix}$$

Amounts in excess of the annual gifting limit A reduce the eventual estate tax exemption limit. The following function provides the reduction of the estate tax exemption limit on gifting

$$G(g) = \begin{Bmatrix} g - A, g > A \\ 0, g \le A \end{Bmatrix}$$

Then the bequeathed value of the estate after taxation in the event there is no gifting is given by

$$Y - F(Y - X)$$

If the amount *g* had been retained by the donor it would have constituted the amount I_e in the total estate of *Y*. Thus on gifting the pre-tax estate at the bequest is given by *Y*- I_e. Thus the bequeathed value of the estate after taxation in the event there is gifting is given by

$$Y - I_e - F((Y - I_e) - (X - G(g)))$$

The incremental value of not gifting to the after tax bequeathed estate is give by

$$I_e + F((Y - I_e) - (X - G(g))) - F(Y - X)$$

The relative after tax value of making a gift during one's lifetime compared to a bequeathing is given by the ratio of the future value of the gift to the recipient to the incremental increase in value of the post-tax estate if the gift had not been made. This is given by

$$\frac{I_g}{I_e + F((Y - I_e) - (X - G(g))) - F(Y - X)}$$

Charitable Gifting in the US

If the gifting is to a Charity then the future value of the gift to the recipient is given by following as charities are not subject to taxation

$$I_c = g(1 + r_g)^n$$

In the United States, contributions to charitable organizations are deductable up to 50% or 30% of the donors' gross adjusted income depending on their deductibility status. Details on this from irs.gov are as follows:

> **Limitations on Deductions**
> In general, contributions to charitable organizations may be deducted up to 50 percent of adjusted gross income computed without regard to net operating loss carrybacks. Contributions to certain private foundations, veterans organizations, fraternal societies, and cemetery organizations are limited to 30 percent adjusted gross income (computed without regard to net operating loss carrybacks), however. *Exempt Organizations Select Check* uses deductibility status codes to indicate these limitations.
>
> The 50 percent limitation applies to (1) all public charities (code PC), (2) all private operating foundations (code POF), (3) certain private foundations that distribute the contributions they receive to public charities and private operating foundations within 2-1/2 months following the year of receipt, and (4) certain private foundations the contributions to which are pooled in a common fund and the income and corpus of which are paid to public charities.
>
> The 30 percent limitation applies to private foundations (code PF), other than those previously mentioned that qualify for a 50 percent limitation, and to other organizations described in section 170(c) that do not qualify for the 50 percent limitation, such as domestic fraternal societies (code LODGE).

> A special limitation applies to certain gifts of long-term capital gain property. A discussion of that special limitation may be found in Publication 526, *Charitable Contributions*.

Let *D* be the donors' gross adjusted income, let *p* be the proportion of *D* which yields the maximum contribution that is tax deductable and let T_{oi} be the tax rate on ordinary income for the donor. Then the tax savings to the donor is given by

$$S(g) = \begin{Bmatrix} T_{oi}Dp, g > Dp \\ T_{oi}g, g \le Dp \end{Bmatrix}$$

Led I_d be the future value of the tax savings to the estate, then

$$I_d = S(g)(1 + r_e(1 - t_{ie}))^n$$

Then the bequeathed value of the estate after taxation in the event there is no charitable gifting is given by

$$Y - F(Y - X)$$

If the amount *g* had been retained by the donor it would have constituted the amount I_e in the total estate of *Y*. Further charitable gifting adds I_d to the pre-tax estate. Thus on charitable gifting the pre-tax estate at the bequest is given by $Y - I_e + I_d$. Assuming that a charitable gift of any amount does not reduce the estate tax exemption limit, the bequeathed value of the estate after taxation in the event there is charitable gifting is given by

$$Y - I_e + I_d - F((Y - I_e + I_d) - X)$$

The incremental value of not gifting to the after tax bequeathed estate is give by

$$I_e - I_d + F((Y - I_e + I_d) - X) - F(Y - X)$$

The relative after tax value of making a gift during one's lifetime compared to bequeathing is given by the ratio of the future value of the gift to the recipient to the incremental increase in value of the post-tax estate if the gift had not been made. This is given by

$$\frac{I_c}{I_e - I_d + F((Y - I_e + I_d) - X) - F(Y - X)}$$

Global Gifting

Horan [1] provides some general expressions for the relative after tax value (*RV*) of making a gift when living compared to passing wealth on death. For non-charitable gifting, these expressions are provided in the context of gifting which is tax free to the recipient and the donor, a gift which leads to a tax on the recipient and a gift which leads to taxes on the donor. It is assumed that the gifting is being considered by donors who anticipated estate at death exceeds a limit above which estate taxes are applied or that the donor lives in a country where estate taxes apply for estates of any size.

The relative after tax value of making a gift is given by the ratio of the future value of one currency unit to the recipient to the future value to the estate if this one currency unit had been retained by the estate. These quantities are represented by the expressions FV_{gift} and $FV_{bequest}$ in the expressions given below:

$$RV_{TaxFreeGift} = \frac{FV_{gift}}{FV_{bequest}} = \frac{\left(1 + r_g\left(1 - t_{ig}\right)\right)^n}{\left(1 + r_e\left(1 - t_{ie}\right)\right)^n\left(1 - T_e\right)}$$

When the gift is taxable to the recipient let T_r denote the tax rate at which the gift is taxable. Then the relative value is given by

$$RV_{\mathrm{Re}cepientTaxGift} = \frac{FV_{gift}}{FV_{bequest}} = \frac{\left(1 + r_g\left(1 - t_{ig}\right)\right)^n\left(1 - T_r\right)}{\left(1 + r_e\left(1 - t_{ie}\right)\right)^n\left(1 - T_e\right)}$$

When the gift is taxable to the donor let T_d denote the tax rate at which the gift is taxable. Then the relative value is given by

$$RV_{DonorTaxGift} = \frac{FV_{gift}}{FV_{bequest}} = \frac{\left(1 + r_g\left(1 - t_{ig}\right)\right)^n\left(1 - T_d + T_d T_e\right)}{\left(1 + r_e\left(1 - t_{ie}\right)\right)^n\left(1 - T_e\right)}$$

When the gift is a charitable gift then the relative value is given by

$$RV_{CharitableGift} = \frac{FV_{CharitablrGift}}{FV_{bequest}} = \frac{\left(1 + r_g\right)^n + T_{oi}\left(1 + r_e\left(1 - t_{ie}\right)\right)^n\left(1 - T_e\right)}{\left(1 + r_e\left(1 - t_{ie}\right)\right)^n\left(1 - T_e\right)}$$

Where the first expression in the numerator is the future value to the Charity assuming no taxes and the second expression is the future value of tax savings to the donor. In the calculators we do assume charities may be taxable depending on the nature of the investments they make (as is the case in the US).

Reference:

[1] Stephen M Horan. *Reading 12 in CFA Institute Level III 2014 Volume 2 Behavioral Finance, Individual Investors, and Institutional Investors*. Wiley Global Finance, 2013-07-12. VitalSource Bookshelf Online.

To return to the calculator [click here.]()